

Prioritisation and Nationalisation of Teaching of Sciences in Ugandan Schools: Practitioners and Documentary Perspectives

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Abstract: Considerable investment in and prioritisation of teaching of sciences among secondary schools in Uganda have been made. But despite this, performance in sciences remains poor. We sought to understand why this is so, and to this end, the present study explores perceptions regarding reasons surrounding students' poor performance in sciences. We used an exploratory case study to interview teachers of science, inspectors of schools, and a representative of the Uganda National Examinations Board. Also, documentary analysis was done for a deeper understanding of the study question. Qualitative analysis was employed in the identification of themes and sub-themes. In the findings, what our research suggested is that there is a combination of factors which have resulted in poor science results within schools – the quality of the teaching, the expectations and support of the school and the ability of the pupils themselves, although the quality of teaching seemed to be the major factor. Therefore, this would suggest that the teaching and learning of the sciences in Ugandan schools could benefit from adapting to new ways – teaching the necessary skills, developing the pupils' scientific

interest and skills, and improving facilities within the schools. Further inquiry could be channeled towards understanding apathy in the teaching and learning of sciences, support strategies in resource utilisation, and monitoring of the teaching-learning process.

Keywords: Priority, Academic Performance, Sciences, Teaching, Learning, Teacher-quality.

1. Introduction

Despite considerable investment in the teaching and learning of sciences among schools in Uganda, students' performance in those subjects remains poor (Kanjee & Acana, 2013; Okello, 2016; Uganda National Examinations Board [UNEB], 2017; UNESCO, 2017). Academic performance remains one of the cardinal ways of ascertaining achievement in education. In the same way, advancement in education is often thought of as the key to the transformation and progress of any country (Ghazi, Nawaz, Shahzad, Shahzada, & Rukhsar, 2013). In essence, the performance of students in schools is considered a stepping stone to prosperity (Spain, 2016; Yengimolki, Kalantarkousheh, & Malekitabar, 2015). Principally, one of the aims of education is to develop students' abilities through the accordance of a favourable atmosphere for optimal achievement in education (UNESCO, 2010; Yengimolki et al., 2015).

Particularly, progress in education, especially in sciences, is believed to accelerate a country's development (Chisman, 1984; Onanuga & Saka, 2015; Organization of the Islamic Conference, 2010). In this paper, sciences mean a parasol of subjects, including chemistry, biology, physics, and mathematics (JICA, 2012; Kabunga, Habiba, & Mnjokava, 2016). To that end, scholars are concerned with finding out what aspects influence students' academic performance and progress in sciences (De-Silva, Khatibi, & Azam, 2018; Kanjee & Acana, 2013; Yengimolki et al., 2015). That could be one of the reasons teaching and learning of sciences are prioritised among many countries. Countries in Sub Saharan Africa, including Uganda, developed policies on priority in teaching and learning sciences. However, the challenge facing education in Uganda today is the persistence of poor performance of the science subjects (Kanjee & Acana, 2013; UNEB, 2017). Focusing on school-related, teacher-related, and student-related attributes, this paper uncovers the obstacles faced after streamlining of sciences.

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Without a doubt, considerable efforts have been made in pointing the scientific evolution to the direction of the teaching and learning of sciences. This phenomenon is what is regarded as the prioritisation of the teaching and learning of the sciences in this paper (De-Silva et al., 2018). That is, investment in the teaching and learning of sciences is given priority among many, especially developing countries. Probably, investment in the sciences could have been in the hope that science would accelerate the countries' economic transformation (Onanuga & Saka, 2015). Other countries make the most of the compulsory learning of sciences for children in lower levels of their education (Japan International Cooperation Agency [JICA], 2012). Compulsory teaching and learning of the sciences, regarded as "nationalisation" in this paper, may in certain instances not necessarily yield fruitful outcomes. All the same, teaching and learning of the sciences remains, to a large extent, a priority in the developing world.

Uganda is one of the countries that implemented prioritisation and nationalisation of teaching and learning of sciences in schools. Prioritisation and nationalisation meant that the sciences were made compulsory at the ordinary level in 2002 and took effect around 2006 (Namatende-Sakwa, 2013). There is a policy now compelling all secondary schools to make sciences compulsory at the ordinary level (UNESCO, 2010; Eitu, 2015). The policy stipulates that the sciences constitute the compulsory subjects" (UNESCO, 2010). The policy is intended to help Uganda compete favourably with the rest of the world in science and technology (Namatende-Sakwa, 2013). The policy further gives incentives to students who opt to do sciences beyond the ordinary level. For instance, the student-loan scheme favours high school graduates undertaking science degrees or related careers.

Subsequently, through her Ministry of Education and Sports, the government instituted measures to uplift performance in the sciences. Science subject facilities (kits) or "boxes of science laboratory materials" were given, mostly to underserved schools – for enhancing teaching and learning of sciences (Eitu, 2015). About 5,000 science subject facilities were provided to 1,341 schools (Kyagaba et al., 2013; Kabunga et al., 2016). The facilities (kits) contained laboratory consumables and non-consumables for low-cost, practical lessons. Aside from the kits, the Secondary Science and Mathematics (SESEMAT) program was instituted to recast teachers' teaching skills and enhance the quality of teaching of the sciences (Komakech & Osuu, 2014; Musar, 1993). Further, numerous textbooks of chemistry, physics, mathematics, and biology were supplied to public schools, on top of the construction of science laboratories in a number of schools (Wetaya, 2020). So, performance in sciences could be evaluated in terms of global school facilities and resources.

1.1 Theoretical Perspective

Accordingly, this study is animated by the incentive theory. The incentive theory was initially coined by Logan in the 1960s (Yukai, 2017). Whereas the traditional theory of incentives focuses on monetary value (salaries, wages, and allowances), the contemporary theory focuses on both monetary and non-monetary incentives (Kimutai et al., 2016; Mallah, 2018). Jürges et al. (2005) contemplate that strengthening non-monetary incentives in the schooling system makes an alternative to money. Setting common standards is one way of typifying non-monetary incentives. Certainly, non-monetary incentives motivate teachers to perform well in their duty of teaching (Chantal & Andala, 2020; Jürges et al., 2005; Mallah, 2018). The latter – non-monetary incentives, is the mainstay regarding the matters of debate in this paper.

The incentive theory in this study is viewed from the perspective of science teaching-learning materials as well as the school climate for teaching and learning. It is postulated that adequate, quality teaching-learning materials, competent and motivated teachers (Jürges et al., 2005), plus a conducive atmosphere enable performance in the sciences. On the other hand, inadequate, poor quality teaching-learning materials, incompetent and demotivated teachers, and unconducive school climates disable performance in sciences (Ssekamwa, 1996). Indeed, studies show that introducing incentives can enhance academic performance (Mallah, 2018; Sansgiry, Chanda, Lemke, & Szilagyi, 2006). Removing incentives, on the other hand, impairs performance. Therefore, the incentive theory serves in examining the obstacles to performance in the sciences. According to the theory, giving incentives to teachers is beneficial in such ways as instilling a culture of academic improvements, propagating and enabling achievement of set goals (Sansgiry et al., 2006).

1.2 Purpose of the Study

Regardless of strategies put forth in streamlining teaching and learning of the sciences, performance in the sciences has remained dismal. Students have continued to perform at low levels in the sciences (UNEB, 2017). In view of that, there was an increasing and consistent trend in failure rates in the performance of sciences for students at ordinary levels over the period of 2010, 2011, and 2012 (UNESCO, 2017). In academic years 2015 and 2016, UNEB reported a declining performance in the science subjects. Consequently, the percentage of students attaining passing levels for all science subjects in 2016 remained low, and only 45% attained minimum passing levels (UNEB, 2017). Without a doubt, performance in the core science subjects remains very poor (Habaasa, 2019). In the 2005-2008 period, students who scored grades A, B, and C in the sciences at advanced level was 10% of the total number of students sitting for exams in these subjects (Okello, 2016). In 2012, nearly 50% of the Uganda Advanced Certificate of Education candidates with science combinations were unable to obtain a pass in at least one subject (Ssenkabirwa, 2013). Against that background, we sought practitioners' accounts of the dismal performance of the science subjects.

1.3 Research Questions

In understanding practitioners' perspectives and in comparison with documentary analysis, the study asked a number of questions that sought to unpack school-related, teacher-related, and student-related attributes of dismal performance in the sciences. The first research question asked:

- What teacher-related attributes could be associated with performance in sciences?
- What are school-related attributes that facilitated underperformance of the sciences?
- What are the student-related attributes responsible for the underperformance of the sciences?

Responses to these questions painted a picture of the impediments surrounding prioritisation and nationalisation of sciences in Uganda. Moreover, these questions were developed into themes in the methods, which helped in interrogating the study subject in detail.

2. Methodology

This section discusses the research methods adopted for the study: the research design, participants and the selection of participants, method of data collection, data management, and analysis.

2.1 Research Design and technique

This study employed a qualitative approach with an explanatory case study to tap into the rich knowledge of experienced education practitioners. The qualitative approach was used for data collection and analysis. The explanatory case study was used to understand the "why" of poor performance, despite the investment in teaching and learning of sciences (Baxter & Jack, 2008; Yin, 2003). The explanatory case study further brought insights from different but important cases together and made meaning out of them.

2.2 Participants

The participants were five purposely selected practitioners in education. They constituted two inspectors of schools (Inspector 1 and Inspector 2), one facilitator at the Uganda National Examinations Board (UNEB1) and a former teacher as well, and two teachers of sciences. The inspectors of schools were selected based on their experience in serving the school inspectorate for many (more than ten consecutive) years before the time of interviews. Hence, the inspectors were selected on the basis of their extensive and intensive knowledge of school milieus. As former teachers, they had extensive knowledge of the teaching and learning process, school administration and management, and school infrastructure. The UNEB facilitator was considered on the basis of long experience in the management of secondary school assessments. The teachers of science were considered on the basis of their experience with the school science system. For instance, the fourth participant, Teacher 1, was practising as a high school teacher of biology and chemistry, who had formerly taught in a high performing school and was currently serving in a low-performing school. Moreover, she was an examiner at the level of the national examination. Similarly, the fifth

participant was a practising chemistry teacher in a low performing school. All categories of participants have been regarded as practitioners in this paper for clarity purposes.

2.3 Data collection techniques

In-depth interviews and documentary reviews were the data collection strategies. The study was conducted from July 2019 to September 2020. In observance of the COVID-19 restrictions, some of the interviews were conducted electronically. Participants UNEB1, Inspector 1, Inspector 2, and Teacher 2 were initially requested to partake in the study via phone call (Maramwidze-Merrison, 2016). Alerting them enabled quick consent and scheduling of the interviews. Telephone interviews were conducted at agreed-upon times (Salmons, 2018) and recorded using a smartphone and written notes. Teacher 1 was requested to participate using phone calls and then interviewed face-to-face. All interviewees consented to participate in the discussion of the subject. We thank the interviewees for taking time off their business to respond to the interviews.

2.4 Data management and analysis

Raw data from the recorded interviews were transcribed using Microsoft Word. The transcripts were coded using open and axial coding. In open coding, data were categorised and conceptualised, while axial coding looked for the underlying logic among the data categories (Huang Z, Ouyang, Huang X, Yang, & Lin, 2021). Initially, the transcripts were compared with the written notes to ensure accuracy and consistency. First, we familiarised ourselves with the data through reading and re-reading the interview texts. Categories were then created to make a corresponding framework with the respective research questions. The categories were teacher-related, school-related, and student-related obstacles to performance in the sciences. The data analysis then followed. Content analysis was used (Beck, 2003) as guided by the research questions. A detailed discourse was developed while identifying themes and sub-themes. Patterns and relationships among the interviews were identified, and the final synthesis of the ideas was produced using quotes (Kawulich, 2015). The final codes were aligned to their themes and verbatim quotes categorised as compelling. Following advice from qualitative research experts, categorising compelling quotes was based upon their ability to inform and add perspective to identified themes and sub-themes.

3. Presentation of Results

This study interrogated practitioners' views and related documents regarding concerns after prioritisation and nationalisation of the teaching of Sciences in Ugandan schools. Interviews were conducted with practitioners, while documentary reviews considered documents related to policy and guidelines regarding teaching and learning of sciences (see table 1 below). The practitioners were school inspectors, school teachers, and a UNEB facilitator. Using thematic content analysis, three themes arose; teacher quality (TQ), school situations (SS), and student aspects (SA). Five issues (subthemes) arose related to the above themes. A number of outstanding issues (subthemes), as reflected in the compelling quotes, were identified during the analysis. These were teacher competence, efficiency, morale, instructional materials, school climate, students' interest, and deprivation.

Table 1: Documentary Review about Prioritization and Nationalization of Sciences in Secondary Schools

Document Reviewed	Evidence To Show Priority of Sciences	Evidence Regarding the Study Aims
^a Handbook on teacher/instructor/tutor education and training policies, 2010	+Programs e.g., SESEMAT, to enhance the teaching of sciences and mathematics in secondary schools and other institutions; education regulatory bodies	Emphasises quality of teachers ¹
^b Education system in Uganda	+provision of construction materials for secondary schools and other institutions + Improving the teaching of sciences and mathematics +Education regulatory bodies	+Making the teacher (of sciences) ² central in education system +Government's provision of facilities for teaching
^c Uganda National Commission for UNESCO-Report on Popularization of sciences, 2017	+Emphasis on strengthening science education-raising investment in science +Enhancement programs like SESEMAT	+Low science teacher enrolment +Several causes of poor performance in the sciences
^d World data on education. UNESCO report, 2010/2011.	+Emphasis on science and technology +Description of restructuring of secondary school sciences +Reviews the role of different government departments and commissions in streamlining teaching and learning	+Putting the learner in the central position of benefiting from education +Retooling of teachers
^e Education in Uganda-David Scanlon	Improving [secondary] school infrastructure	+Teacher education +Teachers' associations to improve standards of teaching of sciences
^f Implementing education policies in Uganda-Cooper F. Odaet, 1990	+Facilities for teaching and learning of sciences, teacher – training +Improving teaching conditions	+shortage of science teachers

3.1 Teacher quality

Quality remains a significant element in the success of an educational enterprise. As a result, the teacher-element featured most in the discussions about the study subject. Indeed, to a large extent, emerging themes pointed to TQ as the overarching concern. Participants think in terms of divided attention on the teachers' side, perhaps due to lack of certain incentives. Three outstanding concerns point to teacher competence, inefficiency, and morale. As UNEB1, Inspector 1, and Teacher 1 concurred, some teachers are not competent, and others had no morale to put enough time in directing their learners. According to Inspector 1, teachers of sciences were lacking ability, as captured in the quotation below:

They are teachers not by choice but by circumstances, driven by 'what shall I benefit from the system', not 'what shall I contribute to the system?'. [There is] no professionalism; learners are not a priority to teachers, no time to nurture learners' interest, because the same teacher was not nurtured. Also, they have wrong perceptions and uncultured beliefs that sciences are hard, (and) for boys, etc. [Inspector 1].

From the caption above, teachers' incompetence could probably have been inherently from a historical, negative perception of teaching as a profession. All the same, the perception by Inspector 1 sounds like the belief of Inspector 2. The argument by Inspector 2 points to poor grounding in their teaching subjects. Moreover, incompetence to Inspector 2 was a "cousin" to teachers' inefficiency.

Half-baked graduate teachers [interviewer interjects for elaboration]. Now you find that teachers get training but are not fully grounded. You find a teacher who has a diploma and starts teaching. But they are supposed to teach the ordinary level! They are not fully grounded, yet they are requested to teach advanced levels where they are not fully grounded. They begin to gamble around...If they upgrade, they will not teach advanced-level content properly because they are not fully grounded [Inspector 2].

So, in regard to the excerpt above, apparent apathy to teaching seems to create a foundation for poor grounding in training. In turn, inadequacy in qualifications could have been part of the problem, to an extent. Nevertheless, with or without the necessary competence and qualifications, other factors could influence the way teachers behave in the execution of their teaching roles. That is in connection with Inspector 2's reminiscence about the mischievous behaviour of teachers:

Yes, science teachers are stubborn. And they go at will and part-time. You find that headteachers have no control over those teachers. In fact, in almost all schools, internally teachers organise to have said three days at one school. Other days are for part-timers. In the second instance, some schools have no adequate teachers for sciences, yet headteachers cannot control the ones that are part-timers. In one of the schools I inspected, I found that a teacher of physics and mathematics had given the school one day per week, as he was a full time somewhere else [Inspector 2].

Probably, and in the image of the caption above, inadequate resources and remuneration could have accounted for the floundering and moonlighting among the teachers of science. Teacher 2 concurs with that perception:

The time given to students by teachers is not enough! You find that a part-time teacher in two schools cannot give students much time. As much as teachers teach those [students] in class, they don't have time to follow up or engage students in revisions or even in practical (lessons). [Teacher 2]

In underscoring the aspect of insufficient concentration on science concepts and giving inadequate attention to learners' concerns, Teacher 1 thought about the rapid sprouting of private schools – the education sector in Uganda is partly public and partly privatised. Teacher 1's perspective seems to reflect on increasing demands on science teachers' workload in the advent of the ever-growing number of private schools. She thought that preparation of lessons and attention of teachers to individual students suffered at the altar of competing demands:

You find that teachers are very busy and have not paid attention to students. There is a lack of attention because teachers run here and there, especially science teachers, are so on their own demand. So, the government employs them here in a government school, but they have to divide the time to go and run to private schools to earn some side income. Therefore, they don't sufficiently prepare students and have no time to take them to the laboratory...and they are not there to give attention to individual students to understand their difficulties... So ...at the end of it all sciences are not passed as you would expect, ... even when the teacher is there.[Teacher 1].

In addition to inadequate attention of teachers to learners, Teacher 1 shared a similar view with Inspector 1, regarding teachers' erroneous labelling of sciences as "hard" to accomplish. Teacher 1 opines:

Even a teacher has never known that he can teach a student and a student gets a distinction. He has never done it and feels it is impossible. So sometimes this teacher tells students that you know sciences are hard and you will not pass them because he has never realised a distinction but a teacher who is well remunerated wakes up, his mind is well focused with learners and his job performed well compared to teachers who are poorly remunerated. [Teacher 1].

However, despite Teacher 1's sceptical viewpoint regarding labelling of sciences as "hard", she believed science teachers joined the teaching career with zeal and got frustrated along the way. The frustration Teacher 1 referred to could constitute part of the gaps in emoluments and other rewards earlier identified in the preceding excerpts. So to Teacher 1, the below-par rewarding system may perhaps breed frustration and consequently inefficiency in the career:

Well, I may not know, but they may join with some positive attitude. When you reach in the field they get frustrated because like I have told you if a teacher is willing to teach. Still, he is teaching in a school where there is no laboratory [and instead] there is something like a store where they put some things (apparatus and reagents) with no access by students, the teacher will not teach well...if you come

to teach. There are no payments in the school, your morale will definitely go low, and you are teaching this student who also has a feeling that sciences are hard... Oh! that is remuneration and the attitude of a teacher. When a teacher is well remunerated, he knows he is getting food allowances, breakfast is there, there is PTA [Parents', Teachers' Association allowance] also added on a government salary, they settle, they pay individual attention to learners, they teach positively, and so they give much of the time to students. The schools where teachers are not well remunerated tend to lose morale, and their self-esteem is low. [Teacher 1].

In light of the perspectives of the practitioners in education, documentary review findings were paradoxical. It appears that most of the reviewed documents in Table 1 show that teacher standards and quality were by policy to be taken as a priority. In a contradictory tone, the same documents decry below the line standards of science teachers. The perceptions and reviews regarding teacher-quality resonate among inadequate grounding or science teachers' ill mastery of the subject material, inadequate attention to the teaching demands, and bias or unfavourable perception of teaching as a profession. Therefore, the combined power of these and other possible forces – such as school-related obstacles, clamps down the original purpose of prioritisation and nationalisation of the sciences.

3.2 School situations and facilities

Capital facilitation to schools relies heavily on the schools' ability and gameness in the productive conversion of the facilitation into academic and other forms of output. The engagement with stakeholders and indeed documentary review in this study alludes to that. Estimable discussion in the interviews rotated about school facilities - perceived improper usage of instructional materials, deficiency in supervision, and the gaps between high-performing and low-performing schools. In the interviews, participants generally believed that the quality or standard of schools immensely influences students' perceptions and achievement in the sciences. As regards the use of reading materials, UNEB1 evoked; "If you visit schools in the countryside, you will find books and other provisions gathering dust in the head teacher's office or store". Similarly, Inspector 1 believed that performance in the sciences was about "resources at play", "poor prioritisation in budgeting process", and "...of course poor learning environment". [UNEB1]. The aforementioned perceptions are not far from those of Inspector 2, in thinking that schools do not put the resources provided by the government to effective use:

...in fact, last term, we inspected [X] and [Y] districts. We found school materials were vandalised. Some laboratory tables were turned into beds for students to sleep on. Taps and other materials (in the laboratories) were really in bad shape (interviewer interjects). That is what I told you earlier on. Teachers use them but cannot always access them. You find they do not use the materials frequently. [Inspector 2]

The thinking above regarding gaps in the maintenance of science infrastructure seems to put both schools and teachers in the limelight of mismanagement of science facilities. Further, it resonates with earlier assertions that teachers could be caught in the conspiracy of science facility mismanagement. Although the quotations below speak directly to the teachers, they bear underlying connotations regarding lack of supervision of teaching or schools' inability to adequately equip science teachers with appropriate skills in using science facilities effectively. Indeed, Teacher 2 thought there was minimal use of the science kits as distributed by the government. It was thought that teachers did not put to use the available science facilities, for practice for example. Teacher2 explains:

Yea, we use the kits during normal lessons for demonstrations. It is not in practice unless the students want to come back for extra explanations. Like us [at the school] we give the candidates, especially senior four the apparatus to handle and prepare for examinations. [Teacher 2]

From the excerpt above, it seems teachers mind about time factor in the delivery of concepts, and indeed in using science facilities. Alternatively, there could be intense pressure on them to complete the syllabi, of course, at the expense of learners' understanding of subject concepts. That

thinking is reflected in Teacher 1's opinion, which also speaks about teachers' improper use of science kits. Also, and as in the preceding excerpt, there could be indirect irresponsibility among schools in facilitating and monitoring use of science equipment.

Aha! I would comment that they are not properly used (science kits) because, as I earlier told you, the teachers don't pay attention to the learners... And as I told you the teachers are always rushing out, they don't encourage students to enter laboratories for practical and in sciences, if the practical part is lacking, the results are not realised... teachers have neglected that part of practical teaching- they don't open laboratories for students. [Teacher 1].

As compared to practitioners' perspectives regarding school facilities, most documents reviewed in Table 1 imply that it was a matter of policy or guidelines that schools were facilitated materially. Most documents reviewed envisioned "strategic" investment in schools to stimulate teaching and learning of sciences. However, from the excerpt of the interviews with practitioners regarding improper use and/or the rotting infrastructure, the investment in schools could not make any significant impact. It seems the policy on school investment remained on paper in certain circumstances, or schools did not put the facilities to reasonable use. Further, it seems the government stopped at the provision of facilities without necessarily following up to ensure schools used and benefited from such facilities. So, it could have been a matter of omission in the supervision of the strategic investments made in the schools. The latter is strongly supported, as it connects with practitioners' accounts regarding poor usage of facilities among schools. All the same, those thoughts and reviews regarding school situations given the performance after prioritisation and nationalisation of the sciences mirror schools' sloppiness in supervision and management of the science facilities. Further, it seems in instances where supervision and management may not be a problem, thoughtful incentives to stimulate the use of the facilities remained undelivered. Nevertheless, such improper usage of school facilities seems to offer a ramifying effect that goes to influence the way students thought about the sciences.

3.3 Student aspects

Students' interest, bias, and deprivation were also underpinned as obstacles to the prioritised teaching and learning of sciences. Although the interviewees thought about students' interests as inherent, most of the discussions point mainly to external stimuli as influencing students' mindset regarding science subjects. As Teacher 2 recounts, "children get bias right from senior one that sciences such as chemistry are hard". Teacher 2 continues when asked about students' interest vis-à-vis compulsory sciences: "Yeah, children are not interested [in the sciences]. Based on this school, they do not ask even if they don't understand-they just keep quiet." However, UNEB1 and Teacher 1 think students' family background and earlier experiences own a share in the poor perception of the sciences. According to UNEB1, "Some students are haunted by personal/ home [background factors]". In related thinking, Teacher 1 reasons in terms of students' preconceived mentalities that sciences are not possible in certain schools:

There is another reason as to this kind of abstinent feeling that sciences are hard. The sciences, especially in third world schools, those small...schools, those other USE[universal secondary education] schools I think because of the families those students come from- the background, they have a feeling science are hard, and they just approach sciences with that fear... Yeah with that fear and that bias and so if a student is already biased that sciences are hard and they know that nobody can pass mathematics because in that school nobody had ever got a distinction, they will not pass because you will be teaching students who will be already biased and so they will not pay attention and they will not take it important. (Teacher 1).

In the quotation above, Teacher 1 negates that sciences in 'big' schools performed well and that it is students in the lower category schools that have a negative perception towards the sciences. Thus, "third world schools" imply schools in the lowest ranking. Further, "USE" refers to "Universal Secondary Education". With help from the government, the latter schools have education at an ordinary level for free for students from unable families.

The document regarding UNESCO-Report on Popularisation of sciences points to a complex of impediments to teaching and learning of the science. Deep analysis of the document points indistinctly to students' apathy towards the sciences. Other documents have nothing much to say regarding students' perception as an obstacle to the performance of sciences. Most likely, the low tone regarding students' perception of sciences as an obstacle could presumably imply that students' perceptions stem from teacher and school factors. Ostensibly, intensifying and transforming school resources and teacher quality could bear some multiplier effect on pupils' perception of the sciences.

4. Discussion of Findings

This study considered the state of affairs relating to the aftermath of prioritisation and the nationalisation of sciences. The focal area was the persistent poor performance of students in the sciences, despite the government's efforts to prioritise and nationalise the teaching and learning of sciences. Interviews and documentary reviews were the techniques used in this inquest. The findings mirror performance in the sciences among secondary school students as an amalgam of teachers', schools', and pupils' dynamics. In addition, the outcomes put the teacher in a central position as regards the impediments of pupils' performance in the science subjects. The participants' arguments and documentary scripts reviewed in this study acclaim that teachers' efforts vindicate the earlier premise of the incentive theory. Thus, the incentive theory is mirrored in the perspective of teachers as one of the central determinants of performance in science subjects. Also, the documentary review discovered that the government effort of empowering teachers to amplify teaching of science was contravened by the interview results showing general ineptness among the teachers.

Participants' ideas that science teachers have a stake in students' performance echo the common stance that teachers play a central role in students' achievement in sciences. According to UNEB (2017), there is still evidence of largely theoretical teaching of the sciences, despite significant efforts by the ministry of education and sports to facilitate schools with laboratory materials and equipment. The perception regarding the role of teacher competence in the achievement of students in sciences is non-peculiar. In a related study, Eitu (2015) concluded that teachers used mainly teacher-centred methods in the delivery of content and that using science kits did not significantly impact the performance of teachers in the core sciences. Similar to what the interviewees in the present study asserted regarding unskilled teachers of science, the paltriness could be attributed to the sporadic nature of the skills of the science teachers. Nevertheless, Prasertcharoensuk, Somprach, and Ngang (2015) found that teacher competency was a predictor of students' learning. Identically, De-Silva et al. (2018) and Ekabu, Kalai, & Nyagah (2018) revealed that teachers' incompetence, low morale, and inefficiency predicted poor learning outcomes. In their study to investigate teachers' competence and performance, Sultan and Shafi (2014) posit that job competence of teachers predicted improvement in academic achievement. Likewise, (Nbina, 2012) found a significant relationship competence among teachers and achievement in the subject of chemistry.

As Prasertcharoensuk et al. (2015) posit, teachers' competencies are essential in improving the quality and hence performance of students. However, the study findings allude to the direction that a supportive school atmosphere could be necessary in addition to teacher attributes. In view of the present study findings, literature advocates a supportive school climate for teachers to perform to their full potential (Jürges et al., 2005). However, the over-aching question radiates from the teachers' failure to perform to the optimum, despite the facilitation of the schools with materials and facilities. It seems investment in the provision of teaching-learning materials without complimentary elevating the other resources and school management vouches for apposite response to the concern above.

Nonetheless, the participants' perceptions regarding a supportive atmosphere sanctify the earlier views in the literature that adequate, quality teaching-learning materials amplify teachers' competence and motivation (Jürges et al., 2005). Without a doubt, a blend of the quality teaching force and appropriate school facilities form a catalyst rather than a crutch in students' academic performance. So, aside from the impetus of the monetary gains, the mainspring of the teachers'

morale and quality remains non – monetary incentives. After all, it is documented that non – monetary incentives motivate teachers to perform well in order to gain reputation or acceptance from colleagues, parents, and students (Jürges et al., 2005; Mallah, 2018).

Results particularly point to availability and proper usage of instructional materials and clear school climate as essential in terms of high-performance levels in the sciences. Despite these claims, the extent of performance in facilitated over non – facilitated schools remains to be established. All the same, the perceptions once more point to the incentive theory in asserting that performance in the sciences relies on the availability and utilisation of the teaching-learning materials and school climate. Nevertheless, the interview discussions claim that some of the schools noticeably vandalise learning materials and other infrastructure provided instead of putting them to use. That, of course, is unfortunate as it works against the aims of improving students' performance in the sciences. It is further detrimental to the already scarce resources not provided to the schools and could be a demoralising force to teachers.

While the government was astute in providing teaching-learning facilities, some schools mainly lack complementary basic facilities. Further, it is possible that other schools do not have facilities at all. Nonetheless, it is opined that the provision of school facilities relates to better educational outcomes (Figueroa et al., 2016). Indeed, student – performance is determined by a host of school-related factors, school climate included (Sultan & Shafi, 2014). And the claims in this study reflect previous research in positing that school climates in developing countries remain rudimentary, as the already scarce basic facilities are not put to good use (Figueroa et al., 2016; Ross & Lewin, 1992). Further, inadequate utilisation of the instructional resources probably frustrates students' morale regarding the sciences.

Other studies indicate that in addition to teachers and school climate, students' interest plays a crucial role in determining their performance in the sciences (Kabunga et al., 2016). These observations echo previous studies (e.g. De-Silva et al., 2018) that students' attitude forecasts their performance in science subjects. The central view, in this case, remains that adequate scholastic facilities and their good usage serve to externally motivate students towards the sciences. Therefore, the idea of students' interest in the sciences taps profoundly into the incentive theory of academic performance (Sansgiry et al., 2006). Essentially, the role of the incentive theory in explicating educational interest is two-pronged. Accordingly, incentives – in this case, adequate scholastic facilities and their use serve to initiate a mentality of excellence and commitment to the science subjects (Sansgiry et al., 2006). However, in the event that the facilities are not in place or not put to effective use, academic performance apparently will be influenced in the opposite.

In sum, it is believable in the current debate that adequate, quality teaching-learning materials, competent and inspired teachers (Jürges et al., 2005), and a conducive school climate enable positive outcomes in the sciences. On the other hand, inadequate, poor quality teaching-learning materials, incompetent and demotivated teachers, and a conducive school climate enable poor performance in sciences. Therefore, investing only in one aspect of teaching and learning sciences and leaving the other uncovered aspects seems trifling.

5. Conclusion and Recommendation

Viewed in a mirror, the ideas in this study reflect an interplay of several factors in the low achievement of students in the sciences. Apart from underdeveloped teaching skills, the teachers have material gain, not the students at heart. Teaching and learning resource utilisation and management are partly responsible for creating a poor learning environment. Further, there is a mentality, unfortunately at times fueled by teachers, that the sciences are difficult. However, these observations are made in consideration of the limitations of the present study. The conclusions in this paper build on interviews with just but a few of the stakeholders in education. There could be a good chance, for instance, that the ideas obtained from the interviewees only reflect subjective perceptions. Based on the above conclusion, the following recommendations were made:

- The teaching and learning of sciences in Uganda could benefit from and adapt to new ways, technologies, methodologies, and skills for better scholarly results.

- Teachers of science, in particular, could be supported in learning and adapting to emerging ways and skills that allow students to enjoy and own their learning, make their own choices, and increase their inner interest in the sciences.
- Also, the subject of study deserves carrying forward in devising more extensive procedures investigating the same.
- A further understanding of the interior and exterior determinants of apathy in the teaching and learning of sciences would support strategies in resource utilisation, monitoring, and renewal.

6. Implications for Further Research

The ideas obtained from the interviewees only reflect subjective perceptions, as the sample was small. It is necessary that subject of study is carried forward in devising more extensive techniques. A quantitative or a combination of empirical methods could be necessary. A further understanding of the disharmony in the strategies regarding science teacher empowerment and the teachers' inept performance could be necessary.

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There are no competing interests to declare. However, Aloysius Rukundo coined the study concept and designed the interview guide. He was involved in data collection, transcription, analysis, reporting, and discussion of the results. Athanansio Bashaija collected, transcribed, and participated in coding and analysis of the data. He participated in writing the discussion of the results. We are grateful to Ms Linda Talbot for her generous support in language-editing the paper. Your time and effort are deeply appreciated. Further, we are indebted to the participants who contributed generously to this paper.

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