 Int J Edu Sci, 4(1): 35-42 (2012)

Mathematics Performance at High School Certificate (HSC) Examination: Predicting the Risky from Selected Student Variables

Dibakar Sarangi

DAV College of Teacher Education, Koraput 764 020, Orissa, India
Mobile: (+91) 9437784619; E-mail: dibakar.sarangi @gmail.com

KEYWORDS Sex. Caste. Parental Education. Parental Occupation. Mathematics Scores. Secondary School

ABSTRACT An attempt was made to examine the relative contribution of sex, caste, parental education, parental occupation, location of prior schooling and Mathematics foundation knowledge towards Mathematics performance in terminal high school examination at the end of Grade 10. The sample consisted of 1731 high school pass outs whose Mathematics score in high school examination was recorded along with information on all the predictor variables. Multiple regression analysis revealed that Mathematics foundation knowledge as assessed at the entry point to secondary stage of education emerged as the strongest predictor accounting for 46.8 per cent of variance while the rest five predictors explained only 2.1 percent of variance. Since poor Mathematics foundation knowledge substantially increases the risk of failure, it is suggested that early diagnostic assessment and remedial intervention would work out as an effective strategy for reducing the risk of student failure in Mathematics in secondary education.

INTRODUCTION

Achievement in different school subjects is determined by factors within the school milieu and within student variables. Research studies on achievement variations across schools, states and nations have examined important components of school system such as learning resources, class size, teaching- learning practices, monitoring and evaluation practices and teacher competency etc., and have concluded these factors as correlates of achievement. For example, Ramirez and Carpenter (2005) pointed that school based factors (class size, number of minority students in the class, number of algebra units taken, number of graduate courses taken by teacher in the subject she teaches most frequently) and home- based factors (socio- economic status, home language, time spent on home work, family composition, level of parent involvement and urbanicity) correlated with success of every child. Bulach and Malone (1994) attributed achievement difference to differences in school climate. Cotton (1996) investigated the role of school size and reported that small schools provide a better learning opportunity for students. Wenglinsky (2002) and Rockoff 2004) reported strong relationship between teacher quality (training and experience) and student learning. However within school, achievement variations have been probed in terms of student- related variables such as personal characteristics, residency and socio-familial background. Dolson (1985) and Derwing et al. (1999) reported that a student's home language is central to success in school, particularly when it is related to the level of parental education. Blair and Legazpi (1999) indicated that income level of a student's family is highly correlated with academic success in school. A study by Portes and McLeod (1996) reported overwhelming relationship between race / ethnicity and academic achievement. Gender difference in reading and Mathematics was reported by Pollyann and Onwuegebuzie (2001). Marsh and Yeung (1997) found prior achievement and self -concept to be good predictors of academic achievement. Harackiewiez et al. (2002) reported that high school performance contributed to college achievement. Hadi and Al-Ommar (2009) observed that student level variables (prior achievement and self concept) were more important than school level factors (school gender, number of students in school, and teachers' satisfaction). On comparative influence of school factors and family background Suter (2000) quoted the findings of Coleman (1966) that examined the effects of student characteristics and family background characteristics on student achievement in grades 3, 6, 9, and 12. The study concluded that schools brought little influence to bear on a child' achievement that was independent of his background and general social context (p. 325). Thus family background is of great importance, and schools represented on a small independent effect due to variations in facilities, curriculum and staff achievement. They also reported that

social composition of the student body (number of minority students) was more highly related to student achievement (independently of the student's own social background) than any school factor. A study by Casanova et al. (2005) showed that the socio-demographic variables (student gender, parent's profession, educational level, economic status and family structure) were not helpful in predicting academic achievement, but variables of family environment (parental acceptance, control, involvement in ward' education and expectation of success) played an important role.

Ronald et al. (2003) examined social capital (with two components: parental networks and student networks.) and resource capital (parent education, parent income, and educational items in the home) as predictors of academic performance. The findings indicated that both indicators of social capital were not strong contributors to academic performance among adolescents. Resource capital indicators were found to be stronger contributors to academic performance.

In common educational discourse achievement variation within a school is accounted largely in terms of socio-cultural deprivation. Certain classes of people in a society have been less privileged to enjoy available resources, facilities and opportunities. They are perforce structured to remain divorced from socio cultural participation in different domains of life. Conventional thought perceives them as inferior / weak; assigns them lower status and holds low expectations from them. Such population is identified as *dalits* (disadvantaged/ backward). Indian constitution although assures equity and equality in every spheres of public life, yet people are categorized into socio- culturally advanced and backward categories across the variables like caste, gender, habitation and economic status. In India the scheduled caste, the scheduled tribes, the rural dwellers, the females and the below poverty line families are considered as socio- culturally disadvantaged population. In matters of education, socio- culturally disadvantaged children are characterized with unsupportive study environment, lack of parental support/ involvement, compulsive engagement in household activities, lack of guidance. These situations impede their schooling and learning performance. Hence, socio- culturally disadvantaged children are commonly identified as achievement risky students.

With the conviction that socio-cultural deprivation largely accounts for educational failure, current educational policy in India aims at compensating the adverse effects of socio-cultural and familial factors for the students belonging to the backward classes and minority communities. A number of measures supporting schooling of children of the said groups have been implemented: These are pre-matric scholarships, National Means cum Merit Scholarship, National Scheme of Incentives(Rs 3000/- to SC, ST and OBC* girls reading in class IX), Provision of cycles to ST and SC girls, dress for girls up to class VIII, Pre-matric scholarship to minorities students (Rs 100/- pm) to all those whose parental income is less than rupees 1 lakh per year, free books up to class VIII. Besides these measures a number of residential schools for children of the socio culturally backward population have been running by the welfare ministries of the provincial governments.

In spite of this, student's performance in the High School Certificate (HSC) examination conducted by the board of secondary education, Orissa is a matter of serious concern. Many students score very low in Mathematics, Science and English contributing to higher failure rates in HSC examination (see Appendix 1). There are schools which were not able to produce even one student who passed the HSC examination. This issue has been continuing over years (see Appendix 2). Low score in Mathematics, English and Science not only limits students' inflow to higher secondary stage in general and to science stream in particular, but also influences future work employment opportunities for the poor performers. Still a more serious concern is that every year some students who fail at HSC examination commit suicide. Concerns from various quarters on students' suicide have been mounting over the last couple of years. These issues would make the goal of universal secondary education in India difficult to materialize.

The Research Question and Focus of the Paper

To address the issue of low achievement in Mathematics, Science and English and consequent large scale failure in the HSC examination, early detection of the risky students is very much required as early as the beginning of sec-

ondary education. Early identification of risky students can help school improvement plans to accommodate appropriate corrective intervention to raise pupils' achievement in the subject areas. Which variables can help high schools teachers to identify the risky children as precisely as possible? In respect of school specific student achievement a number of variables as reviewed earlier may be used as predictors. However from operational point of view, variables which can be assessed easily by the school teachers should be preferred in prediction. Choudhury (2009) on a sample survey found most students admitted to high schools were severely deficient in Mathematics foundation knowledge. In this respect, subject specific foundation knowledge, sex, caste, area of primary schooling, parental education and parental occupation appear more usable at teachers' level as they can be easily assessed. But which of the said variable can best predict students' score at HSC examination? What are their relative contribution for prediction of pupils' scores at HSC examination? The research question is delimited in this paper to Mathematics performance at HSC examination only.

METHODOLOGY

Objective of the Study

This study aimed at finding out the relative efficiency of selected variables (foundation knowledge in Mathematics, sex, caste, area of primary schooling, parental education and parental occupation) for prediction of Mathematics Score at HSC examination.

Student Population for this Study

All students who got admitted into the first grade (class 8) of secondary stage of education in Odisha in 2006 constitute the population for this study.

Sample and Data for this Study

The sample consisted of 1731 students, all the HSC examination pass outs of the sample of 4900 students studied by Choudhury (2009). The sample was drawn from 81 high schools randomly drawn from 4 districts of Orissa chosen purposively.

Tools

Test of Mathematics Foundation Knowledge

Mathematics foundation knowledge of the sample students was assessed with a standardized test with test retest reliability coefficient of .964 and validity coefficient of .912 (foundation knowledge scores were cross validated with pupils' grades obtained in class 7 public examination).

Questionnaire for Students

A questionnaire for the students was used to collect the background information on caste, sex, area of last schooling, parental occupation, and parental education.

Record of Mathematics Performance at HSC examination

Students' Mathematics scores were collected from HSC examination result sheet provided to the schools by the state board of examination.

Procedure

Data on the predictor variables for the sample students were gathered in the beginning of class 8 (the first grade of secondary stage in the state of Orissa) in the year 2006. This batch of students appeared at the secondary end public examination (High School Certificate Examination) conducted by the Board of Secondary Education, Orissa in 2009. Mathematics scores obtained by the sample students were collected in 2009 from the school records.

DATA ANALYSIS

Multiple linear regression is quite a suitable method to predict a scale dependent from the values of a set of independent variables, either scale or categorical. Hence, an OLS multiple linear regression was used to provide answer to the research question. The details of the variables examined in the model are given in the Table 1.The dummy variables corresponding to a predictor were entered in block using forced entry method in SPSS 17 package.

Results of Regression Analysis

The predictor variables exhibited significant inter correlations except the dummy secondary.

Table 1: Variables used in the study

S. No.	*Variable in the model*	*Status*	*Measurement*
1	Mathematics score at HSC exam	Dependent variable	Scale
2	Mathematics foundation knowledge	Predictor	scale
3	Area of last schooling	Predictor 1. Urban- The reference 2. Rural- dummy	Categorical
4	Sex	Predictor 1. Male- Reference 2. Female- Dummy	Categorical
5	Caste	Predictor 1. General- The reference 2. SC- Dummy 3. ST- Dummy	Categorical
6	Parental education	Predictor 1. Above secondary- Reference 2. Upto secondary- Dummy 3. Illiterate- Dummy	Categorical
7	Parental occupation	Predictor 1. High income- Reference 2. Middle income 3. Low income	Categorical

The bivariate correlation coefficients given in Table 2 are the evidence for absence of multi collinerity between pairs of predictors, a critical assumption of regression analysis.

The average Mathematics score at HSC of the sample is 37.44 with S.D= 25.147. The average Mathematics foundation score is 46.625 with S.D= 28.937. The mean of the dummy variables may be seen in Table 3.

Six significant regression models emerged corresponding to the six predictors with a predictor added each time. The summary of these models are shown in Table 4. Mathematics foundation knowledge alone (model 1: F=1522.338, df= 1/1729, p= .000) explained 46.8percent of the variance in the Mathematics score at HSC. Addition of parental education (dummy secondary and illiterate, model 2: F= 536.422, df= 3/1727, p= .000) increased the percent of variance explained to 48.2 percent with a significant R^2 change of .014 (df= 2/1727, p= .000). Inclusion of parental occupation (dummy low income and middle income, model 3: F= 326.869, df= 5/1725, p= .000) elevated R^2 to .487 with significant R^2 change .004 (df= 2/1725, p= .001). Further inclusion of sex (dummy female, model 4: F=276.039, df=6/1724, p=.000) resulted in increased R^2 to 49percent with significant R^2 change of .003 (df= 1/1724, p= .001). However inclusion of area of last schooling (dummy rural, model 5: F= 237.540, df= 7/1723, p= .000) and caste (dummy SC and ST, model 6: F= 184.680, df= 9/1721, p= .000) did not bring any improvement in percent of variance in Mathematics scores at HSC that can be explained by the models (R^2 change = .001, df= 1/

Table 2: Bi-variate correlations between variables (N= 1731)

		Math2 at HSC	*Math1*	*Illiterate*	*Secondary*	*Low income*	*Middle income*	*Female*	*Rural*	*ST*	*SC*
Pearson Correlation	Math2*	1.000	.684	-.345	.022	-.134	-.279	.050	-.165	-.182	-.113
	Math 1*	.684	1.000	-.371	.024	-.138	-.284	-.049	-.240	-.237	-.146
	Illiterate	-.345	-.371	1.000	-.568	.172	.415	-.127	.252	.268	.206
	Secondary	.022	.024	-.568	1.000	-.079	-.107	.053	-.038	-.132	-.087
	low Income	-.134	-.138	.172	-.079	1.000	-.154	-.027	.054	.043	.079
	Middle Income	-.279	-.284	.415	-.107	-.154	1.000	-.132	.301	.201	.205
	Female	.050	-.049	-.127	.053	-.027	-.132	1.000	.005	-.109	-.006
	Rural	-.165	-.240	.252	-.038	.054	.301	.005	1.000	.144	.136
	ST	-.182	-.237	.268	-.132	.043	.201	-.109	.144	1.000	-.191
	SC	-.113	-.146	.206	-.087	.079	.205	-.006	.136	-.191	1.000
Sig. (1-tailed)	Math2**	.	.000	.000	.185	.000	.000	.019	.000	.000	.000
	Math1**	.000	.	.000	.157	.000	.000	.022	.000	.000	.000
	Illiterate	.000	.000	.	.000	.000	.000	.000	.000	.000	.000
	Secondary	.185	.157	.000	.	.000	.000	.014	.059	.000	.000
	low Income	.000	.000	.000	.000	.	.000	.127	.013	.036	.001
	Middle Income	.000	.000	.000	.000	.000	.	.000	.000	.000	.000
	Female	.019	.022	.000	.014	.127	.000	.	.411	.000	.405
	Rural	.000	.000	.000	.059	.013	.000	.411	.	.000	.000
	ST	.000	.000	.000	.000	.036	.000	.000	.000	.	.000
	SC	.000	.000	.000	.000	.001	.000	.405	.000	.000	.

**Mathe2- Mathematics score at HSC, Math1- Mathematics Foundation

Table 3: Descriptive statistics

	Mean	*Std. deviation*	*N*
Math score at HSC	37.41	25.147	1731
Math foundation	46.6251	28.93724	1731
Illiterate	.43	.495	1731
Secondary	.30	.460	1731
Low income	.05	.210	1731
Middle income	.33	.470	1731
Female	.45	.498	1731
Rural	.54	.498	1731
ST	.12	.329	1731
SC	.21	.404	1731

1723, p= .051; R^2 change = 0, df=2/1721, p= .723 respectively). The beta coefficient for dummy rural is .060 (t=1.956, p- .051), for dummy SC .012 (t= .441, p= .659) and for dummy ST is .008(t=.441, p=.859).

Thus model 4 that is regression of Mathematics score at HSC on Mathematics foundation knowledge, sex, parental education and parental occupation emerged as the best predicting model. The estimated parameters of this model are presented in Table 5. All the beta coefficients are significant and thus contribute to prediction of Mathematics scores at HSC. Among these four predictors Mathematics foundation was found to be strongest contributor (Beta= .624, t= 31.95, p= .000). Parental education, parental occupation and sex were found to be weak predictors (see corresponding beta coefficients).

Using the unstandardized regression coefficients the regression equation works out to –
Mathematics score at HSC = 15.719 +.542* Mathematics foundation score – 5.783*Illiterate – 3.895*Secondary – 4.999*Low Income – 3.247*Middle Income + 3.040*Female

The regression equation stated above speaks on the differential impact of the dummy variables on the Mathematics scores at HSC. In respect of parental education, prediction of HSC Mathematics score conforms to the common expectation. As compared to the pupils with parental education above secondary, the average HSC Mathematics scores of the pupils with illiterate parents falls by 5.783; and that for the pupils with parental education up to secondary falls by 3.895. Parental occupation also predicts HSC Mathematics scores in line with normal

Table 4: Model summary

Model	*R*	*R square*	*Adjusted R square*	*Std. error of the estimate*	*Change statistics*				
					R square change	*F change*	*df1*	*df2*	*Sig. F change*
1	.684[a]	.468	.468	18.344	**.468**	1522.338	1	1729	**.000**
2	.695[b]	.482	.481	18.109	**.014**	23.582	2	1727	**.000**
3	.698[c]	.487	.485	18.046	**.004**	6.973	2	1725	**.001**
4	.700[d]	.490	.488	17.990	.003	11.727	1	1724	**.001**
5	.701[e]	.491	.489	17.976	.001	3.827	1	1723	.051
6	.701[f]	.491	.489	17.983	.000	.324	2	1721	.723

a. Predictors: (Constant), **Math Foundation**
b. Predictors: (Constant), Math Foundation , **Secondary, Illiterate**
c. Predictors: (Constant), Math Foundation , Secondary, Illiterate, **Low Income, Middle Income**
d. Predictors: (Constant), Math Foundation , Secondary, Illiterate, Low Income, Middle Income, **Female**
e. Predictors: (Constant), Math Foundation , Secondary, Illiterate, Low Income, Middle Income, Female, **Rural**
f. Predictors: (Constant), Math Foundation , Secondary, Illiterate, Low Income, Middle Income, Female, Rural, **SC, ST**
g. Dependent Variable: Math Score at HSC

Table 5: Regression coefficients[a]

Model		*Unstandardized coefficients*		*Standardized coefficients*	*t*	*Sig.*
		B	*Std. error*	*Beta*		
4	(Constant)	15.719	1.513		10.386	.000
	Math foundation	.542	.017	.624	31.950	.000
	Illiterate	-5.783	1.296	-.114	-4.461	.000
	Secondary	-3.895	1.192	-.071	-3.268	.001
	Low income	-4.999	2.182	-.042	-2.292	.022
	Middle income	-3.247	1.080	-.061	-3.007	.003
	Female	3.040	.888	.060	3.425	.001

a. Dependent Variable: Math Score at HSC

expectation. The HSC Mathematics score of pupils with low income occupations decreased by 4.999; and that of the pupils with middle income occupations decreased by 3.247 as compared to the pupils with high income occupations. It is interesting to note that the mean HSC Mathematics scores for female increases by 3.04 as compared to that for male students.

DISCUSSION

This study attempted to identify the student level variables that can best predict students' Mathematics performance the HSC examination. Out of the six variables (Mathematics foundation, area of last schooling, sex, caste, parental education and parental occupation) examined in this study only students' Mathematics foundation measured at the beginning of secondary stage emerged as the strongest correlate of Mathematics performance at HSC examination. This finding is consistent with the reports of Harackiwiez et al. (2002) and Marsh and Yeung (1997). However, unlike studies by Blair and Legazpi (1999), Portes and McLeod (1996), Ronald et al. (2003) and Casanova et al. (2005) which reported socio- familial factors as strong correlates of pupil achievement, this study found sex, parental education, and parental occupation to be weak correlates of Mathematics scores at HSC. Also, difference in social class (caste) and area of prior schooling (primary education) did not contribute to prediction. This contradiction may be explained as the impact of the variable Mathematics foundation knowledge included in this study. Many studies did not examine the effect of prior achievement (Mathematics foundation) and therefore the said family related variables produced higher correlation with academic achievement. Thus, pupils' academic background proved to be of greater importance as compared to socio familial background in deciding the HSC examination performance.

Educational policy in India focuses on a variety of supportive measures for students from socio- culturally backward classes to ensure equity in secondary education. This strategy to equity in secondary education needs to be examined in the light of the finding of this study. Mathematics foundation knowledge alone accounted for 46.8 percent of the variance in Mathematics performance at the HSC examination and the rest five variables only 2.1 percent. This result suggests that the parameters of socio cultural deprivation examined in this study (sex, caste, parental education, parental profession and the area of last schooling) are not helpful to predict a student's mathematics performance at HSC examination. The aforesaid supportive measures can not guarantee success at HSC examination with poor foundation for secondary stage.

The findings of this study if read with the World Bank report (January 2009) on the backdrop of universal secondary education in India, which has pronounced loudly the issue of poor foundation for secondary schooling, questions the productivity of the said supportive measures. It is widely acclaimed that the non detention policy at primary stage of education that was launched as a strategy to ensure pupils' transition till end of class VII, feeds the secondary schools with poor quality of primary graduates. Hence education policy in India has to seriously look into the issue of poor foundation as it alone largely determines students' success at secondary stage, particularly the HSC examination. The quality issues in primary stage of education warrants attention on priority as an allied issue to Universalisation of secondary education.

It is evident that higher the student's foundation knowledge in Mathematics, greater is the Mathematics score at HSC examination. Putting it otherwise, low foundation knowledge in Mathematics at the beginning of secondary stage stands symptomatic to low score and hence a precursor to failure in HSC examination. Therefore, secondary school teachers need to assess students' foundation knowledge essential for learning secondary school Mathematics to identify the Mathematics risky students. The school improvement planning programmes should include appropriate compensatory inputs which would mainstream the risky pupils during secondary schooling. Early detection and intervention would address the issues of large failure at HSC and consequent suicide by students.

NOTE

*SC (Scheduled Castes), ST (Scheduled Tribes) and Other Backward Castes (OBC) are sections of Indian population who are constitutionally recognized as backward class people in India.

REFERENCES

Blair Sampson L, Legazpi Marilou C 1999. Racial or ethnic difference in high school students' academic

performance: Understanding the weave of social class and ethnicity in the family context. *Journal of Comparative Family Studies*, 30: 539-555

Bulach C, Malone B 1994. The relationship of school climate to the implementation of school reform. ERS SPECTRUM. *Journal of School Research and Information,*12(4): 3-9

Casanova Pedro F, Garsia-Linares Cruz, Torre MJ de la, Carpio M de la Villa 2005. Influence of family and socio-demographic variables on students with low academic achievement. *Educational Psychology*, 25(4): 423-435.

Choudhury LK 2009. *A Study on Foundation Knowledge of Pupils in Mathematics, Science and English at Class VIII Entry Point in Relation to Selected Presage Variables*. Ph D thesis in Education, Unpublished. Berhampur: Berhampur University.

Coleman J S 1966. *Equality of Educational Opportunity.* Washington, DC: U.S. Department of Health, Education and Welfare.

Cotton K 1996. School Size, School Climate and Student Performance. School Improvement Series. (SIRS). pp.1-32 . From< http://upstate.colgate.edu/pdf/ Abt_merger/ Cotton_1996_Size_Climate_Performance.pdf> (Retrieved on 6 June 2010).

Derwing T M, Decorby E, Ichikawa J, Jamaison K 1999. Some factors that affect the success of ESL high school students. *Canadian Modern Language Review,* 55(4): 532- 547.

Dolson David P 1985. The effect of Spanish home language on the scholastic performance of Hispanic students. *Journal of Multilingual and Multicultural Development*, 6: 135-155

Hadi Fawziyah, Al-Omar Badr 2009. Multilevel analysis approach for determining 8th grade Mathematics achievement in Kuwait. *Journal of Educational and Psychological Science*, 10(2): 12-30.

Harackiewicz JM, Barron KE, Tauer JM, Elliot AJ 2002. Predicting success in college: A longitudinal study of achievement of goals and ability measures as predictors of interest and performance from freshmen year through graduation. *Journal of Educational Psychology,* 94(3): 562- 575.

Marsh HW, Yeung AS 1997. Causal effect of academic self concept on achievement: Structural equation modeling of longitudinal data. *Journal of Educational Psychology,* 89(1): 41-54.

Pollyann DJ, Onwuegbuzie AJ 2001. Factors associated with reading achievement attitude among elementary school aged students. *Research in Schools,* 8: 1-11.

Portes Alejandro, McLeod Dag 1996. Educational progress of children of immigrants: The role of class, ethnicity and school contexts. *Sociology of Education,* 69: 255-275.

Ramirez Al, Carpenter Dick 2005. Challenging assumption about the achievement gap. *Phi Delta Kappan,* 86(8): 599-603.

Rockoff Jonah 2004. The Impact of Individual Teachers on Student Achievement: Evidence from Panel Data. Abstract. From < http://econwpa.wustl.edu/ eprints/pe/ papers/ 0304/ 0304. abs >(Retrieved on 6 June 2010).

Ronald L Mullis, Richard Rathge, Ann K Mullis 2003. Predictors of Academic Performance During Early Adolescence: A Contextual View. International Journal of Behavioral Development. November 2003 Vol.27 No. 6 541-548. DOI: 10.1080/01650250344000172. From< http:// jbd.sagepub.com/ content/27/ 6/ 541 abstract > (Retrieved on 27 May 2010).

Suter Larry E 2000. Is student achievement immutable? Evidence from international studies on schooling and student achievement. *Review of Educational Research*, 70(4): 529- 545

Wenglinsky Harold 2002. How School Matters? The Link between Teacher Class Room Practices and Student Achievement Performance. Education Policy Analysis Archives. Vol. 10, No.12. From< http://epaa.asu.edu/ epaa/v10n12 > (Retrieved on 25 May 2010).

World Bank 2009. Secondary Education in India: Universalizing Opportunities. Vol.1. pp. 39-41. From < http://www.worldbank.org/ reference > (Retrieved on June 6, 2010).

APPENDIX

HSC examination results in Orissa over years show very poor performance of students. The two tables speak more on this.

Appendix 1: Results in annual HSC examinations, Orissa

Year	*No. of schools*	*No. of candidates of*	
		Appeared	*Pass %*
1956	234	3579	-
1961	313	11447	57.6
1966	706	23746	51.66
1971	1407	47622	48.82
1976	1885	66497	35.38
1981	2443	108031	50.70
1986	3657	135227	42.39
1991	4641	147558	44.07
1996	5967	226578	53.29
2001	6431	223617	38.38
2006	7018	298982	56.40
2007	7127	322979	5662
2008	7127	314442	51.11
2009	7127	336090	63.41

Source: Board of Secondary Education, Orissa, Cuttack

Appendix 2: Nil results schools of Orissa

S. No.	*Name of the districts*	*No. of Schools showing nil pass out in year*							
		2002	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*
1	Kalahandi	14	11	08	04	06	02	06	05
2	Nuapada	08	07	03	01	02	-	02	01
3	Baragarh	01	-	-	-	03	02	-	-
4	Sambalpur	03	06	04	06	07	03	05	04
5	Deogarh	11	-	-	04	-	-	02	-
6	Jharsuguda	01	02	-	01	01	-	01	-
7	Suvarapur	05	01	02	-	-	-	-	-
8	Bolangir	12	07	07	08	04	03	06	-
9	Sundargarh	08	06	07	04	13	05	02	05
10	Gajapati	03	04	04	05	03	04	04	-
11	Ganjam	03	11	14	08	09	06	03	02
12	Boudha	01	01	01	-	02	01	02	01
13	Kandhamal	12	18	15	09	09	05	08	04
14	Koraput	14	12	17	07	08	03	11	06
15	Malkanagiri	05	04	04	02	06	04	02	-
16	Nabarangpur	09	08	16	10	16	09	09	06
17	Rayagada	07	11	10	02	11	06	01	01
18	Jagatsinghpur	14	03	01	-	-	01	03	-
19	Anugul	15	01	04	05	01	-	05	-
20	Dhenkanal	11	-	-	-	-	-	25	-
21	Jajpur	11	01	09	-	02	02	02	-
22	Kendrapada	28	21	03	03	-	01	02	-
23	Keonjhar	27	12	04	07	12	10	20	11
24	Balesore	09	04	04	05	01	04	04	01
25	Bhadrak	02	01	-	-	01	-	01	-
26	Mayurbhanj	19	10	04	05	04	04	09	05
27	Puri	06	03	04	03	08	02	03	05
28	Nayagarh	03	04	02	-	01	01	01	-
29	Cuttack	08	-	03	03	04	03	01	02
30	Khurda	-	01	02	03	06	02	04	01
	Total	270	170	152	105	140	83	144	60

Source: Board of Secondary Education, Orissa, Cuttack