

Impact Assessment of LESEP on Senior Secondary Schools Students' Academic Performance in Lagos State: ATO Model as Framework

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Abstract

The intervention of Lagos Eko Secondary Education Project (LESEP) was a welcome development to ameliorate students' poor academic performance. This study conducted an impact assessment of LESEP on senior secondary school students' Academic Performance in Lagos state. The study used the Antecedent, Transaction, and Outcome (ATO) evaluation model as a framework. The study adopted a survey research design ex post facto. The sample consists of students with WASSCE results between 2006 and 2020 (143,725 students). Proportionate and purposive sampling technique was used to arrive at the sample. The study used students' performance profile forms (Mathematics, English, and Biology) for data collection. Data collected were analyzed using descriptive frequency distribution, percentages, and mean scores. The result showed that students' performance prior to the intervention was poor because, between 2006- 2008, the majority of the students had f9 in the three subjects (Mathematics, English, and Biology). But it showed improvement in students' performance between 2009 -2016. The result further showed that students' performance improved after the completion of the program compared with the results obtained before and during the implementation stage of the program. The study concluded that LESEP has made a significant impact on the student's academic performance in WASSCE during and after implementation. It is recommended that the training should not be limited to English Language, Mathematics, and Biology teachers alone but should also be extended to other subject areas.

Keywords: Biology, English, Mathematics, LESEP, Intervention.

1. Introduction

The poor state of education suggests that the dream of producing quality manpower for the progress of any nation may be adversely affected. To reverse the situation, there are intervention programs in education from both national and international organizations. These interventions are mainly geared towards supporting the efforts of the governments at different levels, and they come in the form of grants to support school improvement, teacher education, and organizational development (Civic Society Action Coalition on Education for All, CSACEFA, 2016). One such intervention the Lagos Eko Secondary Education Project (LESEP) introduced in 2009 to improve the quality and relevance of education in Lagos state, Nigeria.

The LESEP was launched with the support of the World Bank and aimed to raise education outcomes in public Junior and Senior Secondary Schools by improving students' performance in three core subjects (English Language, Mathematics and Science) among objectives. Achieving this may be difficult without efficient teachers. The quality of any educational system depends to a great extent on the quality of teachers. Teachers are the most important component of any educational system because they shape the behavior, thinking, and attitude of the students in the teaching/learning situation. The quality of teachers determines

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the quality of teaching and knowledge imparted to the students as well as the quality of learning outcomes. To ensure quality delivery of instruction in schools, teachers were trained for the improvement of the quality and relevance of education in Lagos state. The survival of the program was also built around not only recruiting enough teachers for the program but also providing them with continuous in-service training or developmental programs to update the teachers' knowledge, skills, and competence for effective and efficient performance.

Teachers' professional development program (TPDP) focuses on improving the conceptual skill – intellectual and abilities needed to do a better job. The concern of teachers' professional development has been a reoccurring issue of concern. Ekpoh *et al.*, (2013) submission showed that attending training equips teachers with knowledge of the subject, classroom management, teaching method, and evaluation of students. Similarly, Jahangir *et al.*, (2012) aligned with the fact that training plays a major role in improving the teachers' performance in school while it has been pointed out that training of employees enhances knowledge for the job, skills, attributes and competencies and ultimately workers' performance and productivity.

In order to address the acute shortage of teachers, the Volunteer Teachers' Scheme (VTS) was introduced. The shortage of teachers in secondary schools was more obvious in core subject areas including the English language, Mathematics, and the Sciences. The VTS was designed by the government to complement teachers' efforts in public secondary schools by providing additional teachers through a voluntary scheme in core subject areas. The scheme was not designed to substitute fully employed teachers or assume the take-over of teaching vacancies, rather it was aimed at providing extra support to teaching in schools. The Volunteer Teacher Scheme (VTS) was to bring together dedicated and resourceful professionals who are able to contribute professionally to the overall vision of LESEP in three core subjects - Mathematics, English, and Biology at the senior secondary level and Mathematics, English and Basic Science at the junior secondary level. These subjects were chosen by the organizer of the program based on students' disappointing performances in both internal and external examinations as reported by WAEC chief examiners prior to 2009 despite their importance to the scientific, economic, political and technological development of a nation.

2.1 Literature Review

English Language

The English language is a core subject of study in the Nigerian education system across all educational levels. It is not only a core subject taught and learned in the classroom, but it is also the medium of instruction in classrooms. Apart from these, the language is the lingua franca for the people. The importance of the English language as a subject is seen in its usage as the basic language of formal education, the official language, and that which textbooks are written at different levels of education in Nigeria.

Mathematics

Mathematics is a tool for national development and the need to acquire knowledge in the subject world over has become very obvious. Ifamuyiwa (2018) and Oyedeji (2000) described mathematics as a creative language, a tool, and a process. It is not an understatement to say that mathematics is a part of almost every human activity directly or indirectly. Despite its importance and usefulness, it is a subject that is the most feared by primary school pupils and secondary school students. Badru (2017) reported that low achievement in Mathematics is caused by the teachers' over-dependence on inappropriate approaches to teaching Mathematics with seemingly lack of basic mathematics principles that result in rote learning and consequently, low achievement. Meanwhile, Awodeyi and Udo (2017) maintained that achieving success in learning Mathematics will require students to communicate mathematically, reason mathematically, and develop self-confidence to solve. Meanwhile, Ifamuyiwa and Rosanwo (2016) simply attributed students' poor performance in the subject to its nature of being a fearful subject, the methodology of teaching, communication problems, and the teachers' failure to relate the knowledge and use of mathematics to the immediate environment of the learners which consequently hinders consolidation, application, and transfer of learning.

Science

Science is defined as a way of knowing more about the universe through data analysis, interpretation, and presentation of findings. Science has contributed greatly to the nation's economic, industrial, and technological growth as they are quite obvious to almost everyone. Science does not only lay the foundation for scientific development but is also helpful in day-to-day interaction.

As laudable as LESEP seems, the extent to which it has achieved its objectives has not been extensively studied and documented in the literature, especially after the completion of the program. Therefore, assessing the impact of LESEP will provide information on the probable shortcomings of the project and guide against such in other programs or projects that may be launched in Lagos state or other educational interventions. It is against this background that the study assessed the impact of LESEP in senior secondary schools in Lagos state specifically students' academic performance in the three core subjects with the view of providing information on the worthwhileness of the program using Antecedent, Transaction, and Outcome (ATO) evaluation model.

2.2 ATO Model

The ATO model was proposed by Robert Stakes (1967). It is a three-phase program evaluation model, the antecedent phase, the transaction phase, and the outcome phase. The antecedent phase includes conditions existing prior to the implementation of a program. The transaction phase constitutes the process during the implementation of a program while the outcome phase relates to the effectiveness of the program. The model will assist the researcher in assessing the status of students' academic performance education in Lagos state before the commencement of the program (antecedent), during the program (process) and after the completion of the program (output).

Objectives of the Study

The primary objective of the study is to conduct an impact assessment of the performance of the Lagos Eko Secondary Education Project (LESEP) in senior secondary schools in Lagos state. The study used the Antecedent, Transaction and Outcome (ATO) evaluation model.

Specific objectives are to:

- i. assess students' performance in external examination (WASSCE) in Mathematics, English Language and Biology between 2006 and 2008 before the commencement of the program in Lagos state;
- ii. assess if there is an improvement in students' performance in external examination (WASSCE) in Mathematics, English Language and Biology for the years (2009-2016) (during the execution of the program);
- iii. assess if there is any improvement in the students' performance in external examination in Mathematics, English and Biology for the years (2017-2019) (after the execution of the program).

Research Questions

The following research questions were formulated to be answered in the study:

- i. What was the academic performance of students in the West African Senior School Certificate Examination (WASSCE) before the program (2006-2008) in the three major subjects (Mathematics, English and Biology)?
- ii. What was the performance of students in the West African Senior School Certificate Examination (WASSCE) during the implementation of the program (2009-2016) in the three major subjects (Mathematics, English and Biology)?
- iii. Is there an improvement in the student's academic performance in the three major subjects at WASSCE (Mathematics, English, and Biology) after the program (2017-2020)?

3. Methodology

This section presents methods and procedural processes used in carrying out the study. It is discussed under method, population, sampling technique and sample, data instrument, and method of data analysis.

3.1. Methods

The study adopted a survey research design of ex post facto type. This design allows for the description of the event after its occurrence where the variables already existed. This type of design involves a collection of data to accurately and objectively describe the phenomenon that has occurred.

3.2. Participants

The population consists of all result students in three hundred and eight (308) public Senior Secondary Schools in Lagos state between 2006-2020.

3.3. Sample

The sample consists of students results in Mathematics, English, and Biology between 2006 and 2019 in selected schools. Proportionate sampling and purposive sampling techniques were used to arrive at the sample size (Table 1). Based on the six existing education districts, 20% of the schools from each district proportionally such that districts 1, 2, 3, 4, 5, 6 will have 7, 10, 12, 9, 13, and 10 schools respectively as representatives. After this purposive sampling was also used to select all the students in the selected schools.

Table 1. A multi-stage sampling of respondents

Edu. Districts	No of public senior secondary schools in each District	No of the schools selected in each of the districts (20%)	Result of students presented for WAEC in each year
Dist1	37	7	16403
Dist2	51	10	29104
Dist3	61	12	21299
Dist4	43	9	18796
Dist5	66	13	31012
Dist6	50	10	27111
Total	308	61	143725

3.4 Procedure

Research Instrument

Students Performance Profile Form (Mathematics, English and Biology): The instrument was designed to assist the researcher in recording the number of candidates that sat for the WASCE within 15 years. The instrument was used to obtain data on students' performance in Mathematics, English and Biology, year of examination, credit pass, ordinary pass and fail. The results were obtained from the examination body (WAEC). Thus, it was assumed to be valid. However, for face validity, the researcher and two experts in Test and Measurement scrutinized the instruments and found it appropriate for the study. The data collected was analyzed using descriptive statistics.

Table 2. Evaluation Grid using ATO model

Evaluation Model Component	Research Question	Respondents	Instrument	Method of Data Analyses
Antecedent	1	WAEC result (2006-2008)	Students' Performance Profile Scale	Frequency table and percentage
Transaction	2	WAEC result (2009-2016)	Students' Performance Profile Scale	Frequency table, mean, Percentage and Std
Outcome	3	WAEC result (2017-2019)	Students' Performance Profile Scale	Frequency table, mean, Percentage and Std

Source: Researcher

3.5. Results and Analysis

Research Questions

1. What was the academic performance of students in the West African Senior School Certificate Examination (WASSCE) before the introduction of LESEP (2006-2008) in the three major subjects (Mathematics, English and Biology)?

Table 3. Summary of Academic Performance of Students West African Senior School Certificate Examination (WASSCE) between 2006-2008 in Mathematics, English and Biology

Subject	Years	Total No. of candidates (TNC)	(A1-C6) credit %	(D7-E8) Pass %	(F9) fail %
Mathematics	2006	13706	14.47	37.82	47.71
	2007	13622	10.44	28.37	61.19
	2008	12869	14.29	39.74	45.97
Average			13.06	35.31	51.62
English	2006	13706	11.42	24.33	64.25
	2007	13622	10.56	21.48	67.96
	2008	12869	13.01	18.64	68.35
Average			11.66	21.48	66.85
Biology	2006	13706	17.58	37.34	45.08
	2007	13622	17.58	29.82	52.60
	2008	12869	20.41	35.76	43.83
Average			18.52	34.30	47.17

The data in Table 3 shows students' academic performance in WASSCE in three core subjects before the introduction of LESEP (2006-2008). In respect of students' performance in Mathematics in 2006, the table shows that only 14.47% of students had between A1-C6 (credit pass) and 37.82% of the students had between D7-E8 pass while 47.71% of students had F9%. Students' performance in 2007 shows that, only 10.44% of students had between A1-C6 (credit pass) and 28.37% of the students had between D7-E8 pass while a larger percentage, 61.19% of students had F9%. In 2008, a larger percentage (45.97%) of the students had F9% while 14.29% of the students had between A1-C6 (credit pass) and 39.74% had between D7-E8. In summary, between 2006 and 2008 only 13.06 % of the students had between A1-C6 (credit pass) and 35.31% of the students had between D7-E8 (pass) while 51.62% had F9% in Mathematics. Thus, a higher percentage of students failed in Mathematics in 2006-2008. The obtained data also shows that the results in English language, between 2006-2008, only 11.66% had A1-C6 (credit pass) and 21.48% of the students had between D7-E8 (pass) while 60.85% had F9%. Thus, higher percentage of students failed. Furthermore, in Biology, the average 18.52% of students had A1-C6 (credit pass) and 34.30% of the students had between D7-E8 (pass) while 47.17% had F9%. Thus, a higher percentage of students failed in mathematics.

Research question 2: What was the performance of students in the West African Senior School Certificate Examination (WASSCE) during the implementation of LESEP (2009-2016) in the three major subjects (Mathematics, English and Biology)?

Table 4. Summary of Academic Performance of Students West African Senior School Certificate Examination (WASSCE) between 2009-2016 in Mathematics, English and Biology

Subject	Years	Total No. of candidates (TNC)	(A1-C6) credit %	(D7-E8) Pass %	(F9) fail %
Mathematics	2009	12762	22.48	43.10	34.42
	2010	11896	26.15	30.48	43.37
	2011	8728	18.72	27.42	53.86
	2012	8596	4.26	37.65	58.09
	2013	10483	11.57	41.33	47.10
	2014	8996	10.58	38.82	50.60
	2015	8624	6.12	28.95	64.93
Average		8966	54.57	23.62	21.81
Average			19.31	33.92	46.77
English	2009	12762	22.84	32.41	44.75
	2010	11896	28.10	29.56	42.34
	2011	8728	35.41	28.76	35.83
	2012	8596	10.65	32.42	56.93
	2013	10483	10.65	27.65	61.70
	2014	8996	4.72	20.43	74.85
	2015	8624	12,44	32.64	54.92
2016	8966	63.22	18.76	18.02	
Average			23.51	27.82	48.67
Biology	2009	12762	28.41	32.23	39.36
	2010	11896	31.11	33.42	35.47
	2011	8728	27.40	28.40	44.20
	2012	8596	48.53	24.82	26.65
	2013	10483	51.06	30.61	18.33
	2014	8996	31.22	36.54	32.24
	2015	8624	47.27	33.36	19.37
2016	8966	60.41	30.20	9.39	
Average			40.68	31.20	28.12

Source: School Records

The data represented in Table 4 shows students' academic performance in WASSCE in three core subjects during the implementation of LESEP (2009-2016). Using the average of students' performance within the years under review, the data shows that only 19.31 % of the students had between A1-C6 (credit pass) and 33.92% of the students had between D7-E8 (pass) while students in their majority (46.77%) had F9% in Mathematics. Thus, a higher percentage of students failed in Mathematics between 2009 and 2016. For the English language, the result shows that 23.51% had A1-C6 (credit pass) and 27.82% had between D7-E8 (Pass) while 48.67% majority had F9%. Thus, the years under review recorded a higher percentage of failure. Furthermore, in Biology, the results show that only 28.12% of students had F9 compared with 40.68% that had A1-C6 (credit pass) and 31.20% that had between D7-E8 (pass). It thus shows that a higher percentage of students A1-C6 between 2006 and 2008 in Biology. Also, students' performance in the West African Senior School Certificate Examination (WASSCE) during the implementation of the program (2009-2016) in the three major subjects (Mathematics, English, and Biology) shows that a higher percentage of students failed Mathematics and English but higher percentage had credit in Biology.

Research question 3: Is there any significant improvement in the student's academic performance in the three major subjects at WASSCE (Mathematics, English, and Biology) after the program (2017-2020)?

Table 5. Summary of Academic Performance of Students West African Senior School Certificate Examination (WASSCE) between 2017-2020 in Mathematics, English, and Biology

Subjects	Years	Total No. of candidates (TNC)	(A1-C6) credit %	(D7-E8) Pass %	(F9) fail %
Mathematics	2017	9106	54.39	17.84	27.77
	2018	9678	56.40	25.53	18.07
	2019	8952	9.91	28.73	61.36
	2020	9041	46.68	25.82	27.50
	Average			41.84	24.48
English	2017	9106	48.75	27.65	23.60
	2018	9678	45.17	31.22	23.61
	2019	8952	3.57	28.46	67.97
	2020	9041	56.46	22.73	20.81
	Average			38.48	27.51
Biology	2017	9106	54.36	28.17	17.47
	2018	9678	50.37	27.26	22.37
	2019	8952	22.70	20.11	57.19
	2020	9041	48.79	37.43	13.78
	Average			44.05	28.24

The obtained data represented in Table 5 shows the academic performance of students in WASSCE in three core subjects after implementation of LESEP (2017-2020). Using the average of students' performance within the years under review, the table shows only 41.84 % of the students had between A1-C6 (credit pass) and 24.48% of the students had between D7-E8 (pass) while the remaining 33.67% had F9% in Mathematics. Thus, a higher percentage of students passed Mathematics between 2017 and 2020. For the English language, the results show that 38.48% had A1-C6 (credit pass) and 27.51% had between D7-E8 (Pass) while 33.99% had F9%. Thus, the years under review recorded a higher percentage pass. Furthermore, in Biology, the results show that only 27.70% of students had F9 compared with 44.05% that had A1-C6 (credit pass) and 28.24% that had between D7-E8 (pass). It thus shows that a higher percentage of students had A1-C6 between 2017 and 2020.

Table 6. Comparison of students' performance in the West African Senior School Certificate Examination (WASSCE) Before, During and After LESEP ((A1-C6))

	Mathematics (A1-C6) credit %	English (A1-C6) credit %	Biology (A1-C6) credit %
Time			
Before	13.06	13.06	18.52
During	19.31	23.51	40.68
After	44.05	28.24	27.70

In terms of comparison, it appears that students recorded better performance in Mathematics after the implementation of the program having 44.05% of students with A1-C6 credit % when compared with 19.31% and 13.06 % recorded during and before

the implementation of LESEP. The case appears similar to the English language because 28.24% of the students recorded A1-C6 compared with 23.51% and 13.06 % during and before the implementation of LESEP. It however, appears that students recorded better A1-C6 (40.68%) during the implementation stage of the LESEP in Biology compared with 27.70% recorded after the implementation of the program.

3.6. Discussion

The results show that between 2006-2008, the majority of the students had f9 in the three subjects (Mathematics, English and Biology). This confirms the poor state of education at the secondary level in Lagos prior to the introduction of LESEP. The probable reason for this outcome may be attributed to the poor state of finance of education among other factors. Most public schools lack the necessary instructional and infrastructural facilities such as well-equipped laboratories and workshops, vocational equipment, well-stocked school libraries, qualified teachers, technical instructors, and guidance counselors. Further reasoned the poor state to free education operated by the state, he submitted Sitting for the West Africa Senior Secondary Certificate Examination (WASSCE) is also free of charge. As of 2007/08, when the Lagos Eko Secondary Education Project was prepared, 11,387 schools (public and private) enrolled an estimated 2.3 million students. Of these students, approximately 1 million (40 percent) were enrolled in public schools and, by extension were paid for by the Lagos state government. GDI, (2016) submitted that public education was underfunded in Lagos as anywhere else in Nigeria because it accounts for approximately 16% of total appropriations at the state level. Also, rapid population growth, at 2.8% per year nationwide and 3.2% per year in Lagos State, has placed constant pressure on the education system to make room for more students. In general, Lagos State enjoys a high student attendance level, with primary gross attendance at 103% and net attendance at 69%. The secondary gross attendance rate is almost 117% and net attendance is 69% (NPC DHS 2014). The finding confirms the report of GDI (2016) that the quality of primary and secondary education deteriorated markedly in the decade prior to the Eko Project. For example, despite a few high-performing schools, only 18% of candidates taking the WASSCE in Lagos State in 2009 obtained five credit passes and above (a score considered academically adequate for entry into university) in at least five subjects, including English and mathematics.

Also, during the transaction stage of the program, student's performance in the subjects was still not good enough but was better than what was recorded before the introduction of LESEP. The improvement was more noticeable with Biology subject where most of the students (40.68%) recorded credit passes. The improvement may be attributed to the introduction of LESEP. This was partly because School improvement grants were made available to all public junior and senior secondary schools in Lagos State as an additional funding source to improve the quality of education services on the basis of an approved school improvement plan. (Global Delivery Initiative, GDI,2016). Also, Additional performance grants were awarded to the best-performing 40% of schools based on criteria such as test scores and teacher attendance. However, a specific look at the 2014 result shows a decline in the performance of students, the state's WASSCE performance ranking dropped from first to sixth of 36 states (GDI, 2016). Generally, the share of students who obtained five credit passes, including in English and mathematics, dropped from 46% in 2013 to 28% in 2014. The outcome was, however, attributed to the funding gap between the closure of the original project and the delayed effectiveness of additional financing. Potential reasons for the setback include the curriculum reform being undertaken at the time and the shortage of qualified and experienced teachers following a spate of retirements (500 of 3,000 teachers retired in District IV alone during this period), leading to a higher student-teacher ratio (World Bank 2015) The result eventually improved in 2016, World Bank, (2015b) attributed the improvement to increased monitoring and supervision from three times per month to four times) to address the retirement of teachers; the conversion of a number of qualified volunteer teachers to permanent and regular staff positions; the reinstatement of afternoon lessons and Saturday coaching; the intensification and increased frequency of early morning lessons; efforts to urge stakeholders, including SBMCs, to focus on teachers' and pupils' attendance and punctuality and the inclusion of more teachers in training and retraining activities to boost

morale and motivate them to boost their productivity. This finding is synonymous with the report of Akinyemi et al (2014) who report significant differences in the academic performance of students before and after being taught by Eko project trainee teachers. He furthered that the effect of the Eko project accounts for 90%, 84%, and 46% of the variability in Mathematics, English language, and Basic Science performances respectively. This shows that there was an improvement in the student's academic performances after the exposure of their teachers to Eko Project Training.

Lastly, the result of students' performance in the three subjects seems to have improved compared with the results obtained before and during the implementation stage of the program. This sounds impressive that four years after the completion of the program, Lagos State still continues to wax stronger in students' performance using WAEC results as an indicator. This probably suggests that Eko project was very impactful on Lagos state secondary schools. It also suggests that Lagos state had raised the bar a little higher than what was obtained before and during the implementation of the program. The findings confirmed the World Bank report in 2013 on the development aim of the project which has enhanced the quality of public secondary education in the State. Generally, the study confirmed Lagos Eko Secondary Education Project (LESEP) has an obvious impact on the student's academic performance in WASSCE in the three core subjects (Akinyemi, et al, 2014).

4. Conclusion and Recommendations

The challenges inherent in education in Lagos state are quite noticeable in terms of students' poor Performance in the West Africa Senior School Certificate Examination (WASSCE). The purpose of intervention in education has always been to improve the standard of education. This was the same purpose for which LESEP was introduced in Lagos having observed poor students' performance among other shortfalls in education. The study thus concluded that the introduction of LESEP led to improvement in students' academic performance as this was noticed during and after the program. It is recommended that the Lagos state government should encourage more intervention educational programs after identifying areas of need. It is also recommended that the training should not be limited to English Language, Mathematics, and Biology teachers alone but should also be extended to other subject areas.

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