Factors Influencing the Academic Achievement of Secondary School Students: A Structural Equation Model

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One of the major reasons expounding the persisting decline in students' academic achievement and high drop-out rate at the secondary education level in Mauritius, despite the implementation of several educational reforms including the current 'Nine Years Continuous Basic Education' (NYCBE), is that reforms are often developed using a top-down approach with limited grounding into the voices of stakeholders. It is in this perspective that this study, underpinned by the 'general system' theory, uses a two-phases 'sequential exploratory mixed methodology' to capture the voices of different stakeholders to develop a Structural Equation Model (SEM) that showcases the correlations between key contextualised factors and students' academic achievements. The first phase, with a qualitative approach, identified the contextualised factors affecting students' academic achievement in Mauritius, by analysing data derived from 'Focus Group Discussions involving 16 participants, representatives of different educational stakeholders. The second phase, with a quantitative approach, developed a SEM using data collected from 600 students, captured through a survey questionnaire. The generated SEM, with a good fit indices, did not only depict greater impacts of school leadership, followed by student factor, tuition teacher factor, school teacher factor and socio-economic factor respectively on the academic achievements of secondary students, but also showcased the mediated effects between the factors, advocating for a holistic approach to improve school effectiveness in Mauritius. This study provides key information informing policy makers, educational specialists, and school administrative on the way forward towards improved school effectiveness.

Keywords: structural equation model, academic achievement, school effectiveness and improvement, factors, stakeholder voices

INTRODUCTION

The Mauritian education system has undergone several educational reforms during the past decades including the current 'Nine Years Continuous Basic Education' (NYCBE) reform implemented since 2017, with the prime objectives of increasing access to

education, decreasing the rate of school drop-out, and providing quality education to every child, in line with the international commitment to the UN Sustainable Development Goals (SDGs) and 'Reaching Out All (ROA)' initiatives (Ministry of Education, 2015). However, the Mauritian education system is still plagued with a declining trend in the academic achievement of secondary students and high drop-out rate (Atchia & Chinapah, 2019b). In 2021, only 71.6% (10,051 out of 14,044 students examined) cleared the 'National Certificate of Education' (NCE), which is the national examination marking the end of the first 9-years cycle of the NYCBE reform. And adding to the 28.4% of students who failed NCE, 22.3% students who were supposed to sit for the NCE 2021 examination were in the fourth year of the extended programme, which includes the students promoted to grade 7 despite failing the 'Primary School Achievement Certificate'(PSAC). Thus, out of the total number of students who sat for PSAC in 2017, 22.3 % were dropped-out of the mainstream pathway at the end of the primary schooling and an additional 28.4% of the same student population were dropped-out at NCE level, marking the end of the first cycle of NYCBE (Mauritius Examination Syndicate, 2021). This clearly shows that the current reform, as implemented till date, has not been able to decrease the achievement gap and the rate of drop-out, despite being a main target of the NYCBE reform, as stipulated in the policy document 'Inspiring every child' (Ministry of Education, 2015). Thus, the logical question is: Why the Mauritian education system is still failing despite the initiatives set in the NYCBE reform to reduce the achievement gap?

One of the reasons expounding such failures is the top-down approach used to develop and implement educational reforms (Gaziel, 2010; Skedsmo & Huber, 2019) in Mauritius. The initiatives implemented to curb the achievement gap and drop-out rate are not grounded on stakeholders' voices. It is in this perspective that the current study generates contextualised baseline data, including a 'Structural Equation Model (SEM)', that potentially inform policy makers of the key areas on which reforms should be developed. The SEM also depicts the cumulative and integrated impacts of contextualised causal factors such as school-based leadership, student factors, socio-economic-factors, and teacher factors, on the academic achievement of students. Through the SEM, this paper provides extremely important, much relevant, and contextual information in the educational policy domain to improve school effectiveness and the quality of the education offered in Mauritius.

Objectives of the Study

The aim of the study was to develop a 'Structural Equation Model' that depicts the impacts of contextualized factors on students' academic achievement at secondary education level in Mauritius.
The objectives of the study were as follows:
i)   To identify the main factors affecting the academic achievements of the Mauritian secondary students.
ii)   To examinethe academic achievement of students using the 'value-added score' which measure the distance travelled by students from PSAC (national examination

marking the end of primary schooling) and the NCE (national examination marking the end of lower secondary education and the nine-years cycle of the NYCBE reform)

iii)   To generate a 'Structural Equation Model' showcasing the cumulative and integrated impacts of the identified factors influencing the academic achievement of students.

CONTEXT OF THE STUDY

To situate the context of this study, this section comprises a brief overview of the current Mauritian education system, and a summary of the scholarship around key factors that commonly affect students' academic achievement at secondary education level.

The current Mauritian Education System

The current educational reform namely the 'Nine Years Continuous Basic Education (NYCBE)', implemented since 2017, is illustrated in figure 1.
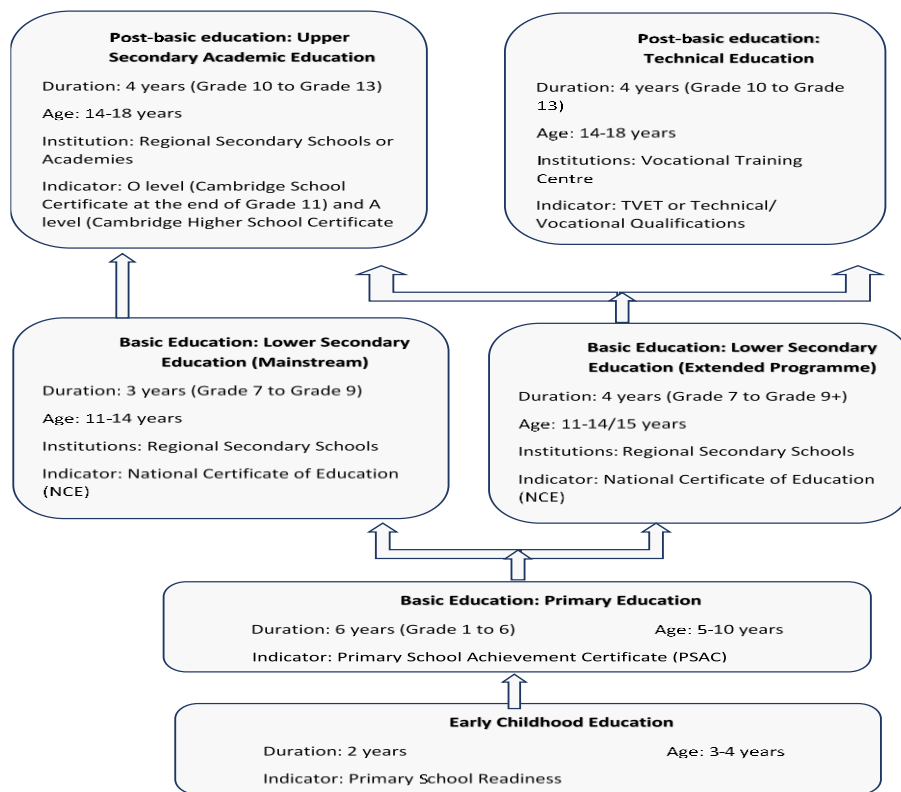

Figure 1
Framework of the NYCBE pathway (Rumjaun, Atchia & Reiss, 2022)

The current education structure, as depicted in figure 1, consists of four cycles, namely (i) the early childhood development and education which lasts for two years targeting students of three to four years old, (ii) the nine years of basic continuous education for students aged five to fourteen, (iii) the post Basic Education (Upper Secondary) for fourteen to eighteen years old students and (iv) the postsecondary and Higher education (above 18 years old). The nine years education structure is divided into six years of primary schooling that end with the PSAC assessment and three additional years at secondary level ending with the 'National Certificate of Examination' (NCE), serving as a selection and promotion exercise to channel students into academics, regional or TVET institutions.

Factors Affecting Students' Academic Achievement

Analysis of the literature revealed several factors affecting the performance and achievement of students, such as age, gender, social status, economic status, teacher factor, geographical location, ethnicity, marital status, student factor, extra-tutoring, parents' education level, parental profession, language, religious affiliations, self-motivation and learning, absenteeism, leadership and class attendance (Muller, 2018; Najmi, Ali Raza & Qazi, 2018; Osmanbegovic, Sulji'c & Agi, 2015; Seebaluck & Seegum, 2013). Atchia & Chinapah (2019a & 2019b) classified these factors into manageable clusters namely demographic, socioeconomic, teacher, leadership, and student factors.

Socioeconomic factors (SEF)

Though many researchers have unveiled significant effects of SEF on students' achievement, divergent school of thoughts have been identified in the literature. For instance, Tomaszewski, Xiang & Western (2020) and Kirkup (2008) concluded that students with high socio-economic status perform better than those with low socio-economic status, whereas Agasisti & Longobardi (2017) and Pedrosa, Dachs, Maia, & Andrade (2006) concluded that students of disadvantaged socioeconomic status perform relatively better than those coming from higher socioeconomic and educational strata. This has been termed as educational resilience. These two schools of thoughts perfectly situate the existing debate on the contextualised effects of SEF on students' achievement.

School leadership

There is growing empirical evidence that support the positive correlation between strong school leadership and students' academic achievement. In fact, researchers like Day, Gu, & Sammons (2016), Hitt & Tucker (2016), and Tan (2018), have revealed that school leaders can improve students' achievement in several ways, including the (i) provision of the necessary direct and indirect supports for quality teaching and learning (ii) involvement of different stakeholders as a community of practice in school matters, and (iii) provision of the necessary ethos and climate that is conducive to effective teaching and learning.

Student factor

As the main stakeholders, secondary students have a major role in their academic achievement. Researchers such as Kang & Keinonen (2018), Lemberger, Selig, Bowers, & Rogers (2015) and Shores, Shannon, & Smith (2010) concluded that student factors, such as time management, self-motivation, engagement, behaviour, and attitudes are the key factors governing their academic success.

Teacher factor

Many studies have provided empirical evidence of the positive correlation between teacher factor and students' achievements. For instance, Vizeshfar & Torabizadeh (2018), and Adnot, Dee, Katz & Wyckoff (2017) showed than an effective teacher can alter students' educational and thus economic outcomes. Analysis of literature revealed that the impact of educators on students' life and achievement vary widely from being a guide, a facilitator, a model, a pedagogical leader, a source of knowledge, a friend and a confider (Khasanah & Anggoro, 2022; Atchia and Chinapah, 2019b).

Private tuition

Private tuition takes different forms in different cultures (Zhang & Bray, 2020). Though Atchia & Chinapah (2019a) showed that private tuition is a key factor affecting students' achievements, they revealed that perspectives of stakeholders differ. One school of thought believes that private tutoring creates constructive out-of-school activities for the young and thus students who receive private tuition are likely to perform better in school and to stay in the education system for longer durations (Damayanthi, 2018). However, the second school of thought believes that private tutoring may distort the mainstream system, place an economic burden on households, and create excessive pressure for children and adolescents. These perfectly situate the debate around private tuition in Mauritius and in other parts of the world.

Though analysis of the literature revealed that the above-mentioned factors are among the most common when considering their impacts on the academic achievement of secondary students, it remains multifactorial and much contextualized. For instance, private tutoring, considered as a key factor influencing students' academic achievement at primary and secondary education levels in Mauritius, is not a key factor in other contexts. It is in this perspective that a mixed methodology approach was used in this study. The first stage of the study has a qualitative stance, where 'focus group discussion' is used to identify the contextualised factors affecting students' academic achievements in Mauritius, whereas the second stage of the study with a quantitative stance analyses the correlations between the identified factors.

Theoretical Framework

The 'General Systems theory' developed by Ludwig Von Bertalanffy in 1956 and adapted by Skyttner in 2005, as depicted in figure 2, was used as the theoretical framework guiding this study. The general systems theory focuses on the relations, interactions, and amalgamated effects of the different parts (inputs) found within or

outside the delimited environment, on the outputs, which is often referred to as a holistic approach to understanding phenomena (Yaşar, 2017; Chikere & Nwoka, 2015). Consequently, aligned to the focus of the 'general systems theory', this study, through a SEM, displays the interactions and inter-connectedness of several determinants/inputs (factors affecting students' achievements) within and outside (external environment) school, on the academic achievement of students (dependent variable or output). The 'feedback externally influenced' represents monitoring and evaluation feedback that inform amendments of input provisions in view of improving the outputs (students' academic achievements).
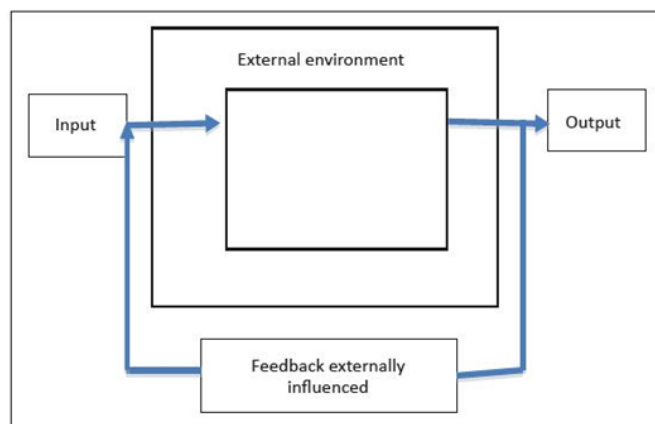
Extrinsic feedback (adapted from Skyttner, 2005).

Figure 2
'General System theory', adapted by Skyttner (2005)

The 'general systems theory' also underpins the essence of this study which is based on studying students' achievements rather than students' performance. In fact, students' performance is limited to one-off assessment whereas achievement takes into consideration the distance travelled by the students over time. Within the achievement paradigm, input represents students' entry level, output represents the level reached after a specific number of years in secondary schools, and the environment represents the factors affecting the distance travelled by each student.

METHOD

This study, underpinned by a mixed ontological and epistemological stand, used a 'sequential exploratory mixed methodology' to explore the factors affecting students' academic achievement at secondary level in Mauritius. The research design, as depicted in figure 3, used a mixed methodology with two main phases. The first phase uses a qualitative approach to identify the contextualised factors affecting secondary students' achievement and the second phase, with a quantitative approach, generates data through a survey questionnaire that captures students' perceptions of how the identified factors affect their academic achievement.
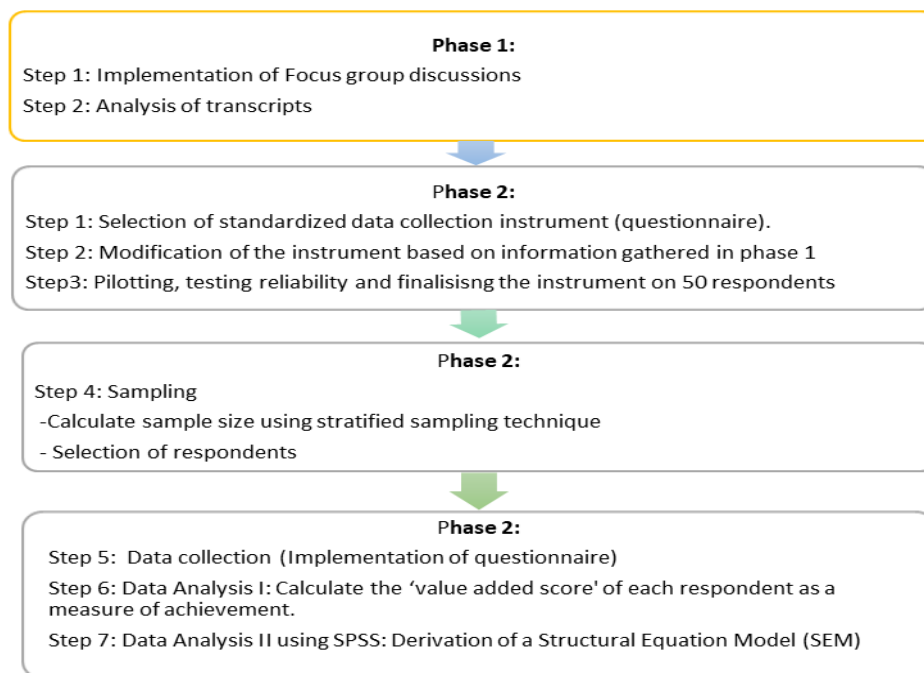
Phase 1:

Step 1: Implementation of Focus group discussions

Step 2: Analysis of transcripts

Phase 2:

Step 1: Selection of standardized data collection instrument (questionnaire).

Step 2: Modification of the instrument based on information gathered in phase 1

Step3: Pilotting, testing reliability and finalisisng the instrument on 50 respondents

Phase 2:

Step 4: Sampling

-Calculate sample size using stratified sampling technique

- Selection of respondents

Phase 2:

Step 5: Data collection (Implementation of questionnaire)

Step 6: Data Analysis I: Calculate the 'value added score' of each respondent as a measure of achievement.

Step 7: Data Analysis II using SPSS: Derivation of a Structural Equation Model (SEM)

Figure 3
Research design

Phase 1: Qualitative stage

The first phase, with a qualitative approach, used 'focus group discussions' (FGDs) to firstly identify the main contextualised factors affecting achievement of secondary school students in Mauritius, and secondly to collect information that guided the selection and modification of the instrument (questionnaire) to be used in the second phase. Sixteen participants, including students, rectors, deputy rectors, senior educators, quality assurance officers, educators, and parents were involved in the FGDs.

The transcripts generated through the FGDs were coded and analysed using the 'long table method' to generate the overarching ideas and themes. In fact, the statements of the participants were analysed and grouped based on common ideas. Then, each group was associated with an overarching theme using common terminologies, being used in the current scholarship on school effectiveness. A selective interpretive approach was used to select the statements that relevantly support each overarching theme. In addition to the identification of the determinants (inputs or factors) influencing students' academic achievement, analysis of the qualitative data provided key information which guided the selection of instrument (questionnaire) to be used in phase 2. As the overarching themes that emerged in the analysis of the transcripts corroborated with the

mains constructs of the 'Trends in Mathematics and Science survey' (TIMSS) questionnaire, it was used to capture the perceptions of students on how the identified factors affect students' academic achievement.

Phase 2: Quantitative stage

The second phase, with aquantitative approach, involved the implementation of the TIMSS questionnaire with a sample of 600 participants, representative of the Mauritian student population. The sample was calculated using Smith's (2013) formula 'Sample size = (Z-score)² x StdDev x (1-StdDev) / (margin of error)²'. The 600 participants were selected using a proportionate stratified sampling method, taking into consideration gender, school types (National and Regional) and location (Mauritius comprises four educational zones), as depicted in figure 4. The schools and respondents were then selected using the 'Excel number generator' to randomly identify schools and students that were assigned specific numbers.
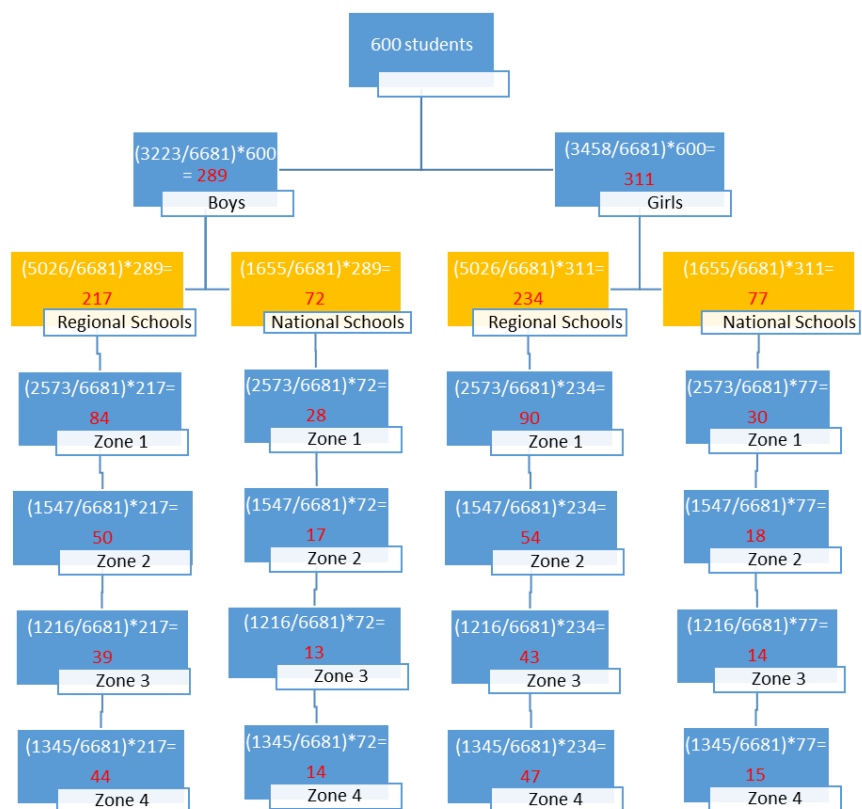

Figure 4
Sampling procedure

After constituting the sample, and completing the all necessary ethical clearance considerations including approval of participants through signed consent form, the next stages of phase 2 were implemented as shown in figure 4, that is (i) the calculation of the 'value-added score' of each participant, representing students' academic achievement, and (ii) data collection through the implementation of the questionnaire, (iii) the input of the collected data collected in the SPSS format, (iv) screening and cleaning of data to create a final database, and (v) analyse data using descriptive analysis, factor loadings and Structural Equation Modelling.

Value added score (VAS)

The VAS is the measure of the distance travelled by students from one checkpoint (PSAC: national examination marking the end of primary schooling) to the next (NCE: national examination marking the end of the lower secondary level and the end of the nine years schooling), in line with the VAS calculation developed by Rodgers (2005). The VAS of each student was calculated as follows:

Value added score = Average point score (APS) at NCE – Average point score at PSAC, *where:*

APS for each student = (Point in English +Point in Mathematics) / 2

The decision of using only English and Mathematics to calculate the Average Point Score (APS) was based on the literature, the policies on numeracy and literacy, and on the fact that VAS requires considering examinable subjects common at both PSAC and NCE for fair comparison, as both are national examinations, where all students in the country sat for the common papers (Atchia & Chinapah, 2019b).

Structural Equation Model (SEM)

Once data input in SPSS were completed, categorical variables were checked, and output of descriptive statistics was analysed to identify errors. The database was then cleaned, and the negatively worded items were reversed by transforming and recoding into the same variables. After checking the data file for accuracy, the reliability of the items was tested using the reliability estimates, and the assumptions for structural equation modelling, such as normality, multicollinearity, autocorrelation, and homoscedasticity were tested before generating the SEM, as depicted in figure 5.

The SEM was used because it integrates several different multivariate techniques into one model fitting framework, and it is an integration of measure theory, factor (latent variable) analysis, path analysis, regression, and simultaneous equations among others (Thakkar, 2020). It is particularly suitable as it involves complex, multi-faceted constructs that are measured with errors, thus making provision for the correction of the said errors.
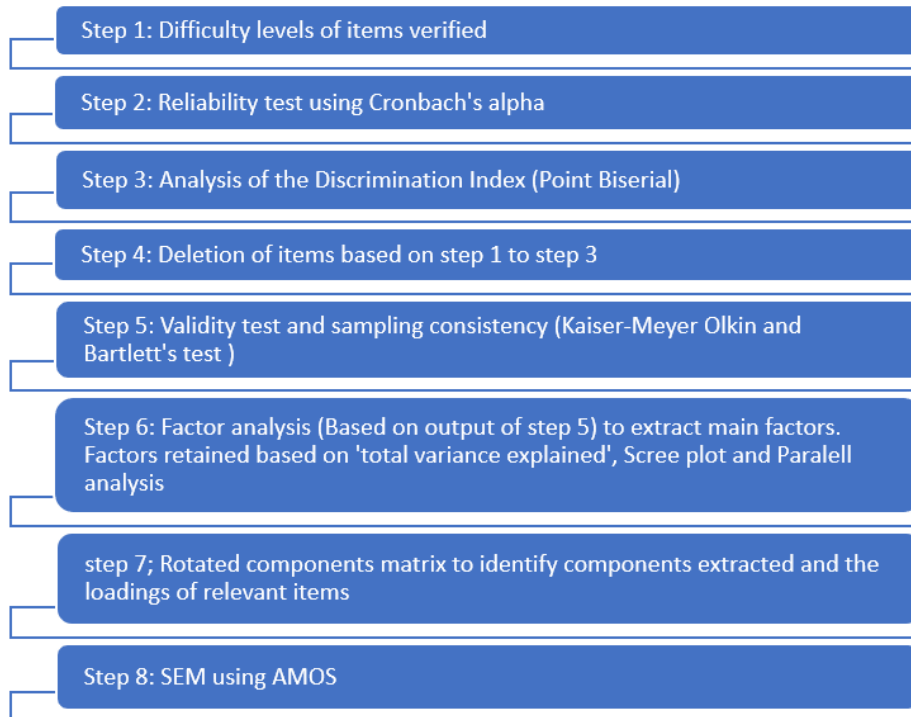
Step 1: Difficulty levels of items verified

Step 2: Reliability test using Cronbach's alpha

Step 3: Analysis of the Discrimination Index (Point Biserial)

Step 4: Deletion of items based on step 1 to step 3

Step 5: Validity test and sampling consistency (Kaiser-Meyer Olkin and Bartlett's test)

Step 6: Factor analysis (Based on output of step 5) to extract main factors. Factors retained based on 'total variance explained', Scree plot and Paralell analysis

step 7; Rotated components matrix to identify components extracted and the loadings of relevant items

Step 8: SEM using AMOS

Figure 5
Stepwise procedure of developing the SEM

FINDINGS

This section presents the findings as given in the research design, laying emphasis on the two main phases namely (i) identification of the factors affecting academic achievement of secondary students in Mauritius, and (ii) the SEM showcasing the effects of the identified factors on students' achievements.

Phase 1: Identification of the factors affecting academic achievement of secondary students in Mauritius

The qualitative data, collected through the FGDs, were coded and analysed as explained in the methodology. The over-arching ideas/themes that emerged from the analysis, together with the key relevant statements of participants supporting each theme are given in table 1.

Table 1
Views of participants in the Focus Group Discussions (FGD)

Over-arching ideas	% Participants highlighting the specific factor				Participants views on how the specific factor affect students' achievement.
	Students	Sc Admin	Educators	Parents	
Socio-Economic Factor (SEF)	100	83	100	83	Participants explained that SEF plays a crucial role in students' achievement through parents' education level, marital status, financial status, guidance, support, parental involvement, peer influence, social networking, community & environment, absenteeism, cultural differences, and language exposed.
Students Factor (SF)	100	83	83	83	Participants explained that SF plays a crucial role through time management, attitudes, behaviours, use/misuse of ICT tools & social media, commitment, self- engagement, shirking of classes, intrinsic motivation, competition, romantic affairs, stress, depression, health problems, self-esteem, entry point and culture.
Teacher Factor at school level (TFSc)	83	100	83	83	Participants explained that TFSc/TFTu influence students' achievements through the quality of teaching, teacher-students interaction, use of ICT in teaching/learning, motivation, support, counselling & pastoral care, teaching techniques & strategies, classroom management, Evaluation, feedback & monitoring, content knowledge, planning & organisation, language of instruction, teacher experience and training.
Teacher Factor at tuition level (TFTu)	83	33	33	17	
Leadership (L)	83	83	33	67	Participants explained school leaders influence students' achievement by ensuring evaluation, feedback & monitoring of students' engagement, ensuring quality of teaching, ensuring conducive ethos & climate, community & social networking, motivation, provision of needs/ resources, opportunities to students and educators, guidance & support, discipline, class size and leadership styles.

As shown in table 1, the overarching ideas that emerged from the FGDs were the socio-economic factor, student factor, school teacher factor, tuition-teacher factor, and leadership. The table also includes key statements of participants that explain how each

factor affects students' academic achievement. These represents key information that may be used by policy makers and educational specialists as baseline data to guide the development of action plans focusing on improving students' achievements and school effectiveness.

Phase II: SEM showcasing the effects of the identified factors on students' achievements

All recommendations required to run factor loadings and SEM were tested and found to be in accordance. In fact, the calculated Cronbach's alpha was 0.980, indicating high reliability and internal consistency of the data collection instrument (questionnaire). The Kaiser-Meyer Olkin (KMO) and Bartlett's Test of Sphericity were 0.971 and 0.000, indicating that the data were appropriate for factor analysis. Moreover, based on eigenvalues greater than 1, the 'Total Variance Explained' table, and the scree plot, five components were extracted representing more than 55.618% of the variance as compared to the remaining components, in line the factor loadings procedures described by O'connor (2000), and Cota et al. (1993).
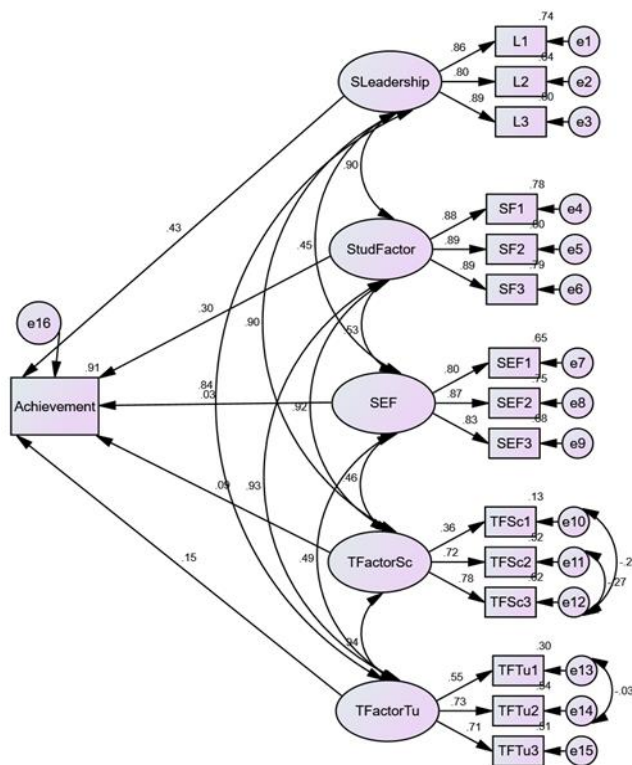

Figure 6
Structural equation model (SEM)

Figure 6 is the SEM generated using the Amos software to show the discrete and cumulative impacts of the independent variables (factors identified in Phase 1) on the dependent variable (students' academic achievements calculated using the value-added score). In line with the procedure described by O'connor (2000), each independent variable was represented by three items (observed endogenous variables) with the highest factor loadings. For instance, School leadership was represented by L1, L2, and L3 with the highest factor loadings 0.840, 0.815 and 0.767 respectively.

The fit indices shown in tables 2a to 2d show the goodness of fit of the SEM presented as Figure 6. It was noted that the test yielded a good Chi-square value of 303.272 for degrees of freedom 87, with a significant P-value (p=0.000). Moreover, the value of the CFI, GFI and NFI were 0.970, 0.951 and 0.959 respectively and thus more than the minimum required value of 0.95. In addition, the AGFI value was 0.905 which is within the acceptable range of $0.90 \leq AGFI \leq 0.95$. The value for RMSEA was .044 which fits the acceptable value of less than 0.05 (Kenny, 2015). We therefore concluded that the proposed structural model exhibited a good fit.

Table 2a
Model Fit summary (CMIN)

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	49	303.272	87	.000	3.486
Saturated model	136	.000	0		
Independence model	16	7347.983	120	.000	61.233

Table 2b
Comparative Fit Index (CFI)

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.959	.943	.970	.959	.970
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Table 2c
RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.059	.951	.905	.601
Saturated model	.000	1.000		
Independence model	.708	.203	.097	.180

Table 2d
RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.044	.057	.072	.001
Independence model	.317	.311	.323	.000

In the SEM, one-way arrows show causal relations whereas the two-way arrows show the correlation between the endogenous independent variables. According to the SEM with a P-value of 0.000 for the regression weights and thus significant, School

leadership showed the highest causal effect of 0.43 on students' achievement, followed by Student factor (0.30), Teacher factor in tuition (0.15), Teacher factor in school (0.09) and finally Socio-economic factor (0.03).

The SEM model also explores the mediating effect of the unobserved endogenous variables on each other, as shown in table 3 through the covariances and correlations between the independent variables.

Table 3
Covariances and correlations between the independent variables

	Factors		Estimate	S.E.	C.R.	P	Correlation
Leadership	<-->	Student Factor	1.015	.071	14.228	***	.903
Student Factor	<-->	SEF	.961	.097	9.889	***	.533
Leadership	<-->	SEF	.723	.084	8.597	***	.450
Student Factor	<-->	Teacher Factor (Tuition)	.520	.048	10.781	***	.930
SEF	<-->	Teacher Factor (Tuition)	.389	.051	7.590	***	.486
SEF	<-->	Teacher Factor (School)	.212	.034	6.193	***	.460
Teacher Factor (School)	<-->	Teacher Factor (Tuition)	.135	.019	6.913	***	.943
Student Factor	<-->	Teacher Factor (School)	.295	.039	7.654	***	.916
Leadership	<-->	Teacher Factor (School)	.259	.034	7.598	***	.900
Leadership	<-->	Teacher Factor (Tuition)	.420	.041	10.311	***	.843

Table 3 showed significant effects with P=0.000 between the independent variables. It is noted that there is (i) strong and significant correlation ($0.75 \leq r \leq 1$) between student factor, Teacher factor and Leadership, (ii) intermediate correlation ($0.25 \leq r \leq 0.75$) between school leadership and SEF, (iii) strong and significant correlation ($0.75 \leq r \leq 1$) between leadership and teacher factor, (iv) intermediate correlation ($0.25 \leq r \leq 0.75$) between student factor and SEF, (v) strong correlation between student factor to both teacher factor at school and Tuition, but (vi) relatively lower correlations between SEF and the other variables. The correlation level used here is aligned to the 'measuring model fit' explained by Kenny (2005)

The SEM which showcased both the main contextualized factors affecting students' academic achievement and the interactions between the factors, represents key data that inform policy makers and other stakeholders on the areas requiring emphasis when planning action plans to improve students' academic achievements and school effectiveness in the country.

DISCUSSIONS

The data generated in this study, cumulated into the designing of a SEM, do not only describe the significance of the discrete and cumulative impacts of the key causal

factors, but also showcase the complex interactions of the factors namely 'school leadership', 'student factors', 'socio-economic factors', and 'teacher factors' at the level of school and private tuition on the academic achievements of secondary students in Mauritius. In fact, the complex interconnectedness and the mediation effects of the factors as depicted in the SEM, provide deep understandings of the multifactorial dimensions of the impacts. Basically, we infer that improvement of students' academic achievement cannot be achieved by focusing on a single factor. Instead, underpinned by the SEM, relevant and context-driven multi-levelled 'action plans' should be designed that focus on the interactive, mediating, and multifactorial approach or interventions (Shatzer, Caldarella, Hallam & Brown, 2014). For instance, implementation of an action plan which focuses only on improving teacher factor will not achieve the expected outcome of improving students' academic achievements, if other factors such as 'school leadership' and 'student factors' are not taken into consideration. In fact, as depicted in the SEM with the one-way arrows showing the causal relationships and the two-way arrows showing the correlation between the endogenous independent variables, the interactions between the different stakeholders, that is policy makers, educational specialists, school administrative, teachers, and students, need to be considered when designing, preparing and implementing policies and actions plans relevant to school effectiveness. In a nutshell, the piecemeal approach focusing on specific factor to improve students' academic performance should be replaced by strategic multi-leveled approach targeting all key factors.

Moreover, these data are fundamentally important to different stakeholders implied in the review of the NYCBE reform, especially when the year 2022 marks the end of the very first cycle of the reform. The findings represent key baseline data that may be used to amend the existing educational reform or guiding the designing of new reforms that focuses on the needs of the society. In fact, the SEM has the potential to be used as the underlying model guiding the development of relevant action plans that may be implemented to address the current educational challenges so that provisions are made for equitable and inclusive quality education. The SEM actually provides relevant details on the key aspects where interventions should be centered to improve students' academic achievement. The following paragraphs highlights the key aspects on which improvement or action plans should be focused.

The SEM clearly revealed that 'school leadership' is the main factor influencing students' academic achievement. Though this finding tallies with the work of other researchers such as Leithwood, Sun & Schumacker (2020) and Hou, Cui & Zhang (2019), it is imperative to understand that the impacts of school leadership differ from one context to another. In the Mauritian context, as highlighted by the participants in the FGDs, it was found that secondary school leaders influence students' academic achievements by (i) monitoring educators' role in the teaching and learning process, (ii) monitoring students' engagement in their studies, (iii) providing resources needed for quality education (iii) evaluating, monitoring and providing necessary feedback on the appropriateness of strategies or methods used by teachers at classroom level, (iv) providing a conducive ethos and climate in the school, (v) involving parents and the immediate community in school matters, (vi) motivating students, teaching and non-

teaching staffs, (vii) coaching and providing guidance and support to members of the school community and (viii) maintaining discipline. In fact, Niqab, Sharma, Wei & Maulod, 2014) and Murphy & Louis (2018) expounded that students' academic achievements remain high when school leaders develop a relationship of trust with staffs and students, inculcating positive working attitudes and values in the school.

The student factors, as depicted in the SEM, is the second most influential determinant on students' academic achievements. Though this finding aligns itself to the work other researchers such as Tokan & Imakulata (2019), and Cimermanová (2018), it remains fundamentally context dependent. In this study, the SEM showcased that student factors have a crucial role on students' academic achievements, through time management, attitudes, and behaviours. The respondents explained that the use/misuse of ICT tools, time spent on social media, self-commitment, intrinsic motivation, engagement in learning, shirking of classes, absenteeism, competition, romantic affairs, stress, depression, health issues, self-esteem, culture, past academic performances, inherent skills, and competences are some of the key components explaining the role of student factors on their academic achievements.

The model also shows a significant positive correlation between teacher factors and students' achievement, aligning to the findings of other researchers. For instance, Ismail, Don, Husin & Khalid (2018) stated that students under the tutelage of ineffective teacher will not achieve adequate academic progress. Muhonen et al. (2018) stated that high efficacy teachers boost students' achievement. In this study, the respondents substantiated the positive correlation by highlighting that teacher factors positively influence students' academic achievement by (i) maintaining high-quality teaching through the use of student-centred approach, (ii) ensuring teacher-students interaction and students engagement in lessons, (iii) making effective use of ICT in teaching and learning process, (iv) constantly motivating students, (v) providing necessary support, counselling and pastoral care to students, (vi) using innovative, differentiated and appropriate teaching techniques and strategies, (vii) maintaining classroom management, (viii) ensuring proper evaluation and monitoring of students' progress, (ix) providing high quality and updated subject content materials, (x) ensuring effective planning and organization, (xi) tendering timely feedback, and (x) maintaining discipline.

Though 'teacher factors' is considered key in the academic achievements of students, this study as showcased in the SEM, revealed that teacher factor in Tuition has a higher impact on students' achievement as compared to teacher factor at School level. Though often considered as a plaque in the Mauritian context, few researchers such as Kulpoo (1998) and Atchia & Chinapah (2019a) have highlighted positive impacts of tuition on students' academic achievement. The impacts have been explained by several researchers in their respective contexts. Sauti (2021), and Yiu (1996) stated that extra tuition might have a positive outcome in improving students learning, providing students with constructive activities, and enabling them to complete syllabus in time. Mohona (2021), and Ireson & Rushforth (2005) viewed tuition as a forum to help students understand mainstream lessons. Makworo (2012) stated that extra tuition enables learners to have extra attention, and ensures improved learning, performance,

personalized relationship, and parents' involvement. Maithya & Mutua (2015) concluded that most teachers and students supported the practice of extra tuition. Bray (2013) stated that in an ideal world, private tuition is meant to favour individual attention, solve learning difficulties of those lagging, and urge those aiming at excellence. However, when private tutoring starts to replace mainstream education, then problems crop up.

According to the model, the factor with the least impact on the academic achievement on secondary school students is the socio-economic factor (SEF). Though such correlation has been emphasized by other researchers such as Rodriguez-Hernandez, Cascallar, & Kyndt (2020), the impact remains much contextualised. In fact, the respondents in this study revealed that SEF influence their academic achievement through (i) parents' education level, (ii) family income (iii) parents' role in motivating and providing guidance and support to their ward, (iii) parents involvement in the studies of their children, (iv) peer influence, (v) social networking, (vi) community and environment, (vii) cultural differences and (viii) language exposed. However, the lower impacts of SEF in the Mauritian context compared to the other factors mentioned above may be explained by the fact that Education is free at the primary, secondary and tertiary level in Mauritius. Thus, even parents with low family income manage to send their ward to school. Moreover, the parents in the focus group discussions highlighted that education of their ward is considered as a top priority in their budget as they believe that education is the only solution to all their financial problems.

CONCLUSION

This study used a mixed methodology approach to identify and analyse the factors affecting the academic achievements of students at secondary education level. Through the development of a SEM that showcase the correlations between the identified factors and students' academic achievements, it was found that school leadership has a greater impact on academic achievement, followed by student factor, tuition teacher factor, school teacher factor and eventually socio-economic factor. These factors, as explained by the 'general systems theory', are the inputs that require special considerations academic achievement (output) is to be improved. In fact, the findings of this study provide important baseline data that inform all stakeholders ranging from policy makers and educational specialists involved in the development of policies and educational reform to schools' staffs involved in the implementation of the reforms, on the way forward towards improved school effectiveness.

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