

The Role of Learners and Parental Socio-economic Conditions on Teaching and Learning of Science Subjects at Mandlethu Further Education Training School

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KEYWORDS Vlaglaagte 1 Location. KwaNdebele. Mpumalanga Province. South Africa. Basic Education

ABSTRACT A survey was conducted at Mandlethu (FET) School in Mpumalanga province of South Africa with the aim of assessing the role of learners and parental socio-economic conditions in teaching and learning of science subjects. A total study population of 126 interviewees made up of science learners (n=63) and their parents (n=63) were randomly sampled whereby selected interviewees were given structured questionnaires to fill with the assistance of the school management. The results indicate that 66.7% of the parents were unemployed, whereas those who were employed were casual workers, domestic workers or worked in grocery shops and as such had limited sources of income. This implied that majority of the parents had low socio-economic conditions because of their type of employment and hence, it was concluded that parents were unable to provide textbooks and other stationeries to their children although they provided moral support by encouraging them to study.

INTRODUCTION

Teaching and learning of mathematics, science and technology in South Africa was affected by under-development of human potential particularly among the Black schools during apartheid era (Mji and Makgato 2006). Being a Black school, Mandlethu Further Education and Training School located in Vlaglaagte 1 in the former KwaNdebele homeland, Mpumalanga Province of South Africa is one of the schools affected by the apartheid regime. Although science subjects are offered at the school, the school does not have facilities such as equipped laboratories, visual aids, models and a school garden for practical agriculture training. However, in recent years, the focus of South African National Basic Education Department has been directed toward discovering ways to increase school learners' performance in science subjects to remedy the problem. Progress has been made in several areas including special education, test preparation, and assessment strategies. However, South Africa is still among the countries performing poorly in Mathematics and science (Makgato 2007). Research has indicated that one of the most effective areas of increasing learner's motivation lies not only in the schools, but also from parental support or support received at home (Hill and Taylor 2004). Parental participation in their children's school activities has

been shown to be one of the determinants for success in education (Mmotlane et al. 2009). Thus, parental involvement continues to be the most influential factor in learners' achievements and motivation (Bafumo 2003). In essence, parenting has its influence indirectly through shaping the child's self concept as a learner and through setting high aspirations. In support of this finding, Singh et al. (2004) found that learners whose parents were closely involved in their school lives and monitored their progress often did well in their studies. These findings have remained fairly consistent despite the fact that schools now operate differently from those of a decade or two ago (Drake 2000). However, Mmotlane et al. (2009) reported that there has been low parental involvement in South African Black schools in recent years. The reason for this situation is unknown but because socio-economic status of the parents is believed to be one of the factors that determine parental involvement in their children's education (Hill and Taylor 2004; Vellymalay 2012), it therefore becomes very important to understand the role of parental socio-economic status on teaching and learning of Science subjects at Mandlethu FET. In brief, socio-economic status of the parents refers to their income, occupation, education level and status in the community (Clemen 2009). For example, parents with high education level, occupations status and income are more involved in their children's education (Vellymalay 2012). On the contrary, parents with

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low socio-economic status were reported to have low involvement in their children's education (Desforges and Abouchaar 2003). Considering that Mandlethu FET School lacks necessary resources for teaching and learning of sciences, the socio-economic status of the parents is one of the determinants of effective teaching and learning at the school. For example, children expect their parents to provide learning resources that are not available at the school. Parents may also be required to contribute to the purchase of teaching and learning resources at the school. Keeping in view with this, the Department of Agriculture and Animal Health in the University of South Africa has been involved in community engagement activities at Mandlethu FET School for the past 4 years. The department adjusted its community engagement training objectives, making them more relevant towards assessing the impact of factors that contribute to learners' success or otherwise through analyzing the role of learners and parental socio-economic condition in teaching and learning of science subjects at Mandlethu FET School. Thus, the overall objective of this study was to evaluate the factors that contribute to learners' success or otherwise in science subjects by assessing the learners' role and socio-economic status of their parents in providing necessary resources for teaching and learning of science subjects at Mandlethu FET School. Therefore, this study focused on socio-economic status because it was discovered during community engagement activities that Mandlethu FET school lacks necessary materials for teaching and learning of science subjects including but not limited to equipped laboratories, teaching aids, visual aids, sufficient textbooks, calculators, pencils, instruments, school garden etc. The study did not focus on the correlation between socio-economic status and performance (academic) achievement of the learners.

MATERIAL AND METHODS

Study Site

This study was conducted in Mandlethu FET School in March 2011. Mandlethu FET School is located in Vlaglaagte 1 in former KwaNdebele homeland, Mpumalanga Province of South Africa. The area is rural and characterized by small-scale livestock and crop production. The

people live mostly in townships (organized settlements). The school consisted of 13 class rooms, 13 educators and 296 learners in Grade 10 to 12 in the year 2010 out of which 100 learners were enrolled for Science subjects namely, Agriculture; Life Sciences; Physical Science; Geography; Mathematics and Mathematics Literacy. Overall, there were 5 educators for science subjects. Mandlethu FET School was chosen because the academic staff members of the Department of Agriculture and Animal Health were involved in community engagement at the school. School management indicated that the school did not have sufficient resources for teaching and learning of sciences; and most of the learners were from poor background and as a result, their parents were not able to provide such resources; lack of parental involvement in their children's school activities was also raised.

Procedures

This study was confined to three groups of male and female science school learners representing grades 10, 11 and 12 and their parents, respectively. A sample of 63 was drawn from 100 science learners at the school. This was done to increase the validity of the study because the required minimum 10% for a survey was too small for the study population. Hence, a total study population of 126 interviewees made up of male and female science learners ($n=63$) and their parents ($n=63$) were randomly sampled whereby selected interviewees were given structured questionnaires to fill with the assistance of the school management. This amounted to 21 science learners and 21 parents each from learner grades 10, 11 and 12, respectively. This represented about 50 % each of the total number of learners and parents of science learners enrolled in the school. Data collection was done through administered structured questionnaires filled out by the randomly selected science learners and their parents of grades 10, 11 and 12, respectively. Data obtained from the learners were based on the reasons why they want to study science subjects and included the following: Explain why you chose to study science subjects; what are some of the difficulties you experience in studying science subjects; what factors hinder your studies? Comment on the tuition you receive in science subjects. What do you think needs to be done at the school to

improve teaching and learning of science subjects while primary data and information obtained from the parents included the following; parent's occupation, attendance of school meetings; frequency of participation in school meetings; parental support and encouragement of their children's education; type of support towards children's education; parental assistance in purchase of their children's books and stationery; children's access to books and other stationery and children's activities after school.

Data Analysis

Completed questionnaires were retrieved and analyzed through using spread sheet for descriptive statistics in terms of simple means, frequencies and percentages to describe the parents' occupation, attendance of school meetings; frequency of participation in school meetings; parental support and encouragement of children's education; type of support towards children's education; parental assistance in purchasing of their children's books and stationery; children's access to books and stationery and children's activities after school and the results presented in tables.

RESULTS

Data on the occupation of the parents interviewed in the study is shown in Table 1. The results indicated that majority of the parents in the study were unemployed (66.7 %). However, 20.6% of the parents were casual workers while 9.5 % were domestic workers. The remaining 3.2 % of the interviewed parents worked in local grocery shops. Data on the participation and attendance of school meetings is summarized in Table 2. In showing support for school meetings, 80.6% of the parents indicated that they attended school meetings and only 19.4% indicated that they did not attend school meetings. Of the parents that attended school meetings, 43.6% indicated that they attended meetings more than twice in one term, 16.4% indicated that they attended twice per term and 27.3% indicated that they attended once per term. However, 9.1% of parents who were interviewed indicated that they never attended any school meetings. Parental support in their children's education is indicated in Table 2. Out of a total

of 63 respondent parents, 62 (98.4%) of the parents indicated that they supported their children's education. However, 1 (1.6%) of parents indicated that they did not support their children's education. The kind of support that parents provided to children was moral support, through encouraging their children to learn and was indicated by 91.8%. Only 8.2% of the parents indicated that they supported their children by providing school necessities (Table 2). This was not unexpected since 66.7% of the parents indicated that they were unemployed. In fact, most of the parents (52.6%) indicated that their children received books from the provincial government and only 42.1% of the parents indicated that they bought books for their children with the support from grandparents and relatives as shown in Table 3. However, 57.14% of parents indicated that their children had enough books, while 42.86% of parents indicated that their children did not have enough books as shown in Table 3. The result of the present study showed that 45.2% of the parents indicated that the type of activities that their children engaged in after school were mainly reading at school and helping in house chores (38.7%). However, 8.1% of the parents were not sure about their children's activities after school as shown in Table 3.

Table 1: Occupation of parents

<i>Variable</i>	<i>No. of participants</i>	<i>Proportion (%)</i>
Unemployed	42	66.7
Casual workers	13	20.6
Domestic workers	6	9.5
Grocery shop owner	2	3.2
Total	63	100.0

Table 2: Attendance and participation of parents in school meetings

<i>Variable</i>	<i>No. of participants</i>	<i>Proportion (%)</i>
<i>Attendance of School Meetings</i>		
Attend	50	80.6
Do not attend	12	19.4
Total	62	100.0
<i>Participation in School Meetings</i>		
Once	15	27.5
Twice	9	16.4
More times	24	43.6
Don't know	2	3.6
None	5	9.1
Total	55	100.0

Table 3: Parental support in their children's education

Variable	No. of participants	Proportion (%)
<i>Support and Encouragement</i>		
Support children's education	62	98.4
Do not support children's education	1	1.6
Total	63	100.0
<i>Type of Support</i>		
Provide school necessities	5	8.2
Moral encouragement	56	91.8
Total	61	100.0
<i>Parent's Assistance in Purchase of Children Books and Stationery</i>		
Relatives	16	42.1
Government	20	52.6
Guidance and counseling by educators	2	5.3
Total	38	100.0
<i>Children Access to Books and Stationery</i>		
Access to books and stationery	36	57.1
Do not have access to stationery	27	42.9
Total	63	100.0
<i>Children's Activities After School</i>		
Play games	2	3.2
Goes to library	2	3.2
See friends	1	1.6
Helps in the household	24	38.7
Reads at home	28	45.2
Don't know	5	8.1
Total	62	100.0

DISCUSSION

In explaining why they chose science as a subject, the learners emphasised that they want to be engineers or environmental scientist and some others have a flair for science subjects.

.....I want to be an engineer, environmental scientist

were the responses of learners indicating their chose of a future career path. These learners showed confidence in studying science subjects. However they indicated that the difficulties they encountered with studying science at Mandelethu FET were basically mathematical equations and in areas of Geomorphology with questions that need explanation mainly because of language barrier. On the other hand, the learners at Mandelethu FET identified lack of library and enough study materials coupled with poor English writing and communication skills as hindrances to their studies. Basically, language barrier is seen as a major deterrent to effective learning of sciences given that English is a sec-

ond or even a third language for most learners. Asked about the preferred language of instruction, a number of learners preferred to learn the science subjects in their home languages. The home language spoken by many students was IsiNdebele and a number of students wanted to use this language.

'.....I might not know the answer in English but I know it in IsiNdebele'.

'.....I want home language...'

'...I want some questions to be explained in my home language'

The above statements show that language is a barrier to some of the students who could not communicate well in English language. This was also observed by the interviewers who encountered learners during the course of conducting the interview who could not express themselves in English necessitating the services of a translator. The present findings is consistent with a number of studies conducted on using home languages or mother tongue in learning which have indicated the difficulties that learners face in learning (Latu 20005; Ndamba 2008). Such learners need more help from the educator; they need the educator to listen to them, be patient with them so that they are able to understand what is taught in the subject.

With regard to tuition, there were mixed views from the learners. There were those who rated the tuition as being out rightly poor in other words not satisfactory while there were those who felt that the tuition was excellent. Those who felt the tuition was poor said so because they felt the teacher was incompetent in certain aspects and as a result she could not offer satisfactory explanations regarding the same. The teacher not being able to attend classes all the time as a result of his sickness and his fast teaching approach were some factors that lead to the feeling that the tuition was of a poor standard. In furtherance to this, patience with the learners and the willingness to offer full explanations was lacking and that was another factor considered to be hindering their understanding of the science subjects.

I cannot understand because my teacher is very fast and does not want to explain properly when you ask him to do so

To improve on the teaching and learning experience at Mandelethu School, learners suggested that the learning should include provision of drawings, charts, DVD'S and library to

enable them have firsthand knowledge of what science subjects entail. Furthermore learners suggested that they need extra lessons, since there is no time to study at home because of helping in household chores. Following this, data on information obtained from parents were presented in a tabular form and the results in Table 1 of the present study indicate that majority of the parents were predominantly unemployed (66.7%). In most cases, employed parents were either casual workers, domestic workers or worked in local grocery shops which are known to be less paying jobs in South Africa (Bhorat et al. 2012). This type of employment for parents is an indication that parents have low socio-economic conditions. Thus, this high unemployment rate has a negative impact on the ability of the parents to support their children's education as evidenced by only 8.2% of the parents indicating that they were able to provide school necessities to their children. The inability of parents to provide necessities for learning to their children has an impact on learning because some learners cannot do their school work. For example some children are unable to study thoroughly because they don't have their own textbooks or calculators. The incapability of parents to support their children is in agreement with the findings of Desforages and Abouchaar (2003) which indicated that poor parents with low socio-economic status found it difficult to support their children's educational development since parental socio-economic status has more influence on their participation in the education of the children than other variables such as gender, age and marital status (Astone and McLanahan 1991; Grolnick et al. 1997). On the other hand, parents are not in a position to help the school with donations for purchasing of necessary resources for teaching and learning of science subject because of their low socio-economic conditions. Compared to parents with low socio-economic conditions, Hoddinott (2001) reported that parents with high socio-economic conditions are able to contribute to the school in order to help improve teaching and learning. For example, the contributions can be through donations of necessary resources for teaching and learning or financial donations. One of the possible outcome of this low socio-economic status is that in trying to empower the family, children spend time helping with household activities after school hours as indi-

cated by 38.7 % of the interviewed parents and hence supporting the learners position. Singh et al. (2004) reported that involving children in such activities after school hours may be tiring and children will think of sleeping afterwards instead of studying. This practice leaves the learners poorer in their pursuit for basic education and as such it could lead to poor performance at school. Although there was a clear indication that most of the respondents could not support their children's education, at least 52.6% of the parents indicated that their children received books from the government. This shows that there is existence of an opportunity for increased access to school necessities. However, it seems that there are certain underlying factors inhibiting the efficient functioning of this provincial government intervention program as 42.9 % of the parents indicated that their children do not have access to books and stationery, a finding that supports the importance of conducting research to identify ways of improving access to books and stationery to meet the learners needs since the inadequacy of this intervention program is a limitation to science learners in this area considering the fact that science subjects may sometimes require referral stationery and books which will help learners to perform certain school activities.

On the other hand, the findings of the present study showed that there were certain desirable traits that were commendable as it was found that 91.8% of the interviewed parents gave moral support and general encouragement to their children to learn. This result was not unexpected as majority of the parents (80.6%) were able to attend school meetings. This suggests that parents communicate the importance of education to their children, which is likely to motivate them as reported by Gonzalez-Dehass et al. (2005). This is also supported by the fact that 60 % of the parents attend meetings more than once per year. Thus, one possible reason for this high parental participation in school meetings could be attributed to an overwhelming support for their children's education as indicated by 98.4 % of the interviewed parents. As suggested by Trusty and Lampe (1997) parental involvement offers a sense of security and comfort especially during adolescent stage which strives for growth and self-development and hence by being involved in school activities, parents may improve their professionalism,

time management, organization skills and gain a better understanding of their children and themselves (Martin 2003). Contrary to the present finding, Mmotlane et al. (2009) found that there is a low parental participation in school activities in South African Black schools.

Similarly, Martin (2003) reported that some parents did not participate in their children's school activities because they felt that it was not their job or had no interest because of their attitudes or beliefs. However, it must be emphasized that general encouragement in most cases does not focus on making learners have a clear vision of where they should see themselves when they finish their studies. Importantly, this erodes the opportunity for proper career planning and guidance in the future lives of the learners as it is capable of having a negative effect on the learners' success at tertiary institutions. Apparently, the fact that only 5.3 % of the learners indicated that they received support in the form of career guidance is worrisome. This is because it has a tendency of increasing the learners' state of under-preparedness for tertiary education and might have its own toll which includes poor throughput rates and high dropout rates. This observation is contrary to the content of the Further Education Training (FET) White Paper 4 of 1998 which made a clear commitment towards this as it mentions that career guidance will be a central element of the new FET system. Apparently, it has been observed that if the learners are offered adequate guidance and counseling support, they become motivated to undertake an active and meaningful approach to their studies. Hence, as a corrective measure, it is suggested that provision is made in the school's funding arrangement for improvement and furtherance of academic guidance and counseling support services as this will help to produce a holistically equipped student. Teachers can play a pivotal role with regard to career guidance because they know the capabilities of the learners and career opportunities for the subject they teach.

CONCLUSION

In conclusion, as observed in the present study, Mandlethu FET School is a public 'black' school located in Vlaglaagte Location 1 situated in the former Kwa Ndebele homeland which is rural and characterized by small-scale

livestock and crop production and hence devoid of any meaningful employment opportunities. Thus, it is highly likely that this situation will expose parents to more barriers to involvement in their children's school activities mainly because of their work schedules, lack of resources, lack of transport and stress because of living in poor neighbourhoods as similarly observed in the present study with most of the parents of learners at Mandlethu FET School being unemployed whereas those who were employed were either casual workers, domestic workers or owned grocery shops. Although it is the responsibility of the government to provide teaching and learning materials in public schools, parents are accountable for learning of their own children. However, parents are able to provide moral support to their children by encouraging them to study irrespective of their low socio-economic status. However, it must be emphasized that general encouragement in most cases does not focus on making learners have a clear vision of where they should see themselves when they finish their studies. Importantly, this erodes the opportunity for proper career planning and guidance in the future lives of the learners as it has a tendency of increasing the learners' state of under-preparedness for tertiary education and might have its own toll which includes poor throughput rates and high dropout rates. Additionally, one possible outcome of parental low socio-economic status is that children spend time helping with household activities after school hours instead of concentrating on their studies. This practice leaves learners poorer in their pursuit for basic education and might have a negative effect on helping South Africa to attain the Millennium Development Goals on improving science education.

RECOMMENDATIONS

Finally, it is recommended that more research is needed to identify ways of improving access to books and stationeries to meet the learners needs since the inadequacy of provincial government book and stationary intervention program is a limitation to science learners in Mandlethu FET School. This is very important especially considering the fact that science subjects may sometimes require referral stationeries and books which will help learners to perform certain school activities to improve their performance.

ACKNOWLEDGEMENTS

The authors wish to acknowledge the Department of Agriculture and Animal Health, University of South Africa for financial support and the learners of Mandlethu FET School for helping with the distribution of questionnaires.

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