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## DETERMINANTS OF ACADEMIC ACHIEVEMENT AT SECONDARY LEVELS: A STUDY IN MAGURA DISTRICT OF BANGLADESH

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### ABSTRACT

The purpose of this study was to identify the factors influencing academic achievement of secondary students in *Magura* district of Bangladesh. Using survey design, this study was carried out in a total of eight educational institutions, including schools, colleges, and *Madrasah*, both in urban and rural areas of *Magura* district. Administering a self-reported questionnaire (SRQ), segmented into four different modules, data were collected from 566 students of various levels of secondary education system following proportionate multistage random sampling. The exploratory factor analysis (EFA) suggests a four-factor solution, and the role of teacher' explained the most variations. The hierarchical regression analysis show that academic achievement of secondary students was influenced by track of education (0.173,  $p < 0.001$ ), education (-0.221,  $p < 0.001$ ), socioeconomic status (0.137,  $p < 0.05$ ), location (0.176,  $p < 0.01$ ) as well as size of class (-0.068,  $p < 0.10$ ), academic stress (-0.071,  $p < 0.10$ ) and motivation (0.145,  $p < 0.001$ ). Despite some limitations, this study has contributed empirically to a limited literature on academic achievement of secondary students in Bangladesh. Based on the results, it is strongly suggested that the government should implement an education system involving all the stakeholders, including students, parents, teachers, and educational administrators to re-direct future education policies and strategies to achieve an all-inclusive and equitable education for all. Besides, the policymakers should address the socioeconomic composition of schools, colleges and similar educational institutions and need to provide adequate human, financial and technical resources to improve overall educational and learning environments to achieve a sustainable education system.

**Keywords:** Academic performance, Socioeconomic status, Institutional characteristics, Secondary education, Parents and teachers, Academic motivation, and stress, Bangladesh

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# MALAYSIAN ONLINE JOURNAL OF EDUCATIONAL MANAGEMENT (MOJEM)

## INTRODUCTION

After independence in 1971, Bangladesh set its goal to arouse patriotism and good citizenship to effect planned social transformation and advancement through trained individuals with competence and ability to achieve favorable economic development (Ministry of Education, 1974). Hence, all successive governments of Bangladesh, whether elected or selected, along with their development partners advocated the improvement of education sector, both human and infrastructural, by implementing numerous policies and strategies, such as 'subsidized universal primary education,' 'female stipend programs,' 'supply of free text books,' 'reaching-out of school children (ROSC),' 'school feeding programs,' 'education for all (EFA)' agenda, 'second chance education programs,' 'provision of appointment and training of female teachers' etc. (Kono, Sawada, & Shonchoy, 2018; Ministry of Finance, 2017; Rahman & Islam, 2009). All these initiatives are designed to make sure of quality and equitable education for all, irrespective of class, caste, location, religion, ethnicity as boasted by the constitution of Bangladesh (Ministry of Law Justice and Parliamentary Affairs, 2011). These interventions, however, required a huge sum, and over the last three decades, the public spending in education, indeed, has increased progressively from a meagre 0.3 percent in 1973-80 to 1.9 percent of the GDP in 2015-2016, and by the fiscal year of 2018-2019 it is expected to rise up to BDT 53,054 crore (Bangladesh Bureau of Educational Information and Statistics, 2016; Habib, 2018).

Hence, Bangladesh has experienced a breakthrough in respect to overall rise of enrolment in primary education with greater gender parity followed by increased completion rate in the last three decades (Ahmed, 2011; Bangladesh Bureau of Statistics, 2015b). During the same period, the number of primary schools increased almost three folds, from 39,914 to 1,08,537, the enrolled students doubled from 8.4 million to 19.5 million, while the sum of teachers involved in primary education soared from 0.1 million to 0.4 million (Bangladesh Bureau of Statistics, 2015b; Nath, Chowdhury, & Ahmed, 2015).

With the increased universal primary education, perhaps the most notable change took place in secondary education – the terminal point of primary education as well as the building blocks to the rest of education levels and professional skills (Alam, 1994). It is noteworthy that the secondary education in Bangladesh has been divided into three clusters – junior secondary education (from Class VI to Class VIII), secondary education (from Class IX to Class X) and higher secondary education (from Class XI to Class XII) (Bangladesh Bureau of Statistics, 2015b; Kono et al., 2018). The net enrolment rate rose from around 20 percent in 1980s to 47.2 percent in 2013 with greater gender parity (Alam, 1994; Bangladesh Bureau of Statistics, 2015b). Bangladesh also experienced a sheer growth in numbers of both educational institutions as well as students. For example, there was less than seven thousand secondary educational institutions in 1970s educating over a million students. Now, there are twenty thousand dedicated secondary schools and *Madrasahs* across Bangladesh, offering education for 10 million junior secondary and secondary students (Bangladesh Bureau of Educational Information and Statistics, 2017; Nath et al., 2008; Rahaman, 2017; Schurmann, 2009), and an additional two and a half-thousand colleges committed entirely for intermediary (higher secondary) education (Bangladesh Bureau of Educational Information and Statistics, 2017).

Keeping pace with the increasing number of enrolments together with the intensified quantity of educational institutions and educators, the performance of secondary students in public examinations also amplified over the last few decades. According to Bangladesh Bureau of Educational Information and Statistics (2017), more than 0.4 million students participated in secondary school certificate (SSC) and another 0.3 million took part in higher secondary certificate (HSC) examinations back in 1990, out of which around 32 percent for SSC and 30 percent for HSC passed the hurdles, respectively. In 2017, however, 1.4 million examinees sit for SSC examination, followed by approximately 1 million for HSC examination, and surprisingly more than 80 percent of SSC examinee successfully completed their SSC examination whereas the number was 66 percent for HSC examination. Out of the total students in SSC and HSC examinations, 'GPA 5' – the highest grade achievable by the students – was attained by 97 thousand students in SSC examination and it was 33 thousand for HSC examination.



# MALAYSIAN ONLINE JOURNAL OF EDUCATIONAL MANAGEMENT (MOJEM)

The performance of students – whether in primary, secondary or tertiary – cannot be explained by governmental and non-governmental policy interventions only. Undeniably, there are some other factors, such as personal, familial, institutional, or psycho-social issues, that are critically affecting the participation and learning achievement of students. This study is, therefore, designed to examine how personal attributes, socioeconomic status, institutional characteristics, and relevant psycho-social factors are influencing the performance of secondary students in public examination, and to identify the factors critical to explain academic achievement in the context of Bangladesh.

## **Theoretical Framework**

Coleman (1988) mainly focused on three major forms of capital: *human*, *financial*, and *social* capital. *Human capital* includes ‘skills and capabilities’ that enable individuals to ‘act in a new way’ by bringing desired changes; *financial capital* comprised of ‘tangible’ resources, often measured by ‘wealth or income’; and *social capital* consisted of ‘elements of social structure’ to facilitate ‘certain actions of actors’ through changes in ‘relations among persons’, and combined with other ‘capitals’, it can produce different ‘system-level-behavior’ and ‘different outcomes’ for individuals. Coleman (1988) considered all these elements are mutually inseparable as *human capital* assures a cognitive environment – with time and intellectual resources – for children to aid learning, *financial capital* provides the physical resources – such as home, learning materials and other financial resources – to support academic attainment, and *social capital* ensures a broader social network with stronger social relations within and outside family to offer more conducive and better academic opportunities for individuals.

Coleman (1988), analyzing social capital, delineates three more integral concepts, such as *obligations and expectations*, *information channels* and *norms and effective sanctions*. In a social structure, individual actors interact with others and contribute, overtly or covertly, for well-being of others – family, friends, or neighbors – for mutual dependence (*obligations*) trusting the recipients will reciprocate the favor in future (*expectations*). However, the *obligations and expectations*, according to Coleman (1988), is subject to ‘degree of affluence’, ‘cultural differences’, and ‘closure of social networks’. The concept ‘*information channels*’ refers to the sources of information – within (parents, siblings and relatives) and outside (religious, educational or economic institutions) family – inheres in social relations that facilitate actions of individuals. Information, in general, are acquired through interaction, and people often maintain social relations to get information from reliable sources to satisfy personal interests. The *norms and effective sanctions* are a set of standardized behavior pattern, supported through external rewards (social support, status, and honor) or disapproval for actions, that reinforce collective interest over personal gain. Effective norms not only facilitate certain actions, but it can also obliterate deviant behavior and actions from the community as well.

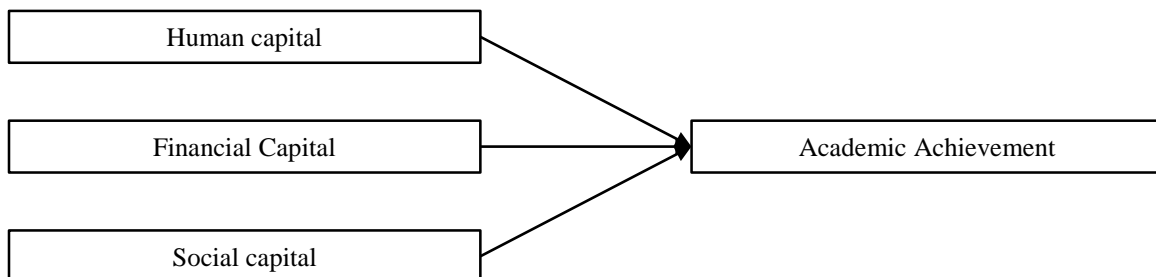


Figure 1. Theoretical framework

Coleman (1988) argued that social capital, both in the family and in the community, plays decisive roles in the achievement of next generation. There is no denial to the fact that ‘financial’ and ‘human’ capital of parents are two strong determinants of children’s intellectual development. However, they may become ‘irrelevant’ if children do not have strong relations with parents. In fact, ‘structural deficiency’ in modern families, such as ‘single-parent’ and ‘dual income’ families where children do not have access to parental human capital – both physical presence and



# MALAYSIAN ONLINE JOURNAL OF EDUCATIONAL MANAGEMENT (MOJEM)

attention of guardians, may generate different educational outcomes, including weaker academic achievement and even dropout. Apart from family, as Coleman (1988) extended, other social relations within community, the social relations in educational institutions in particular, add some values in the academic progress of young educands. 'Types of school', for example, is a useful indicator of social capital. Students from private schools are less integrated within and outside their schools which, in turn, adversely influence the academic success. Besides, school proximity, movement of family adjacent to the educational institutions as well as parental involvement in educational instructions also shape the academic success stories.

## LITERATURE REVIEW

There are a handful of studies in Bangladesh assessing the academic achievement of students and the factors influencing their performance, however, almost all of them focused largely on primary education. Mohsin, Nath, and Chowdhury (1996), for example, aimed at identifying the socioeconomic factors associated with the academic competency of children. Administering random cluster sampling, a total of 2,520 children aged 11-12 were surveyed. The results suggest that basic competency as well as academic skill of an individual was significantly influenced by sex and education of educands, as well as parental education, economic condition, and location of household, where male child often outperformed female child and urban children outdone their rural counterparts academically.

An earlier study by Alam (1992) assessed the performance of non-governmental schools in public examinations at secondary level by constructing four regression models. Results suggest that passing rate in secondary school certificate examination was influenced by location of school as well as regular salary for teachers. The achievement of first division was also determined by regular salary for teachers as well as school committee meetings. It is, however, evident that performance of students was negatively influenced by number of teachers per hundred, suggesting greater the size of class lesser the number of pass rate.

Asadullah (2005), in his study, attempted find out how the class size influenced the pass rate in national public examination. Based on a national representative sample on secular secondary schools only, the findings showed that the performance in public examination at union levels was significantly influenced by class size, number of total enrolments in Class X and type of school, however, there was no association between shift of schools, single-sex or co-education system and teacher-student ratio. At district levels, it appeared that students' performance was influenced substantially by competition among schools, number of enrolments in Class X, type of school and single-sex education. However, the academic achievement was negatively related with girls' only school, whereas boys' only school was positively related with public examination outcomes.

Following their footprints, Nath (2012) explored the factors associated with learning achievement of primary school students. The author considered a total of twenty-one variables under three large sets of factors – socioeconomic factors, school-related factors, and some educational input issues, against a competency test. The results of bivariate analysis suggest a positive correlation between academic competency and sex, location, parental education, access to mass media and electricity, participation in supplementary and pre-school courses. Moreover, the characteristics of teachers, including educational qualification, working experience and professional training, were also positively correlated with competency test result. In contrast, age and class size were inversely correlated. The results of ordinary least square (OLS) regressions show that socioeconomic factors, e.g., age, sex, ethnicity, religion, areas of residence, father's education etc., followed by institutional characteristics were more crucial to explain academic performance of primary school students in Bangladesh.

In a study on ethnic minorities in northern Bangladesh, Uddin (2017) examined the association between academic attainment and ethnic identity together with other socioeconomic factors of primary students. The results of bivariate correlation suggest significant correlation between ethnicity and academic attainment, where class enrolment was negatively correlated. The regression results indicate that ethnic identity and household income were the most significant predictors of primary class enrolment in Bangladesh. The findings also show that the class



## MALAYSIAN ONLINE JOURNAL OF EDUCATIONAL MANAGEMENT (MOJEM)

attendance of the individual in primary schools was dependent largely on ethnic identity as well as the punishment by the teachers. The latter factor is responsible for irregular class attendance, which eventually shape the academic performance of the young educands.

In a more recent study, Richards and Islam (2018) measured the ability of primary school students in reading and solving mathematical problems. The authors observed a positive association between grades and academic competency of primary students, suggesting students' reading and mathematics performance improve at higher grades. Besides, parental education and household food affordability were also significantly influencing the academic competencies of school students. The presence or absence of electricity has no effect, however. But the results suggest that the reading and mathematical competencies of students from NGOs tend to decline at higher grades.

There are a number of relevant studies carried out in Asia, Africa and other parts of the world, stressing on various issues related with academic achievement. Saeed, Gondal, and Bushra (2005), for example, investigated the levels of achievement of primary school students of Pakistan and the factors, including family background, habits, and academic elements, shaping the achievement. Their findings show that boys both in Grade 3 and Grade 5 performed better in mathematics than girls, however, girls outperformed their counterparts in *Urdu* and life skill test. When compared geographically, rural students performed relatively better than those of urban areas in all three assessments. The results also suggest a wide range of factors, including parental, habit, and academic factors, were associated with academic achievement of both Grade 3 and Grade 5 students of Pakistan, whether negative or positive. Among them the more pronounced were family size, parental education and motivation, self-motivation and effort and teacher's guidance etc.

Salfi and Saeed (2007) carried out a study in the Punjab province of Pakistan to investigate the relationships among school size, school culture and academic achievement. Following survey research design, covering a substantial number of schools, as well as head and other teachers of various categories, the authors found a negative correlation between school size and academic achievement, meaning smaller schools performed better than medium and larger schools in examinations. School size was also negatively correlated with academic culture of school. On the contrary, school culture was positively related with the academic achievement of students, suggesting students from schools with better communication between teacher-student, between teacher-parent, and with qualified teachers, performed better academically.

Ready (2010) investigated the impact of class attendance on academic achievement with a stress on socioeconomic variations. The findings suggest that class attendance, both at kindergarten and First-Grade, was influenced by socioeconomic status, type of family, race, language spoken in household as well as grade repeater. Students from well-off and English-speaking families were less likely to be absent in the class, both at kindergarten and First-Grade. On the contrary, students from single-parent families, non-white and non-Asian and grade repeaters were more likely to be absent in the class. The regression analysis indicates that individual's early literacy development was influenced largely by socioeconomic status and class absenteeism. The latter, however, was negatively associated with both literacy development and academic achievement.

Tayyaba (2010) wanted to figure out the mathematics achievement of government middle school students of Pakistan and the extent to which personal, family, institutional and regional factors determined the achievement. Findings suggest that among demographic variables, male students performed relatively better than female students, similarly urban students were outperformed by their rural counterparts. However, mathematical achievement tended to increase with an increase in socioeconomic status of the Grade VIII students. Among home background variables, location (urban) and language (*Urdu*) seem to have negative relation with mathematical achievement, while mother's education, on the contrary, had positive impact. Among homework variables, student's frequency, and time to homework as well as help from parents to do home task proved to have positive impact on the achievement of mathematical test. However, excessive home-based mathematics exercise showed a negative



## MALAYSIAN ONLINE JOURNAL OF EDUCATIONAL MANAGEMENT (MOJEM)

effect on the achievement. The results suggest that student's self-confidence, positive attitude, and preference of mathematics over other subjects, along with parental communication and expectations, had positive effect on subject efficiency. It is also appeared that the mathematical mastery was influenced positively by smaller class size, mixed education system and academic resources as well as physical facilities of the institutions.

Benner, Boyle, and Sadler (2016) assessed to what extent parental educational involvement influence the academic achievement of school students. The results of bivariate correlation suggest significant correlation among parental education involvement (at home, at school, expectation, and advice), socioeconomic status of family and educational achievement, however, parental involvement at home was negatively related with academic performance. The regression analysis indicates that all the variables, except for home involvement and advice, together with family SES had positive impacts on grade point average.

Schultz (1993) attempted to find out the effects of socioeconomic status and academic motivation on academic achievement. The findings show a positive correlation among academic achievement and socioeconomic status with mathematics and reading achievement. The results of multivariate analysis of covariance also exhibit that student from better off families outperformed those of less advantaged socioeconomic families. Similarly, Schultz also found that students with greater academic motivation performed way better than those of less motivated.

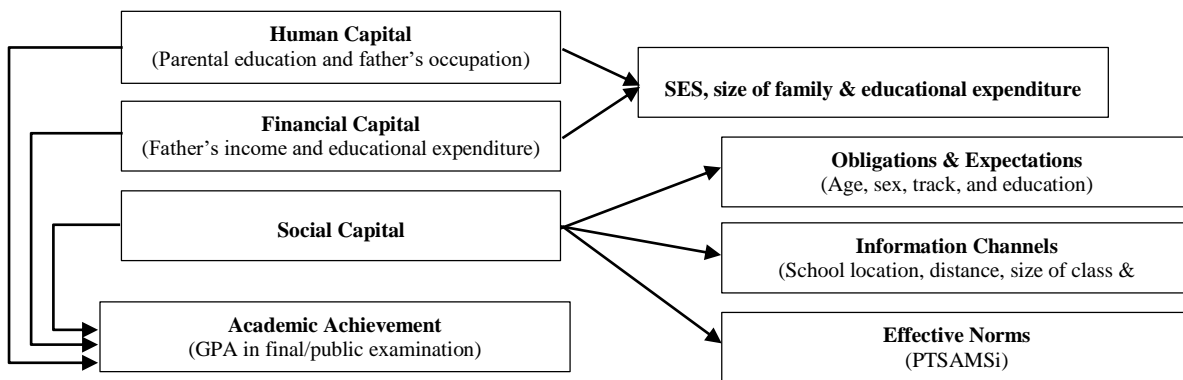


Figure 2. Conceptual framework

In contrast to Schultz (1993), Deb, Strodl, and Sun (2014) wanted to examine the prevalence of academic stress and examination anxiety among secondary students of private schools in Kolkata, India, and its association with various demographic, socioeconomic as well as academic parameters. The findings suggest that the academic achievement depends both on personal factors as well as socioeconomic status. For example, male students had better grades than female students, on the contrary, female students were more efficient in English than their male counterparts. Students from well off families reported high academic grades and English proficiency. Similarly, the academic attainment was upward for students whose parents were more educated and involved in fixed income and white-collar jobs. About academic stress and anxiety, it appears that students from low socioeconomic families were more stressed and anxious during examination compared to those of high socioeconomic families. It is also evident that students having low grades and less English efficiency were suffering from more academic stress, examination anxiety and often being pressured by their parents for better academic results.

Contrasting to the aforesaid studies, as they assessed the academic achievement of school students mainly, Yousef (2013) tried to find out the performance of undergraduate business students of UAE in quantitative courses and its determinants. The author found several factors significantly associated with performance in quantitative courses. Among the key factors, track of education, sex, age as well as grade point average (GPA) were influencing quality points in quantitative course. Students of science background in high school performed better than those with art background. Similarly, female, and younger students outperformed male and older students, respectively. The





## MALAYSIAN ONLINE JOURNAL OF EDUCATIONAL MANAGEMENT (MOJEM)

findings also indicated that non-Emirati outfoxed the Emirati students in quantitative courses as did the students with high GPA over the students with low GPA.

In a similar but more recent study, Yousef (2017) investigated the QP of business students in quantitative courses with relation to teaching style, English language and assessment methods. By using Likert-scale, the author assessed the teaching style, English language and assessment methods, and the descriptive results suggest that the Business students often struggle with technical terminologies, class discussion, inefficiency in English language as well as tasks assigned in quantitative courses. The regression analysis, however, show that the teaching style and English language were positively influencing the QP of Business students, whereas assessment methods had negative but not significant relation.

El Massah and Fadly (2017) examined the relation between academic performance of women in UAE and their personal attributes, socioeconomic background, and other relevant variables. Among personal and socioeconomic aspects, as the results show, individual's marital status, high school grade and mother's education had positive and significant impact on academic performance, while age, father's education and number of siblings exhibit no significant effect. Among other issues considered in the study, the findings suggest that only class time – especially at afternoon class – had positive effect on academic achievement of women in higher education at UAE, and the rests, including language, commute time, engagement in sport, had no significant impact at all.

The literature review reveals a contentious situation as a wide range of factors has been identified by researchers, whether in Bangladesh or in other places of the world, which are determining the academic achievement of students at all levels. Mohsin et al. (1996), for example, emphasized on personal attributes as well as socioeconomic status, others stressed on personal and institutional characteristics only (Alam, 1992; Asadullah, 2005; Salfi & Saeed, 2007; Yousef, 2017), some paid attention to all three factors, i.e. personal profile, socioeconomic status and institutional features (El Massah & Fadly, 2017; Nath, 2012; Ready, 2010; Richards & Islam, 2018; Saeed et al., 2005; Tayyaba, 2010; Uddin, 2017; Yousef, 2013) and there are some focused on relevant social, educational, and psychological issues (Benner et al., 2016; Deb et al., 2014; Schultz, 1993). It is, however, can be assumed from the reviewed literature that younger students may perform better than the older ones, while male students may outperform female students. It could be assumed that students from well-off families may outrun their equivalents from less-privilege families. It can also be expected that student having parental and teachers' support with more educational motivation and less academic stress may perform better than those with low parental and teachers' support and low academic motivation with greater stress.

### ***Objectives and research questions***

This study was designed to identify the extent to which the academic achievement of secondary students can be explained by their personal and family characteristics, institutional attributes as well as by the support of parents and teachers and by their own academic motivation and stress. The following research questions were expected to be answered by this study –

1. To what extent does the personal profile of secondary students explain their academic achievement?
2. What is the magnitude of influence of family background in explaining academic achievement of secondary students?
3. Does institutional attribute explain the variations in academic achievement of secondary students?
4. How does parent and teachers' support as well as academic motivation and stress explain the academic achievement of secondary students?
5. What are the major factors explaining academic achievement of secondary students in Bangladesh?



# MALAYSIAN ONLINE JOURNAL OF EDUCATIONAL MANAGEMENT (MOJEM)

## METHOD AND PROCEDURE

### *Study area and sampling*

*Magura* district is a southwestern district under Khulna Division of Bangladesh. Accommodating around 0.9 million people in an area of 1,039 Km<sup>2</sup>, *Magura* is the fifth most densely populated district under Khulna division (Bangladesh Bureau of Statistics, 2015a, 2015c, 2015d). Out of the total population of *Magura* district, according to Bangladesh Bureau of Statistics (2015c), only 13.1 percent lived in urban areas, however, the literacy rate was almost 20 percent higher in urban areas (65.2%) than those of rural areas (48.4%).

Administratively, *Magura* district is divided into four *Upazilas* (sub-districts), namely *Magura Sadar*, *Mohammadpur*, *Shalikhha* and *Sreepur* (Bangladesh Bureau of Statistics, 2015a, 2015c), of which *Magura Sadar* is the largest (401.6Km<sup>2</sup>), most educated (52.4%) and more urbanized (25.9%) *Upazila* with relatively smaller household size (4.37) compared to the rests (Bangladesh Bureau of Statistics, 2015a). Among the listed *Upazilas*, this study was carried out in *Magura Sadar* and *Shalikhha Upazila*, largely because of the convenience of the researchers. According to Education Management Information System (2017) there were 275 educational institutions in *Magura* district, out of which 167 were primary and secondary schools, 33 were colleges offering education up to master degree and another 75 were sectarian educational institutions. In *Magura Sadar* and *Shalikhha Upazila*, there were a total of 162 educational institutions, including primary, secondary and tertiary schools, colleges and *Madrasah* (Education Management Information System, 2017). It is important to note that the secondary education in Bangladesh is divided into three more categories – junior secondary (Class VI to Class VIII), secondary (Class IX to Class X) and higher secondary (Class XI to Class XII) (Kono et al., 2018).

For this study, proportionate multistage random sampling was used to select both educational institutions as well as the participants, and. At the initial stage, four educational institutions, including schools and colleges, were picked based on their performance in national public examinations, i.e., junior secondary certificate (JSC), secondary school certificate (SSC) and higher secondary certificate (HSC). In the following step, some specifications were made – e.g., the participants must be enrolled in Class IX, Class XI and Class XIII after successful completion of JSC, SSC and HSC or equivalent examinations, respectively, without repetitions – to develop an inventory list of eligible students. It must be noted that the secondary students were selected largely because they have perfect understandings about the issues under scrutiny, i.e. personal, socioeconomic and institutional factors as well as the role of parents, teachers, their own academic motivation and stresses they faced, either through personal judgment or experience (Ayodele, Oladokun, & Gbadegesin, 2016), which in turn might help to actualize the social realities of academics in Bangladesh. Based on the aforesaid criteria, an inventory list of eligible students was made, comprising 1,899 secondary, higher secondary and tertiary students, from registry books of the selected educational institutions. Finally, a total of 566 students, 300 each from both urban and rural areas, were selected randomly, proportionate to the number of students from each educational institution. Later, 34 cases were dropped for incompleteness of the self-reported questionnaire (hereafter SRQ).

### *Instrument and procedures*

To facilitate survey for this study, a structured SRQ in English, containing both open-ended and close-ended question items, was administered to collect considerable amount of social data for more acceptable generalization. The SRQ, developed after reviewing relevant literatures, was divided into four sections. The first section focused on the basic information of the participants, and the items include questions on age, sex, religion, level and track of education, and academic achievement. The participants were requested to report the grade point average (GPA) attained in JSC, SSC and HSC examinations. The second section highlighted the items regarding parental as well as household information, and it included questions on parental education, occupation and monthly income, the latter reported in Bangladeshi Taka (BDT). Apart from parental issues, there were some items on type and composition of family





# MALAYSIAN ONLINE JOURNAL OF EDUCATIONAL MANAGEMENT (MOJEM)

and the financial issues – such as household monthly income and expenditure, and monthly educational expenditure for the participants. The third section contained questions on the details of educational institutions they were enrolled in Class VIII, Class X and Class XII, and they answered questions on approximate distance of educational institution from home, type, location and size of educational institution, size of the participants' class and the number of students per teacher. The questions on size of educational institution and class as well as the number of students per teacher were verified by the Head/Principal of the institutions. The fourth and final section contained 24 five-point Likert-type questions, ranging from '1' – 'strongly disagree' to '5' – 'strongly agree', measuring the perception of secondary students about the role of parents, teachers, their academic motivation as well as academic stress.

Before data collection, the researchers visited the selected educational institutions with an official permission from the District Education Officer (DEO) of *Magura* District as well as the Head or Principal of each institution. To maintain ethical aspects of research as well as to collect reliable data, the researchers verify the identity of the participants by their class teachers, which in turn helped the researchers to ease the communication with the participants. The researchers introduced themselves and gave a short briefing about the purpose of the study. In addition to the researchers, there were six data enumerators, and they were trained extensively about the content of the questionnaire to maintain uniformity of the survey as well as the anonymity of the participants. After the briefing, the students were reorganized in a manner to avoid duplication of the answer to maintain the integrity of the data as well as to extract authentic information. It is important to note that a guarantee of anonymity and confidentiality was assured by the researchers to both the educational institutions and the participants. The SRQs were collected after fifteen to twenty minutes of distribution from the participants. It is, however, noteworthy that the SRQ was pre-tested to eliminate the possibilities of inconsistent and invalid data on 30 participants, 15 each from *Magura* and *Shalikha Upazilas*, who were later dropped from the actual fieldwork. From the feedback of the pre-test, some modifications were made in the content, style, and language (the SRQ was translated to Bengali from English) to ease the data collection from the selected educational institutions. Data were collected during January to March 2017, and it was administered in the convenient time – usually during the launch break – of each educational institution without interrupting their regular academic activities.

## MEASURES

### *Personal profile*

Personal profile generally refers to the specific characteristics of an individual. The specifications, however, vary considering the research issues (Akareem & Hossain, 2016; Tayyaba, 2010; Yousef, 2017). In this study, personal profile was assessed by the participant's age (measured in year), sex, religion, education (measured in year), track of education, where the latter one was based on the grouping of science, business studies and humanities. The descriptive statistics, presented in Table 1, show that more than half of the participants were male, and around 81 percent were Muslims. Averaging around 16 years of age, the participants had about 10 years of schooling, and a significant percentage of them studied in humanities other than science and business studies.

### *Socioeconomic status, family size and educational expenditure*

Socioeconomic status is, in general, measured by an individual's social and economic position with reference to their financial capacity, educational background and professional record. Hollingshead (1975), for example, advocated four factors, i.e. education, occupation, sex and marital status, to determine the social position of individuals occupying in social structure. Snyder, Dillow, and Hoffman (2009), on the contrary, suggest considering a composite of five components, including father's education, occupation, mother's education, family income and other household items, to explain the socioeconomic status of an individual in educational research. In the present study, however, socioeconomic status is constructed as a single variable of parental education [where '0' was assigned for 'no education', '1' for primary education (Class I to V), '2' for secondary education (Class VI to X), '3' for higher



# MALAYSIAN ONLINE JOURNAL OF EDUCATIONAL MANAGEMENT (MOJEM)

secondary (Class XI to XII) and '4' for tertiary education (Class 13 ≤)], occupation of father ('0' for irregular job & salary, and '1' for regular job & salary) and income of father ('1' for income equal or less than BDT 20,000, '2' for BDT 20,001 to BDT 40,000 and '3' for equal or more than BDT 40,001). It is evident that fathers were relatively more educated than mothers ( $\pm 9.8$  years against  $\pm 8.4$  years), and like many patriarch societies, fathers were the breadwinner with an average monthly income of BDT  $\pm 19,604$ . The aggregated score, used for socioeconomic index (SESi), was ranging from 1 (Low) to 12 (High) with a mean of  $\pm 6.4$ . The size of family, measured by per by household, was also considered in this study with a mean of  $\pm 4.9$  person per household. Furthermore, the monthly educational expenditure, generally spent for after-school supplementary education, was used to understand the pattern of household contribution for educational purpose, and the studied families, on an average, spent around BDT 3,200 per month for the participants.

### ***Attributes of educational institution***

The attributes of educational institution refer to the salient features of the schools/colleges/universities etc. The characterization of educational institution, like personal profiling, also subject to the research interests as some may include the class and school facility related items (Asadullah, 2005; Nath, 2012; Tayyaba, 2010), while others may be interested to include the details of class, school and faculty altogether (McCoach & Colbert, 2010; Salfi & Saeed, 2007). In this study, the attributes of educational institution were measured by distance from home, types, location, class size and student per teacher. Table 1 suggest that the participants were largely enrolled in private or semi-government schools, and they had large class size as the teachers had to deal with around 80 students per class.

### ***Parent-teacher support and academic motivation-stress inventory***

In addition to providing the basic information about personal attributes, socioeconomic status and characteristics of educational institution, the participants were asked about their perception regarding the role of their parents and teachers along with how they evaluate their academic motivation and stress in relation to their academic achievement. They responded to an inventory – *parent-teacher support and academic motivation-stress (PTSAMS*i*)* – of twenty-four questions adjusted to a five-point Likert-scale – ranging from '1' strongly disagree to '5' strongly agree – divided equally into four indices. The overall alpha reliability coefficient of the inventory was  $\alpha = 0.821$ . After reviewing relevant literature (Eccles & Harold, 1996; Keith, Reimers, Fehrmann, Pottebaum, & Aubey, 1986; Kohl, Lengua, & McMahan, 2000; Nguon, 2012; Park, Byun, & Kim, 2010; Régner, Loose, & Dumas, 2009; Zhang, 2011), a total of six questions were formed to assess the *role of parents* index and it was determined by asking the participants about the involvement and activities of parents to support and maintain the academic performance and this dimension has the alpha<sup>[1]</sup> reliability coefficient of 0.822. Likewise, the *role of teachers* index also assessed by six relevant questions developed following the review of literature (Johnson, Johnson, & Anderson, 1983; McCoach & Colbert, 2010; Régner et al., 2009; Tse, 2014; Zhang, 2011), and these questions measured the extent of care given by the teachers at school or at private tuition to facilitate children's academic attainment, and this dimension has the alpha reliability coefficient of 0.872. Following the aforesaid indices, the third index – the *academic motivation* – was developed by using the past research works (Caleon et al., 2015; Lang & Fries, 2006; Vallerand et al., 1992), and this index measured the commitment and enthusiasm for academic excellence by the participants, and it has the alpha reliability coefficient of 0.727. The fourth and final index – *Academic stress* – developed after a careful review of relevant literature (Fioravanti-Bastos, Cheniaux, & Landeira-Fernandez, 2011; Renner & Mackin, 1998; Spangler, Pekrun, Kramer, & Hofmann, 2002) and through this index the anxiety of the participants about academic activities exerted by expectations and social strains was measured, and it has the alpha reliability coefficient of 0.720. The exemplary items are – "My parents make a congenial environment at our home where I can study" (item 1),

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<sup>[1]</sup> The Cronbach's  $\alpha$  was calculated for parent-teacher support and academic motivation-stress inventory (*PTSAMS*i**) to provide indications of the reliability and internal consistency of results ( $\alpha = 0.821$ ). The highest achievable score is 1, thus, an alpha score of 0.7 is considered normal, and anything below 0.6 is regarded as non-usable (DeVellis, 2003)



# MALAYSIAN ONLINE JOURNAL OF EDUCATIONAL MANAGEMENT (MOJEM)

“My teachers review my academic performances and report to my parents regularly” (item 12), “I cannot give up when I study, because I enjoy studying my lessons” (item 14), and “I feel anxious about the examinations, even if I work harder” (item 21). Among the dimensions of PTSAMSi with a Cronbach’s  $\alpha$  0.824, presented in Table 1, it appears that the secondary students acknowledged the role of their parents and teachers in shaping the academic performance. They agreed upon the significance of academic motivation while skeptic about academic anxiety.

### **Academic achievement**

Academic achievement has been measured by the researchers from different perspectives globally. Some studies measured academic achievement by a collection of assessment methods, including teacher ratings or marks, school grades and test scores (Baumann & Harvey, 2018; Chowa, Masa, Ramos, & Ansong, 2015; Tayyaba, 2012; Westerman & La Luz, 1995), while there are some others who assessed the academic achievement not only by grades or marks, rather by regular school attendance and concertation on learning by responding in answer-question session in the class (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996; Uddin, 2017). In this study, however, the academic achievement of students was measured, as El Massah and Fadly (2017), Nguyen (2016), Salfi and Saeed (2007) did in their respective studies, by the grade point average (GPA) achieved in preceding national public examinations, including JSC, SSC and HSC. The GPA, in contemporary education system of Bangladesh at school and at college levels, ranges from the lowest letter grade ‘F’ (0-32 marks with grade point 0.00) to the highest letter grade ‘A+’ (80-100 marks with grade point 5.00). The GPA of the participants ranged from 5.00 to 1.80 with an average of  $\pm 4.1$ .

Table 1  
*Descriptive information*

Variables	% (N)	M (SD)	Max - Min	Possible range (Max-Min)
<b>Personal attributes</b>				
Age		15.8 (1.9)	20 – 13	
Sex				
<i>Male</i>	53.7 (304)			
<i>Female</i>	46.3 (262)			
Religion				
<i>Sanatan</i>	18.7 (106)			
<i>Islam</i>	81.3 (460)			
Education		10.3 (1.5)	13 – 9	
Track of education				
<i>Humanities</i>	52.5 (297)			
<i>Science &amp; business studies</i>	47.5 (269)			
GPA in public examination		4.1 (0.7)	5.00 – 1.80	
<b>Socioeconomic status</b>				
Education of father		9.8 (5.4)	17 – 0	
Occupation of father				
<i>Irregular job &amp; salary</i>	39.2 (222)			
<i>Regular job &amp; salary</i>	60.8 (344)			
Income of father (in BDT <sup>1</sup> )		19,634.8 (12,134.7)	78,000 – 2,000	
Education of mother		8.5 (5.3)	17 – 0	
SES		6.4 (3.1)	12 – 0	12 – 1
Size of family		4.9 (1.5)	13 – 2	
Educational expenditure (in BDT)		3,195.7 (3,056.3)	12,000 – 100	
<b>Attributes of educational institutions</b>				
Location				
<i>Rural</i>	49.8 (282)			
<i>Urban</i>	50.2 (284)			



# MALAYSIAN ONLINE JOURNAL OF EDUCATIONAL MANAGEMENT (MOJEM)

Distance from home (in Km)		4.1 (6.8)	50 – 0
Type of educational institutions			
<i>Public</i>	41.5 (235)		
<i>Private/semi-government</i>	58.5 (331)		
Size of class		209.2 (110.5)	350 – 50
Students per teacher		77.9 (90.5)	240 – 18

**Note:** *M.* Mean; *SD.* Standard deviation; *Max.* Maximum; *Min.* Minimum; *BDT.* Bangladeshi Taka; *GPA.* Grade point average; *Km.* Kilometer  
1. 1 BDT = US\$ 0.012

## Data analysis

Data were analyzed in five consecutive stages. At the very first stage, several key characteristics about the participants, including age, sex, religion, education, track, parental and school background information, were illustrated by descriptive statistics using percentage, mean, standard deviation and range. At the second stage, exploratory factor analysis (EFA) was applied to determine major dimensions to formulate the PTSAMSi. At the third stage, the relation between academic achievement and other independent variables (personal attributes, socioeconomic status, institutional characteristics and PTSAMSi) was explained quantitatively by applying Pearson's bi-variate correlation to sort out the variables for regression analysis. The GPA, attained by the participants, was a continuous variable, therefore, the decision of executing stepwise multiple regression was made. A total of four models were built following a stepwise backward deletion approach as it considers all independent variables at the beginning, then start to delete one at a time if not contribute significantly in the regression equation (Tabachnik & Fidell, 2013). Finally, a hierarchical regression was executed as it weighs the values added by independent variables, entered in blocks, after controlling other predictors at its own point of entry (Pallant, 2011; Tabachnik & Fidell, 2013).

## RESULTS

### Exploratory factor analysis

To identify the important components influencing academic achievement, a total of 24 items were used for EFA. To assess the suitability of the data for EFA, a preliminary analysis was done through principal component analysis (PCA) and the sample adequacy was assessed by Kaiser-Meyer-Olkin (KMO) value and Bartlett's test of sphericity. The KMO value was 0.896, signifying the sampling adequacy as the benchmark was 0.600 (Pallant, 2011; Tabachnik & Fidell, 2013) and the Bartlett's test of sphericity was significant as well ( $\chi^2 (276) = 5020.380, p < 0.000$ ). The decision of determining the number of components for EFA was guided, as suggested in the works Pallant and Bailey (2005) and Pallant (2011), by three decision rules, namely the Kaiser's criterion (Kaiser, 1960), Cattell's scree plot test (Cattell, 1966) and Horn's parallel analysis (Horn, 1965). The eigenvalues suggested a five-factor solution, whereas the scree plot suggested a four-factor solution. The suitability of a four or five-factor solution was further assessed by comparing the eigenvalues from the extracted eigenvalues generated from the same size of random data set, and it also suggested a four-factor solution as the first four factors with the eigenvalues exceed the values from randomized data (Horn, 1965; Watkins, 2000). However, the pattern coefficient of  $\geq 0.40$ , and an internal consistency of  $\geq 0.70$  (DeVellis, 2003) were considered for a meaningful and consistent factor structure. The items were sorted and grouped by size of loading, and four items were deleted as their loadings were under 0.40, while another one was deleted for high cross-loading (Hair Jr., Black, Babin, & Anderson, 2014). Later, another item was deleted from the extraction as three of them had low commonalities ( $\leq 0.30$ ).

Table 2 represents the loading patterns in the rotated factor component matrix. The first principal component, explaining about 15% of the total variation, entails the factors associated with teachers' role, and it includes the ways teachers instruct to ensure quality education, extend their helping hands to comply with the demands of educational institutions as well as examinations, motivate their pupils for higher academic goals, their hardship to



# MALAYSIAN ONLINE JOURNAL OF EDUCATIONAL MANAGEMENT (MOJEM)

educate and train their followers, their depth of knowledge about the subjects they taught and their meaningful feedback to ensure better performance of the students, academically and socially. The second principal component, clarifying just over 13% of the total variation, highlights the roles of parents to ensure better performance in academia, including parents' advice about the methods of studying and ways of maximizing academic grades, their monitoring and suggestion to boost academic activities by getting help from supplementary education, their communication with teachers to get feedback about academic performance of their children in educational institutions. Explaining 10% of the total variations, the third component depicts the academic pressure and anxiety of the secondary students, including their anxiousness and fear of failing in examination and their feelings expressed through both emotionally and physicality. The last component, explaining just around 10% of the variations, refers to the academic motivation of the secondary students, and this component portrays their self-confidence of successfully completing the assigned academic works, including homework and examinations, their enjoyment and involvement in academic activities and their potentiality to comply with difficult issues given by teachers as well as the recommended readings.

Based on the results of the EFA, the scores of the four-factors were measured by unit-weighted items together. The Cronbach's  $\alpha$  coefficients for the four-factors were 'teachers' support' – 0.822, 'parents' support' = 0.872, 'academic stress' = 0.737 and 'academic motivation' = 0.725, respectively, and the overall coefficient was 0.786 (see Table 2).

Table 2  
*Results of exploratory factor analysis (N = 566)*

Items	Components				$h^2$
	Teachers' support	Parents' support	Academic stress	Academic motivation	
9	0.707				0.586
11	0.662				0.502
10	0.618				0.463
8	0.616				0.522
7	0.550				0.383
12	0.471				0.356
4		0.786			0.765
3		0.749			0.612
5		0.674			0.651
2		0.620			0.598
23			0.732		0.558
24			0.687		0.489
20			0.552		0.311
21			0.550		0.325
13				0.676	0.512
14				0.590	0.405
17				0.546	0.400
18				0.519	0.317
% of variance	15.072	13.415	10.156	9.997	
Cronbach's $\alpha$	0.822	0.872	0.737	0.725	

Note:  $h^2$ -Communalities

### **Bivariate correlation**

To investigate the relationship between academic achievement and independent variables – personal information, SES, institutional characteristics, and the dimensions of PTSAMSi – Pearson's bi-variate correlation was executed (see Table 3). Among the personal attributes, age, sex, track, and education were significantly correlated with academic achievement, where age ( $r = -0.339, p < 0.01$ ) and education ( $r = -0.356, p < 0.01$ ) had negative correlation.



## MALAYSIAN ONLINE JOURNAL OF EDUCATIONAL MANAGEMENT (MOJEM)

On the contrary, science and business studies as a track of education had moderate but positive relation ( $r = 0.362$ ,  $p < 0.01$ ) with academic achievement. Among other background information, SES ( $r = 0.509$ ,  $p < 0.01$ ) and educational expenditure ( $r = 0.451$ ,  $p < 0.01$ ) were positively correlated with academic achievement, however, size of family had negative relation ( $r = -0.177$ ,  $p < 0.01$ ).

There was a mixed relationship found between academic achievement and institutional attributes, where location of institution had moderate but positive correlation ( $r = 0.429$ ,  $p < 0.01$ ) with academic achievement and the rests, except students per teacher, had negative but significant correlation with academic performance of students. It suggests that students covering long distance, enrolled in private or semi-government school and in overcrowded class had lower GPA compared to those covering short distance, enrolled in public schools and in optimum class size. Among the dimensions of the PTSAMSi, parents' as well as teachers' support and academic stress were moderately correlated with academic achievement, however, only the latter had negative ( $r = -0.313$ ,  $p < 0.01$ ) relation. Academic motivation ( $r = 0.289$ ,  $p < 0.01$ ) had a low but positive correlation.





# MALAYSIAN ONLINE JOURNAL OF EDUCATIONAL MANAGEMENT (MOJEM)

Table 3  
Bivariate correlation between academic achievement and all independent variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1 GPA	1.000																			
2 Age	-0.339**	1.000																		
3 Sex	0.108*	-0.141**	1.000																	
4 Religion	-0.004	-0.097*	0.019	1.000																
5 Education	-0.356**	0.912**	-0.103*	-0.127**	1.000															
6 Track of education	0.362**	-0.072	-0.011	-0.015	-0.005	1.000														
7 SES	0.509**	-0.414**	0.087*	-0.012	-0.375**	0.328**	1.000													
8 Type of Family	0.051	-0.088*	0.029	0.009	-0.062	0.059	0.123**	1.000												
9 Size of Family	-0.177**	0.168**	0.006	0.056	0.133**	-0.088*	-0.239**	-0.631**	1.000											
10 Educational Expenditure	0.451**	-0.215**	0.001	-0.026	-0.188**	0.417**	0.719**	0.074	-0.209**	1.000										
11 Location	0.429**	-0.049	-0.010	-0.016	0.006	0.488**	0.549**	0.033	-0.129**	0.676**	1.000									
12 Distance from home	-0.211**	0.465**	-0.052	-0.109**	0.513**	0.020	-0.276**	-0.044	0.127**	-0.054	0.060	1.000								
13 Type of Institution	-0.283**	-0.091*	0.020	0.000	-0.159**	-0.383**	-0.297**	-0.008	0.041	-0.374**	-0.840**	-0.151**	1.000							
14 Size of class	-0.164**	0.355**	-0.272**	-0.154**	0.350**	-0.040	-0.096*	0.021	0.070	-0.001	0.064	0.194**	-0.302**	1.000						
15 Students per teacher	-0.014	0.499**	-0.068	-0.012	0.523**	0.250**	-0.152**	-0.041	0.081	0.036	0.503**	0.313**	-0.628**	0.205**	1.000					
16 Teachers' support	0.309**	-0.121**	0.065	-0.075	-0.095*	0.307**	0.473**	0.080	-0.161**	0.528**	0.461**	0.051	-0.277**	0.165**	-0.055	1.000				
17 Parents' support	0.350**	-0.030	0.029	-0.051	0.001	0.309**	0.568**	0.130**	-0.198**	0.571**	0.582**	0.106*	-0.421**	0.198**	0.139**	0.579**	1.000			
18 Academic stress	-0.313**	0.204**	0.014	0.041	0.169**	-0.203**	-0.396**	-0.025	0.128**	-0.411**	-0.401**	0.097*	0.281**	0.092*	-0.019	-0.264**	-0.275**	1.000		
19 Academic motivation	0.289**	-0.042	0.021	0.006	-0.048	0.147**	0.292**	0.080	-0.153**	0.302**	0.268**	0.057	-0.147**	0.110**	-0.053	0.472**	0.456**	-0.097*	1.000	

\*\* Correlation is significant at the 0.01 level (2-tailed).  
\* Correlation is significant at the 0.05 level (2-tailed).



# MALAYSIAN ONLINE JOURNAL OF EDUCATIONAL MANAGEMENT (MOJEM)

## Regressions

Significant factors from bivariate correlation ( $r$ ) were retained in the ordinary least square regression analysis to investigate how these factors were influencing the academic achievement of secondary students in Bangladesh.

Table 4 presents the four models explaining academic achievement with relation to personal attributes, SES, institutional characteristics and PTSAMSi. Model 1 shows the personal profile related predictors of academic achievement. Among the four variables considered, findings suggest that sex, track, and education significantly influenced the academic achievement of secondary students. Female students performed better than male students and students of science and business studies outperformed their counterparts from humanities track, whereas education was negatively associated with academic performance, suggesting young students performed better in public examinations than their older counterparts. However, all three variables explained 26% of the variations in academic achievement.

Model 2 represents the predictors relevant to background information, including SES, size of family and educational expenditure. Of the three variables, the model took two, while size of family had no contribution. SES and educational expenditure together explained just over 27% variations in academic achievement of secondary students. Among the aforesaid variables, SES made the most contribution, suggesting students from better socioeconomic background performed better than students from poor socioeconomic households. Likewise, students from high spending families outdone academically students from low spending families.

Model 3 embodies institutional predictors, and the model took three out of five variables. Among the significant predictors, location of institutions made the highest contribution in the model. Except for location of institution, which suggests a positive relation between geographical position with academic achievement, in this case the urban areas, the rests indicate negative relationships. The independent variables together explained just over 26% of the variations in academic performance.

Model 4 shows three out of four dimensions of PTSAMSi as predictors of academic achievement of secondary students. Academic stress and parents' support made the highest contribution in explaining the variations followed by teachers' support and academic motivation. Academic stress was negatively associated with the academic performance, whereas parents' and academic motivation had positive and significant effects on students' academic excellence. The dimensions of PTSAMSi explained about 20% variations of academic achievement.



Table 4

*Stepwise-backward multiple regression predicting academic achievement*

Variables	$\beta$ (SE)	$p$ value
<i>Model 1: Personal attributes</i>		
Track of education	0.361 (0.049)	< 0.001
Education	-0.347 (0.017)	< 0.001
Sex	0.076 (0.050)	< 0.05
$R^2$	0.263	
$F$	66.736***	
<i>Model 2: Socioeconomic status, size of family and educational expenditure</i>		
SES	0.382 (0.011)	< 0.001
Educational expenditure	0.176 (0.000)	< 0.01
$R^2$	0.274	
$F$	106.278***	
<i>Model 3: Attributes of educational institution</i>		
Location	0.452 (0.050)	< 0.001
Distance from home	-0.209 (0.004)	< 0.001
Size of class	-0.152 (0.000)	< 0.001
$R^2$	0.263	
$F$	66.887***	
<i>Model 4: Parent-teacher support and academic motivation-stress (PTSAMS) inventory</i>		
Parents' support	0.206 (0.007)	< 0.001
Academic stress	-0.240 (0.008)	< 0.001
Academic motivation	0.172 (0.011)	< 0.001
$R^2$	0.197	
$F$	45.826***	

**Note:**  $\beta$ . Standardized coefficient; SE. Standard error

\*\*\*. Significant at 0.001% level

Table 5 presents the results of hierarchical regression predicting academic achievement of secondary students in four models. Step 1, where control variables were added, was significant,  $F(3, 562) = 66.736$ ,  $p < 0.001$ ,  $R^2 = 0.263$ , suggesting that this model collectively explained 26% of the variance in the academic achievement. Adding SES and educational expenditure in Step 2 increased  $R^2$  by 9.4% with the overall model remaining significant,  $F(2, 560) = 41.121$ ,  $p < 0.001$ ,  $R^2 = 0.357$  (an increase from 0.26 in Step 1), suggesting SES and educational expenditure played a decisive role in explaining the academic achievement of secondary students. Adding the attributes of educational institutions (location, distance from home and size of class) in Step 3 increased  $R^2$  by 2.3% with overall model remaining significant,  $F(3, 557) = 6.736$ ,  $p < 0.001$ ,  $R^2 = 0.380$  (an increase from 0.357 in Step 2), indicating attributes of educational institutions yielded key role in explaining academic success of secondary students. Finally, adding the dimensions of PTSAMS (parents' support, academic stress as well as motivation) in Step 4 yielded  $R^2$  by 2.4% with overall model remaining significant,  $F(3, 554) = 7.445$ ,  $p < 0.001$ ,  $R^2 = 0.404$  (an increase from 0.380 in Step 3), signifying that the PTSAMS inventory significantly influenced the academic performance of secondary students.



**MALAYSIAN ONLINE JOURNAL OF  
EDUCATIONAL MANAGEMENT  
(MOJEM)**

Table 5  
*Hierarchical multiple regression predicting academic achievement*

Variables	Model 1 $\beta$ (SE)	Model 2 $\beta$ (SE)	Model 3 $\beta$ (SE)	Model 4 $\beta$ (SE)
$R^2$ ( $\Delta R^2$ )	0.263	0.357 (0.094)	0.380 (0.023)	0.404 (0.024)
$\Delta F$	66.736***	41.121***	6.736***	7.445***
Step 1 (Control variables)				
Track of education	0.361*** (0.049)	0.224*** (0.051)	0.172*** (0.053)	0.173*** (0.052)
Education	-0.347*** (0.017)	-0.231*** (0.017)	-0.232*** (0.20)	-0.221*** (0.020)
Sex	0.076* (0.050)	0.065 <sup>+</sup> (0.047)	0.056 (0.048)	0.052 (0.047)
Step 2 (Socioeconomic status and educational expenditure)				
SES		0.234*** (0.011)	0.189*** (0.012)	0.137* (0.012)
Educational expenditure		0.140** (0.000)	0.053 (0.000)	0.023 (0.000)
Step 3 (Attributes of educational institution)				
Location			0.213*** (0.067)	0.176** (0.069)
Distance from home			-0.041 (0.004)	-0.062 (0.004)
Size of class			-0.048 (0.000)	-0.068 <sup>+</sup> (0.000)
Step 4 (PTSAMSi)				
Parents' support				0.036 (0.008)
Academic stress				-0.071 <sup>+</sup> (0.007)
Academic motivation				0.145*** (0.009)

**Note:**  $\beta$ . Standardized coefficients; SE. Standard error  
 \*\*\*,  $p < 0.01$ ; \*\*,  $p < 0.01$ ; \*,  $p < 0.05$ ; <sup>+</sup>  $p < 0.10$



# MALAYSIAN ONLINE JOURNAL OF EDUCATIONAL MANAGEMENT (MOJEM)

## DISCUSSION

This study was aimed at identifying the factors influencing the academic achievement of secondary students in Bangladesh. In response to the first research question, it appeared that two variables of personal profile, out of five, were significantly associated with academic achievement of secondary students. Findings indicated that track of education has positive relation with academic achievement. In Bangladesh, despite the dearth of qualified teachers and well-equipped laboratories the outstanding students are in general enrolled in science, followed by business studies, while humanities courses are preferred for the students who struggle academically (Ashraf, 2008). In contrast, education was negatively related with academic achievement, meaning younger students performed better in public examination than their older counterparts, and this result contradicts with studies such as Mohsin et al. (1996), however, confirms the findings of Tayyaba (2010). In Bangladesh, younger students are strictly supervised and monitored by both parents and teachers, at home or at school, and they have least options to be deviated from the academic activities. On the contrary, older students often get involved in non-academic and co-curricular activities, including student politics, voluntary works etc., and they are not over-watched by parents or other guardians. Moreover, there are other means, such as internet addiction, that distract their attention from academic activities (Golder, Jabbar, Alam, Hossain, & Chandra, 2017; Mamun & Griffiths, 2019).

About the second research question, it is evident from the results – of correlation and regression – that the performance of secondary students in public examinations was positively influenced by SES. Studies both in developed and developing countries often report a positive association between SES with children's academic achievement (Ataç, 2017; McConney & Perry, 2010), and Bangladesh is not an exception (Uddin, 2017). Generally, children from families 'more capable' to spend money for educational purposes, for 'shadow education' or after-class education (Nath, Chowdhury, Ahmed, & Choudhury, 2014), and sometimes for 'question paper leakage' (Dhaka Tribune, 2018; Mahtab, 2017) herein Bangladesh, often achieve unprecedented educational feat.

Apart from personal and household characteristics, it is also evident that institutional features are an important catalyst of academic achievement of secondary students. Location of institution appeared to be positively associated with academic performance, and such result confirms previous studies (Ansong, Ansong, Ampomah, & Adjabeng, 2015; Vidyattama, Li, & Miranti, 2019). In Bangladesh, location of educational institution is a critical issue, because in rural or remote areas in general, there are still shortages of quality secondary educational institution, and this scenario worsen further if the students seek quality science or business teachers. Students, therefore, compelled to commute longer distance, which in turn consume time as well as energy, and subsequently the students could not reflect their efforts in academic transcripts. Besides, class size has negative effects on academic achievement. Studies, whether in Bangladesh or elsewhere, suggest that students from smaller class size often perform better than those of larger class size (Asadullah, 2005; Nath, 2012; Tayyaba, 2010). Because smaller class size with fewer students per teacher allow the educator to pay attention to individual demands and requirements of each student. On the contrary, greater number of students per class make it difficult for teachers to know the problems each student is dealing with, subsequently the teachers and students both could not fulfill their educational prerequisites.

For the fourth research question, it is apparent that all only two dimensions of PTSAMSi were significantly associated with academic achievement of secondary students. Findings indicate that individual's academic motivation and stress were significantly influencing their performance in secondary public examinations, however, the latter has negative influence. Previous studies suggest that students with greater academic motivation produce higher levels of academic achievement than those with lower academic motivation (Baumann & Harvey, 2018; Guay & Vallerand, 1996). In contrast to the positive effects of motivation on academic achievement, past studies endorse that academic anxiety and stress, in various forms, had negative effects on the overall performance of students, whether at schools or at universities (Deb et al., 2014; Jan, Anwar, & Warraich, 2016; Schultz, 1993; Spangler et al., 2002).

When put together all the explanatory variables, the results suggest a wide range of variables explaining the academic performance of secondary school students in public examination, including the personal (education and



# MALAYSIAN ONLINE JOURNAL OF EDUCATIONAL MANAGEMENT (MOJEM)

track), SES, location of institution as well as academic motivation and stress. However, personal characteristics were the most decisive ones in explaining academic disparity followed by socioeconomic and educational predictors, and such findings corroborate previous studies (Ataç, 2017; Nath, 2012; Tayyaba, 2012).

This study, however, has certain limitations. For example, the study was carried out in only eight educational institutions of two *Upazilas* of *Magura* district, one of many districts of Bangladesh, thus, the results should be generalized with caution. The number of participants was also relatively small considering the bulge of secondary students of Bangladesh. Moreover, data were collected from students, aged between 13 to 20 years, who successfully completed the secondary examinations, i.e., JSC, SSC and HSC, exempting those who failed and those of others in various classes/grades of secondary levels. The response of the participants also may have been biased considering their age and perception of 'right answers' for the questions, specifically, the Likert-scale items. The academic achievement, in this study, was measured only by the GPA, and did not consider other procedures, such as class attendance, proficiency test etc., which may have some internal inconsistencies. Therefore, reader's discretion is strongly suggested, and not to generalize these findings in the context of Bangladesh as a whole. Despite these short falls, the study is expected to contribute substantially to the limited literature of academic achievement of secondary students in the context of Bangladesh as it marked by some intriguing findings.

## RECOMMENDATIONS AND CONCLUSION

The study, aimed at addressing the determinants of academic achievement of secondary study in Bangladesh, found a range of factors influencing the academic achievement, including the personal (track and education), SES, institutional (location and size of class) as well as psycho-social issues (academic motivation and stress). Bangladesh, like many developing countries, is thriving for both human and knowledge development through education. However, to achieve the sustainable development goals by 2030, Bangladesh needs to improvise its education strategies and policies for ensuring equitable and quality education for all.

1. Bangladesh needs to devise a unified monitoring system, engaging students, parents, teachers, and educational administrators, to overwatch the educational development of individuals and advise possible remedies to improve academic learning and performance.
2. The educational institutions need to develop socioeconomic profiling of the students to understand the trends and patterns of academic learning and performance of students regarding their socioeconomic status, and suggest necessary steps involving students, parents, and teachers for the betterment of the educands as well as the educational institutions.
3. Government should address the requirements of the stakeholders – students, parents and teachers – at the grassroots and increase budget allocation for improving transportation and communication system at remote and rural areas, establish government schools and colleges to ensure optimum utilization of limited resources through increased competition among schools and avoid monopolization of education by appointing qualified and trained teachers and technicians, especially, for science courses and laboratories, considering the class and school size.
4. Government should organize compulsory pedagogical trainings and seminars for teachers with an emphasis on ethical aspects of education, and it must institutionalize the private tuition or shadow education with certain conditions. The latter should be taxable; therefore, it will increase government income as well as minimize pressure on household overall expenditure for education, and make sure of better performance of students in public examination without the risk of 'question leakage.'
5. Educational institutions in a collaboration with government health services should monitor the nature and extent of academic anxiety and pressure among students, and by appointing educational psychologists, they should advise solutions for academic and examination related anxiety and pressure and aspire students for better performance and achievement, both academically and socially.





# MALAYSIAN ONLINE JOURNAL OF EDUCATIONAL MANAGEMENT (MOJEM)

Besides, more empirical research should be directed by both government and non-government organizations based on nationally representative sample to find the potential causes of academic achievement inequalities in broaderspectrum to offer insightful ideas into educational outcomes to redesign and implement equitable and all-inclusive education for all.

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