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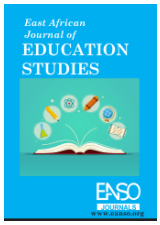

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Original Article

Challenges to Attainment of Secondary Education Curriculum Objectives in Preparing Students for Industrialisation in Nyamagana District, Mwanza, Tanzania

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Challenges, Curriculum, Competence-Based Curriculum, Secondary Education Curriculum Objectives, Industrialization.

ABSTRACT

This study specifically explored the challenges that hinder the attainment of secondary education curriculum objectives towards preparing students for industrialisation in Nyamagana District, Mwanza, Tanzania. The study employed a mixed research method under a convergent parallel design. A sample size of 119 was drawn from a population of 44,448 using both probability and non-probability sampling. The sample included 47 teachers, 64 students, 5 heads of schools, 1 ward education officer, 1 district education officer, and 1 school quality assurance. Questionnaires were used to collect data from students and teachers, while an interview guide was used in data collection from the heads of schools, the school quality assurance, the ward education officer, and the district education officer. The tools were obtained through a pilot study and the correlation coefficient of 0.81 demonstrated that the instruments were reliable for data collection. Quantitative data collected was coded using descriptive statistics with the help of Statistical Package for Social Science (SPSS), version 20, and then presented in tables, figures, frequencies and percentages. Qualitative data was analysed thematically and presented in narratives. The study found that the attainment of curriculum objectives in preparing students for industrialisation is hindered by inadequate use of ICT tools and computers, poor medium of instruction, inadequate teachers, and shortage of school infrastructure. Therefore, the study recommends that the government should reform the curriculum, strengthen the media of instruction, invest in science and technology, improve school infrastructure, and introduce entrepreneurship and technical subjects to secondary schools.

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INTRODUCTION

The increased advancements in global technology continue to necessitate the development of human capital is inevitable. The attainment of economic growth and industrial progress depends much on the nature of human capital available because human capital is the engine for the attainment of industrialisation (Project, 2013). As such, various countries are struggling to improve their education curricula to ensure it prepares learners to move according to the needs of the world of industries (Ndalichako, 2014). Therefore, for the proper development of human capital, a well-developed and relevant education is needed to equip learners with competencies and innovativeness. A curriculum structured according to the needs of society, resources available, and world technological changes are of the essence. Onyango and Tangi (2020) describe a curriculum as a syllabus that consists of a specific course of study, a specific time to be utilised, and is designed for a certain group of people. Therefore, a curriculum is important in enhancing the rate of literacy and expertise in different professions, especially in the industrial sector.

In Singapore, Lee (2019) observes that the school curriculum is connected to industrialisation. The curriculum prepares students to become creative, promote technological advancement, become competent in their workplace, pursue self-employment and compete ably in the world market. Further, Singapore's secondary education curriculum equips students with competencies in self-management, responsible decision-making, innovation, critical thinking, and information skills through applied subjects such as entrepreneurship, business, game development, and 3D animation, all of which enable students to compete in a globalised and industrial world (Lee, 2019). As such, Singapore has ensured that learning facilities such as classes and laboratories are advanced to give students a better understanding of scientific concepts and mastery of skills (Ling, 2016).

In Scotland, Armstrong (2014) notes that a new curriculum, commonly known as Curriculum for Excellence, was introduced. The curriculum helps students to translate what they are learning into real-life situations, thus developing their life skills and competitive skills that help them pursue self-employment.

According to Udofia (2018), in 2005, Nigeria, under the National Council on Education (NCE), was directed to review the curriculum in response to cope with the Millennium Development Goals, National Economic Empowerment Development Strategy and Vision. The NCE devised a new senior secondary curriculum with subjects like computer science, electronics, general metalwork, woodwork,

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clothing and textile, auto mechanics, and basic electricity aimed at equipping learners for future self-employment and industrialisation.

Moreover, Acayo (2013) shows that the education curriculum in Uganda was inherited from the British after independence in 1963. Nevertheless, gradual reforms have been effected on the Ugandan education curriculum, the most prominent of which was the revision of the secondary school curriculum by the Ugandan National Curriculum Development Centre (NCDC) in 2012 and its implementation in 2014. Therefore, the new curriculum reduced core subjects and increased practical training and computer programmes to equip students with skills needed for computer technology and industrialisation (Acayo, 2013).

In Tanzania, the history of the curriculum can be traced back to the independence of Tanganyika in 1961, which was adopted from the colonial rule period. Over the years, several reviews have been made to improve the country's secondary education system and to match it with the Millennium Development Goal and Tanzania Development Vision 2025, which seeks to make Tanzania an industrialised country by the year 2025 (Ndalichako, 2014). These reviews were undertaken in 1962, 1963, 1967 and 2005 and have seen a shift from content- to a competency-based curriculum. The aim of these reforms has been to inculcate in learners abilities of self-study, self-confidence, and self-advancement in new frontiers of science and technology, academic, occupational knowledge and skills. These skills and competencies are directly linked with industrialisation and the development of technology as they promote entrepreneurship and innovativeness (Tanzania Institute of Education, 2010; Athuman, 2019).

Apart from all these reviews and reforms, the objectives of the secondary education curriculum in Tanzania have not been attained. Indeed, a high percentage of secondary school students exhibit low problem-solving skills (61%) and low self-control (37%) (UNICEF, 2018). Moreover, Munishi (2016) and Ndalichako (2014) report that the problem of having incompetent and unskilled graduates has its roots in primary and secondary levels, where students are less trained to become self-confident and self-driven in new frontiers of science and technology. It is on this basis the study explored the challenges hindering the attainment of secondary education curriculum objectives in preparing students for industrialisation in Nyamagana District, Mwanza, Tanzania.

LITERATURE REVIEW

The structure of Observed Learning Outcome (SOLO Taxonomy) theory, introduced by Biggs and Collis (1982), guided this study. The theory is based on the fact that structural competence increases with increased student learning. Therefore, learning becomes qualitative when details are combined in a structural pattern. At the highest level of students' understanding, a student should be able to generalise integrated aspects into new domains and evaluate, predict, create, reflect different related concepts, and transfer ideas into other related circumstances (Ilguy, Fisekcioglu & Oktay, 2014). According to the SOLO Taxonomy theory, for the attainment of educational objectives, a well-prepared curriculum is needed to help students realise their full potential.

Shah, Khan and Ellahi (2019) undertook a study in Pakistan on redesigning curriculum in line with industry human capital demand. The study found that curriculum implementation is affected by political disturbances and decisions made based on political rather than professional reasons. The study, therefore, recommended the establishment of an independent education body and curriculum matrix that equips students with technological competencies, capabilities, new knowledge and skills for self-actualisation and industrialisation.

In addition, Buabeng (2015) studied the implementation of ICT in learning, focusing on

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Ghanaian secondary schools using descriptive statistical analysis to analyse data. The study identified a problem of content coverage among teachers who did not prefer to use ICT in teaching. Moreover, there was too much focus on grades at the expense of developing inquiry-based and student-centred teaching approaches. As such, the education system tended to muzzle students' interests and competencies in the subjects and make it difficult for them to apply what they learned to their life. Therefore, the study proposed to improve innovation and creativity in teaching to enrich the intended competencies of students.

Musasia, Abacha and Biyoyo (2012) investigated the effect of practical work in physics on girls' performance, attitude change and skills acquisition in Kenya's secondary schools. The study involved students transitioning from Form Two to Form Three using experimental design. They pointed out that skills and knowledge taught in class are irrelevant to industrialisation. The study proposed the need for the curriculum to align with the goals of industrialisation.

Further, Ziganyu (2010) did a study on factors affecting curriculum implementation in secondary schools in Kakamega South District, Kenya. The study used interview guides and questionnaires as research instruments. The findings revealed that the effective implementation of secondary education curriculum is hindered by factors related to human resources, such as understaffing, incompetence and alcoholism and drug abuse among teachers. Other factors noted included the shortage of school infrastructure and political influence on education issues. Therefore, the study recommended that the government, NGOs and other education stakeholders should ensure the availability of competent human resources through proper staffing and in-service training.

Nguru (2010) did a study in Iringa, Tanzania, to investigate factors determining the performance of schools. The study found that the lack of laboratories and related facilities, among other school infrastructures, was a hindrance to the attainment of industrialisation through education since learning emphasised more on theoretical than practical knowledge. The same challenge has been identified by Abubakar (2012), who opines that the shortage of classes and laboratory facilities poses a challenge to quality teaching and learning. Both Nguru and Abubakar propose the need to have well-equipped and standard infrastructures as a prerequisite to effective teaching and learning for the attainment of industrialisation.

Furthermore, Rwehumbiza (2018) undertook a study on preparedness and implementation of the compulsory science curriculum in public secondary schools in Bukoba District Council, Tanzania. The study used a mixed research approach. The findings revealed that, despite having good curriculum objectives, the compulsory science curriculum is poorly implemented due to teacher incompetence, shortage use of ICT, overcrowded classes, and high teacher-student ratio, among other factors. Therefore, the study recommended the need to increase funding for schools to support the building of more infrastructures.

METHODOLOGY

The study employed a mixed research approach. The study was undertaken in Nyamagana District, Mwanza, Tanzania. The study deployed a convergent parallel research design because it allows the use of various research instruments in data collection and analysis. Both probability and non-probability sampling techniques were used to sample 119 respondents from a population of 44,448. The sample comprised 47 teachers, 64 students, 5 heads of schools, 1 ward education officer, 1 district education officer, and 1 school quality assurance. Both a questionnaire and an interview guide were used to gather data. The questionnaire was administered to students and teachers, while in-depth interviews were conducted with school heads, ward education officers, district

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education officers, and school quality assurance officers. Quantitative data was coded using descriptive statistics with the help of Statistical Package for Social Science (SPSS), version 20, then presented in tables, frequencies and percentages, while qualitative data was analysed thematically and presented in narratives.

RESULTS AND DISCUSSION

Challenges Hindering the Attainment of Secondary Education Curriculum Objectives

The study sought to determine the challenges hindering the attainment of secondary education curriculum objectives in preparing students for industrialisation. Teachers and students were asked to give their views on the challenges hindering the attainment of the secondary education curriculum. A five-point Likert scale was used to assess the views as follows: 1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = Disagree, and 5 = Strongly Disagree. The findings were as indicated in *Table 1*.

Table 1: Teachers' Views on Challenges Hindering Attainment of Secondary Education Curriculum Objectives

Statement	1	2	3	4	5
I use computer-assisted ways of teaching like projector, animation, and video	-	-	-	35(74.5)	12(25.5)
We are enough teachers in relation to students to impart to them with needed skills	-	-	21(44.7)	26(55.3)	-
Practical activities are part and parcel of my teaching methodologies	-	11(23.4)	30(63.8)	6(12.8)	-
The school has a computer lab	-	-	-	34(72.3)	13(27.7)
The school has enough classroom	-	11(23.4)	30(63.8)	6(12.8)	-
The school laboratory has enough apparatus	-	11(23.4)	13(27.7)	23(48.9)	-
The school has a library	-	15(31.9)	11(23.4)	21(44.7)	-

***Source**: Filed Data (2022)*

The study results in Table 1 indicate that 74.5% of teachers disagreed there was no use of computer-assisted teaching and learning, while 25.5% strongly disagreed with the statement. This implied that most public secondary schools did not use computers in teaching and learning activities. Therefore, there was little integration of science and technology elements in the daily learning process, which in turn limits students' abilities to develop interests in science and technology. Past studies have shown that the integration of technologies in education makes students innovative and competent in science and technology. The findings of the study agree with those of Buabeng (2015) that most of the teachers in secondary schools do not use ICT in teaching. As a result, students fail to develop interest and competence in science subjects and find it difficult to apply technology in learning and other aspects of life.

The findings in Table 1 also show that 44.7% of respondents indicated neutral responses, while 55.3% disagreed with the statement that there are enough teachers in relation to students in their schools. This showed that the secondary schools studied did not have enough teachers. In achieving curriculum objectives, an optimal teacher for students is crucial for quality learning and

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achievement of educational objectives. These findings were in support of Ziganyu (2010), who observed that the effective implementation of secondary education curriculum is hindered by various human resource factors, including under-recruitment and incompetent teachers.

Furthermore, the findings in Table 1 show that 23.4% agreed, 63.8% were neutral, and 12.8% disagreed that practical activities were part and parcel of their teaching methodologies. These findings suggested that it is unclear if teachers engaged students in practical activities to enhance students' mastery and application of curriculum content. As one interviewee affirmed, "in our school, most of our teachers are still using teacher centred method which cannot allow students get involved in practical learning, and this has caused many students to lack creativity after completing secondary education" (Personal Communication, Interviewee V, May 2022). These findings imply that in most secondary schools, students are not involved in practical activities since most teachers use lecture methodology. This kind of teaching denies students the chance to explore materials and see the application of the learned materials.

The above findings are in line with those of a study conducted by Rwehumbiza (2018), which showed that inquiry-based teaching approaches are the best way to enable students to explore materials and be free to give out their views. This idea has been emphasised by Musasia *et al.* (2012) who found that a lack of practical work means that students fail to acquire skills and knowledge relevant to industrialisation. Therefore, there is a need for teaching methodologies that prepare students to contribute to industrialisation. Indeed, the Structure of Observed Learning Outcome theory suggests that students need to practice and learn more about their own learning in order to become self-directed learners (Newton & Martin, 2013). Practical teaching helps students master content easily.

Concerning if schools had computer labs, 72.3% of the teachers disagreed, while 27.7% strongly disagreed. These figures show that most schools did not have computer labs. A computer lab is necessary for schools because digital technologies are critical to the development and contemporary workplaces. The findings reiterated the view by Ziganyu (2010) that the shortage of infrastructure for teaching and learning affects the implementation and achievement of curriculum objectives. In the words of one interviewee, "in our district, we do not teach our students computer literacy and other related technical subjects" (Personal Communication, Interviewee S, May 2022). Therefore, the lack of computer labs and computer education limits the attainment of curriculum objectives towards industrialisation.

The respondents were also asked to state if schools had enough classrooms. The results in Table 1 show that 23.4% of teachers agreed, 63.8% were neutral, and 12.8% were against the statement. From these results, it is evident that in some of the studied schools, insufficient classrooms were still a challenge. This was supported by an interview who had this to say:

> *The big challenge we see when visiting schools is inadequate infrastructure, for most classes, you may find a school has a large number of students compared to the number of classes. This has caused teachers not to meet the need of students as required* (Personal Communication, Interviewee S, May 2022).

Shortage of classes affects teaching and learning processes. It impairs the impartation of relevant knowledge and skills for industrial development. This is supported by Nguru (2010) who points out that a deficiency of classrooms leads to overcrowded classes and ineffective learning. Similarly, Abubakar (2012) opines that a shortage of classes limits teaching and learning.

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Moreover, the study found that most schools had science laboratories. However, many of the laboratories lacked important apparatus. From the results, 23.4% of teachers agreed, 27.7% indicated neutral, and 48.9% disagreed with the statement. Therefore, the study found that laboratories were not sufficiently equipped to expose students to practical industrial skills. These findings concurred with those of Nguru (2010) that the lack of well-equipped laboratories in most schools means that students engage more in theoretical than practical learning. Laboratory apparatus assist teachers in teaching practically, thus helping students to learn by doing, which is important for preparing human capital for industrial works. Studies have also shown that practical lessons make students self-directed with less reliance on the teacher (Ilguy *et al.*, 2014).

The study also examined if schools had well-equipped libraries to support learning. The results in Table 1 show that 31.9% of teachers agreed that their schools had a library. Moreover, 23.4% responded neutral, and 44.7% disagreed with the statement. These findings suggest that many schools in the study area did not have libraries. Affirming this view, one of the interviewees said, "Our school has a library, but the problem is insufficient learning resources in the library, and this has been affecting the effort towards the attainment of curriculum objectives" (Personal Communication, Interviewee X, May 2022). Similarly, Abubakar (2012) has revealed that most secondary schools in Tanzania have a shortage of infrastructure such as libraries for learning.

Students were asked to indicate the challenges that hindered the attainment of curriculum objectives towards the attainment of industrialisation. Their views were rated on a five-point Likert scale, as presented in Table 2.

Table 2: Students' Views on Challenges Hindering Attainment of Secondary Education Curriculum Objectives

Statement	1	2	3	4	5
My school has enough classes	-	16(25.0)	39(60.9)	14(21.9)	-
My school laboratory has enough apparatus	-	-	18(28.1)	29(45.3)	17(26.6)
My school have a computer lab	-	-	-	39(60.9)	25(39.1)
My school has enough teachers in all subjects	-	-	20(31.2)	32(50.0)	12(18.8)
I am involved in practical activities at school	-	-	19(29.7)	30(46.9)	15(23.4)

***Source**: Field Data (2022)*

The results in Table 2 show that 25% of students agreed, 60.9% were neutral, and 21.9% disagreed with the statement that their respective schools had enough classes. This implied that most of the studied secondary schools did not have sufficient classrooms. This finding was confirmed by one interviewee as follows: "Infrastructures have much to do with the performance of students, but the problem with our schools have scarcity of infrastructures, and most of them are dilapidated" (Personal Communication, Interviewee D, May 2022). Therefore, most secondary schools did not have sufficient infrastructures, including classrooms, to support effective learning and attainment of curriculum objectives. These findings were in support of Abubakar's (2012) observation that the scarcity of classes is a hindrance to better teaching and learning in Tanzania.

Further, on the availability of well-equipped laboratories, the results in Table 2 show that 28.1% of students rated the statement as neutral, meaning they were not aware that the laboratories had sufficient apparatus. Meanwhile, 45.3% disagreed, and 26.6% strongly disagreed with the statement.

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These results implied that in most secondary schools in Nyamagana District, science laboratories did not have sufficient apparatus. These findings aligned with those of a study conducted by Rwehumbiza (2018), which revealed that, though most secondary schools have laboratories, they lack facilities to support practical lessons in science subjects. As a result, most students are unable to master the subject content sufficiently.

The results in Table 2 further show that 60.9% of the students disagreed with the statement that their schools had computer laboratories. Moreover, 39.1% strongly disagreed with the statement. These findings suggested that in most secondary schools in Nyamagana District, there were no computer laboratories. As such, students in these schools did not learn computer skills, which is important for industrial development. During the interview, one of the key informants had this to say:

> *In our district, we do not have even a single school with a computer lab or a school that teaches computer studies. Although, the government insists, and the curriculum indicates that computers must be taught in schools to keep pace with the growth of science and technology* (Personal Communication, Interviewee D, May 2022).

The results showed that computer studies were not taught in most schools in the district. Computer skills are crucial in preparing students to contribute to industrialisation through technological innovations. Students who are highly skilled in computer literacy can also adapt to various changes in their everyday world.

Additionally, Table 2 shows that almost all schools involved in this study had a scarcity of teachers. From the findings, 31.2% of the students indicated neutral, while 50% of them disagreed, and 18.8% strongly disagreed with the statement that their schools had enough teachers for all subjects. Therefore, most of the schools under study suffered from a shortage of teachers. This was supported by one of the key informants in an interview as follows:

> *In secondary schools, teachers are not enough, especially science teachers. You may find a school with only one science teacher teaching from form one to form four as a result no effectiveness in teaching and students complete form four with inadequate knowledge and skills in science subjects which are crucial for industrial development* (Personal Communication, Interviewee S, May 2022).

Another interviewee had this to say: "we have a shortage of teachers compared to the number of students, especially currently where the rate of enrolment is high because of fee-free education" (Personal Communication, Interviewee X, May 2022). Similarly, Project (2013) found that the shortage of teachers is among the factors limiting the attainment of curriculum objectives in secondary schools. As such, without sufficient teachers, the endeavour to realise industrial development through education becomes a mirage.

Moreover, Table 2 presents students' responses on the state of practical teaching and learning activities in their respective schools. As indicated, 29.7% indicated they were neutral, 46.9% disagreed, and 23.4% strongly disagreed with the statement that they were involved in practical learning activities at school. This implied that students in most of the schools were not exposed to practical learning experiences to enhance their understanding and skills. The finding agreed with those of Said, Friesen and Al-Ezzah (2014), which showed that students are not involved in practical work due to a shortage of technical support, lack of equipment for practical work, and time constraints owing to an overloaded curriculum.

CONCLUSION AND RECOMMENDATIONS

Based on the findings, it is clear that secondary education curriculum objectives are not attained due to the lack of sufficient teaching and learning

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resources, content overload, poor infrastructures, and curriculum design that prioritises theoretical more than practical learning. Further, most schools experience a shortage of computers, libraries, classes, laboratories and teachers. These challenges hinder the attainment of curriculum objectives of preparing students to contribute to the country's industrialisation.

It is recommended that the government should commit to reforming the entire system of secondary education in Tanzania. The reform should focus on curriculum review and improvements in the provision of instructional resources. There is also a need to translate instructional materials from English to Swahili since it was observed that most teachers could hardly express themselves in English. Furthermore, the government should increase budgetary allocation to education to support the development of school infrastructures such as classrooms, laboratories, computer laboratories and libraries. Moreover, the government should invest in science and technology, especially ICT for education, to enable teachers and students to enrich their teaching and learning experiences. On their part, secondary schools must insist on education for self-reliance by promoting subjects such as agriculture, animal husbandry, woodwork, mechanics and computer studies. These subjects also have a direct bearing on the country's industrial economy. Lastly, there should be a high investment in human educational resources, especially in the area of management of education, to allow innovation and creativity in the management of schools.

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