Factors affecting internal efficiency of secondary schools in northern region of Bangladesh

Abstract:

To assess the internal efficiency of secondary schools in Dinajpur district, northern region of Bangladesh using purposive sampling technique for the collection of data in this study. The study utilized exploratory factor analysis to identify appropriate factors and multivariate analysis of variance to determine differences in secondary schools in the district. Results showed that a significant relationship existed between the internal efficiency (grade point average) and adequacy of physical resources, reasons for chosen the school, factors responsible for low grade, and teaching methods that will be beneficial to teacher and students in the development of appropriate efficiency to differentiate themselves in a meaningful way to potential students, not just in the Bangladesh but also over the world.

Keywords: affecting; efficiency; factors; internal; secondary; schools;

1. Introduction

Bangladesh is developing country with heavy population density with 152.25 million on a land of 147570 sq. km in developing countries of the word (BBS, 2011). This dense population can be a resource for its development. There are three stages in the structure of institutional education in Bangladesh. Primary education is a five-year cycle from grade I-V. Secondary education comprises of a three year junior secondary from grade VI-VIII and a two-year secondary from grade IX- X. Higher secondary education extends from grade XI-XII Bangladesh Bureau of Educational Information and Statistics, (BANBEIS, 2007). Education has been recognized as a priority sector by all governments since Bangladesh gained independence. Secondary education is one of the most main and biggest sub-sectors in education. The number of secondary schools in Bangladesh was 18756, with 209496 teachers and 6819748 students (BANBEIS, 2008). Education is the best cost-effective means for increasing human capital, eradicating poverty and achieving sustainable economic growth. It is a key determinant for enhancing the productive capacities of individuals and the level of aggregate in economic development. It allows individuals to develop within their society and country, and enables nation to struggle and survive in the global economy. A healthy, educated, efficient and conscious population is a pre-requisite for the development of any country. Making an allowance for the importance of education, Government of Bangladesh is committed to enhance the quality of education and also to create opportunity for higher education. The Government has established strong commitment to education since independence by formulating relevant national policies, strategies and laws, and ratifying relevant conventions and declarations at regional and international levels.

Gupta (2001) noted that the question of internal efficiency is ultimately linked to the matter of resources allocation and utilization. According to Ajayi (2009), efficiency in education is a relationship between output and input in an educational system. This is corroborated by Akangbou (1985) and Ojedele (1998) who see educational efficiency as that situation where the school administrations are able to satisfy the needs of human basics in the system. The indicators of internal efficiency used by Abdulkareem (1989); Durosaro (1991); Owolabi and Fabunmi (1999); and Afolabi (2006) are wastage rate and graduation rate. Wastage rate is caused by unsuccessful school leavers, who left school system before they complete with their courses. Wastage may occur between grade level, and among those students who repeated the grade and those who dropped out of the system. Internal efficiency refers to the number of students who pass from one grade to the other grade and complete that cycle within the stipulated period of time. It shows the relationship between input and output at a given educational level. Internal efficiency is the relationship between the outputs and inputs of an education system. The internally efficient education system is one, which turns out graduated without wasting any of students-year or without dropouts and repeaters (Akinwumiju, 1995). Olubor (2004) the inputs of education can be summarized as teachers, materials, and buildings and these are all used to transform one set of outputs (say primary school leavers) into another set of output (*i.e.,* secondary school graduates).

Babalola (2003) internal efficiency is the degree to which resources made available to the educational system are being used to achieve the objectives for which the educational system has been set up. In this view, the input into the system and the output from it needs to be measured. These inputs include classroom, teachers, furniture, library, textbooks, etc. and all these can be quantified as the cost per student per year. Thus, the input has to be in terms of student years. The out puts of the educational system are the graduates from that system. In order to measure internal efficiency in education, a researcher needs to do a cohort analysis. The cohort analysis simply tells the history of a particular level of education to the time the group of students left the level. As such, it shows to what extent the educational system is able to use its raw materials (students) in the production of output (graduates). In this regard, the cohort analysis would show the flow rate in the educational system such as the promotion rate, repetition rate and the dropout rate of students. If the system is able to see the students through the system in the shortest possible period, then we can say that the system is efficiency. In another form, system is efficiency if the wastage rate of the system is low. The smaller the wastage rate the more efficient the system is.

Luke (1999) found that school environment was the major determinant of efficiency in schools and hence for students' performance. However, he did not single out the various components for which the school environment is consisted. The

education goals of Kenya's Vision 2030 are to provide globally competitive quality education, training, and research to their people for development and enhanced individual well - being. This can be achieved by improving internal efficiency in provision of education so that the input into the educational system yields maximum output in terms of good grades, high completion rates, and low repetition rates.

1.1 Significance of the study

The study will make possible to the investigator to make research findings about the quality of internal efficiency of the students. And it's results will be help full to the policy makers in improving the quality of the schools, it will also be useful for the other researchers for future investigation related to internal efficiency of secondary school.

1.2 Objectives of the study

The aim of the study is to identify the factors affecting internal efficiency of secondary schools in Dinajpur district, northern region of Bangladesh.

- to identify the independence of students' family background on internal efficiency in secondary schools.
- to determine the factors that influence internal efficiency in secondary schools.
- to find the relationship between demographic characteristics and internal efficiency in secondary schools.

1.3 Hypothesis of the study

There is no relationship between input and output, demographic characteristics and family background in measuring internal efficiency of secondary schools in Dinajpur district.

2. Background of the study

Mearg (2018) conducted a study about the magnitude of the problem of internal efficiency and effectiveness in the form of dropouts and repetition of secondary schools in wellquitweredata, a sample of 40 teachers and 40 students were selected using purposive sampling and convenience sampling techniques respectively. Data was collected using questionnaire from students and teachers through semi structured interview from the school leaderships. As a result the findings showed that the students travel long distance to school. It has been also revealed that there is lack and absence of encouragement of pupils from teachers. Students believe that they fail to study hard and show lack of interest in education. Parents are unable to provide their children with the necessary of educational support. It has been reported that parents demand for chores is high. The discussion revealed that the prevalence of early marriage, teenage pregnancy, and gender role disparity. Fear of abduction or rape on the way to school and family breakdown (disunity) are also indicated. concerning the availability of educational facilities; laboratory and library, computer rooms are available. However, it has been indicated that there is lack of instructional materials, reference and counseling service. Moreover; there are also overcrowded students in classes. Teachers agree that students' participation in income generating activities is one of the reasons for repetition and dropout of students.

Dr. Emmanuel *et al.,* (2017) conduct their study about the effects of school facilities on internal efficiency they found that the correlation index of 0.67 with level of significance of $0.00 < 0.05$ this overwhelmingly clears that school facilities significantly influence the internal efficiency of secondary schools in yaounde Centre. Some recommendations were made to education stake holders.

Pascal (2014) conducted a study to establish the relationship between physical resources and internal efficiency of public secondary schools in Tana River County in terms of number of classrooms, libraries, laboratories, textbooks, furniture, toilets/latrines, and electricity among others. He found that the secondary education system in Tana River County as at the period of study was inefficient with a mean dropout rate of $(M = 16)$. On the basis of findings, the study concluded that physical resources are positively correlated with internal efficiency of public secondary schools in Tana River County. It was also recommended that for realization of internal efficiency, there was need to equip schools in Tana River County with the necessary physical resources, adequate mechanisms and procedures for ensuring retention and high completion rates in schools. lastly, the researcher recommended that schools should be given funds directly for them to have a chance of prioritizing and acquiring essential physical resources based on their specific needs.

3. Methodology

3.1 Study population and sampling design

The target population refers to the total number of subjects or the total environment of interest to the researcher (Oso & Onen, 2009). The target population consisted of four secondary schools in Dinajpur district. A purposive sampling technique was employed to select the students who participated in the study. In purposive sampling, which is also called as judgment sampling researcher used his own judgment about whom to select and included those who were most appropriate for achieving the objectives of the researcher. The number of sampled students for this study was 250 which is 12 percent of the total number of students (Hox, 2005), indicates that a sample size of 5% to 20% of the target

population is enough as long as it allow for reliable data analysis by cross tabulation and provide desired level of accuracy in estimate of large population.

3.2 Data collection instruments

During this study, the researcher used questionnaires and observation list as the instruments for gathering information. Mugenda and Mugenda (2013) observed that questionnaires are commonly used to gather information since they are relatively cheaper, convenient, easier to construct and administer. The researcher can simultaneously collect information from the respondents hence saving time. The instrument included information regarding demographic factors, academic performance of the students (CGPA), personal and family matters of students, environmental and learning facilities and etc. The respondents had their freedom to answer sensitive questions in the absence of the researcher. Questionnaires with closed ended questions were administered to get information from teachers, and students in the sampled schools

3.3 Field implementation and quality control of the study

The instrument that was used by the researcher was observation list. In this method, the information was sought by way of investigator's own direct observation without asking from the respondents. The observation method is subjective. Biasness was eliminated since the observation was made carefully. The researcher explained to all the teachers and students who participated in the study that the study is for academic purposes only and not for witch-hunt. The researcher further ensured that the responses given by the respondents were treated with confidentiality. The researcher did not harass the respondents during the collection of data but each respondent was given enough time to fill in the questionnaire before submitting it back to the researcher.

4. Result and discussion

4.1 Association between internal efficiency and the family background

In this section the independent variables may be from either nominal or ordinal variables (family background), chi – square test of independence was used test for the association among the two categorical variables namely family background and internal efficiency (Grade point average) among the selected secondary schools in Dinajpur secondary schools. The examined variables are (sex, Father's education, Monthly family income, and Monthly family expenditure). The results of the chi-square indicated that there is significant relationship between internal efficiency (GPA) and the variables of father's education, monthly family income, monthly family expenditure and sex.

Table 4.1.1 Internal efficiency according to father's education

		Internal efficiency		Total
		Fair grade	Best grade	
Father's education	Class 1	0	1	1(0.4%)
	Class 2	4	4	8(3.2%)
	Class 3	0	3	3(1.2%)
	Class 4	0	5	5(2%)
	Class 5	3	12	15(6%)
	Class 6	1	10	11(4.4%)
	Class 7	3	13	16(6.4%)
	Class 8	6	27	33(13.2%)
	Class 9	1	12	13(5.2%)
	Class 10	2	19	21(8.4%)
	Class 11	2	17	19(7.6%)
	Class 12	1	50	51(20.4%)
	MS	1	53	54(21.6%)
Total		24(9.6%)	226(90.4%)	250(100.0%)
Test		Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square		29.457[a]	12	.003
Likelihood Ratio		25.712	12	.012
N of Valid Cases		250		

Table 4.1.2 Internal efficiency according to monthly family income

		Internal efficiency		Total
		Fair grade	Best grade	
Monthly Family Income	= < 15,000	14	45	59(23.6%)
	16,000 - 30,000	7	124	131(52.4%)
	> = 30,000	3	57	60(24%)
Total		24(9.6%)	226(90.4%)	250(100%)
Test		Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square		17.769[a]	2	.000
Likelihood Ratio		14.995	2	.001
N of Valid Cases		250		

Table 4.1.3 Internal efficiency according to gender

| | | Internal efficiency | | Total |
		Fair grade	Best grade	
Sex	Male	8	130	138(55.2%)
	Female	16	96	112(44.8%)
Total		24(9.6%)	226(90.4%)	250(100%
Test		Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square		5.133[a]	1	.023
Continuity Correction[b]		4.202	1	.040
N of Valid Cases		250		

Table 4.1.4 Internal efficiency according to monthly family expenditure

| | | Internal efficiency | | Total |
		Fair grade	Best grade	
Monthly Family Expenditure	2,500 - 10,000	12	49	61(24.4%)
	11,000 - 25,000	10	112	122(48.8%)
	>= 25,000	2	65	67(26.8%)
Total		Count	24(9.6%)	226(90.4%)
Test		Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square		10.786[a]	2	.005
Likelihood Ratio		10.440	2	.005

4.2. Adequacy of physical resources

Table 4.2.1 Shows that the overall mean for adequacy of physical resources sub-scale (M =1.64) is slightly below the mean. Since the mean is 2, it is below inadequate for the adequacy of physical resources sub-scale. For this sub-scale a closer score to 3 (not available) indicates a worst level availability of physical resources. The fourth question in this sub-scale (labeled as "d"), "adequacy of biology laboratory", has the highest mean among the questions in this sub-scale. The mean for this question is 2.064 (SD = .929). The lowest mean in this sub-scale is for the question, "adequacy of textbooks:" M =1.076 (SD =.333).

Table 4.2.1 Distribution of student's opinion regarding to adequacy of physical resources that have direct influence to low internal efficiency of secondary schools in Dinajpur.

No	Item	N	Mean	SD
A	Class rooms	250	1.1480	.42758
B	Textbooks	250	1.0760	.33267
C	Chemistry laboratory	250	1.9320	.94814
D	Biology laboratory	250	2.0640	.92917
E	Physics laboratory	250	1.9640	.95832
F	Furniture	250	1.9120	.96539
G	Toilets/latrines facilities	250	1.1880	.47493
H	Water and electricity	250	1.0920	.36341
I	Laboratory equipments	250	1.9280	.94572
J	Health facilities	250	1.9600	.95185
K	Library	250	1.7240	.83583
L	Computer room	250	1.6560	.78238
	Overall mean		1.6400	

Table 4.2.2 Means, standard deviation and number of subjects of the demographic variables with Grade point average

Variables	Mean	Std. Deviation	N
Your grade point in final examination	4.5654	.60684	250
Sex	1.45	.498	250
Age	15.00	.784	250
Who financially supports you?	2.03	1.021	250
Father's occupation	5.05	2.256	250
Mother's occupation	6.04	1.797	250
Father's education	9.65	3.130	250
Mother's education	9.02	3.191	250
Monthly family income	25990.0000	13676.29571	250
Monthly family expenditure	25412.0000	52833.75701	250
Do you have a computer in the home?	1.6080	.48918	250
Do you have electricity in the home?	1.0520	.22247	250
Do you have desktop/table in the home?	1.3880	.48827	250
Do you have calculator in the home?	1.0800	.27184	250
Do you have internet access in your home?	1.2680	.44381	250
How many students, on average do attend in a class?	2.1000	.93246	250
The number of your teachers are not enough Compared to the number of students.	2.7960	1.26839	250

Table 4.2.3 shows that the internal efficiency depends on the number of your teachers are not enough compared to the number of students., Monthly family income, Age, Father's occupation, Do you have electricity in the home, Do you have internet access in your home, Do you have desktop/table in the home, Mother's education, Who financially supports you, Do you have calculator in the home, How many students, on average do attend in a class, Sex, Your grade point in final examination, Do you have a computer in the home, monthly family expenditure. Mother's occupation, Father's education and it was found that there is a significant correlation at ($R = 0.532a$, Sig $F = .000b$) between the dependent and the independent variable, that is internal efficiency (repeating) with "the number of your teachers are not enough compared to the number of students, Monthly family income, Age, Father's occupation, Do you have electricity in the home, Do you have internet access in your home, Do you have desktop/table in the home, Mother's education, Who financially supports you, Do you have calculator in the home, How many students, on average do attend in a class, Sex, Your grade point in final examination, Do you have a computer in the home, monthly family expenditure, Mother's occupation, Father's education". While about 28.3% ($R2 = 0.283$) of the total variation in grade point average was explain by the Father's education, Age, Sex, How many students, on average do attend in a class and Mothers education were found to be significant. Such that ($\beta = 4.253$, sig $t = 0.000$) for the fathers education, ($\beta = -3.465$, sig $t = 0.001$) for the age of the students, ($\beta = -2.403$, sig t = 0.017) for the sex of the students, ($\beta = 2.293$, sig $t = 0.023$) for the number of students, on average do attend in a class and lastly mothers education ($\beta = 2.073$, sig $t = 0.039$) while the rest of the variables were found to be insignificant in the model.

Table 4.2.3 Regression adequacy of reasons for chosen the school, adequacy of physical resources, educational inputs, teaching methods and factors that influence grade, and internal efficiency (grade point average)

Multiple R	. 532[a]	Standard Error	.53106
R Square	.283	F	5.758
Adjusted R	.234	Sig F	.000[b]
Variable	Beta	T	Sig. t
(Constant)		8.429	.000
Sex	-.150	-2.403	.017
Age	-.201	-3.465	.001
Who financially supports you?	-.029	-.476	.635
Father's occupation	.082	1.450	.148
Mother's occupation	.101	1.444	.150
Father's education	.298	4.253	.000
Mother's education	.136	2.073	.039
Monthly family income	.075	.871	.385
Monthly family expenditure	.035	.521	.603
Do you have a computer in the home?	-.117	-1.844	.067
Do you have electricity in the home?	-.060	-1.006	.316
Do you have desktop/table in the home?	-.103	-1.712	.088
Do you have calculator in the home?	-.058	-.969	.333
Do you have internet access in your home?	.070	1.147	.252
How many students, on average do attend in a class?	.141	2.293	.023
The number of your teachers are not enough compared to the number of students.	-.036	-.638	.524

4.3 Relationship between demographic characteristics and internal efficiency of secondary schools.

Table 4.3.1 below is the correlation matrix with the internal efficiency (Grade point average) is not significantly correlated with who financially supports you, Father's occupation, Reason for choosing this school and Teaching methods highly correlated. While among the correlated variables with internal efficiency is the Physical facility having a highest negative of -0.569.

Table 4.3.1 correlation matrix of demographic characteristics and other input variables

	Your grade point in final examination	Repeating	Sex	Age	Who financially supports you?	Father's occupation	Mother's occupation	Father's education	Mother's education	Monthly family income	monthly family expenditure	reason for choosing this school	Physical Facility	Educational Inputs	Teaching Methods	Low Grade
Your grade point in final examination	1															
Repeating	.398**	1														
Sex	-.212**	-.077	1													
Age	-.220**	-.123	.107	1												
Who financially supports you?	.065	.098	-.178**	-.015	1											
Father's occupation	.109	.031	-.037	-.020	.029	1										
Mother's occupation	-.168**	.021	.225**	.046	-.248**	.003	1									
Father's education	.380**	.098	-.101	-.068	.118	.042	-.324**	1								
Mother's education	.203**	.021	-.038	-.087	.133*	.010	-.480**	.213**	1							
Monthly family income	.289**	.049	-.286**	.066	.255**	.044	-.332**	.540**	.228**	1						
monthly family expenditure	.134*	.026	-.127*	.117	.125*	.084	-.253**	.162*	.150*	.525**	1					
Reason for choosing this school	.003	-.196**	-.085	-.210**	-.006	.143*	-.120	-.059	.012	.051	.035	1				
Physical facility	-.569**	-.058	.193**	.103	-.008	.013	.299**	-.376**	-.239**	-.382**	-.170**	-.218**	1			
Educational Inputs	.263**	-.086	-.274**	-.204**	-.042	.052	-.189**	.172**	.141*	.206**	.119	.308**	-.372**	1		
Teaching methods	-.094	-.063	-.227**	-.018	.120	-.011	-.027	-.032	-.134*	.087	.094	.129*	.140*	.124	1	
Low grade	.267**	.007	.082	-.219**	-.044	.012	-.028	.203**	.096	.188**	.063	.183**	-.371**	.397*	.102	1

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

Table 4.3.2 Variables in the equation numerical problems such as multicollinearity among the independent variables (constant excluded) are checked by examining the value of standard errors for the B-coefficients in table 4.3.2. A standard error larger than 2 indicates numerical problems. None of the independent variables in this analysis had a standard error larger than 2 indicating that there is no numerical problem of the model in the current study. The probabilities of the Wald statistic at 95% confidence interval for the variables Reason for choosing this school, Physical Resources and Factors for Low Grade as predictors are < 0.016, 0.000 and 0.002 respectively which is less than or equal to the level of significance of 0.05. This suggests the relationship that "students who have Reason for choosing this school, Physical Resources and Factors for Low Grade.

This model shows that the variables like physical resources, reasons for choosing this school, and factors for low grade have significant with students performance (GPA).

Table 4.3.2 Variables in the Equation

		Different values of Variables in the Equation						95% C.I.for EXP(B)	
		B	S.E.	Wald	Df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	CTS	-.271	.112	5.808	1	.016	.763	.612	.951
	PR	-.285	.061	21.511	1	.000	.752	.667	.848
	EI	-.080	.064	1.574	1	.210	.923	.815	1.046
	TM	.374	.199	3.525	1	.060	1.454	.984	2.149
	FLG	-.139	.046	9.183	1	.002	.870	.795	.952
	Constant	14.941	3.376	19.588	1	.000	3081222.408		
a. Variable(s) entered on step 1: *CTS* = Reason for choosing this school, *PR* = Physical Resources, *EI* = Educational Inputs, *TM* = Teaching Methods, and *FLG* = Factors for Low Grade									

5. Conclusion

The results indicated out-of-region students consider cost, facilities, and family support as significantly important factors when choosing secondary schools compared to the others. This study conducted to investigate the factors affecting internal efficiency of secondary schools in Dinajpur district. Based on the findings the study concluded that

- Adequacy of physical resources, teaching methods, factors responsible for low grade, reasons for choosing the school, father's education, mothers education, were found to be significant.

- The education stakeholders should ensure that teaching materials and school physical facilities are improve the internal efficiency of secondary schools.

- Parents should provide the necessary learning materials for better achievement scores of their children.

- There should be a self-motivating strategy through edifying remarks such as 'you can do it' are said to weaker students.

- The results will be useful for teacher students and administrators to consider the management and presentation of its resources to the wide market place of current and future students.

Therefore, the research will be beneficial in developing appropriate internal efficiency that teacher recruiters can use to differentiate their schools in a meaningful way to potential students worldwide.

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