

Basic Facilities and Academic Achievement: A Comparative Study between Boarding and Non-boarding Schools

L.S.T. Maphoso and D. Mahlo

*Department of Psychology of Education, University of Limpopo, South Africa
Department of Inclusive Education, University of South Africa
E-mail: mahlofd@unisa.ac.za*

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ABSTRACT One of the reasons parents send their children to boarding schools is the standard of basic facilities, which it is believed is higher than in non-boarding schools, and can have a positive impact on academic achievement. These basic facilities include buildings, water and electricity, which this study investigated, along with the correlation between them and academic achievement of Grade 12 learners of the Capricorn District in the Limpopo Province of South Africa. A simple random sample was drawn from the population of 339 schools, comprising of 51 principals, 158 teachers and 290 learners from 51 schools. Ten of the 51 schools accommodated boarders, whereas the remaining 41 did not. The instrument used to collect data was the School Environmental Questionnaire (SEQ), consisting of closed questions to determine if the school was boarding or non-boarding and the availability of basic facilities. The Capricorn District Academic Summary Report of the Grade 12 results was used to collect data on academic achievement. The data analysis technique used was the t-test. The results showed a significant difference in basic facilities between boarding and non-boarding schools, with the former having more basic facilities. It also revealed a significant difference between low and high achieving schools in basic facilities, with high achieving schools being boarding schools. The implication of this study is that basic facilities have a positive correlation with academic achievement.

INTRODUCTION

Basic facilities are those that facilitate the smooth running of the school and include the infrastructure, buildings, water, electricity and sanitation. According to the United Nations Children Education Fund (UNCEF 2004), inadequate sanitation at schools leads to lower attendance and is one of the reasons for girls, in particular, to drop out of school. Corum and Dawn (2010) confirm the correlation between teachers' stated intentions to stay in their current assignment and the condition of school facilities. Schools that have almost all basic facilities are mostly boarding schools, defined as those in which some or all pupils study and live during the school year with their fellow students and possibly teachers and/or administrators (Bamford 1967). A typical modern fee-charging boarding school has several separate residential houses, either within the school grounds or in the surrounding area. Pupils generally need permission to go outside defined school bounds and may be allowed to travel at certain times. The infrastructure of boarding schools in the Limpopo Province is, however, poor (Mashamba 2004),

and this study therefore focuses on the Capricorn District, and the correlation with academic achievement of Grade 12 learners.

The Nature of Boarding Schools and Academic Achievement

Boarding schools are independent, preparatory schools that provide accommodation for learners and faculty, and are usually chosen for their academic excellence, small class sizes, individual attention from teachers and advisors, and diverse curricula (Valentino 2012). They have a wide range of buildings, such as staff houses and recreational facilities (Thomas and Dieter 2000); a record of high student achievement, educational excellence and a challenging curriculum, and greater financial resources (Smith 2001); and excellent facilities (Linden International Recruitment Tour 2012). According to Press Release Login (PRLog) (2012), boarding schools in the neighboring Gauteng Province have all the facilities which students will need during their studies, which create a learning environment for pupils to access libraries, computers and teachers while doing their homework. Valentino (2012) writes that students attending

boarding schools on average show higher achievement rates, both academically and socially, because boarding schools become extended families where teachers and students live and learn - whether in the classroom, on the playing field, or in the dormitory. There is also a significant difference in reading and note-taking between day and boarding learners' study habits (Abdullahi 2010). In South Africa, Sihlezana (1990) found statistically significant differences between boarding and non-boarding school in terms of academic achievement.

There are however setbacks to boarding schools, for instance those cited by Thomas and Dieter (2000) as the relative artificiality of the learning environment, which does not correspond to the 'outside world' of real work and life. Boarding schools can lead to an over-concentration on one area or style of curriculum to the neglect of all others. Sheerman (in Asthana 2008) suggests that taking a child to a boarding school at the age of eight or 11 is psychologically not the wisest thing to do for their development, and cites psychological evidence suggesting that the best place for a child to grow up is with a supportive family.

Water and Academic Achievement

Murillo and Roman (2011) found that the availability of water has an effect on the achievement of primary education students, but its relative weight varies significantly from country to country. These researchers concluded that there was a need to continue investment in resources and basic facilities and to incorporate them into school effectiveness models. In South Africa, it has been pointed out that government's failure to provide water and sanitation is undermining the children's chances of obtaining education (WaterAid 2004). WaterAids also revealed that 104 million children worldwide did not go to school due to lack of safe water and sanitation. According to UNCEF (2004), in schools where girls were sent to fetch water there was a high rate of absenteeism and the practice negatively affected academic achievement.

In the Eastern Cape, the Department of Education has stipulated that all schools must have water and sanitation for the improvement of education, while also in the Limpopo Province, Mashamba (2004) stresses the importance of water supply in the improvement of education.

Buildings and Toilets

School buildings must be not only a container or a functional servant of the educational program but also a friendly, attractive, and stimulating place that imparts a feeling of security and a sense of pride to all whom it serves (Lipham and Hoeh 1974). Buildings and toilets are some of the basic facilities that impact on academic achievement, in most cases positively (Bullock 2007; Hughes 2005; Jimenez-Castellanos 2010; Milkie and Warner 2011; O'Neill 2000). Durán-Narucki (2008) provided empirical evidence of the effect of building quality on academic outcomes whilst Berner (1992) also found that students in school buildings with poor conditions had an academic achievement that was six percent below schools with fair conditions and eleven percent below those with excellent condition. In another study, Berner (1993) discovered that the condition of the buildings was related to academic achievement, and improvement in their condition of was associated with improvement in achievement scores. The availability of basic infrastructure and services such as sewage in the school do have an effect on the achievement of primary education students (Murillo and Roman 2011). Simons et al. (2010) showed that schools in lower socio-economic districts and schools attended by younger students had the strongest association between poor building conditions and absenteeism.

In South Africa's Eastern Cape schools, learners at the 400 schools have benefited tremendously, especially the girl learners, who have access to private, clean and hygienic toilets, and the sanitation improvements have seen an increase in attendance rates at schools which are being serviced (Bhagwan 2012).

Electricity and Academic Achievement

Electricity also plays an important part in schools since it provides light and facilitates many activities. Murillo and Roman (2011) also show that the availability of electricity in the school has an effect on the achievement of primary education students, whilst Bacolon and Tobias (2006) discovered that schools providing basic facilities such as electricity performed much better in achievement growth than schools that did not. The quality of air inside public school facilities may significantly affect the stu-

dents' ability to concentrate (Andrews and Neuroth 1988), and most fans, air conditioners, or heaters need electricity for their operation. Heating and air conditioning systems appear to be very important, along with special instructional facilities (such as laboratories or equipment) in contributing to student achievement (McGuffey 1982). Electricity also helps in the operation of televisions, computers and overhead projectors. Schools with lighting were generally rated above standard by school staffs. Adjustable classroom lighting is a feature which provides a healthy learning environment (Koval 1991).

On one hand, Filardo and Vincent (2010) maintain that there is a small but steadily positive relationship between the quality of a public school facility and a range of academic and community outcomes, whilst on the other, McGowen (2007) claim that school facility conditions are not statistically significant in relation to academic achievement. Whatever the case, the researchers agreed with Earthman and Lemasters (1997) that research into educational facilities is important if industry and school districts are to make correct decisions on funding and maintaining good educational environments for their students.

The Research Focus

The problem statement of this study was: Is there any significant difference in the basic facilities among schools in the Capricorn District of the Limpopo Province, and can the basic facilities have any relationship with the academic achievement of Grade 12 learners?

The study had the following research questions:

- (a) Is there a significant difference in basic facilities between boarding and non-boarding schools?

- (b) Is there a significant difference between low and high achieving schools in basic facilities?
- (c) Is there a significant relationship between basic facilities and academic achievement?

The above research questions lead to the following research hypotheses:

- H_{o1} There is no significant difference in basic facilities between boarding and non-boarding schools.
- H_{o1} There is a significant difference in basic facilities between boarding and non boarding schools.
- H_{o2} There is no significant difference between low and high achieving schools in basic facilities.
- H_{a2} There is a significant difference between low and high achieving schools in basic facilities.
- H_{o3} There is no significant relationship between basic facilities and academic achievement.
- H_{a3} There is a significant relationship between basic facilities and academic achievement.

METHODS

The sample was 51 schools selected from six areas, randomly selected from a population of 339 schools of the Limpopo Province's Department of Education in the Capricorn District. The District was made up of six areas, with 10 of the 51 schools accommodating boarders, and the remaining 41 not (See Table 1). The sample of 51 principals, 158 teachers, and 290 learners were respectively selected from 339 principals, 4,915 teachers, and 144,518 learners in the District to participate in this research. The schools that participated were those that had written the

Table 1: Sample of schools from the Capricorn District

Name of area	No. of schools	Schools participating			Percentage participation
		Non-boarding	Boarding	Total	
1. Bochum	74	6	1	7	8%
2. Konekwena	58	8	1	9	15%
3. Mankweng	59	7	3	10	12%
4. Mogodumo	53	6	3	9	17%
5. Polokwane	60	6	2	8	13%
6. Zebediela	34	8	0	8	23%
Total	339	41	10	51	15%

matriculation examination of the South African Certification Council the previous year. All areas had at least one or more boarding schools, except the Zebediela Area, which had none (See Table 1).

The School Environmental Questionnaire (SEQ) was used to establish whether the school was a boarding school. The respondents to this section were the principals (See Table 2).

The questionnaire was also used to collect data about the availability of toilets, water and electricity. The principals, teachers, and learners were respondents to this section, which was about the basic facilities, including water, toilets, and electricity. The availability of these was assigned one point while their unavailability was given zero (See Table 3). If the school scored high points it meant it had favorable basic facilities.

Table 3: Section 2 of the School Environmental Questionnaire (The physical environment)

2. Physical Facilities		
Does your school have the following:		
	Yes	No
1. Toilets		
2. Water		
3. Electricity		

The questionnaires were forwarded to academics in the field of Research and Educational Psychology in the Faculty of Humanities of the University of Limpopo for evaluation, who confirmed that the contents of the questionnaire seemed to be relevant. Educators and research officials confirmed that the SEQ could measure the environment of the school and specifically its basic facilities.

It can be evaluated from the foregoing observations that the Capricorn District had a sum-

mary of the Grade 12 results for all its areas, each of which was submitted to the district office by the areas themselves, and in turn submitted to the Provincial Head Office. The researcher worked out the percentage passed with exemption per school, which represents the academic achievement. If a school had obtained a high percentage pass with exemption it had obtained high academic achievement.

Pilot Study

The pilot study was conducted before the schools closed for the winter vacations, and schools that took part were Reholegile High from the Zebediela area, Mapelwana High from the Mankweng area, and Manyong High in the Polokwane area. The principal, one teacher, and three learners completed the questionnaires (See Table 4). The outcome of the pilot study was that on the questionnaire, under the section asking “others?” the participants gave irrelevant answers so the question was changed to “Any ad

Statistical Analysis

This research study used a t-test to determine if there was a significant difference in the basic facilities ratio between boarding and non-boarding schools. It also determined if there was a significant relationship between basic facilities ratio and academic achievement.

OBSERVATIONS AND DISCUSSION

- ♦ *Is there a significant difference in basic facilities between boarding and non-boarding schools*

Table 2: Section 1 of the School Environmental Questionnaire (Type of school)

1. Type of School.....		
Name of School:		
Name of Area:		
1. Type of school	Boarding	Non-boarding
2. Is it boarding or non-boarding? Boarding	Boarding and Non-boarding	Non-boarding
3. Number of boarders and non-boarders (write number next to appropriate block)	Boarders	Non-boarders
4. Learners gender All boys	All Girls	Boys and Girls
5. Number of boys and girls	Boys	Girls
6. Are you satisfied with the type of school?	Yes	No
7. Any additional information you would like to add:		

Table 4: Sample of pilot study

Name of school	School profile			Participation			Total filled
	No. of learner	No. of teacher	No. of principal	No. of learner	No. of teacher	No. of principal	
1. Reholegile	927	36	1	7	4	1	12
2. Mapelwana	514	12	1	8	2	1	11
3. Manyong	350	8	1	3	1	1	5

The t-test compares the mean of basic facilities between boarding and non-boarding schools (See Table 5). It indicates that the p-value is less than 0.0001 at 0.01 level of significance. The null hypothesis was rejected. As such it can be accepted that there was a highly significant difference in the percentage of basic facilities between boarding and non-boarding schools.

Table 5: Basic facilities between boarding and non-boarding schools

	N	Mean	SD	P-Value
Boarding	10	2.117	0.834	<0.0001
Non-boarding	41	3.00	0.000	##

Highly significant

The study thus reveals that boarding schools had more basic facilities than non-boarding schools (See Table 6). The difference in the availability of toilets was fifteen percent (100% for boarding and 85% for non-boarding). Toilets in non-boarding schools included pit-toilets, of which some were situated a distance away from the class buildings. Most non-boarding schools in rural areas still used forests or bushes. Some used pit toilets and some toilets that belonged to neighboring households. The time taken by the teachers or learners to go to these toilets could have been used profitably for academic activities. All of the boarding schools under survey had electricity, while only 12% of the non-boarding schools had electricity. Most of non-boarding schools, especially

those in poor rural areas, could not afford electricity, which might also contribute to their not having all the technological teaching aids for their operation. All boarding schools in the study had water, whereas 27% of the non-boarding schools did not. This problem was faced not only by schools but also by households. If the community does not have water in their households this shortage can also spread to their schools. This is different in boarding schools because the provision of water and sanitation is planned during the first stage of the construction of the school.

Table 6: Percentage response on basic facilities between boarding and non-boarding schools

Item	Response	Type	
		Non-boarding %	Boarding %
P1. Toilets	No	15	-
	Yes	85	100
P2. Water	No	27.5	-
	Yes	72.5	100
P3. Electricity	No	35	-
	Yes	65	100
P11. Are you satisfied with the facilities of the school?	No	100	60
	Yes	-	40

- ♦ Is there a significant difference between low and high achieving schools in basic facilities?

The t-test in Table 7 also compares the mean of basic facilities of high and low academic

Table 7: Relationship between basic facilities and academic achievement

	N	Mean	SD	P-value
Low academic achievement	30	2.13	0.819	<0.038 #
High academic achievement	19	2.63	0.761	

Significant

achievement schools. It indicates that the p-value is less than the 0.05 significance level, hereby rejecting the null hypothesis. There is thus a significant difference between low and high achieving schools in basic facilities.

The schools with a high academic achievement scored highly in the availability of physical facilities (See Table 8). The finding implies that where there are more basic facilities in the form of toilets, electricity, and water, academic achievement will be higher. Schools with a lower academic achievement in Grade 12 scored higher in terms of the unavailability of water and electricity. This implies that the unavailability of water and electricity influences Grade 12 academic performance negatively. Some teaching aids that need electricity for their operation cannot be operated and as such learners miss valuable information that can help them to improve their academic output. Those teaching aids include technological inventions such as televisions, computers, films, and overhead projectors. There is a high percentage difference of dissatisfaction about the physical facilities among both schools that scored high and low in academic achievement, with the higher performing schools complaining slightly less than the low performing schools at eighty-nine and ninety-three percent respectively.

(d) *Is there a significant difference in academic achievement between boarding and non boarding schools?*

The t-test in Table 9 indicates that the p-value is 0.010 at 0.05 level of significance. Because p-value is less than 0.05, the null hypothesis is rejected. There is a significant difference in academic achievement between boarding and non-boarding schools.

Table 8: Percentage response on physical facilities between low and high academic achievement

Item	Response	Academic achievement	
		Low A.A %	High A.A %
P1. Toilets	No	17.2	5.3
	Yes	82.8	94.7
P2. Water	No	27.6	15.8
	Yes	72.4	84.2
P3. Electricity	No	34.5	15.8
	Yes	65.5	84.2
P11. Are you satisfied with the basic facilities of the school?	No	93.1	89.5
	Yes	6.9	10.5

Table 9: Academic achievement of learners between boarding and non-boarding schools

	N	Mean	SD	P-value
Boarding	10	51.066	31.933	0.010 #
Non-boarding	39	18.488	14.334	

Boarding schools scored higher in academic achievement, which concurs with the finding by Sihlezana (1990:35) who established that boarders outperform non-boarders in academic achievement. This study revealed that the difference may have been caused by basic facilities that are more common in boarding schools than in non-boarding schools. Other contributing factors may be that in boarding schools, pupils spend more time on the school campus. For example, girls fetch water, prepare food for the family, and do such work as washing dishes and clothes at the expense of their schoolwork. UNICEF (2004) maintains that this situation contributes to absenteeism and the high dropout rates amongst girls.

CONCLUSION

This study reveals that there is a highly significant difference in basic facilities between boarding and non-boarding schools, with the former having more basic facilities. There is also significant difference in basic facilities between schools with low and high academic achievement, with high achieving schools having more basic facilities than low achieving schools. There is also significant difference in academic achievement between boarding and non-boarding schools, with the former performing better. The logical conclusion derived from these findings is that the basic facilities of high performing (boarding) schools are higher than the basic facilities of low performing (non-boarding) schools, indicating that basic facilities contribute to high academic achievement in boarding schools. Basic facilities that definitely contribute to academic achievement are toilets, water, and electricity.

RECOMMENDATIONS

It can be recommended that water, good building and toilets, and electricity be made available at schools, as they contribute to children academic performance. Where possible, send-

ing learners to boarding schools where basic facilities are favorable is encouraged.

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