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International Journal of
**Educational Administration and
Policy Studies**

December 2022
ISSN: 2141-6656
DOI: 10.5897/IJEAPS
www.academicjournals.org



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Full Length Research Paper

The implementation of complementary subjects for English Course in teacher training institutes

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Received 31 August, 2020; Accepted 8 June, 2022

In 2007, some curricular changes of teacher training system were initiated in Mozambique with teacher training course model 10+1. The changes included the teaching of English together with other new subjects that required the training of teachers capable of implementing them to meet the needs of primary education curriculum. In order to examine the implementation of the curricular changes in primary teachers' institutes, an in-depth study was conducted with attention paid to the integration of complementary subjects for English course at Chicuque teacher-training institute, using a qualitative study. Data were collected through in-depth interviews and document analysis. During the fieldwork, qualitative data were initially analysed through manual methods of coding, clustering and summarizing. At the later phase, electronic methods were used for data processing in Word and Excel software. The personnel's qualifications, specialization and position were used as the criteria for inclusion of 37 participants involved in curriculum design, Education management and teachers of English in primary schools based on a non-probability and purposive sampling technique. The results indicated that curricular change in study has never been implemented owing to the flaw found in the policy formulation. This article claims that if the curriculum itself is designed with omissions of key guidelines, it will be unlikely to have an effective implementation and suggests a deep evaluation of teacher training policies to review the study plan of the English Course for primary education.

Key words: Teacher training, curricular changes, implementation, policy formulation.

INTRODUCTION

The educational system in Mozambique comprises six educational subsystems out of which the teacher training is the fifth subsystem as listed in Art. 9 of Law 18/2018 of December 28. The teacher training for basic education takes place at the Teacher Training Institutes, which are divided into two categories: state institutes called IFPs and private colleges called EFPs, but both run the same training curriculum delivered and monitored by the

Ministry of Education as the central body. Since 1975, when Mozambique became independent from colonial system, the teacher training policies and practices have changed along the time and a few studies have shown that the training models change overtime alongside with the curricular reforms (Passos, 2009; Matavele, 2016; Carita et al., 2017). Thus, in 2007 a new one-year training model was introduced in order to meet the needs

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of English teaching within the new curriculum for basic education (MINED, 2006) and the potential candidates were those students who finished grade 10 of general secondary education (Decree 41/2007 of May 16), hence it is commonly shorthanded as model 10+1. This study is mainly concerned with the implementation of the curricular changes in primary teachers' institutes focusing on the realisation of complementary subjects for English course at Chicunque teacher training institute (CTTI), as one out of nineteen state institutes where the training course model 10+1 is still in force (MINED, 2018). The change consisted of a set of about five proposed subjects to be integrated in the English course training (Table 1). The curricular change under study was proposed in the training syllabus designed by the National Institute of Education Development (INDE) under the Ministry of Education. It was formed in a top-down or centralized perspective by the government policy-planning organization, giving it a form of mandatory implementation instrument to the training institutes. The top-down approach adopted for designing the teacher training syllabus seems to be appropriate since in Mozambique there is a single public agency responsible for designing educational programs for teacher education (Sabatier, 1986).

For Wolman (1981), policy formulation process starts with the conceptualization of the problem by policymakers. Thus, the need of trained teachers for English teaching in primary schools was the problem identified before the formulation of the new curriculum for basic education introduced in 2004, which comprised English as new school subject to be taught from grade 6 (MINED, 2003). Then, the policymakers conceived the course model 10+1 as policy response that could in short term deliver higher number of graduates into Education system. The implementation of new educational policy depends mainly on how teachers as implementers are prepared to put it into practice (Chaudhary, 2015). That is, if teachers lack appropriate training on complementary subjects for English course, the implementation of the proposed subjects will be unlikely to take effect. This article seeks to share the findings of a qualitative study conducted in the scope of curriculum implementation. The study aimed to examine the implementation of curricular changes in primary teachers' institutes focusing on the materialisation of the policy of integrating complementary subjects in the English course model 10+1 at Chicunque teachers' institute in Inhambane Province. As defined by the central body, the major purpose of the curricular change was to equip the graduates of English course with teaching methodologies of other subjects along with English since they are expected to teach the proposed subjects as required by the primary education curriculum. Curriculum implementation is one of the phases of the entire curriculum development process (Roselli, 2005). It is the operational phase where the political decisions in form of

teacher training syllabus are realized. Therefore, it has been expected that at implementation stage the teacher trainers as implementers would put into practice the integration of complementary subjects for English course and quality control could be granted to provide an opportunity of making necessary adjustments to the training process; but through this study it could be found that neither the subject integration nor the quality control has been made. This reveals a gap in the implementation process owing to lack of clear guidelines on how the complementary subjects should be executed.

Available literature on policy implementation provides two theoretical traditions as foundation to this study, namely the *Top-down* and *Bottom-up* approaches represented by scholars like Van Meter and Van Horn (1975), Nakamura and Smallwood (1980), Mazmanian and Sabatier (1983) cited in (Guro, 2009). The top-down corresponds to centralized power (authority) and bottom-up corresponds to the decentralized power (democratic). In this perspective, Fullan (2012) highlights the flaw of centralization in its side of over control and decentralization for being prone to chaos. In the same vein, Pulzl and Treib (2006) state that Top-down models put their main emphasis on the ability of decision makers to produce unequivocal policy objectives and on controlling the implementation stage. Bottom-up critiques view local bureaucrats as the main actors in policy delivery and conceive implementation as a negotiation process within networks of implementers (pp. 2-3).

Furthermore, scholars point out that implementation and policy formulation are inter-dependent processes (Pulzl and Treib, 2006). Jansen (2003) quoted by Guro (2009) adds that "the relationship between policy and practice is not a linear, rational and predictable process" (p.23). Thus, the present study finds its theoretical support in this view point because the way the training curriculum is implemented at bottom level (teachers' institutes) is dependent on how that policy instrument has been designed by the top authority. Even though the actual teacher trainers' experiences qualifications and indicators of academic ability or subject-matter knowledge appeared to be good enough for their job, they do not know how to effectively integrate the complementary subjects since the course syllabus (policy) provided no strategies of how the complementary subjects should be executed and this seemed to be the critical design flaw. This study was guided by two major questions: How do primary teachers' institutes implement the policy of integrating complementary subjects in the English course? How can the policy implementation impact the teaching practices in primary schools? By taking a qualitative study approach, it was hoped that an in-depth understanding could be gained of how specialists of curriculum design, education managers and teachers of English in primary schools perceived their work experiences in connection with the implementation of curricular changes in teachers' institutes for primary

education. This study can be considered of great relevance since its outcomes can provide the body of policymaking with an indication of what could be improved in the formulation of teacher training policies with particular reference to training teachers of English for primary education in Mozambique. Besides, it also updates information on teacher training in Mozambique such as the effectiveness of the cyclical curricular reforms, which have been reported in the previous studies conducted by scholars like Matavele (2016), Carita et al. (2017), Beutel et al. (2011), Guro (2009), Passos (2009) and Mucavele (2008). A few of these studies have made an accurate diagnosis of problems in the implementation of teacher training policy, but none have explored the factors behind the non-integration of complementary subjects into English course and its impact on the quality of education. Moreover, this study pays special attention to the training model 10+1 which delivers higher number of graduates estimated in 4644 applicants trained in 19 teachers' institutes (MINED, 2017) than 942 from the concurrent model 10+3.

A conceptual background is herein provided with the discussion of the key concepts of this study, namely; the teacher training in Mozambique, curricular changes in teacher training system and curriculum implementation as follows: Teacher training is defined by Mozambique's Law 18/2018 of December 28 (Art.16) as a subsystem of education aimed at: ensuring an integral training of teachers, enabling them to hold responsibility of educators and train children, youth and adults; conferring teachers, a consistent general scientific training, psycho-pedagogical, methodological, ethical and deontological training; and offering a training that stimulates a reflexive, critical and active conduct in accordance with the social reality. An overview of the beginning and evolution of teacher training policies and practices in Mozambique since 1975 has been made in three previous studies by Passos (2009), Matavele (2016) and Carita et al. (2017). Therefore, this article is not intended to trace back all the curriculum changes made in teacher training, but it highlights the changes since the national independence in 1975, Mozambique has experimented over 21 different teacher training 'models' without reaching an ideal model (Beutel et al., 2011). Guro (2009) added that "the change from one training model to another has not had a follow-up or a thorough evaluation to determine the strengths and weaknesses of the previous models" (p.6). These remain true until today, because since 2018, two models of teacher training have taken place simultaneously; one model with one-year duration and another one with three years (MINED, 2018). This study is interested in the earlier model 10+1 introduced in 2007.

Regarding the curriculum changes, Passos (2009) points out "two common reasons in teacher education. One is the need to conform to political changes and another is the need to improve the quality of teaching" (p.33). Passos further explains that in 1975, changes

were introduced in Mozambique to adjust to new policies and goals in education, but in recent years, the main reason for change has been to improve the quality of education. The current legal framework of teacher training is established under the Law 18/2018 of December 28, which establishes that training for all education subsystems will thereafter be imparted in specialized institutions, and defines the general goals for this training as follows: to integrally train teachers, providing them with solid scientific, psycho-pedagogical and methodological skills as well as the ability to continuously develop them. The Law 18/2018 of December 28 defines six levels of teacher training, to wit: for pre-school, for primary education, for secondary education, for technical and professional education, for adult education and for higher education. Each of these levels has its training institution, access requirements and the target degree to teach. However, the focus of this study is on the second level for primary education with much attention on the initial training model 10+1 rather than in-service and continuing training. The initial teacher education has a major part to play in the making of a teacher because it marks the initiation of the novice entrant to the calling and as such has tremendous potential to imbue the would-be teacher with the aspirations, knowledge-base, repertoire of pedagogic capacities and human attitudes (Kumar, Chapter 6 in Manichander, 2016). Effectively, teacher performance is a major factor in school success and a good performance of the teacher depends to a large extent on his training whereby the most important part "of the entire process of teacher education lies in its curriculum, design, structure, organization and transaction modes, as well as the extent of its appropriateness" (Kumar, Chapter 6, in Manichander, 2016, p.152). This is where the phenomenon in study was identified, that is, the implementation of the English course guidelines was brought into question because its design and structure appeared not articulated.

The term 'curricular change' will be used in this article as interchangeable with curricular innovations, curricular reforms or curricular development, which is defined as planned, a purposeful, progressive, and systematic process of creating positive improvements in the educational system (Alvior, 2014). When changes or developments happen around the world, the school curricula are affected, hence there is a need to update them to address the current society's needs. Curricular reforms are not new and occur worldwide. So, in 2004, the new basic education curriculum was introduced in Mozambique (MINED, 2003), comprising new subjects including English for the 3rd cycle of primary education and required trained teachers of English and other new subjects. Because of the innovation in primary education curriculum, the teacher training curriculum in Mozambique had to be adjusted to this new reality, and in 2007 a new training model 10+1 was introduced,

consisting of two optional courses: regular course and English course with complementary subjects such as Crafts, Musical Education and Visual Arts (MEC, 2006). Each of these courses consists of several compulsory training subjects which trainees are required to complete for graduation. This study aimed to examine how the curricular innovation of integrating complementary subjects in English course of teacher training has been implemented and the reason why it has been implemented in that way. It also attempted to identify its possible effect on the teaching practices in primary schools in accordance with the new curriculum of basic education.

Curriculum implementation refers to the stage when the curriculum itself, as an educational programme, is put into effect. Kumar (2016) and Chaudhary (2015) explain that the term “entails putting into practice the officially prescribed courses of study, syllabuses and subjects” (p.984). It consists of putting into practice an ideal programme or set of new activities and structures for the people expected to change (Fullan and Stiegelbauer, 1991). In other words, policy implementation is a process whereby people put in practice the norms, regulations, policy and decisions taken by policymakers. In Mozambique, the main strategies to implement the new curriculum for basic education are teacher training, teachers’ upgrading and the expansion of primary schools. This study is concerned with the implementation of the policy changes designed for teacher training model 10+1, mainly for the English course because research has shown that “innovations are seldom implemented in the classroom in exactly the same way developers had intended” (Elmore and Sykes, 1992, p.42). The realisation of curriculum implementation depends on a number of factors that influence a successful implementation. Chaudhary (2015) puts forward the following factors: resource materials and facilities, the teacher, the school environment, culture and ideology, instructional supervision and assessment. One more element could be added to the range of factors above listed and that is ‘curriculum formulation’ because if the curriculum document is flawed in its design, it will be unlikely to have an effective implementation. This belief is supported by Guro (2009) and Malen and Knapp (1997) when they state that in general, failure of policy implementation is due to badly designed policy which is also influenced by economic and political reasons in developing countries.

MATERIALS AND METHODS

Two methods were used for data collection in this study: one was *in-depth interview* to gather primary data and another was documentary analysis seeking secondary data from government publications. Despite the limitations of in-depth interviews as pointed out by Kothari (2004), this method was adopted for its merits and flexibility, and, more importantly, being this a small-scale study, individual interviews were conducted with a small number of

respondents to explore their experiences, perceptions and the thoughts they have on the implementation of the curricular change proposed to integrating complementary subjects in the English course delivered in teacher training institutes. It allowed the author to get large amounts of data for later interpretation as “the theoretical roots of in-depth interviewing are in what is known as the interpretive tradition” (Kumar, 2011, p.151). In addition, *documentary analysis* was used when access to informants was denied at the National Institute of Education Development (INDE) and at Education inspectorate in Inhambane respectively. Johnson (1984) further states that “the lack of access to research subjects may be frustrating, but documentary analysis of files and records proved to be a valuable alternative source of data for the study” (p.23). Thus, key documents such as the teacher training syllabus and primary education programme were asked from senior officials of Education and both were designed by the INDE under the Ministry of Education. This study was carried out in the first term of 2020 at Chicupe Teacher Training Institute (CTTI) sampled from a pool of 19 teachers’ state institutes (MINED, 2018) which follow the same course model 10+1. The site selection was based on a judgemental or purposive sampling technique within a non-probability sampling design (Martella, et al., 2013 cited in Molapo and Pillay, 2018). The first reason for choosing this study site was the fact that the CTTI is the author’s work place and as local teacher trainer he wanted to find out why the training policy seemed to be unaligned with classroom practice. The second reason was the belief that the homogeneous features of the training curriculum used at CTTI could provide commonalities and patterns of the occurrence of the phenomenon in other institutes running the same training course model. According to Daniel (2012) purposive sampling of population is done on the basis of their fit with the purposes of the study and specific inclusion and exclusion criteria. Thus, the selection criteria used in this study for interviewing informants were people’s qualifications, specialization and position they hold in the assumption that these traits aggregate value to their acquaintance with the central phenomenon. A few procedures were followed for this study to be accomplished: first, the submission of permission letter and the research credential gave room for the accomplishment of this study, to have access to the study sites, approach the study population and set an interview schedule with 37 participants including two specialists of curriculum design working at the National Institute of Education Development, five heads of departments in Education management working at the National Directorate of Teacher Training, at Provincial Directorate of Education and Human Development, at four District Offices of Education, Youth and Technology, at CTTI and 30 teachers of English in primary schools in Inhambane Province. The data confirmation, approval, validation and accuracy were ensured by transcription of interviews which were then shared with participants. Since this study aimed to examine the procedures of curriculum implementation process, the data analysis was made within interpretive framework of analysis (Kumar, 2011) in which qualitative data expressed in words, descriptions, accounts, opinions and feelings were converted through coding, clustering and summarizing to make analysis (Miles and Huberman, 1994). The process of data analysis was made through manual coding of qualitative data (Lofland, 1971; Bogdan and Bilken, 1982) for both in-depth interviews and documentary analysis since this was a small-scale study (Bell, 2005) and then processed in Word and Excel software.

RESULTS AND DISCUSSION

The principal aim of this study was to examine the implementation of the curricular changes in primary teachers’ institutes, focusing on the integration of

complementary subjects for English course at Chicuque teacher-training institute. Research has demonstrated that various factors play a role in the effective implementation of curricular changes (policy). Alghazo (2015) presents first, factors related to the teaching process such as instructional materials and strategies, teachers' expertise and their training in this area as well as the teaching approaches. Second, factors related to the learning process such as individual differences of learners, their linguistic and educational backgrounds, their expectations, their use of language learning strategies, and above all their motivation to learn, to mention just a few. Third and last, but not least, contextual factors such as institutional constraints and policies also play a great role in this regard. Institutional variables include the curriculum structure and design, the choice of teaching materials, the timing of lectures and the availability of instructional aids and facilities that teachers can make use of in their teaching. This study is concerned with the last type of institutional factors (that is the curriculum structure and design) that affect how the training of primary school teachers takes place in the TTI. The data analysis yielded the findings in alignment with the major themes that can be inferred from the study questions.

Curriculum implementation

It was found that the teacher training institute of Chicuque has not implemented the curricular change of integrating complementary subjects into the English course and the reason behind the implementation failure is the error found in the curriculum formulation, that is, the planning agency designed the Curricular Plan of Teacher Training for Primary Education which integrates the study plan of English course. Within the curricular plan it is proposed that the English course training should integrate complementary subjects whose language of instruction is Portuguese to enable the future teachers of English to also teach these subject in primary schools where a single teacher deals with all the subjects of a certain grade including English from grade 6 onward. However, the same planning body did not put forward the integration mechanism possibly by creating an appropriate slot in the study plan. This omission is regarded in this study as the critical flaw which made the proposal of complementary subjects to fail in its implementation because it had no implementation strategy. This applies to eighteen more teachers' institutes that follow the same training model 10+1.

This finding could be regarded as a response to the gap of knowledge found in previous studies on how the teacher training institutes implemented the curriculum changes by giving no attention to the policy of English course. Guro (2009) explored the relationship between policy and practice like the present study; his research aimed to determine how the learner-centred approach

and interdisciplinary approach was implemented in one of teacher training institute, but no attention was given to the implementation of the new subjects including English, as the interest of the present study. Another study carried out in 2008 by Mucavele discussed the phenomenon of curriculum implementation, which is also tackled in this manuscript. However, while the previous study aimed to examine the implementation process of the new basic education curriculum in Mozambique in order to ascertain how the intended curriculum changes were being operationalized, the present study aims to examine the implementation process of the teacher training curriculum in attempt to find out whether or not the policy of integrating complementary subjects in the English course is implemented, and then ascertain the associated factors. The correlation between the two studies is that, one investigates the curriculum implementation in the downstream of Education system (bottom up approach) and the other examines the same phenomenon in the upstream (top down approach) and both studies are concerned with the effect of curriculum changes in the primary education for achievement of the goal of improving Education quality in Mozambique.

Impact of curriculum implementation

The study showed that the curricular change examined has not been implemented and the graduates finish their training without the required competence to teach the proposed subjects. This may reveal that the issue of 'competence to teach' is put at stake as Medley and Shannon (1994) highlight that a competent teacher should possess two kinds of knowledge, knowledge of subject matter and professional knowledge, and training programmes are developed to help students become competent in this sense. Thus, the effect of the error found in the policy formulation on implementation process is that, since the policy designer (central authority) did not predict the implementation strategy or a mechanism of how the innovation of complementary subjects should be executed, as a result, the intended innovation was not realised by the downstream implementers.

Lack of coherent training policy

It was found that the curricular plan for English course is not aligned with its course plan and the teaching programme in primary schools. Research had reported the lack of a coherent teacher training policy in Mozambique and this finding came to confirm the phenomenon.

Curriculum formulation

The study discovered that the curricular plan (syllabus)

Table 1. Comparison of the curricular plan used for teacher training and primary education.

Areas(Department)	Subjects taught at Chicuque TTI	Complementary Subjects taught in Primary schools
Communication and Social Sciences	Mozambican languages and Bilingual Education Methodology	Mozambican languages and Bilingual Education
	Teaching Methodology of Portuguese language Communication Skills	Portuguese --
	Teaching Methodology of Social Sciences	Social Sciences (History, Geography)
	Teaching Methodology of Musical Education	Musical Education
	English Course subjects: Teaching Practice, Speaking, Writing, Reading, Listening, Language Use, English Language Teaching - Methodology Plus Sciences of Education	English Language
Mathematics and Natural Sciences	Teaching Methodology of Mathematics	Mathematics
	Teaching Methodology of Natural Sciences	Natural Sciences (Biology, Physics and Chemistry)
Practical Activities and Technology	Teaching Methodology of Visual Arts (Fine Arts)	Visual Education (Fine Arts)
	Teaching Methodology of Crafts	--
	Teaching Methodology of Physical Education	Physical Education
	Introduction to Research methodology and ICTs	--
Sciences of Education	Basic Concepts of Building, Maintenance and School Crops	--
	Psychopedagogy	
	School Administration and Organisation Teaching Methodology of Moral and Civic Education	Moral and Civics Education

Source: MINED/INDE (2003; 2006).

for English course contains an error in its formulation. The discovery came to light during the documentary analysis of the curricular plan for basic education and teacher training curriculum. One of the official documents analysed in this study is the Curricular Plan of Teacher Training for Primary Education which integrates the Study Plan of English course. The plan covers four departments namely: Communication and Social Sciences; Mathematics and Natural Sciences; Practical Activities and Technology and Educational Sciences as detailed in Table 1. A thorough reading of this document shows that the Study Plan of the English Course has no slot to integrate the complementary subjects of Block 3 which are proposed in the same document as curricular innovation, except four other subjects whose medium of instruction is Portuguese namely; the Teaching Methodologies of Moral and Civic Education, Mozambican languages, Psychopedagogy and School Administration

and Organisation. These subjects are delivered in the first term of the course not as integrated part of the curricular innovation. In other words, the complementary subjects that were proposed intending to meet the primary school needs are given no room during the training in favour of other subjects that are regarded as minor in the English course all in accordance with the design of the training curricular plan. From the context described above, it can be perceived that the issue of complementary subjects was only proposed in the policy design by the policymaker (INDE), but the same entity did not suggest the integration mechanism possibly by creating an appropriate slot in the Study Plan. As a result, the curricular innovation is deemed as failure of policy formulation which poses great challenges to the new generation of teachers who take the training model of 10+1 because they finish their training with a gap of knowledge of the teaching methods for the subjects they



Figure 1. Qualifications of teachers of English in Primary Schools of Maxixe City.
Source: Study data, 2020.

are directed to teach soon they graduate in a clear incoherence of the training policy and teaching practice in primary schools. The policy incoherence is depicted in a top-down comparative analysis between the curricular plan of teacher training and curricular plan for Basic Education in Primary schools (Table1) to see if they match one another. Through this comparison, it could be noticed that since the teachers of English are directed to teach every primary school subject, they are in fact, subject to teach without the required qualifications because the subjects listed for their training in English do not include every primary school subject. Chaudhary (2015) says there are various factors that influence curriculum implementation as presented in the introductory section above; however besides those factors, this study puts forward one more element of curriculum formulation, that is, if the curriculum design contains critical guideline omissions as described above, it may not have an effective implementation like the policy innovation investigated in this study. This standpoint is also supported by Malen and Knapp (1997) when they argue that in general, failure of policy implementation is due to badly designed policy influenced by economic and political reasons in developing countries.

Teachers' qualifications

This study found that there are teachers with no training for teaching and other trained ones who teach subjects out of their training areas, as illustrated in Figure 1. Looking at both categories, the trained and untrained teachers become unskilled staff to teach complementary subjects together with English in primary schools because they had no previous exposure to the teaching methodology of those subjects. This is not new, in previous studies Craig et al. (1998) stated that:

In most developing countries, nations are forced to employ some under-qualified and often unqualified

teachers in order to achieve universal primary education. This has generally been a major factor in the decline of the overall quality of education and the increase in recurrent budget expenditure. (p.6)

In connection with this finding, majority of teachers of English in primary schools perceive some challenges in their work experience marked by knowledge limitations on how to teach issues of Social Science, Musical Education, Mathematics, Portuguese, Physical Education as some of the subjects they are assigned to teach while their training in English course did not cover these subjects. These challenges could be regarded as an immediate effect of curriculum design leading to faulty implementation of teacher training policy, which in turn will negatively influence the learning quality.

Teachers' placement

The study found that the placement of trained teachers in schools and their subject distribution do not always correspond with their training areas. This finding confirmed the report of a previous assessment of the Teacher Training Strategy 2004-2015 carried out by the MINED (2004), which revealed that there was lack of a national policy of teachers' placement according to their qualifications. As a result, the placement of teachers in primary schools tends to be an administrative procedure of the local Education authorities, which is only concerned with having the teaching staff in schools and gives no attention to the combination of qualifications, experience and teachers' inclinations with the specific needs of the schools where they are placed. This assertion is sustained with examples of primary teachers who did the regular course model 10+1 with no specialization in ELT, but they are assigned to teach subjects of block 3 including English. Similarly, there are teachers who have undertaken English course, but when they apply for the teaching post, they are oriented to

teach either grades without English (from 1 to 5) or subjects which were not taught during their training.

Curriculum assessment

It was found that the training model 10+1 of English course has not been subjected to a formal assessment to measure its achievements. It is believed that a timely course assessment would contribute to identifying the training shortcomings and take the proper measures.

Remedial strategies

The study shows that some palliative solutions have been put in place to enhance the performance of untrained teachers and those lacking qualifications to teach complementary subjects and these include 'knowledge sharing' between novice teachers and experienced ones, peer-observations, group planning, capacity building sessions and the CPD and on-job training programmes. The government adopts these measures in acknowledgment of several challenges faced in the national educational system. This study also revealed that a new teacher training curriculum has been designed for applicants who finished grade 12 and it will have three-year duration to be in force from 2019 onward, which will cut the English course off from teachers' institutes because the English subject will no longer be taught in primary schools, but rather from secondary schools up to universities.

Conclusion

It has been confirmed that the teachers' institutes for primary education have not implemented the policy of complementary subjects in the same way as intended. This is due to some design flaw in the curriculum document. It is characterised by not providing strategies of how the complementary subjects should be executed. This led us to conclude that the relationship between policy and practice is not as linear and predictable as it may appear for the top authority. In this context, Hargreaves and Fink (2006) highlight that "change in education is easy to propose, hard to implement, and extraordinarily difficult to sustain"(p.6). Therefore, the evidence from this study showed that the practical application of the innovation of complementary subjects for English course at Chicuque teachers' institute remains a failure due to "lack of internal consistency within the curriculum design" (Van den Akker, 2010, p.178). Moreover, a previous study on teachers' competence and its effect on pupils' performance (Passos, 2009) reported that the lack of a coherent teacher training policy may somehow explain the low level of effectiveness of the

education system. The present study corroborates with this assertion since it has revealed that the curricular plan of English course is not aligned with its course plan and the teaching programme in primary schools, and consequently the goals of the educational innovation of complementary subjects are prone to fall through. Since a large number of teachers from model 10+1 leave the institutes without the required pedagogical knowledge for teaching complementary subjects, some teaching limitations were reported by the teachers of English as part of their work experience, despite the implementation of remedial strategies by the government. Thus, it can be concluded that Mozambique faces problems related to teachers' qualification as substantiated by evidence that there are qualified teachers assigned to work with subjects not connected with their training fields and other teachers with no training at all. The implication of non-implementation of complementary subjects for English course is that graduates finish their training without the required skills to teach the proposed subjects and afterward they hardly meet the teaching needs in primary schools where they are urged to teach complementary subjects together with English. As a result, it raises questions about the achievement of students' learning in the hands of unskilled teachers. Scholars have reaffirmed that "the teacher quality is the main school-based predictor of students' achievement (...) and the impact of many reforms of teacher policies depends on specific design features" (System Approach for Better Education Results [SABER], 2014, p.1). Thus, the flaw in policy design of complementary subject has made it ineffective in its implementation and impact. Despite the caveats of scholarly reports on the negative consequences of the coexistence of different teacher-training models on the quality of education (Passos, 2009; Beutel et al., 2011; Carita et al., 2017) and lack of formal assessment on the strengths and weaknesses amid the change from one model to another (Guro, 2009), it can be concluded that this phenomenon will still raise concerns for future studies. This is because this study showed that until 2018, the training model 10+1 had been in force, parallel to model 10+3 for seven years, and in the following year another training model 12+3 was in force.

Recommendations

This study has identified a few issues with implications on policy designing and it is hoped to give contributions to strengthen decision making in Mozambique's education system particularly in teacher training subsystem. Its findings led to the following recommendations:

1. The Ministry of Education. The lack of a deep and thorough evaluation with a formal report on strength and weaknesses of the training model 10+1 makes it hard to measure the achievements of the curricular changes in

teacher training subsystem. Therefore, the Ministry of Education should appoint a panel of experts to investigate the nature of the challenges and problems experienced in the implementation of the national curriculum of teacher training and propose long term guidelines which will be assessed from time to time.

2. The policymakers and curriculum designers. A timely review of the course plan of English course should be made for an effective integration of the complementary subjects since the graduates are called to respond to the teaching-learning needs in primary schools.

3. The Education managers. The training area of each teacher to be employed should be taken into account at recruitment for their school placement and subject distribution rather than placing them on the basis of administrative measures and schools' needs of teaching staff.

CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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Full Length Research Paper

Creating a psychological paradigm shift in students' choice in tertiary education in Sri Lanka through education vertical integration

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Received 4 April, 2022; Accepted 23 June, 2022

Tertiary education is a turning point in anybody's life. Students' choice of tertiary education is crucial for them, their family members, and the country. All parents would like to see their children reach the heights in education and develop many career prospects. In Sri Lanka, critical job profiles are limited to medical doctors, engineers, accountants, and lawyers. However, the fact remains that this type of lean job market is not realistic or sustainable. Firstly, a country needs not have many professionals from a handful of fields. Secondly, not all students have the capacity to complete the coursework of their respective programs. On the other hand, many vacancies in different fields must be filled consistently, and a country cannot be sustained otherwise. Making a shift in students' psychological paradigm is essential in this scenario. This paper introduces a new concept called vertical education integration (E.V.I.). E.V.I. provides a strategic solution to bridge various gaps in the current education system. This concept has been tested and proved for successful results in Sri Lanka.

Key words: Education, Industry, University, School.

INTRODUCTION

Unemployment is a severe issue in any country, and graduate unemployment or underemployment has been an issue in Sri Lanka for several decades (Gunaratne et al., 2018). Education vertical integration (E.V.I.) refers to integrating the education process from primary education leading to the industry affiliation via the university system. It is the comprehensive application of the services marketing concept in the education system. In other words, tertiary education institutes need to supply the graduates demanded by the industry. For example,

marketing refers to identifying, satisfying, and anticipating customers' needs and wants at a profit, better than their competitors, in a socially responsible manner through a holistic approach. In this case, the "customers" denotes various industries that provide jobs to graduates. Accordingly, tertiary-level education providers should identify, anticipate, and satisfy the present and future demands in the job market. However, it is realized that a conflict arises when the specific degree programs that are newly introduced are based on anticipated futuristic

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demand by the industry. Since the students at the tertiary level are not interested in following such modern degrees, they consider it as risking their career by entering a new academic/professional territory. As a result, the supply of graduates is never compatible with the industry demand. This mismatch results in waste of human resources, non-return on investment in education, and social unhappiness. For example, students enter government universities after a highly competitive selection process due to inadequate resources to accommodate those who obtain minimum entry qualifications in Sri Lanka. It is regrettable if they are compelled to be unemployed due to a mismatch of employers' perspectives in the modern world. This happens due to a mismatch of job opportunities against the skills and competence they developed in tertiary education. The time spent by students and the money spent by the government on providing free education will become a waste. In countries like Sri Lanka, instruction is offered free to students/parents. It is an investment that a government expects a return on it after graduation, but when graduates are unemployed, return on investment is not achieved. This impacts the country's economy as well as at the family or individual level (Gunaratne et al., 2018). It is therefore vital to develop a mechanism to overcome this issue. The solution should lead to a psychological paradigm shift in students' demand and enrolment for various academic disciplines in tertiary education. To make this exercise meaningful, the universities must conduct degree programs that cater to the need of employers and are on par with the perspectives in the modern world. For example, there are clear doubts that the learning of degree programs conducted in government universities cater to the demands of the commercial world in the present context. It is encouraging to note the contribution from the non-state higher education institute is emerging. These institutions will react to the demand immediately due to faster decision-making in the private sector. These institutes may cater to the new paradigm provided the right message about changing the job market is conveyed to students and parents. This paper discusses the essential nature of vertical education integration (E.V.I.) to create a paradigm shift in students' Choices in the value chain of a modern higher education institute in Sri Lanka.

LITERATURE REVIEW

Tertiary education usually refers to all formal post-secondary education. This may include the education provided by public and private universities, colleges, technical training institutes, and vocational schools (World Bank, 2021). Students are not passive: they are 'blurring' the boundaries partly to better situate themselves with respect to employment prospects and

adult life (Whitman, 2003). Usually, the education value chain refers to a network of activities centered on teaching, research, and community service functions. Post-secondary education is a crucial point for students as it usually defines the destiny of becoming an industry professional or an entrepreneur (Edirisinghe et al., 2022). Parents play a significant role in primary and secondary education in Sri Lanka. In tertiary education, students are flexible in selecting the academic path they wish to take depending on their past academic achievements. From the perspectives of state universities and non-state higher education institutes, involvement in educational design, educational delivery, assessment, research and development, and outreach activities are crucial in the education value chain. The value-driving activities for higher education include student enrolment, research grants and publications, teaching and learning training, research training and development services, technology, student evaluation of teaching, and visibility (Dorri, Yarmohammadian, & Nadi, 2012). This paper focuses on how the vertical education integration could lead to a psychological paradigm Shift in students' choice in tertiary education. A paradigm shift is a significant shift in how something works or is completed regarding conceptions and practices (Edirisinghe et al., 2022). A student's preference to follow a specific degree choice may depend on the type of employment they prefer to enter after graduation. A rapid growth in the enrolment of tertiary-level education is evident in developing countries (Salmi and Bassett, 2014). In Sri Lanka, the highest student enrolment is evident in the arts faculties. To prove the mismatch, the unemployment rate among the performing arts and arts graduates has been cited in recent research. It is noted that the unemployment rate of performing arts and arts graduates stands at 57.1 and 50.4%, respectively. According to some research, the third-largest unemployment rate is shown under management graduates, who are 27.7% (Gunaratne et al., 2018). However, education is a non-utility function to the students, and tertiary education should not only focus on the skills and abilities of the grandaunts. It is paramount to focus on how the students feel about the educational experience that attracts them to make a choice logically (Abdullah, 2006). In some countries, tertiary education has been highly commercialized. There is severe competition among these institutes, and they always tend to cater to students' existing demands rather than developing degree programs in new academic disciplines. According to the results, the customer-oriented higher education system is accepted based on the quality of tertiary education. Further, it was highlighted that the corporate strategy should come from consumer needs. Regarding marketing in education, the term "Customer" is different from other sectors. The customer includes both parents and students. The consumer is not the customer in most cases. For example, the parents pay the expenses on behalf of

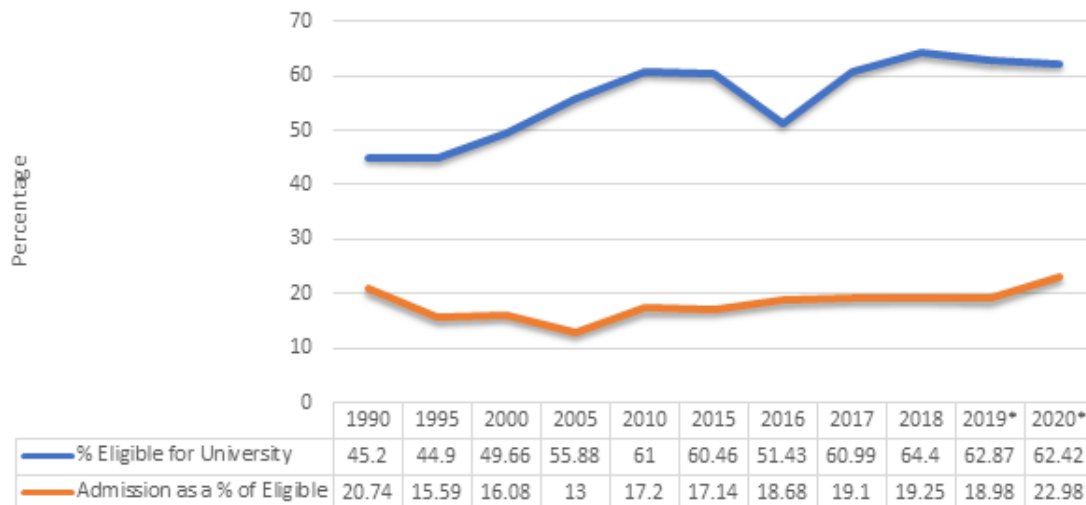


Figure 1. The flow and trend of students qualifying for tertiary level.
Source: (UGC, 2021) * =Provisional.

tertiary education in Sri Lanka in most cases. Therefore, it is not only the students' choice always. Many factors could influence the students' choices in tertiary education. Six dimensions to measure the quality of tertiary education, namely, non-academic aspects, academic aspects, reputation, access, program issues and understanding, and student perception were identified as a sixth dimension (SALMI, 2003). This study highlighted that the government of a country should assist their tertiary education institutions in increasing innovation and high responsiveness to the requirements of global education markets. Tertiary education benefits society in terms of long-term returns from basic research, new technology applications, and social cohesion. As per the results, many tertiary education institutions have produced a wide variety of choices for students who could pay and those who were eligible to borrow while promoting government universities to innovate and modernize. Also, public tertiary institutions make a great effort to provide responsiveness to the changes in training requirements of employers and develop the educational demands of students, which will contribute to having a productive labor force. Also, Salmi (2003) highlighted that globalization and the borderless higher education systems in the world had become an important question affecting tertiary education. The gender imbalance is also evident in specific education sectors due to lesser female participation in some jobs. Seafaring is generally perceived for males rather than females. According to the Tracer report (Gunaratne et al., 2018), there are two significant issues in the higher education sector in Sri Lanka. Firstly, failure to create sufficient opportunities to cater to the demand for tertiary education; secondly, the quality of graduates produced by the system varies across disciplines. This problem is

seen even among universities. This factor intensifies the level of graduate unemployment. Generally, Students select the academic field based on their knowledge and the advice of parents, siblings, teachers, and peers. Sometimes, the culture in the secondary level education may influence that decision. In Sri Lanka, the decision-making flow of degree program selection has two thresholds. Primarily, students should obtain at least a simple pass grade in three subjects at their selected academic stream's G.C.E. (Advanced Level) examination. Also, they need a minimum mark of 30% for the typical general test. However, all students that reach this threshold cannot enter a government university due to resource constraints in the state sector. The University Grants Commission of Sri Lanka selects students with the highest "Z score" obtained in the G.C.E. (Advanced Level) examination depending on the slots available in the state universities in the respective year. Figure 1 illustrates the filtration rate from the university qualifying examination (G.C.E. Advanced Level) to the actual university entry in Sri Lanka according to University Grants Commission (U.G.C.).

It is clear from the above statistics that approximately 80% of those qualified to enroll for a university degree failed to find a placement in a state university every year. Those who find a post must settle only for the academic degree assigned to them based on their Z score. This choice is limited to the slots available in state universities under each educational program. Therefore, students' choice is immaterial for the top 20% of students who perform better in the university entry examination. However, the rest of the students may enroll in various degree programs offered by non-state higher education institutes in Sri Lanka, or they opt to migrate to follow a degree in a foreign university. These students have a

Table 1. The demography of respondents in the survey.

Category	Sample size
Industry associations	
Career development officers	9
University alumnus	
Human resource managers	
Technical colleges	7
Internships providing organization	
Parents of university students	10
Officials from selected ministries	06
Vice-chancellors	
Deans	8
School principals and teachers	
Current students in state and private universities	20
Lecturers in state and private universities	18

Source: Author

more excellent choice, but it is noted in the current scenario that the selection is limited to a few essential degrees popular in society. For example, the parents, students, and even teachers always admire to qualify to become a medical doctor, engineer, lawyer, or accountant. However, this cannot be done by the higher education institutes alone. The students' choice is usually based on their predisposition about their academic/professional destiny and cannot be suddenly changed. It is essentially influenced by the culture and family background etc. Therefore, a tertiary-level education paradigm shift is essential to address this issue. It needs the combined efforts of all stakeholders in the education value chain.

RESEARCH METHODOLOGY

The approach of this paper is tri-faceted, given the complicated nature of the topic. It is predominantly qualitative research that combines a case study, opinion survey, and desk research. The concept of E.V.I. covers three main stages, from the schools to universities to the industry, there is a wide range of stakeholders. Therefore, The target population of this study consisted, of a broad spectrum of audiences. To cover the industry perspectives, top officers of industry associations, career development units of higher education institutes, and representatives from university alumni were interviewed. A cross-section including managers in the human resources department in private and public sector organizations, managers of technical colleges, managers of companies that provide internships to students, and parents of university students (state and Private universities) were interviewed. In addition, carefully selected officials in leading ministries such as the Ministry of education, Ministry of Skills Development and Vocational Training, Ministry of shipping and ports, and Ministry of Finance were interviewed. As the critical stakeholders in tertiary education, vice-chancellors, deans of various faculties in private and government universities, school principals, and teachers were interviewed. It was revealed in the exploratory study that apart from the parents and siblings, the schoolteachers are usually consulted

by students in their selection of academic streams. Current students in state and private universities covering various academic disciplines and lecturers in state and private universities were also interviewed. Accordingly, a convenient sample of seventy-eight respondents representing all stakeholders of the E.V.I. as per Table 1 was consulted. This is the sample chosen as a matter of judgment. Most were conducted as interactive zoom meetings, WhatsApp, and telephone conversations. However, the ministry secretaries were contacted through physical means. The discussions were interactive, informal, and non-time bound, and the data collection process was nonlinear and iterative. A single researcher collected data to avoid the subjectivity of forming and interpreting the raw data. However, the time of data collection was extended significantly to ensure the quality of the data. Accordingly, data collection by one person for the research was not detrimental to achieving the study's objectives. The narrative analysis method was used to administer and reformulate ideas presented by the respondents. It was not easy to find correlations or differentiate between each respondent of each response. Therefore, the standard methodology of developing coding and identifying themes, patterns, and relationships was skipped in the data analysis. It was limited to revising primary data by researchers and summarizing them into relevant categories. However, more time was involved in debriefing and discussing between other researchers about the data collected through voice recording; thus, the transformation of raw data into critical information was done through a collective approach and consensus. Statistics about education and global trends in reports published by the International Bank for Reconstruction and Development, The World Bank, and the United Nations Educational, Scientific, and Cultural organization were studied. Also, various domestic reports of the Department of Census and Statistics, University Grants Commission, Central Bank of Sri Lanka, Ministry of Education, and Department of Examinations were referred for more clarity on the input given by respondents. A case study was done in a leading maritime training education in Sri Lanka to understand E.V.I.'s reality better.

DISCUSSION

Education leads to knowledge acquisition and development of skills. Universities should know the

destination of graduates after their formal studies at the university (Gunaratne et al., 2018). There are government universities/institutes that are established and come under the purview of the University Grants Commission (U.G.C.). Under the Universities Act, there are three categories: Universities, Institutes, and Campuses. Private-sector education has been in operation for over two decades. They offer degrees approved by the Ministry of education. Private higher education institutes also offer degrees accredited by various foreign universities. The fundamental challenge faced by students in Sri Lanka is government universities' lack of infrastructure capacity. Annually, 180,000 students lose the opportunity to obtain the free university education provided by the government. Even after graduating, these candidates suffer due to unemployment and underemployment. It was reported that only 65.5% were employed by those who graduated from state universities in Sri Lanka. 32.2% were unemployed, and 2.4% were engaged as volunteers (Gunaratne et al., 2018). Those who could not join the government universities may seek opportunities in private sector higher education institutes. However, if the students still prefer to follow the similar degree programs conducted by the government universities, the same disparity between unemployment and underemployment will continue. Sri Lankan students seek migration to enhance their employment prospects (D'Souza and Moore, 2017). Focus on degree programs that have more job opportunities in the current global trend, such as Science, Technology, Engineering, and Math (STEM) education programs. To drive future economic growth, more focused degree programs are required (AHEAD, 2018). Considering the above background of tertiary education in Sri Lanka, the higher unemployment rate of graduates is not only a problem for them but also for others who sacrificed their future in this tough competition. It is a problem for those who pay taxes, making it possible for a government to provide free education in the universities. It is a problem for their parents and other family members who contributed significantly to their lives, making them graduates. Consequently, those who have the money go overseas for higher education. They earn their tertiary education using the country's valuable foreign exchange, which is hard-earned through exports and other sources. Unfortunately, many of them do not return to Sri Lanka after qualifying. This is another significant loss to the country in terms of economy, and their parents lose their association forever.

CASE STUDY

The case study was conducted in Sri Lanka. Tertiary education in Sri Lanka has a crucial challenge. 85% of candidates are left behind from the formal tertiary education as only 15% would be accounted to enter the

university system due to infrastructure incapability (Ranwala et al., 2020). Education vertical integration (E.V.I.) is a novel concept introduced in Sri Lanka. This concept has been proposed to the Ministry of Education as a policy proposal by a leading tertiary education institute, namely, CINEC Campus. The policy proposal was presented in 2020, among other things. However, the actions about the first project for Logistics education have been progressing since 2015 and will be completed in 2021. The second E.V.I. project targeting the Tourism and Hospitality sector is currently in progress. There are a few other policy concerns also relevant to tertiary education. It proposes a revision to the selection criteria for state university entrance. To expand the horizon for future students, it is suggested to introduce new academic disciplines in the school curriculum, either in secondary or tertiary education. Teaching technical and vocational education is encouraged at the tertiary level. Finally, it proposes to recognize and appreciate children with different skills formally. This will help and guide them to reach heights where they can perform well. In Sri Lanka, non-state universities usually enrol students who are deprived of the free education at state universities. This case study explains how this institute has implemented the E.V.I. for the Logistics degree program. The timelines and activities of the five text boxes indicated in Figure 2 are given in Table 2. The outcome of this approach is fascinating. Industry players continue to absorb all graduates from the internship stage, and students end up in high-paying local and foreign jobs. The employability rate of graduates stands at 100%. This institute is conducting BMgt. (Hons) Tourism and Hospitality Management degree approved by the University Grants Commission/Ministry of Higher Education, focusing on the future demand in the trade. After completing the first E.V.I. project, they are currently engaged in the second project called E.V.I. of the Tourism Industry. This institute is also involved in another project under the World Bank research grant called "Development of a mechanism that leads to a psychological paradigm shift in students' demand and enrolment for various academic disciplines in the tertiary education in Sri Lanka." Currently, this institute is developing an online tool to evaluate various options by students before selecting their education path. It was noted that they would use algorithms to carry out a comprehensive SWOT (strengths, weaknesses, opportunities, and threats) analysis to determine the best choice of academic stream out of many options.

Conclusion

This paper suggests E.V.I. as a timely solution for any country to bridge the gaps in demand and supply in current global trends. The traditional job markets are now redundant with the rapid development of technology.

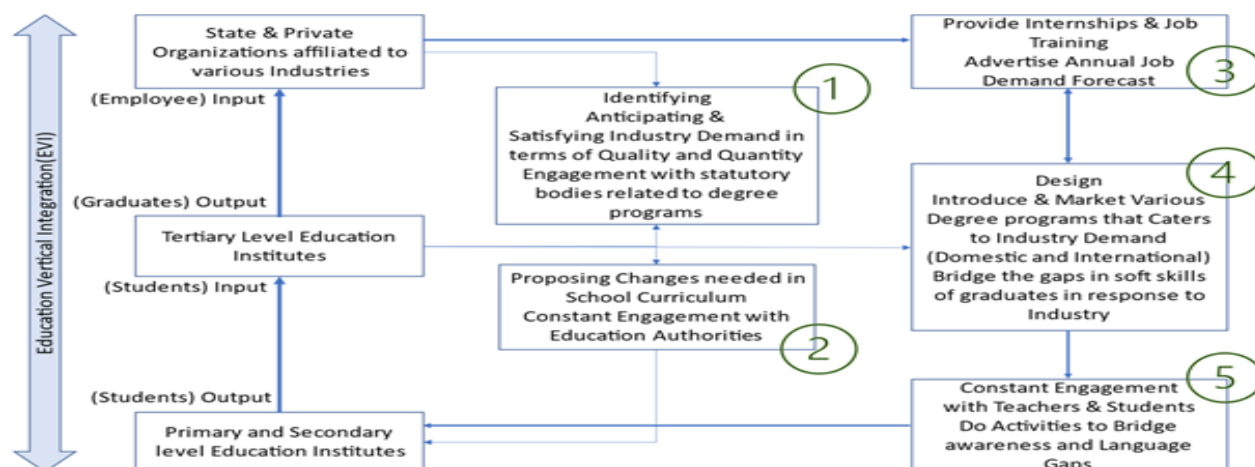


Figure 2. Education Vertical Integration (E.V.I.).
Source: Author

Table 2. Timelines of project deliverables.

Year	Text box label	Activities completed
2007	1	Commencement of International Degree in Logistics by CINEC– (Only seven students enrolled, but demand for graduates in the market was 1000+)
2011	3	Closely monitor the gaps in soft skills demanded by the industry
2012	3	Introduced a Professional Development Program before sending students for internships
2014	4	Commencement of Local degree in Logistics approved by U.G.C. at a lower course fee (due to nonpayment of Royalty fee to foreign university) providing access to more students – (students increased to 40+)
2015	5	CINEC commenced island comprehensive Annual Logistics Quiz competitions for School Children
2017	2	Incorporating Logistics as a part of commerce subject in the School Curriculum after constant pressure from authorities
2018	4	Commencing U.G.C. approved BMgt (Hons) Supply Chain Management Degree (It is the second generation of Logistics education)
2018	1	CINEC undertook the Chairmanship of Sri Lanka National Logistics Awards 2018, organized by the Chartered Institute of Logistics and Transport
2019	4	Student enrolment for Logistics Degree increased to 250 this year
2020	4	Introduce a new Tag line “Beyond a Graduate” to the institute
2021	1	Despite the increasing Limited the annual intake for the logistics degree to 100 considering the industry growth and encouraged fill over students to join Supply Chain Management Degree based on industry demand
2021	1	Establishment of National Logistics Day in Sri Lanka through a Cabinet paper in consultation with the Ministry of Transport
2021	1	Obtaining the approval from Department of Official Languages for the most suitable Sinhala term for Logistics
2021	4	Introducing a compulsory supplementary (Free of charge) soft five-day skills development program, "Beyond a Graduate."
2021	5	Publishing the first textbook on Logistics in Sinhala medium, introducing two new transport theories to the world
2022	1	CINEC held the Chairmanship of the Panel of Judges in the Sri Lanka National Logistics Awards 2022, organized by the Sri Lanka Logistics and Freight Forwarders Association
2022	1	Author of a Working paper on "Mind the Gender Gap in the workforce, including transport and logistics: the perspective from Sri Lanka and beyond" published by ESCAP of United Nation
2022	1	Commenced a professional program to improve the quality and competence of Logistics firms based on Sri Lanka's Logistics Performance Indicator published by the World Bank

Source: Author

The concept of E.V.I. would play a significant role in this scenario, considering the above background. The vertical integration of education can be illustrated in Figure 2. According to various activities highlighted in Figure 2, the E.V.I. is a circular process. Students in the primary and secondary levels need to be transformed so that they ultimately cater to the jobs available/demanded in the local and international markets. However, given the social and cultural norms and ideologies in a country this is easier said than done. It was also realized that there is no standard system for students to make a learned decision about the best choice for their academic or professional destiny. Ideally, the student should self-evaluate their strengths and weaknesses. After that, the results must be mapped with opportunities and threats in the respective industry/market. This process is partly equal to a psychometric test. Psychometric tests primarily measure an individual's mental capabilities and behavior. However, this SWOT (Strength, Weaknesses, Opportunities, and Threats) analysis needs to examine the conditions beyond a psychometric test. Apart from evaluating a person's overall suitability for a particular role based on performance, personality characteristics and aptitude/cognitive ability, this factor is usually tested in a psychometric test. The proposed situational analysis needs to forecast industrial development, business trends, technology development, etc. In other words, the output of the proposed test needs to direct the student about the most suitable career.

ACKNOWLEDGMENT

The authors wish to acknowledge the funding of this research by the World Bank under the Accelerating Higher Education Expansion and Development (AHEAD) project.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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Full Length Research Paper

Parents' involvement and students' academic performance in Ryakasinga centre for higher Education-Sheema District, Uganda

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Received 18 June, 2021; Accepted 25 June, 2022

The study examined parents' involvement (PI) and students' academic performance (SAP) in Ryakasinga Centre for Higher Education (RCHE) - Sheema district - Uganda. The objectives were to examine the effect of parenting, learning at home, and volunteering on students' academic performance in RCHE. The study was underpinned by Systems theory. The sample size was 117 with 43 teachers and 74 Form 4 students selected using simple random sampling giving a sample size of 117. The response rate was thus 93.6%. Data were collected using a questionnaire and analyzed using SPSS. The findings revealed positive significant relationships between parenting ($r=0.576^{**}$), learning at home ($r=0.378^{**}$), and volunteering ($r=0.519^{**}$). Regression analysis indicated significant prediction effects of parenting ($t = 5.363$, $p < .05$), learning at home ($t = 3.11$, $p = 0.003$), and volunteering ($r=0.519^{**}$) on academic performance. The study concluded that communication was a major reason for success in SAP and that a good learning environment positively influences SAP. Recommendations for policy and practice are provided.

Key words: Parents' involvement, students' academic performance, systems theory.

INTRODUCTION

Parents' involvement in their children's education has long been viewed as crucial to optimal childhood development and academic achievement (Powell, 1989). In the recent decade, the positive impact of parental involvement on children's intellectual achievement, particularly throughout elementary school, has been gathered (Henderson and Berla, 1994; Johnson and Walker, 1991; Stevenson and

Baker, 1987). The accumulation of evidence has prompted both education scholars and practitioners to seek measures to increase parental participation. In particular, among parents of socio- economically disadvantaged and non-English speaking students, whose children have a history of low academic achievement, there was a significant increase in the number of students enrolled in

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college (Coleman et al., 1966). To enable many parents to assist their children in reaching their intellectual potential, it is necessary to identify generally effective parental practices that promote cognitive maturation. Given concurrent worries over the school performance of poor and minority children (a growing demographic) and the low performance of American children in general, especially in comparison to Asian youngsters such as the Japanese, this is not a trivial objective (McKnight et al., 1987; Pallas et al., 1989).

Given that the majority of children's development and socialization occurs in two primary contexts - families and schools - it seems logical that connecting these two spheres of influence so that they are mutually reinforcing and mutually supportive of children's development would produce many positive outcomes for children. In her idea of "overlapping spheres of influence," Epstein (1987) argues that productive families and schools share responsibility for the children in their care and, as a result, a portion of their job must be performed collaboratively. This research was underpinned by the Systems Theory of (Von Bertalanffy (1972) which states that a system consists of various components (or sub-systems) that must work together in order for it to function effectively and efficiently.

Statement of the problem

Parents' involvement has always been crucial to students' success in any particular educational institution (Barnard, 2004; Fan and Chen, 2001; Feuerstein, 2000; Jeynes, 2003; McWayne et al., 2004). Many parents at Ryakasinga CHE do not appear to care about their children's academic performance. They have made few efforts to create a conducive learning atmosphere at home. Some are reticent when it comes to discussing school matters, and they never attend meetings of the parents' and teachers' association (PTA). In addition, the majority of parents do not read or enquire about the material on their children's reports and in the end-of-term letter to parents. They appear to have ignored their parental duties.

However, the government has provided textbooks and chemicals and assigned trained employees, the school administration has attempted to excite the staff, and the teachers have scheduled remedial classes. In addition, external benefactors have supplemented government support by constructing classrooms, laboratories, and dormitories.

Nonetheless, academic achievement has not improved (Uganda National Examinations Board [UNEB], 2008-2011). The statistics of the past four years indicate that only 2.5% of UCE students received distinctions. At advanced (A) level, only 0.25% were able to obtain a Principal A (just one A in four years), and only 37% were able to obtain two principal passes, allowing them to enter higher education institutions. In business studies, only 43% of courses were passed over the course of four years,

with only six subjects receiving distinctions. If this tendency continues, it is feared that parents may remove their children, which could lead to the demise of Ryakasinga CHE. This study sought to examine the regression effect of academic achievement of students of Ryakasinga CHE on their parents' involvement in their study activities. The following objectives and hypotheses were achieved:

Specific objectives

1. To examine the prediction effect of parenting on students' academic performance in Ryakasinga CHE.
2. To evaluate the influence of parents' involvement in children's learning at home on the children's academic performance in Ryakasinga CHE.
3. To examine the regression effect of students' academic performance on parents' involvement in volunteering in Ryakasinga CHE.

Study hypotheses

1. Parents' involvement in provision of basic needs and regular communication (parenting) to their children significantly predicts the children's academic performance
2. Parents' involvement in children's learning at home significantly predicts the children's academic performance in Ryakasinga CHE.
3. The regression effect of students' academic performance on parents' involvement in volunteering in Ryakasinga CHE is statistically significant.

Conceptual frame work

This study examined the association between the various characteristics of parental participation as an independent variable and students' academic success as a dependent variable. Academic achievement is based on a wide range of other factors. The conceptual framework given in Figure 1 indicates that parental involvement in the provision of basic necessities, effective communication, participation in children's school and home activities, infrastructure development at school, and decision making influence students' academic achievement. It is expected that the academic achievement of students would improve when parental participation increases.

Significance of the study

The findings of the study are anticipated to benefit the parents, PTA, BOG, and administration of Ryakasinga CHE and similar schools. Parents can now understand what they are expected to accomplish and how they should contribute to their children's academic

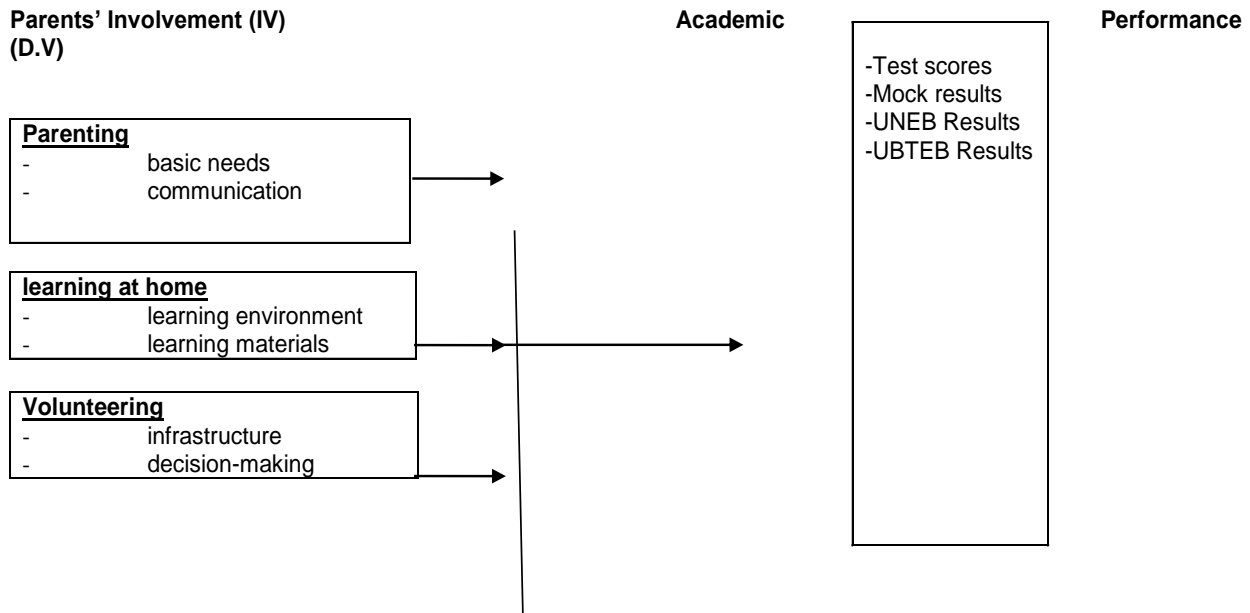


Figure 1. Conceptual frame work showing relationship between parents' involvement and students' academic performance. Source: Adopted from Epstein, 1995 and modified by the researcher.

achievement. The PTA, BOG, and Administration are able to determine how parental involvement in the school system affects the academic achievement of students and take steps to involve them in the day-to-day administration of the school. The research has added to the current body of evidence regarding the effect of parental involvement on students' academic performance.

Justification of the study

Numerous scholars have compiled comprehensive literature assessments on the effects of parental participation on adolescents' academic success (Beecher, 1984; Henderson, 1987, 1994; Illinois Board of Education, 1993; U.S. Department of Education, 1994). These scholars concur that parental participation enhances learning and, consequently, academic success at all levels of education. The researcher discovered that not all studies support parental participation as a strong factor of academic achievement (Baker and Soden, 1997).

Several causal model studies on the topic have determined that direct parental participation had minimal, null, or negative effects on the academic performance of secondary school kids (Anderson, 1991; Keith et al., 1986; Natriello and McDill, 1986). Coupled with the fact that no such research had been conducted in Ryakasinga CHE – Sheema District – Uganda, the researcher felt compelled to investigate the impact of parental involvement on students' academic achievement at Ryakasinga Centre for Higher Education, Sheema District-Uganda.

Scope of the study

The study was done in RCHE in Nyakatokye cell, Kisyabya Parish, Shuuku Sub County- Sheema District-Uganda. The relationship between PI and SAP in RCHE in the period of four consecutive years (2008-2011). The researcher focused on PI as an independent variable and the researcher considered parenting, helping learning at home and volunteering as its indicators. The dependent variable in this study was SAP and the researcher measured this using test scores, mock, UNEB and UBTEB results.

METHODOLOGY

The study employed a quantitative approach of collecting and analyzing data collected using questionnaires (Bruce, 1994). The use of the two approaches was based on the principle of triangulation, which helps in converging opinions to be able to arrive at better conclusions (Amin, 2005; Bruce, 1999). Cross-sectional survey research design was used to select a sample of participants from the target population at a given point in time. The design catered for ease and cheapness of data collection (Amin, 2005).

The sample size was 125 out of 143 determined using Krejcie and Morgan's (1970) table of sample selection which ensures good decision model. Fully filled questionnaires were obtained from 43 teachers and 74 Form 4 students selected using simple random sampling giving a sample size of 117. The response rate was thus 93.6%. Data collection was done quantitatively using questionnaires. The questionnaires for this study were valid with a content validity index (CVI) of 0.84, greater than the 0.50 advocated for by Amin (2005) and Kothari and Palls (1994). The Cronbach's Alpha reliability coefficient calculated using Statistical Package for Social Scientists (SPSS) was 0.72, which was above the 0.70 value for a reliable research instrument (Amin, 2005).

Table 1. Linear regression of academic performance on parenting.

Coefficients						
Model		Unstandardized coefficients		Standardized coefficients	<i>t</i>	<i>p</i>
		B	Std. error	Beta		
1	(Constant)	1.608	0.383		4.197	0.000
	Parenting	0.550	0.103	0.576	5.363	0.000

^aDependent Variable: Academic Performance $R^2 = 0.320$, $F = 28.757$, $p < 0.05$.

Source: Researcher's Field Data

The items were scored on a 5-point Likert scale, 1 (*strongly disagree*) to 5 (*strongly agree*). The results are further explained using correlations in order to show the relationships between the variables followed by regression analysis to find out the extent to which parents' involvement impacts students' academic performance. The mean response which is above 3.0 meant that the respondents were in agreement, mean of 3 denotes neutral and mean below 3.0 suggest disagreement with the statement. The standard deviation is a measure of how spread out numbers are; a small standard deviation indicates that the scores are very close to the mean which denotes a stronger agreement, large standard deviation indicates more widely spread-out from the mean which denotes a weaker agreement. Overall scores were obtained by summing the individual score for each subscale. The data were analyzed using SPSS to derive relevant descriptive statistics (Frequencies, pie chart and percentages) which was further analyzed in order to arrive at relevant conclusions. It was also presented using tables. The relationship between variables was computed using Pearson's correlation coefficient. Study hypotheses were tested using simple linear regression analysis.

The data were presented using descriptive statistics, frequency tables, percentages and pie charts. Descriptive statistics allowed the generalization of the data to give an account of the structure or the characteristics of the population as represented by the sample. The higher the score: the better the level of parental involvement and academic performance.

Frequencies allowed data to be looked at more objectively since it was organized, carefully summarized and presented. Percentages and pie charts facilitate comparisons between two or more sets of data that is continuous and discrete data (Chandan, 2004). Ethical considerations were duly followed in the conduct of the study. The researchers obtained an introductory letter from Uganda Management Institute (UMI) and to access the research gatekeepers at RCHE. The researchers obtained permission from the administration of the school to meet the different participants.

RESULTS

This study examined the relationship between parents' involvement and students' academic performance in Ryakasinga CHE – Sheema District – Uganda. The results are presented in Tables in order of objectives.

Parenting and academic performance

Parents' involvement in parenting was considered in two dimensions: provision of basic needs and regular communication to the children. The overall parenting level was generally high ($M = 3.67$, $SD = 0.67$), indicating that

the majority of the participants agreed that parenting affects students' academic performance. There was a strong significant positive correlation between parenting and academic performance ($r = 0.576$, $p < 0.05$). This implies that as parenting improved, academic performance in Ryakasinga CHE also improved.

To establish the extent to which parenting influenced academic performance, a simple linear regression analysis conducted using the ANOVA techniques revealed an adjusted R^2 value of 0.320 ($p < 0.05$). This implies that parenting alone predicted 32.0% of the variance in academic performance, suggesting that parenting was a relatively strong significant predictor of academic performance. The linear regression analysis results are presented in Table 1.

Analysis of variance gave a significant difference effect ($F = 28.757$, $p < 0.05$) of parenting in predicting the students' academic performance. From Table 1, results indicate that every unit increase in the level of parenting causes a 0.55 unit increase in academic performance ($t = 5.363$, $p < .05$). Therefore, the hypothesis that "parental involvement in parenting through provision of basic needs and regular communication to their children significantly predicts the children's academic performance" is accepted.

Learning at home and academic performance

Parents' involvement in children's learning at home consisted of setting up a conducive home learning environment and provision of appropriate learning materials. The mean parental involvement in learning at home was low ($M = 2.93$, $SD = 0.67$), which indicates that an absolute majority of the respondents disagreed that parental involvement in learning at home affected students' academic performance significantly. There was a moderate positive significant relationship between learning at home and academic performance ($r = 0.378$, $p = 0.003$). The linear regression analysis coefficients for the prediction effect of parental involvement in learning at home on academic performance are presented in Table 2. To establish the extent to which learning at home influenced academic performance, a regression analysis was conducted using the ANOVA technique of adjusted R^2 values, standardized beta values, t-values and the

Table 2. Prediction effect of parents' involvement in learning at home on academic performance.

Coefficients ^a						
Model		Unstandardized coefficients		Standardized coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.574	0.348		7.399	0.000
	Learning	0.360	0.116	0.378	3.110	0.003

^aDependent Variable: Academic Performance; $R^2 = 0.320$, $F = 28.757$, $p < 0.05$.
Source: Researcher's Field Data

Table 3. Prediction effect of parents' involvement in volunteering on students' academic performance.

Coefficients ^a						
Model		Unstandardized coefficients		Standardized coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.199	0.318		6.924	0.000
	Volunteering	0.434	0.094	0.519	4.621	0.000

^aDependent Variable: Academic Performance; $R^2 = 0.256$, $F = 21.353$, $p < 0.05$.
Source: Researcher's Field Data

significance measured at 0.05 levels (Table 2). The model summary showed an adjusted R^2 value of 0.128 between parents' involvement in children's learning at home and academic performance, which implies that parents' engagement in their children's learning at home predicted up to 12.8% of the variance in the children's academic performance.

Analysis of variance ($F = 9.673$, $p = 0.003$) shows that the parents' involvement in children's learning at home significantly explains the variance in the children's academic performance. The beta and t -test results in Table 2 indicate that for every unit increase in the level of parents' involvement in children's learning at home, there was a 0.36 unit increase in academic performance ($t = 3.11$, $p = 0.003$). Therefore, the Hypothesis 2 that, "parents' involvement in children's learning at home significantly predicts the children's academic performance in Ryakasinga CHE" is accepted.

Volunteering and academic performance

The dimensions of parents' involvement in volunteering included participation in infrastructure development and decision-making at school. The mean volunteering level was high ($M = 3.29$, $SD = 0.76$), which indicates that majority of respondents agreed that parents' volunteering affects students' academic performance significantly. There was a strong significant positive correlation ($r = 0.519$, $p < 0.05$) between parents' volunteering and academic performance in Ryakasinga CHE, with an adjusted R^2 value of 0.256 which suggests that volunteering predicted up to 25.6% of the variance in

academic performance. The regression model is presented in Table 3.

ANOVA results indicate that parents' participation in volunteering significantly explained the variance in students' academic performance ($F=21.353$, $p < 0.05$). From Table 3, the beta and t -test results show that for every unit increase in parents' involvement in volunteering infrastructure development and decision making, there was a 0.434 unit increase in the students' academic performance ($t = 4.621$, $p < 0.05$). Hence, Hypothesis 3 showed that, "the regression effect of students' academic performance on parents' involvement in volunteering in Ryakasinga CHE statistically significant" was accepted.

DISCUSSION

The results generally prove that learners' academic performance is a function of several parental involvement aspects.

This confirms the systems theory of Von Bertalanffy (1972) which states that a system consists of various components (or sub-systems) that must work together in order for it to function effectively and efficiently. The discussion of the specific findings by objective is as follows.

Parenting and academic performance

The study findings revealed that parenting in form of provision of basic needs and effective communication to their children significantly predicted the children's

academic performance. This is in agreement with Christian et al (1998) who asserts that parent-child interactions, specifically stimulating and responsive parenting practices, are important influences on a child's academic development. This view is further supported by Trina (2010) who asserts that parents can teach children how to form positive, constructive relationships that do not revolve around harmful behaviors or substances. However, the findings of this study differ from Bobetsky (2003)'s findings that parents come to school to check on their children's discipline with the teachers or administrators only when they are suspended without necessarily caring for the children's basic needs.

According to Maslow (1943), people strive to satisfy the lower basic needs before they can think of the higher more aesthetic ones. Parenting in form of provision of basic needs and effective parent-child communication is therefore a primary provision which will enhance children's academic performance through class attendance, active participation in class work, engagement in co-curricular activities, and ultimately assessment scores. Students who miss some basic needs are likely to underperform in their academics. Bude (1991) asserts that parents' involvement in their students' academic performance helps children understand their parents' attitudes and expectations which help them perform well.

Learning at home and academic performance

The study findings revealed that parents' involvement in their children's learning positively predicted the children's performance in academics at school. The study further agreed that parents encourage their children to do some reading while at home. These findings are in support of Fan and Chen's (2001) finding which similarly affirms that parental involvement in children's learning at home positively affects the child's performance at both primary and secondary schools. Melhuish et al. (2001) further reveal that effective parenting leads to higher academic achievement, greater cognitive competence, greater problem-solving skills, greater school enjoyment, better school attendance and fewer behavioral problems at school.

These findings, in conformity with Flouri and Buchanan (2004), confirm that parental involvement in children's literacy practices is a more powerful force than other family background variables, such as social class, family size and level of parental education. The study findings also confirm those of OECD, (2002) which reveals that parents get involved in knowing what their children study in some subjects and also parents reward their children whenever they improve academically or see that they are working hard on their studies. According to Dave (1963) who defined educational environment as "the conditions, process and psychological stimuli" which affect the

educational achievement of the child, home surrounding is conducive for revising and doing homework. Gottfried et al. (1998) affirm that home environment has a statistically positive and significant effect on academic intrinsic motivation.

Volunteering and academic performance

The study findings revealed that parents' voluntary participation in infrastructural development and decision making at school positively predict students' academic achievement. Parents were shown to volunteer in fundraising for school to improve infrastructure such as classrooms, laboratories, and others. Zellman and Waterman (1998) assert that volunteering is critical for skill development, to socialize, and to have fun. According to Dornbusch and Ritter (cited in Hickman et al., 1995), parent attendance at high school activities had a positive correlation with students' school attendance. Printing parents' involvement in school newsletters was shown to increase parents' attendance at school events. Dornbusch and Ritter's study show that parents take time to consult school administration when certain decisions are made. The findings of the study similarly revealed that parents were involved in attending school functions such as parents' and teachers' annual general meetings, class meetings, and others where major decisions are made. Bwire (2012) advises parents to participate in parents' meetings and trainings and always assist with classroom activities so as to harness the academic excellence of their children.

Conclusion

The findings of the study reveal that parents' involvement in children's education through provision of basic needs and effective communication significantly influences the children's academic performance. Basic needs such as smart school uniforms, shoes, socks and sweater enhance learners' participation in school activities. It can thus be concluded that having basic needs at school enhances learners' academic performance. Communication is also a major parenting activity for the children's academic success given that parent and children are able to express their academic progress challenges and tease solutions.

Parents' provision of a good learning environment at home positively predicted students' academic performance. It can be concluded that all parents need to be brought on board to provide adequate learning materials and conducive study environments at home to enable the children to revise while at home. Parents' direct participation in knowing what their students study in some subjects and also encouragement to study at home would be beneficial to the academic progress of the children.

Given that parents' voluntary participation in infrastructural development and decision making significantly predict students' academic performance, it can be concluded that more volunteering activities such as fundraising for the school need to be initiated to improve infrastructure and hence support teaching and learning. All this requires proper decision-making that calls for regular meetings involving parents.

Recommendations

On the basis of this study finding, it was recommended that schools should initiate parents' activities that will sensitize them on the need for better provision of basic necessities such as balanced diet in feeding to enable the children concentrate on their academic engagements. It was further recommended that the parents need to check on their children, not necessarily waiting for disciplinary causes to visit them at school. It was also recommended that the parents be supported to make children's learning environment at home more comfortable so as to encourage the children to study at home. Initiatives such as establishment of home libraries and provision of stationery at home can enhance learners' home schooling. The researchers also recommended that parents should support provision of holiday packages, black boards, chalk and white boards to improve the children's academic performance.

Limitations of the study

This study focused on parents' involvement and students' academic performance in RCHE. The challenges faced by RCHE may be unique and different from those faced by all other high schools. Therefore, the findings are not readily generalizable to all high schools. The study did not investigate the effects of intervening variables which may also have influence on parents' involvement and students' academic performance in RCHE.

CONFLICT OF INTERESTS

The authors has not declared any conflict of interests.

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Full Length Research Paper

Effect of household income and expenditure on tertiary school enrolment in Nigeria

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Received 12 October, 2022; Accepted 18 November, 2022

The bounds testing (augmented autoregressive distributed lag, ARDL) technique to cointegration was used in this study to investigate the effect of household income and expenditure on tertiary school enrolment in Nigeria from 1970 to 2020. The model was employed to estimate the relationship between these three variables while also accounting for interactions with total education expenditure. When the dependent variable is tertiary school enrollment, the bounds tests show that the variables of interest are bound together in the long run. Tertiary education is widely regarded in Nigeria as a path to higher-paying jobs and a better quality of life, so some interesting observations were made. It was discovered that there is a significant negative relationship between GDP per capita, which is a proxy for household income. The findings also show that a household's consumption expenditure provides tertiary education enrollment power; an increase in a household's consumption expenditure increases the tertiary education enrollment ratio. When the variables deviate from their equilibrium values, the speed of adjustment to equilibrium is 128% within a year. The study suggests that the government establish more tertiary institutions and improve the reputation of existing ones by adequately funding them.

Key words: Household, income, expenditure, augmented autoregressive distributed lag (ARDL).

INTRODUCTION

Getting access to tertiary education is the most effective way for students from low-income or rural families to progress from the lower to upper class in society (Zhou, 2001; Xu and Yi, 2014). Tertiary education encompasses all post-secondary formal education, including public and private universities, colleges, technical training institutes, and vocational schools. Tertiary education is widely regarded as a path to higher-paying jobs and a better quality of life. Indeed, there is a direct relationship between higher education and development (Luhanga et

al., 2003). The rate of development, on the other hand, varies from country to country. Universities, according to Altbach and Knight (2007), are the engines of the postindustrial age and the knowledge economy. The primary role of the university is multifaceted. While the ultimate goal is to develop a skilled workforce, the end result is economic growth. Alternatively, higher education and economic development are inextricably linked (Makulilo, 2012). Even when students attend public tertiary institutions where tuition is waived, tertiary

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education is not a free activity for families. Aside from the opportunity cost of tertiary education, households supplement government efforts in funding and preparing students for tertiary education. The cost of tertiary schooling to households includes monetary costs associated with schooling, non-monetary contributions such as time spent in tertiary school and travel to and from tertiary school, time and labor contributed by other household members in support of tertiary schooling (Yu, 2017). These monetary and non-monetary costs of tertiary education may be difficult for some households to bear and, in some cases, may be so burdensome that members do not attend tertiary school or leave tertiary education. Only 26% of the 10 million applicants who sought admission into Nigerian tertiary institutions between 2010 and 2015 were admitted, according to data from Nigeria's National Bureau of Statistics (NBS) and the Joint Admissions and Matriculation Board (JAMB) (Kazeem, 2017).

For the 1.9 million students who registered for the JAMB exam in 2019, there were only 1.1 million slots available across the country's tertiary institutions. In other words, 40.4% of students enrolled that year are automatically expelled. Some courses, such as medicine and law, are extremely popular. This is one of the reasons students were denied admission, according to JAMB. Individual tertiary education options are now limited not only by personal abilities, but also by the ability of families to finance education. As a result, families' financial ability to pay for tertiary education weakens the minimum ability requirements. For both state-subsidized and full-tuition students, the educational process and final certificates of degrees obtained are the same. As a result, under the current educational system, Nigerian youth have two options: they can be smart enough to enter universities, or their parents can "buy" them admission. A country's consumption expenditure patterns reveal the level of welfare and poverty that it is experiencing. An analysis of household consumption expenditure over time is very important in every country because it provides a clear picture of the various components of household consumption expenditure and consumption trends. It provides information about people's living standards and the degree of inequality. As a result, assessing the effects of household spending on student achievement is an important issue for both researchers and stakeholders in educational systems. Although public expenditure has been extensively researched in the context of debates on enrolment, school effectiveness, and government accountability (Baldacci et al., 2004; Tsang and Ding 2005; Ihugba et al., 2019), very little or no research has been conducted on the relationship between household expenditure and enrolment. The primary goal of the current study is to examine families' tertiary education choices in relation to their income, the impact of family expenditure, and existing tuition policies on these choices.

Brief description of Nigeria's tertiary education

Tertiary education includes all forms of postsecondary formal education, including public and private universities, colleges, technical training institutions, and vocational schools. Tertiary education is critical for promoting growth, alleviating poverty, and increasing shared prosperity. Innovation and growth require a highly skilled workforce that has access to a good postsecondary education for life. People with more education are more likely to get jobs, are more productive, earn more money, and can handle economic changes better. Tertiary education benefits society as a whole, not just the individual. Graduates of tertiary education are more environmentally conscious, have healthier habits, and participate in civic activities at a higher level. Increased tax revenue from higher earnings, healthier children, and smaller family sizes all contribute to stronger nations. In short, tertiary education institutions prepare individuals not only for adequate and relevant job skills but also for active participation in their communities and societies. The economic returns for tertiary education graduates are the highest in the educational system, with an estimated 17% increase in earnings compared to 10% for primary and 7% for secondary education. In Sub-Saharan Africa, where graduates earn an estimated 21% more (World Bank, 2022) than those who did not go to college, these high returns are even bigger. Nigeria's tertiary education is now made up of public and private universities, polytechnics, monotronics, and education colleges. As of August 2017, the country had 153 universities registered by the NUC (Nigeria University Commission), of which the federal and state governments owned 40 and 45 respectively, 68 were privately owned. According to the Federal Ministry of Education, Nigeria has 43 federal universities, 47 state universities, 75 private universities, 28 federal polytechnics, 43 state polytechnics, 51 private polytechnics, and 152 colleges of education (27 federal, 82 private, and 54 state colleges of education) (Wikipedia, 2022). For example, in Nigeria, the number of students enrolled in tertiary education programs has more than doubled in the last decade. This is critical because, according to a World Bank Group (WBG) report, a student with a tertiary education degree will earn more than twice as much as a student with only a secondary school diploma over their lifetime. As the youth population grows and graduation rates in primary and secondary schools rise dramatically, there is an increasing demand for expanded access to high-quality tertiary education. Tertiary technical and vocational education and training can be an effective and efficient way to give students skills and knowledge that are useful in the job market in addition to traditional university studies.

State and federal governments are increasingly realizing that the entire educational system—from pre-kindergarten to tertiary education—must reflect the new

social and economic needs of the global knowledge economy, which increasingly requires a better-trained, more skilled, and adaptable workforce. But there are still problems. Even among the larger group of college graduates, many don't have the locally relevant skills needed for successful integration into the workforce. At the same time, increased enrollment puts a strain on publicly funded institutions of higher learning, and many countries with limited resources are struggling to meet the growing needs of a larger student body without sacrificing the quality of their educational offerings. Tertiary education is also out of reach for many of the world's poorest and marginalized people. In Sub-Saharan Africa, only 9% of people in the traditional age group for tertiary education go from secondary to tertiary education. This is the lowest enrollment rate of any region in the world. The Nigerian government has restructured its tertiary education systems in order to expand their reach and effectiveness. Progress, however, has been uneven. Participating in strategic reforms of the country's tertiary sectors benefits from ensuring that their national strategies and policies prioritize equitable access, improved learning and skill development, efficient retention, and consideration of the employment and education outcomes sought by graduates and the labor market. Policy and academic degrees must both be strategically tailored to meet the needs of the local society and economy. Only then will the government be able to turn gains in primary and secondary education into long-term economic and social growth through access to and progression in tertiary education.

LITERATURE REVIEW

The importance of education in a country's social, political, and economic development is well documented in the literature. Human resources, according to Aliu (2001), determine a country's growth and development. And it has been stated that the primary goal of education in Nigeria is to provide much-needed manpower to accelerate economic growth and development (Schultz, 2002). This belief in the efficacy of education as a powerful development tool has led many nations to commit vast sums of money to the establishment of educational institutions at all levels—primary, secondary, and tertiary. According to Ajayi and Ekundayo (2006), education funding should not be viewed as an expense but as a long-term investment that will benefit society as a whole. Cameron and Heckman (2001) looked at the research on why people go to school and found that a strong link exists between family income and finishing school. The most prevalent explanation of this data is that while choosing a school, teenagers encounter educational funding limitations. Another reason for the favorable association between parental income and educational attainment is that family income has long-

term effects. Several studies have revealed a link between family income and other variables of family background and accomplishment in elementary and secondary school test results. This result suggests that parental income, like parental education, influences children's cognitive abilities and educational preferences. The impact of family income and other family characteristics has been demonstrated in many different situations, including those with free tuition and no admission limitations, according to Carneiro and Heckman (2002). Several studies, however, have found family income to be the most influential of all household factors (Behrman and Knowles, 1999; Glick and Sahn, 2000; Orazen and King, 2008). There is controversy concerning the constraints of family income estimates, which include measurement errors associated with utilizing current yearly income. In the literature, it has also been highlighted that household income is disclosed less accurately in surveys than spending. To compensate for this error, some research (Tansel, 1997) has utilized expenditure as a substitute for income. Tansel (2002) revealed, using an ordered probit model and a well-designed dataset encompassing 26256 households in Turkey, that family education spending had a positive connection with school attendance at the elementary, middle, and high school levels. However, this was not a causal conclusion, because test scores were not used as a measure of educational performance in the research. Aside from that, it is often considered that the association between family income and education is favorable (Glick and Sahn, 2000; Lincove, 2009). This is because impoverished families may be unable to pay the direct and indirect expenses of education as well as borrow to meet the expenditures. In general, if a household becomes destitute, its children will not attend school. Indeed, it has been said that one of the key reasons why so many youngsters drop out of school and begin working is because their parents' income is poor (Ray, 2000). While some studies contend that child labor prevents children from fully benefiting from school by increasing opportunity costs, resulting in a decrease in child schooling (Ray, 2000; Lincove, 2009), Patrinos and Psacharopoulos (1997) find that in Peru, working allows children to attend school, particularly when parents do not have enough funds to keep their children enrolled. The level of price elasticity in private schools is higher than in public schools. Price sensitivity is higher in poorer families than in affluent ones (Alderman et al., 2001).

In Nigeria, several efforts have been made to scientifically verify the impact of educational expenditure on growth. Akangbou (1983), Mbanefoh (1980), and Anyanwu (1996) are three of these initiatives (1996). Using 1974 to 1975 data from the former Midwestern Nigeria, Akangbou (1983) estimated the crude private average rates of return on education for secondary and postsecondary levels. The expected crude private rate of return for lower secondary schools was 13.4%. The

percentages were 11.9, 11.2 and 17.2% for secondary technical schools, upper secondary schools, and universities, respectively. He also computed crude societal average returns for lower secondary, secondary technical, upper secondary, and university levels to be 12.3, 11.0, 10.4 and 12.7%, respectively. His results imply that, regardless of how much money is spent on education, the private and societal returns are always lucrative and reasonable. Investing in education also helps the economy.

Okedara (1985) used the three-year experimental adult literacy program at the University of Ibadan to create the private and societal advantages connected with formal and informal (adult literacy program) elementary education. He calculated the private rate of return on formal elementary education. These values were derived after accounting for economic growth. As a result, both formal and informal elementary education boost productivity not just via wages but also through greater capacity for future earning possibilities, which in turn leads to growth. Mbanefoh (1980) also did a cost-benefit study of university education in Nigeria. His conclusion was that investing in university education at any discount rate between one and ten is always profitable. Because of this, more people in many developing countries want to go to school now that they know how helpful it can be.

METHODOLOGY

The structure of the augmented autoregressive distributed lag (ARDL) model is explained in this section. For example, when a researcher looks at possible relationships between two or more variables, they often use Equation 1, where Y is the dependent variable, X is a vector of independent variables, and f is some function.

$$Y = f(X) \tag{1}$$

The ARDL model attempts to represent the relationship in $f(X)$ Pesaran and Shin (1999) and Pesaran et al. (2001) say that the ARDL (q, p) model of equation 1 can be described by Equation 2, where y_t is the dependent variable, x_t is the independent variable, and q, p are the respective lags.

$$\Delta y_t = \beta_0 + \sum_{i=1}^q \delta_i \Delta y_{t-i} + \sum_{j=0}^p \omega_j \Delta x_{t-j} + \mu_1 y_{t-1} + \mu_2 x_{t-1} + \varepsilon_t \tag{2}$$

The coefficients β_0 is the constant term and ε_t is the error term.

The coefficients δ_j and ω_j for all j corresponds to the short-run relationship while the $\mu_i, j = 1, 2$ corresponds to the long-run relationship.

The ARDL model requires two steps to be completed. The first step is to calculate Equation 2 so that an F-bounds test for a long-run relationship between the variables can be performed. The

ARDL model is then used to generate an Error Correction Model (ECM).

F-Bounds test

After obtaining the results of Equation 2, we can determine whether the variables have a long-run relationship. To determine the existence of a long-run relationship, an F-test is used. The test entails solving Equation 2 and determining whether the coefficients

for the one-period lagged variables, namely, μ_1 and μ_2 are jointly zero. As a result, the following hypothesis test is carried out:

$H_0 : \mu_1 = \mu_2 = 0$: There is no such thing as a long-term relationship

$H_1 : \mu_1 \neq 0 \cup \mu_2 \neq 0$: There is a long-term relationship

The F-test in the ARDL framework has a non-standard distribution that depends on:

1. The mix of $I(0)$ and $I(1)$ independent variables.
2. The number of independent variables
3. If the model includes an intercept and/or trend term.

The hypothesis test has upper and lower critical value bounds, as well as three different cases. The F-test results are compared to the critical values tabulated by Pesaran et al (2001). If the computed F-statistic is greater than the upper bound, the null hypothesis is rejected, and the existence of a long-run relationship between the variables is evident regardless of the order of integration. The null hypothesis cannot be rejected if the F-statistic falls below the lower bound, and the presence of cointegration is not significant. Finally, the test is inconclusive if the F-statistic falls between the upper and lower bounds (Pesaran et al. 2001):

Fail to Reject H0 < Inconclusive < Reject H0

Error correction model

In the case of inconclusive F-bounds test results, Banerjee et al. (1998) and Kremers et al. (1992) proposed testing the error correction term. There are a few assumptions that must be made in order to define an ECM-term. Since the F-bound test gives good results, the long-run equilibrium relationship can be found without using spurious regression. This is because the linear combination of the non-stationary variables is stationary in a simple OLS framework (Haq and Larsson, 2016):

$$y_t = \beta_0 + \beta_1 x_t + \varepsilon_t \tag{3}$$

To capture the convergence of the model towards equilibrium an error correction term is defined by:

$$ECM_{t-1} = y_{t-1} - \hat{\beta}_0 - \hat{\beta}_1 x_{t-1} \tag{4}$$

The estimators from Equation 4 are $\hat{\beta}s$. Note that the residual from Equation 4 is ECM_{t-1} . Furthermore, if the model is approaching equilibrium in the long run, the difference between the independent and dependent variables $(ECM)_{t-1}$ cannot increase because this would impose divergence. As a result, the difference must

decrease. Furthermore, because x_t, y_t, β_j are all provided by the regression in Equation 5, ECM_{t-1} form a new data series. To obtain the short-run dynamics, we estimate the lagged variables x_t, y_t with the error correction term ECM_{t-1} using Equation 2. The equation is written as follows:

$$\Delta y_t = \beta_0 + \sum_{i=1}^q \delta_i \Delta y_{t-i} + \sum_{j=0}^p \omega_j \Delta x_{t-j} + \lambda ECM_{t-1} + \varepsilon_t \tag{5}$$

The primary goal of estimation is to obtain a model that will converge to equilibrium. If the ECM coefficient λ is statistically significant and negative, then our model has reached equilibrium. A significant coefficient also confirms the existence of a long-run stable relationship and cointegration between the independent and dependent variables. The coefficient also influences the rate of adjustment towards equilibrium; for example, suppose we have annual data and $\lambda = 0.6$. Then, Y after a shock in X will return to equilibrium in the long run at a rate of 60% per year.

Unit root tests

To test for stationarity in time series data, a common method is to use an Augmented Dickey-Fuller test (ADF) (Dickey and Fuller, 1979). A non-stationary time series is one that has a unit root. Other common methods for determining a variable's stationary state include the Phillips and Perron (1990) test. The test is similar to the ADF test, but with a few changes to account for autocorrelated residuals. Both tests will be used in our research. Although the ARDL framework does not require variable pre-testing, unit root tests can tell us about the order of integration for each variable and convince us whether the ARDL model should be used or not, as well as investigate the order of integration for each variable. The computed F statistics provided by Pesaran et al. (2001) are not invalid in the presence of $I(2)$ variables. The bound test assumes that the variables are $I(0)$ or $I(1)$. As a result, unit root tests in the ARDL procedure may still be required to ensure that none of the variables are $I(2)$ or exceed.

Lag selection

The lag selection, like the unit root tests, is critical because it determines the model's results. There are several methods for determining the best lag for each variable. In the ARDL framework,

$$\Delta TSER_t = C + \sum_{i=1}^p \beta_{1i} \Delta TSER_{t-i} + \sum_{i=0}^{q1} \beta_{21} \Delta LFCEXP_{t-1} + \sum_{i=0}^{q2} \beta_{3i} \Delta LTEDEXP_{t-1} + \sum_{i=0}^{q3} \beta_4 \Delta LGDPPC_{t-1} + \mu_0 TSER_{t-1} + \mu_1 LFCEXP_{t-1} + \mu_2 LTEDEXP_{t-1} + \mu_3 LGDPPC_{t-1} + \varepsilon_t \tag{6}$$

Where TSER= Tertiary education enrollment ratio, FCEXP= Final Consumption Expenditure of Household, TEDEXP= Total government expenditure on education, GDPPC= GDP per capita, p lags are used for dependent variable and q lags used for independent variables, c is the intercept, ε is the white noise. The remaining coefficients describe short-run and long-run relationships. The, $j = 0, 1, \dots, 3$ correspond to the long-run relationship while the short-run effects are captured by the coefficients for the first

however, the Schwarz Information Criteria (SIC) provides slightly better estimates than the Akaike Information Criteria (AIC) in small samples (Pesaran and Shin 1999). The AIC criteria also have a tendency to overestimate the number of lags to be included, which is undesirable in small samples because increasing the lag reduces the number of observations. As a result, in order to create a coherent model, the SIC criteria will be used to determine the optimal lag length for both the ADF test and the ARDL model.

Diagnostic tests and stability test

Because the ARDL model seeks the best linear unbiased estimator (BLUE), diagnostic tests are required. Finally, we will use the Breusch-Godfrey serial correlation LM test for residual non-autocorrelation, normality (Jarque-Bera), and stability to see if the model is strong enough (cumulative sum of squares, CUSUM-SQ).

Data source

Secondary data from the Nigerian Central Bank and the World Bank were used in the analysis. The study spans the years 1970 to 2020. All-time series data will be converted to a log-log equation. As a result, the coefficient may be considered elastic. Table 1 lists the variables and their sources.

Econometric modeling

It is assumed that parents derive utility from their own consumption of goods (C) as well as from sending their children to tertiary institutions (TR). $U = U(C, TR [EXP])$, where tertiary institution enrollment is assumed to be determined by household expenditure (EXP). Sending children to tertiary institutions necessitates a sacrifice of current consumption in order to invest in fees and school supplies. Following secondary school graduation, households have three options: learn a skill/trade, look for work, or pursue the first level of tertiary education. At this point, the decisions of households are influenced by their income, household expenditure, and expected future earnings, as well as the expected probabilities of finding a job that corresponds to the tertiary education obtained by the household member. The data are subjected to the ARDL model, and the general equation is presented and explained. The lag selection required for good results is described, as is the specific F-bound test. Following the above description and Equation 2, the applied ARDL model is given in Equation 6, where the tertiary education enrollment ratio is denoted as TSER in the Equations. Except for the tertiary education enrollment ratio, all data is expressed as natural logarithms. The logarithm is used to make it easier to figure out what the results mean and to lower the chance of heteroscedasticity.

difference variables *i.e.* , $i = 1,2,3,4$.

Equation 7 shows the corresponding error correction model equation. The significance of each variable will be determined based on significance rather than the magnitude of the coefficients or the p-value. This means that if the variables are found to have an explainable relationship with the tertiary education enrollment ratio, they are deemed significant.

Table 1. Measurement of variables and data sources.

S/N	Variable	Measurement	Expected sign	Sources of data
1.	Tertiary school enrolment ratio (TSER)	The tertiary enrollment ratio is the proportion of total enrollment, regardless of age, to the population of the age group that corresponds to the level of education shown. Tertiary education, whether to an advanced research qualification or not, usually requires successful completion of secondary education as a minimum condition of admission.	-	UNESCO Institute for Statistics (http://uis.unesco.org/)
2.	Final consumption Expenditure of Household (FCEXP)	Household final consumption expenditure is the market value of all goods and services purchased by households, including durable goods (such as cars, washing machines, and home computers). It excludes dwelling purchases but includes imputed rent for owner-occupied dwellings. It also includes payments to governments for permits and licenses. Even when reported separately by the country, household consumption expenditure includes the expenditures of nonprofit institutions serving households.	Negative	Central bank of Nigeria (CBN) statistical bulletin volume 17, December 2006 and 31, December 2020
3.	Total education expenditure (TEDEXP)	Total government expenditure on education (current, capital, and transfers). It includes expenditure funded by transfers from international sources to government. General government usually refers to local, regional and central governments.	Positive	https://data.worldbank.org
4.	GDP per capita (GDPPC)	GDP per capita (constant 2010 US \$), it is a proxy for the level of household income	Positive	https://data.worldbank.org/indicator

Source: Compilation of researchers, 2022

Table 2. Unit root test result.

Variable	ADF test statistic				PP test statistic			
	Constant	Constant and trend	None	First difference	Constant	Constant and trend	None	First difference
TSER	-0.88	-3.04	-2.62*	-3.09*	-0.40	-2.85	1.06	-11.58*
LFCEXP	-0.19	-2.31	1.52	-8.07*	-0.02	-2.19	1.85	-8.20*
LTEDEXP	-0.76	-0.75	4.39	-4.63*	-1.78	-1.86	0.96	-6.69*
LGDPPC	-0.58	-1.36	0.51	-5.84*	0.89	-1.29	0.70	-5.99*

Notes (ADF): Test critical values at 5% (At level: constant = -2.93, Constant and trend = -3.51, none = -1.95 while at First difference = -2.93); P-value= Probability value, * signifies stationarity. (PP): Test critical values at 5% (At level: constant = -2.92, Constant and trend = -3.50, none = -1.94 while at First difference = -2.92); P-value= Probability value, * signifies stationarity.

$$\Delta TSER_t = C + \sum_{i=1}^p \beta_{1i} \Delta TSER_{t-i} + \sum_{i=0}^{q1} \beta_{2i} \Delta LFCEXP_{t-i} + \sum_{i=0}^{q2} \beta_{3i} \Delta LTEDEXP_{t-i} + \sum_{i=0}^{q3} \beta_{4i} \Delta LGDPPC_{t-i} + \lambda(ECM)_{t-1} + \varepsilon_t \tag{8}$$

The following hypotheses are used to investigate the causation and co-integration of TSER and LFCEXP, LTEDEXP, and LGDPPC: Is there a short-run relationship in Nigeria between TSER and the independent variables? (ii) In Nigeria, is there a long-run relationship between TSER and the independent variables?

Analysis of result

Although the ARDL cointegration approach does not require unit

root tests, nevertheless we need to conduct this test to ensure that none of the variables are the integrated of order 2, that is, $I(2)$ because, in case of $I(2)$ variables, ARDL procedures makes no sense. If a variable is found to be $I(2)$, then the computed F-statistics, as produced by Pesaran et al. (2001) can no longer be valid. The unit root test results are presented in Table 2. All variables are non-stationary when examined at levels with a constant, constant and trend, and none, as indicated by the

Table 3. VAR Lag order selection criteria.

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-99.09387	NA	0.000945	4.386973	4.544433	4.446226
1	87.66089	333.7745	6.62e-07	-2.879187	-2.091890*	-2.582922
2	107.6095	32.25727	5.69e-07	-3.047211	-1.630077	-2.513934
3	120.2750	18.32460	6.82e-07	-2.905319	-0.858348	-2.135030
4	157.0528	46.95033*	3.05e-07*	-3.789479*	-1.112670	-2.782178*

Source: Researcher's calculations from Eviews 9, 2022. * indicates lag order selected by the criterion.

Table 4. ARDL bound test of cointegration.

Test statistic	Value	k
F-statistic	13.06696	3
Critical value bounds		
Significance (%)	I0 Bound	I1 Bound
10	2.72	3.77
5	3.23	4.35
2.5	3.69	4.89
1	4.29	5.61

Source: Researcher's calculations from Eviews 9, 2022.

asterisk. Because the series is not stationary when examined at constant and trend, it is argued that they are non-stationary at the level, with the exception of TSER, which is stationary at zero in the ADF test but proved otherwise in the PP test, which is a confirmatory test. However, when estimating a large sample, ADF tests are frequently influenced by the lag length (p) chosen and lose power. As a result, the Phillips–Perron (PP) test confirms the results of the ADF tests. So, all series are stationary because the PP test statistics are less than the test critical values of 5% (*ADF test statistics < test critical value at 5%*).

Lag determination

The results of lag-order selection are shown in Table 3. The lag order for the SC, HQ, and FPE selection criteria is one, while the lag order for the AIC selection criteria is four. Because AIC has the lowest value, the investigation will move on to other tests using lags (4).

F-Bounds test

The presence of long run cointegration has been tested using the bounds test now that it has been established that none of the selected series are $I(2)$ or beyond and the optimal order of lag has been determined. Table 4 displays the results of the ARDL bound test of cointegration. The F-statistics has a higher value (13.07) than the upper bound critical value (4.35) (at 5% significance level) provided by Pesaran et al. (2001). As a result, we have sufficient reasons to reject the null hypothesis of no long-run relationship at the 5% significance level, as well as the

possibility of cointegration among the variables studied.

Estimation of long-run relationships

To determine whether the variables are cointegrated in the long run, the applicable hypothesis is that there is no long-run relationship, such as:

$$H_0: \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = 0 \text{ (there is no long-run relationship)}$$

$$H_1: \lambda_1 \neq \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq 0 \text{ (there is a long-run relationship)}$$

The long-run results are presented in Table 5. The coefficient of final consumption expenditure of a household is FTCEXP in its first and second lags is 2.40 and 2.51, which are both statistically significant, which implies that a 1% increase in the first lag of final consumption expenditure of a household will lead to a 2.40% increase in tertiary education enrollment ratio in the long run. It will increase by 2.51% in the second lag. The coefficient of GDP per capita in its fourth lag is -16.64 and it is statistically significant, which implies that a 1% increase in GDP per capita (proxy for income) will reduce tertiary education enrollment ratio by 16.64% in the long run. The coefficient of total education expenditure in its third lag is 0.54 and it is statistically significant, which implies the effect of government policy on education on tertiary education enrollment in its third lag is a 54% increase in the long run.

Model checking

Table 6 shows different diagnostic test values and demonstrates that the ARDL model is an identically full-fitted model for both long-run and short-run results for testing tertiary education enrollment in

Table 5. Long-run relationship: Selected model (ARDL (4, 2, 4, 3)).

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TSER(-1)	0.238591	0.129228	1.846280	0.0747
TSER(-2)	0.033138	0.155958	0.212481	0.8332
TSER(-3)	-0.355574	0.160212	-2.219396	0.0342
TSER(-4)	0.285517	0.122535	2.330083	0.0267
LFCEXP	0.497797	1.024380	0.485949	0.6305
LFCEXP(-1)	2.405635	1.173611	2.049772	0.0492
LFCEXP(-2)	2.511872	1.043761	2.406558	0.0225
LGDPCC	-5.767826	5.368651	-1.074353	0.2912
LGDPCC(-1)	8.975693	6.450248	1.391527	0.1743
LGDPCC(-2)	-12.23132	6.188983	-1.976305	0.0574
LGDPCC(-3)	8.570619	7.099882	1.207150	0.2368
LGDPCC(-4)	-16.64023	5.729821	-2.904144	0.0068
LTEDEXP	1.024664	0.323997	3.162567	0.0036
LTEDEXP(-1)	-0.609826	0.424622	-1.436162	0.1613
LTEDEXP(-2)	0.017850	0.362953	0.049180	0.9611
LTEDEXP(-3)	0.544930	0.243182	2.240830	0.0326
C	-13.36016	5.761374	-2.318920	0.0274

R-squared=0.98; Adjusted R-squared=0.97; Prob. (F-statistic) =0.000; DW=2.1
Source: Researcher's calculations from Eviews 9, 2022.

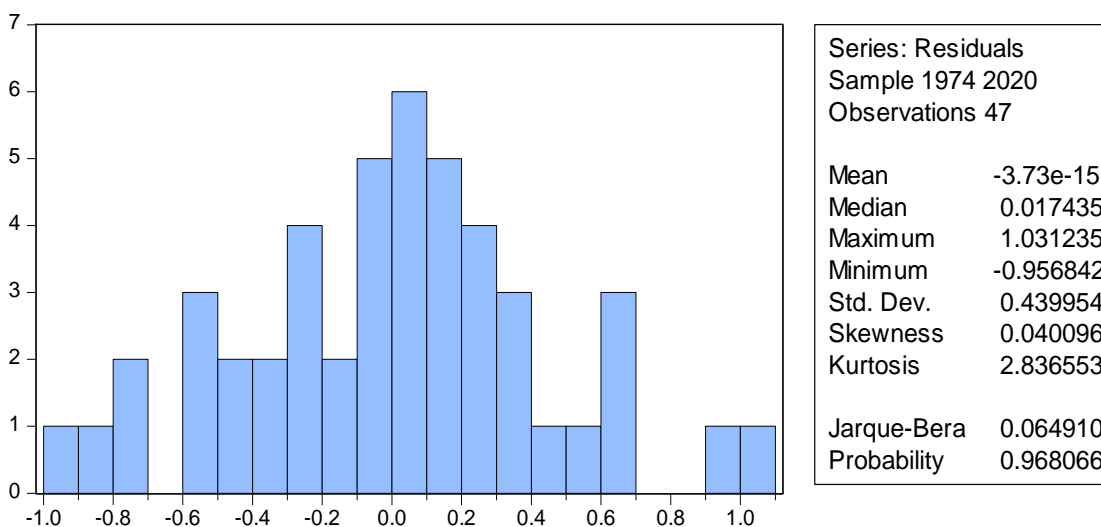


Figure 1. Normality test.
Source: Author

Nigeria. The null hypothesis is tested to ensure that there is no serial correlation in the long-run model, with a guideline of accepting the null hypothesis (H_0) if the probability is greater than 5%. Table 6 demonstrates that there is no serial correlation. Similarly, the normalcy test is carried out. The skewness is 0.04 and the kurtosis is 2.84, as shown in Figure 1. The JB is represented by 0.06 and has a probability value of 0.97, which is not significant at a 5% critical value. Based on this test, our model is normally distributed. Table 6's heteroscedasticity test indicates constant variance. At the 5% critical value, neither of the observed R-square probability

values for the Breusch-Pagan-Godfrey Test is significant. As a result, the TSER systems equation is stationary and homoscedastic, and thus suitable for economic analysis. The model passes the Reset Specification test with an F-statistics value of 7.231509 and a probability value of 0.1108, indicating that there is no functional misspecification in the model.

Short-run relationship

The model is specified as follows:

Table 6. Diagnostic tests results.

Statistics	F-statistics	P-value
Serial correlation	0.833813 Prob. F(4,26)	0.5161
Heteroskedasticity	4.526297 F(16,30)	0.3524
Reset Test	7.231509 (1, 29)	0.1108

Source: Researcher’s calculations from Eviews 9, 2022.

Table 7. Serial correlation test of the dynamic model.

F-statistic	1.628509	Prob. F(4,27)	0.1959
Obs*R-squared	8.940902	Prob. Chi-Square(4)	0.0626

Source: Researcher’s calculations from Eviews 9, 2022.

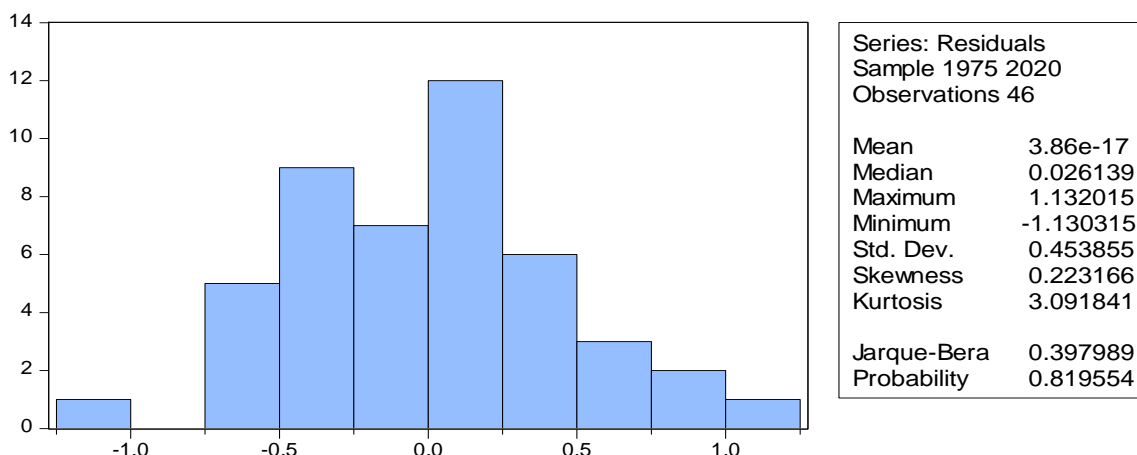


Figure 2. Normality test.
Source: Author

$$\sum_{j=0}^p \delta_j \Delta LMVA_{1t-j} + \sum_{l=0}^q \varphi_l \Delta LENG L_{2t-l} + \sum_{m=0}^q \delta_m \Delta LE L C_{3t-m} + \sum_{n=0}^q \eta_n \Delta L I N F_{4t-n} + \sum_{a=0}^q \mu_a \Delta L M L_{5t-a} + \varepsilon_t \tag{8}$$

Table 6 displays the short-run results. All of the determinants are clearly statistically significant. Furthermore, the ECT_{t-1} coefficient is negative, as expected, and statistically significant. The significance of the lagged error correction term implies that all variables in the tertiary education enrollment model have long-term causality towards consumption and expenditure. The error correction term has an error correction coefficient of around -1.28, indicating that 128 % of the disequilibrium in tertiary education enrollment is corrected annually. To be more specific, it takes a year to correct short-term disequilibrium and restore Nigeria’s previous year’s shock to return to long-term equilibrium of income and consumption. The error correction model results show that there is a short-term relationship between tertiary education enrollment and household income, household consumption, and the government education policy model. The final consumption spending of households with a lag of one is significant at the 1%

confidence level. This shows that there is a short-term cause-and effect link between a household’s final consumption spending and the number of people in the household who go to tertiary school.

Model checking

Table 7 demonstrates that there is no serial correlation. Similarly, the normalcy test is carried out. The skewness is 0.22 and the kurtosis is 3.09, as shown in Figure 2. The JB is represented by 0.40 and has a probability value of 0.82, which is significant at a 5% critical value. Figure 3 shows the stability test result, which shows that the Cusum plot test statistic did not cross the 5% critical lines, indicating that the model is stable. Finally, Brown, Durbin, and Evans (1975) propose the cumulative sum of recursive residuals (CUSUM) and CUSUM square (CUSUMSQ) tests to investigate the

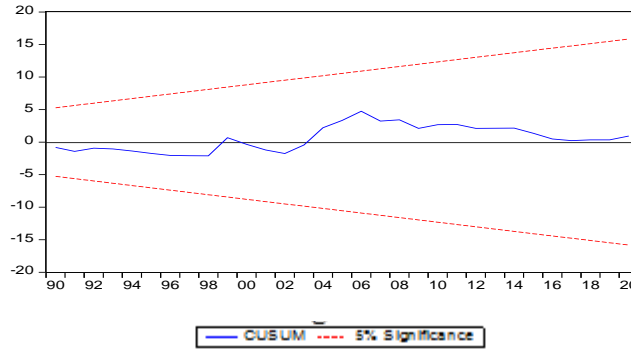


Figure 3. Cusum significance.
Source: Author

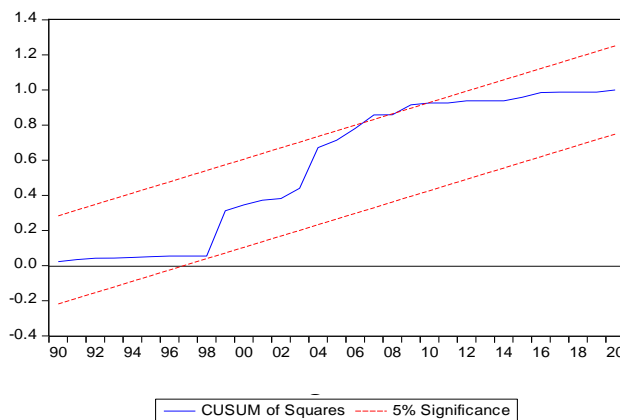


Figure 4. Cusum of squares
Source: Author

model's stability. Figures 3 and 4 show that the plot of the CUSUM or CUSUMSQ line do not break the limits. This means that the coefficients are stable.

FINDINGS AND DISCUSSION

The ARDL test results suggest a positive, significant relationship between final consumption expenditure of a household and tertiary education enrollment in the first and second lags. The significant relationship indicates that final consumption expenditure of households and tertiary education enrollment are related in the short and long run. Changes in Nigerian households' final consumption expenditure explain changes in tertiary education enrollment. It also shows that consumption expenditure of a household gives tertiary education enrollment power; an increase in consumption expenditure of a household increases tertiary education enrollment ratio. The findings also show that the high cost of living reduces the ability of households to train their children and wards in tertiary institutions. The findings back up prior studies by Behrman and Knowles (1999), Glick and Sahn (2000) and Orazen and King (2008) that

household income is revealed less accurately in surveys than expenditure when it comes to school enrolment.

Other results are equally interesting. For example, total education expenditure (LTEDEXP) is insignificant and negatively related to tertiary school enrolment in Nigeria, which is not in line with the findings of Baldacci et al. (2004) and Ihugba et.al. (2019). However, the coefficient of household income (proxied by GDP per capita) in its second and fourth lags is significant and negatively related to tertiary school enrollment in Nigeria, which contradicts the findings of Glick and Sahn (2000) and Lincove (2009).The findings support the report of Nigeria's National Bureau of Statistics (NBS) and the Joint Admissions and Matriculation Board (JAMB) as reported by Kazeem (2017) about the disparity between the applicants who sought admission into Nigerian tertiary institutions and the number of tertiary institutions. The large percentage of candidates who don't get admission into tertiary institutions in Nigeria is not as a result of the income of those that will sponsor them. It is also confirmed by the negative relationship that if the income of households increases, the demand for public tertiary institutions will reduce. Parents choose public

Table 8. Short run coefficients (error correction model).

Variable	Coefficient	Std. error	t-Statistic	Prob.
C	-0.042009	0.104573	-0.401718	0.6906
D(TSER(-1))	0.453593	0.138981	3.263709	0.0027
D(TSER(-2))	0.159163	0.106451	1.495173	0.1450
D(TSER(-3))	-0.461361	0.109793	-4.202091	0.0002
D(TSER(-4))	0.603504	0.130203	4.635120	0.0001
D(LFCEXP(-1))	2.954957	0.993707	2.973670	0.0057
D(LFCEXP(-2))	0.528360	0.876473	0.602826	0.5510
D(LGDPPC(-1))	2.000192	5.128705	0.389999	0.6992
D(LGDPPC(-2))	-4.847719	4.178571	-1.160138	0.2548
D(LGDPPC(-3))	1.908172	4.080700	0.467609	0.6433
D(LGDPPC(-4))	-5.386044	4.830053	-1.115111	0.2734
D(LTEDEXP(-1))	-0.366563	0.273473	-1.340397	0.1899
D(LTEDEXP(-2))	0.005561	0.273763	0.020314	0.9839
D(LTEDEXP(-3))	0.401539	0.226065	1.776208	0.0855
ECT(-1)	-1.280838	0.229908	-5.571088	0.0000

Source: Researcher's calculations from Eviews 9, 2022.

institutions because of the cost of schooling. The result of the estimates of the error correction model presented in Equation 2 is reported in Table 8. The estimated error correction model provides information on the short-run relationship among TSER, LFCEXP, LTEDEXP, and LGDPPC. Except for TSER, all of these variables are reported in their (lagged) difference. The one-lagged error-correction term ECT_{t-1} , which measures the disequilibrium between the actual and equilibrium TSER is statistically significant at one per cent level of significance and has the correct sign. According to the estimated coefficient for ECT_{t-1} , $\Delta TSER$ takes about 1.28 years (that is, one divided by the estimated coefficient of ECT_{t-1}) to converge to a long-run steady state. Moreover, the estimated results suggest that the model has a reasonable good fit with robust diagnostic tests for error processes such as the absence of serial correlation, stability, and normality. The result presented in Table 7 also shows that the coefficient of the first lag of household expenditure is positively related to tertiary school enrolment and statistically significant. This implies that, holding other variables constant, a percentage change in the lag of household expenditure in the first year will result in a 295% change in tertiary school enrolment. This is consistent with our a priori expectation that increased household expenditure will lead to an increase in tertiary school enrolment.

CONCLUSIONS AND RECOMMENDATIONS

The study concluded that household expenditure, which measures the standard of living, has a relationship with tertiary school enrolment and is a key determinant of

students' participation in tertiary schools in Nigeria. An increase in household income affects the number of candidates who get admitted into tertiary institutions negatively. The study recommends that the government should establish more tertiary institutions and improve the reputation of the existing ones by funding them adequately.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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