Research Paper

Academic Performance Characteristics of Special Boarding Students: The Case of Adama, Ethiopia

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Article Info	Abstract
	The main purpose of this study was to investigate academic performance characteristics of Oromia Development Association Special Boarding School (ODASBS) students. To this end, a descriptive correlational research method was employed. Purdue Academic Rating Scale (PARS) was used to gather data. One hundred ODASBS students (Male = 56, Female = 44) were selected through random sampling technique from grades 9 - 12. The academic performance characteristics of students were rated by subject-teachers of mathematics, English language, science, and social studies. Results of rating students' academic performance characteristics showed that ODASBS students were at excellent level in academic performance in mathematics, English, and science whereas at a strong average in social studies. Out of the maximum possible rating scores, this study revealed that the academic performance characteristics rated as 45.42, 44.58, 44.76, and 36.2 for mathematics, English language, science, and social studies subjects, respectively. Result of correlation analysis showed that there was positive and significant relationship between mathematics and English language academic performances ($r = 0.332$, $r^2 = 0.11\%$, $p < 0.01$, df $= n - 2 = 98$). Mathematics academic performance was the leading academic performance characteristics and in no subject, ODASBS students fell under average performance. The school, social studies teachers and students should give emphasis to social studies as equal as other subjects.

1. Introduction

Educating superior students in special boarding school is aimed at helping students with high academic ability to grow smartly with an astonishing base that helps them in further learning. Hence, education for students with superior academic scores is among academically popular topics all over the world. Its popularity has been increasing with an increase in societies' awareness of the right to education for gifted students (Said, 2013; UNESCO, 1994). Thus, the presence of special boarding schools in the country used to protect the right to learn for those students and meant

to realize the goal of appropriate education for all (EFA). Global experiences indicate that academics at boarding schools operate at very high levels by positively meeting students' educational needs (Bass, 2014). Students are encouraged to learn and discuss a wide array of subject matter in special boarding schools.

Even though the school did not label students as gifted, Oromia Development Association Special Boarding School (ODASBS) is a school for the blending of average, high-achiever and gifted students. ODASBS is residential type of special boarding school that aimed at maximizing the

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academic capacity of students. ODASBS established in 2014 as an education division of the Oromia Development Association (ODA) that was founded in 1993.

The system of ODA special boarding school may impact academic performance characteristics of its students. Certain scholars have assumed boarding schools as institutions that encompass all spheres of life which enables them to shape the behavior and character of the students. A residential boarding school allows boarding students to engage in a different set of learning activities and interactions with peers and staff which provides opportunities for growth and development of students (Holden et al., 2010). Regulation and tight scheduling system of boarding school for their students could impact students' academic performance (Cookson, 2009; Lee & Barth, 2009; Williams, 2011). The most common academic characteristic of boarding school students is their superior academic achievement in one or more school subjects. Regarding this, Martin et al. (2014) stated that boarding school is an environment in which distinct proximal processes are influential. Students in boarding schools mainly demonstrate academic characteristics of outstanding performance or potential for superior performance in academics compared to their peers in day schools (Martin et al., 2014). Thus, special boarding school is meant to educate gifted high-achiever and non-gifted high-achiever students in the same school. This can be strange for scholars who endorse for elite-based traditional boarding schools, but possible to educate these two groups of students in the same school in a single classroom.

Parents and teachers advocate the idea that gifted and high-achiever students might be best educated in special classrooms or schools (Sahin, 2015). It is the current researchers' ontological philosophical position that education for high-scorer students at special boarding schools in Ethiopia should be neither as rigid as elitism nor as floppy as egalitarianism; rather it should be flexible and inclusive. Special boarding schools (SBS) have been newly emerged in Ethiopia. The establishment of special boarding schools in Ethiopia has policy ground. Enabling gifted learners in accordance with their potential and needs is among the specific objectives of the Ethiopian education policy (MoE, 1994). The 1994 ETP has confirmed under Educational Structure No. 2.2.3 that efforts will be made

to enable the gifted to learn in accordance with their potential and need (Tirussew, 2006). As a result, some regional states have established special boarding schools under their Regional Educational Bureaus (REB). Kallamino Special Boarding School in Tigry National Regional State is the first of its kind that was established by the Tigray Development Association (TDA) in 1998. Following this, Addis Ababa City Administration (Kotebe Science School), Oromia National Regional State (ODASBS), Amhara National Regional State (Dassie Special Boarding School) and Southern Nation Nationalities and People Regional State (Hayole Special Boarding School) have been established.

The newly emerging special boarding schools for students with superior academic scores in Ethiopia is the focus of this research. SBS education programs are a timely issue to improve the quality of education. The researchers of this study believe that our students with superior academic scores would be significantly benefited from school-wide enrichment programs of special boarding schools that are emerging in different regional states in Ethiopia. The objective of this study is to explain the academic performance characteristics of ODASBS students. To deal with this objective, the following research questions were addressed. (A) What are academic performance characteristics of ODA Special Boarding School students in specific academic subject areas? (B) What are the inter-subjects correlations of ODASBS students' academic performance characteristics?

2. Materials and Methods
2.1. Research Design

A correlational research method was employed to study relationships between academic performance characteristics in four subjects. This method was used to determine association among academic performances of ODASBS students in four subject areas (Mathematics, English, Science, and Social studies). Average academic performances for these subjects were computed to determine students' performance characteristics. The percentage of students' academic performance levels for each subject was also computed. Scores on Purdue Academic Rating Scale (PARS) were the variables considered in this study.

2.2. Participants

This study was conducted at ODASBS that is located in Adama, eastern central part of Ethiopia. The total population of this study was 595 (Male = 366, Female = 229) students. Simple random sampling via lottery method was used to select 100 (Male = 54, Female = 46) students. The participants of this study were selected from grade 9, 10, 11, and 12 students at ODASBS. Twenty students were selected from grade 9, 30 students were selected from grade 10, 24 students were selected from grade 11, and 26 students were selected from grade 12. This was 16.8% of the total population of students. For continuous data with population size = 600, at alpha = 0.05, sample size of 100 is acceptable (Mai, 2014). Out of 40 teachers at this school, 24 were selected by purposive sampling to participate in the rating of academic performance characteristics of the students. The age of the participants was between 15 and 25.

2.3. Instruments

The instrument for academic performance characteristics was adapted from PARS developed by Feldhusen et al. (1990). The items in PARS were developed by Purdue University instructors from teachers' classroom observations, from a review of the research literature in each area, and administration of the scales that was directly derived from teachers' classroom experiences with superior students. PARS consist of five subjects, but four of them were used in the current study. The four parts of PARS used in this study were Mathematics, Science, English, and Social studies. Among five subjects on original PARS, the only subject not included in the current study was foreign language. This exclusion was due to absence of foreign language subject other than English for grade 11 and 12. Grade 9 and 10 students study Chinese as foreign language. Each of the four subjects has fifteen (15) items. The PARS has a total of sixty (60) items in the form of a four-scale Likert type. PARS has a well-established district line that can be expressed by a quantitative description of data for teacher-rating academic characteristics (performance) of students that expressed by the interval of academic performance. The possible maximum rating score for each subject is 60 whereas the minimum is 15. According to RICE (2012), the range of academic ability or limit-line used to categorize students' academic

performance characteristics were indicated as following; below average (< 20), average (20-33), strong average (34-42), excellent (43-51), and superior (52- 60). For instance, when the rating score is 25 out of 60 on a subject, the student's performance is at average. Cronbach's alpha (α) reliability for the overall PARS with 60 items for the current study was $r = 0.707$. This instrument was developed based on academic performance characteristics. PARS is a culture-fair instrument. Hence, the contextual difference would not be significant. Thus, the scale was appropriate for Ethiopian special boarding school students.

2.4. Research procedures

Academic performance characteristics of students were rated by subject teachers. The teachers have got training on how to rate the students after vivid observation in the classroom and outside the class. It was assured that the teachers know each student a minimum for six months before they assigned to observe them. The observation and filling the rating questionnaire took 25 days. Academic performance characteristics of science are filled by biology, physics and chemistry teachers. The scores from these were summed and the average result considered.

2.5. Data Analysis

Raters' responses to instruments were coded based on the 4-point Likert scale that worth Never (1), Sometimes (2), Frequently (3), and Always (4) in which 4 is the highest and 1 being the smallest rate. Using SPSS program version 23, Pearson product-moment correlation analysis was computed to determine relationships between students' academic performance characteristics in the four subjects

3. Results and Discussions

3.1. Results

3.1.1. Descriptive Statistics

Table 1 indicated that ODASBS students' mathematics performance ($M = 3.03$) was leading characteristics followed by science performance ($M = 2.98$) and English language academic characteristics ($M = 2.97$). Social studies performance was least among them with ($M = 2.41$). This implies that lowest attention has been given to social studies. More attention has been given to natural science. This could be the influence of 70%-30% enrollment strategy to higher education, respectively for natural and social streams.

Table 1: Descriptive statistics for subject-area academic performance of students ($n = 100$)

Subject area	Mean	Std. Deviation
Mathematics academic performance	3.0280	0.62072
Science academic performance	2.9840	0.73221
English language academic performance	2.9720	0.62769
Social studies academic performance	2.4133	0.37665

From Table 2, ODASBS students' mathematics academic performance (MAP) on PARS is computed as follow:

$$\text{Mean MAP} = \frac{46 + 838 + 1446 + 2212}{100}$$

$$= 45.42$$

Thus, ODASBS students' average mathematics performance was 45.42. This average performance is found between 43 and 51. This makes ODASBS students to be labeled in average as excellent students in mathematics performance on PARS. Specifically, 6% of the students were at average performance, 46% of the students were at a strong average, 12% of the students were at excellent and 36% of them were at a superior level of performance. In another way, 52% of the students (6% + 46%) were shared the tendency of average students whereas 48% of the students (12% + 36%) were shared the tendency of above-average mathematical performance. There was no percent fall below average in mathematical academic performance.

From Table 3, ODASBS students' English language academic performance (ELAP) on PARS is computed as follow:

$$\text{Mean ELAP} = \frac{40 + 834 + 1764 + 1820}{100}$$

$$= 44.58$$

Thus, ODASBS students' average English language academic performance was 44.58. This average academic performance of students is located between 43 and 51. This makes ODASBS students to be labeled on average as excellent students in English language performance on PARS. Specifically, 12% of the students were at average performance, 35% of the students were at a strong average, 29% of the students were at excellent and 24% of them were at a superior level of performance. In another way, 47% of the students (12% + 35%) were shared the tendency of average students whereas 53% of the students (29% + 24%) were shared the tendency of above-average English language performance. There was no percent fall below average in ELAP.

Table 2: Mathematics performance of ODASBS students as rated by 4 teachers ($n = 100$).

Item No	Frequency of valid responses			
	Never	Sometimes	Frequently	Always
1	0	44	16	40
2	18	47	19	16
3	0	8	50	42
4	0	39	20	41
5	0	39	21	40
6	0	12	38	50
7	0	14	47	39
8	0	5	55	40
9	1	19	42	38
10	0	36	21	43
11	2	37	23	38
12	10	34	19	37
13	6	38	15	41
14®	9	32	49	10
15	0	15	47	38
Total	46	419	482	553
Weight	1(46) = 46	2(419) = 838	3(482) = 1446	4(553) = 2212

® = the item is reversed

Table 3: English language performance of ODASBS students as rated by 5 teachers ($n = 100$).

Item No	Frequency of valid responses			
	Never	Sometimes	Frequently	Always
1	1	31	50	18
2	0	28	35	37
3	1	29	27	43
4	1	25	41	33
5	0	23	49	28
6	7	28	32	33
7	8	22	40	30
8	1	26	46	27
9	0	24	43	33
10	0	24	42	34
11	0	19	50	31
12	5	48	20	27
13	14	26	38	22
14	1	33	38	28
15	1	31	37	31
Total	40	417	588	455
Weight	1(40) = 40	2(417) = 834	3(588) = 1764	4(455) = 1820

From Table 4, ODASBS students' Science academic performance (SAP) on PARS is computed as follow:

$$\text{Mean SAP} = \frac{488 + 796 + 1392 + 2200}{100}$$

$$= 44.76$$

Thus, ODASBS students' average SAP was 44.76. This average performance found between 43 and 51. This makes ODASBS students to be labeled in average as excellent students in SAP on PARS. Specifically, 16% of the students were at average performance, 24% of the students were at a strong average, 19% of the students were at excellent and 41% of them were at a superior level of performance. In another way, 40% of the students (16% +24%) were shared the tendency of average students whereas 60% of the students (19% + 41%) were shared the tendency of above-average science performance. There was no percent fall below average in SAP.

Table 4: Science performance of ODASBS students as rated by 10 teachers ($n = 100$).

Item No	Frequency of valid responses			
	Never	Sometimes	Frequently	Always
1	6	29	28	37
2	3	18	40	39
3	15	23	29	33
4	14	17	33	36
5	3	32	24	41
6	4	39	34	23
7	5	38	29	28
8	1	34	29	36
9	8	26	29	37
10	3	28	31	38
11	8	19	38	35
12	3	13	34	50
13	5	29	32	34
14	5	25	19	51
15	5	28	35	32
Total	88	398	464	550
Weight	1(88) = 88	2(398) = 796	3(464) = 1392	4(550) = 2200

From Table 5, ODASBS students' social studies academic performance (SSAP) on PARS is computed as follow:

$$\text{Mean SSAP} = \frac{140 + 1514 + 1338 + 628}{100}$$

$$= 36.2$$

Thus, ODASBS students' average SSAP was 36.2. This average performance found between 34 and 42. This makes ODASBS students to be labelled in average as strong average students in social studies performance on PARS. Specifically, 27% of the students were at average performance, 60% of the students were at a strong average, 13% of the students were at excellent and 0% (no percent) of them is at a superior level of performance. In another way, 87% of the students (20% + 60%) were shared the tendency of average students whereas 13% of the students (13% + 0%) were shared the tendency of above-average SSAP. There was no percent fall below average in SSAP.

As Table 6 revealed, 94% of students' academic performance characteristics in mathematics was above average, 84% of students' academic characteristics in science was above average, 88% of students' academic characteristics in English language was above average, and 73 % of students' academic characteristics in social studies was above average. It was inferred from Table 6 that about 15% (90 students) of the students were neither gifted nor high-achievers but average students who can attend any regular school. This was computed from the above Table 6 in such a way that summing up the results and divide by four (6+16+12+27)/4 =15.25%. Due to inappropriate identification, the school loses unnecessary budget on these average performing students. The annual budget per individual student allotted was 30,000 Birr. Hence, the school loses about 2.7 million Birr yearly. About 41.25% of the students were at strong average and about 18.25% of the students were at excellent level. Students at strong average and excellent level (41.25% +

Table 5: Social studies performance of ODASBS students as rated by 5 teachers ($n = 100$).

Item No	Frequency of valid responses			
	Never	Sometimes	Frequently	Always
1	7	54	19	20
2	10	29	35	26
3	11	68	9	12
4	19	22	53	6
5	9	55	29	7
6	1	52	30	17
7	1	43	46	10
8	2	56	37	5
9	0	52	29	19
10	9	58	32	1
11	14	55	20	11
12	48	35	10	7
13	3	57	32	8
14	4	73	22	1
15	2	48	43	7
Total	140	757	446	157
Weight	1(140) = 140	2(757) = 1514	3(446) = 1338	4(157) = 628

Table 6: Summary of ODASBS students' academic performance characteristics in percent (%)

Subject	No of students in interval of PARS as rated by subject teachers				
	Below Average [< 20]	Average [20-33]	Strong Average [34-42]	Excellent [43-51]	Superior [52- 60]
Mathematics	0	6	46	12	36
Science	0	16	24	19	41
English	0	12	35	29	24
Social studies	0	27	60	13	0

$18.25 \approx 60\%$) were equivalent to high-achiever students. In similar fashion, about 25% of the students were at superior level which is equivalent to gifted students.

3.1.2. Inter-Subjects Correlation of ODASBS Students Academic Performance

As Table 7 showed, there was moderate positive and significant correlation between mathematics performance and science performance ($r = 0.298$, $r^2 = 8.8\%$, $p < 0.01$, df = n - 2 = 98). There was moderate positive and significant correlation between mathematics performance and English language performance ($r = 0.332$, $r^2 = 11\%$, $p < 0.01$, df = n - 2 = 98). There was no significant correlation between mathematics performance and social studies performance ($r = 0.158$, $r^2 = 2\%$, $p < 0.01$, df = n - 2 = 98). There was significant negative correlation between science performance and social studies performance ($r = -0.240$, $r^2 = 5.76\%$, $p < 0.05$, df = n - 2 = 98). The correlation between performance in English language and performance in science was negative and statistically not significant ($r = -0.071$, $r^2 = 0.005\%$, $p < 0.05$, df = n - 2 = 98). The correlation between performance in English language and performance in social studies was statistically not significant ($r = 0.194$, $r^2 = 0.037\%$, $p < 0.05$, df = n - 2 = 98).

Table 7: Pearson product correlations between subject-areas academic performance ($n =100$).

S/N	Variables	1	2	3	4
(1)	Mathematics performance	-			
(2)	Science performance	0.298**	-		
(3)	English language performance	0.332**	-0.071	-	
(4)	Social studies performance	0.158	-0.240*	0.194	-

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

3.2. Discussions

The results of this study reveal that ODASBS students perform well in their academics. Data from the teacher-rating questionnaire on PARS study reveals ODASBS students are excellent in all except in social studies. Their performances in order from high to low are mathematics = 45.42, science = 44.76, English language = 44.58, and social studies = 36.2. The first

three are labeled as excellent performances whereas the fourth is labeled as strong average. The findings of the current study agree with Ehioghiren and Izehiuwa (2014) that stated boarding school students performed significantly better in mathematics and English language subjects than day school students. Three things interact here; relatively good learning environment, high-scorer students (gifted and high-achiever), and their academic performance. According to Laiser and Makewa (2016), the boarding school learning environment has a direct relationship on academic performance. The results of current study revealed that there are average students, but no student under average in the school. These average students can learn at regular secondary schools rather than SBS. The result of the study indicates that as academic performance in science increase, the performance in social studies decrease ($r = -0.240$, $r^2 = 5.76\%$, $p < 0.05$, df = n - 2 = 98). As performance in mathematics increase, the performance in science also increase ($r = 0.298$, $r^2 = 8.8\%$, $p < 0.01$, df = n - 2 = 98). There is no significant correlation between Mathematics performance and Social studies performance ($r = 0.158$, $r^2 = 2\%$, $p < 0.01$, df = n - 2 = 98). It also shows that there is moderate positive and significant correlation between mathematics performance and English language performance ($r = 0.332$, $r^2 = 11\%$, $p < 0.01$, df = n - 2= 98).

According to RICE (2012), students who scored on PARS in each subject less than 20 are below average students; 20 - 33 are average students; 34 - 42 are strong average students; 43 - 51 are excellent students; 52 - 60 are superior students.

The inter-subject performance correlation of ODASBS students is in range between small and moderate Pearson product-moment correlation coefficient. Regarding this, Cohen (1988) suggests the following guidelines to interpret correlation: Small $r = 0.10$ to 0.29; Medium $r = 0.30$ to .49; Large $r = 0.50$ to 1.0. There is a positive and significant correlation between mathematics and science academic performance ($r = .298$). The interesting finding of the current study is that the correlation between mathematics and English language performance ($r = 0.332$) which gives hint for further study for cognitive researchers to revisit the assumption numerical abilities and language ability are performed in different hemisphere of the brain.

4. Conclusion and Recommendations

ODASBS students have the characteristics of superior students (gifted and high-achiever) as well as strong average in their academic performances. ODASBS students are not only gifted and high-achievers, but also the blending of gifted, high-achievers, and average students. Compared to the standard rating scales on PARS , ODASBS students' academic performances are excellent in mathematics, English language, and science subjects whereas strong average in social studies. ODASBS students' SSAP is least compared with the other three subjects. There are small to moderate inert-subject correlations of ODASBS students' academic performance.

Based on the foregoing findings the following recommendations are suggested:

- The school should give emphasis to social studies as equal as mathematics science and English language.
- The academic performance characteristics of ODASBS students are promising and have to be shared for regular school students in their respective local areas where ODASBS students come from.
- The school should set appropriate multiple identification tools in order to spend limited budget on education of superior students.

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