A Case Study of What Determines Learner Performance in a Combined School in Mpumalanga Province

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Abstract: The study investigated what determines learner performance through an education production function using regression methodologies. The case study of Bankfontein combined school in Mpumalanga province used data obtained from SA-SAMS. The education production function in this investigation included variables such as learner performance, age, gender, days absent and socio-economic status. The study yielded results which showed that age, absenteeism and socio-economic status can strongly determine learner performance. For instance, absenteeism and socio-economic status could negatively affect learner performance. Moreover, as measured by examination scores the poor community of Bankfontein yielded poor educational outcomes. It was recommended that the school with diverse learners should be managed strategically, by providing or directing learners for necessary surviving skills such as entrepreneurship and artisans to name a few. As village schools have several socio-economic challenges ranging from many child-headed households, parents lacking adequate parenting skills especially to education matters, staying with old illiterate grandparents and others, schools should devise means to consider that in the day-to-day activities.

Keywords: Quantile regression, Learner performance, SA-SAMS, Production function, Ordinary Least Squares

1. Introduction

In the post-apartheid era, the South African government has been fighting to improve its education system. However, considering all sorts of spending by the government, matriculation results still seem to be a disappointing. Mpumalanga's matriculation results have continuously improved over the years but not according to the allocated money injected in the system. According to the report released by the Department of Education (DoE), there are priority areas outlined to be improved over the period up to 2014 (DoE, 2010). This plan was part of the school realization of the year 2025 government objective. The report further outlined the aim of improving learner performances by disabling the weaknesses in the educational system. On that note, there are continuous efforts to improve education access, provide decent classrooms and infrastructure, provide teaching and learning material and provide qualified educators (DoE, 2010). These can contribute to provide an ideal schooling system so as to achieve better learner outcomes (DoE, 2014, 2015; Hanushek; 2020; Masondo, 2016; Makgato & Mji, 2006). Since 1994, there has been generally disappointing schooling outcomes (matric pass rates) in South Africa, this problem has been witnessed at the national level and also true in the Mpumalanga province (DoE, 2015). However, several programs and propositions that have been documented and deployed in the past which were intended to improve the devastating schooling outcomes. Also, South Africa showed poor results particularly in subjects such as Mathematics, Accounting and Physical Sciences compared to the small developing countries like Tanzania and Seychelles (Van Der Berg & Low, 2006).

The study is aimed at focusing on all secondary grades (8 to 12) to evaluate the significance of factors contributing to the pass rate at Bankfontein Combined School in Mpumalanga Province under the Nkangala district. The Mpumalanga Education MEC believes that lower grades need to be attended to as they feed to matric results (DoE, 2017). The level of concentration on lower grades by the government is very minimal as compared to grade 12 or matric. This great focus on matric has resulted in the fact that in South Africa, the matric pass rate is a standardized and reliable measure of schooling outcomes. However, the position of this study is to reveal that matric is only one of the components of the schooling outcomes, in fact; lower grades are also an important factor in the schooling outcomes. Hence, it was interesting to examine the determinants of the

learner performance to ultimately influence schooling outcomes at Bankfontein Combined School in Mpumalanga province in the period 2018.

2. Literature Review

Theoretical and empirical literature of education production functions are reviewed in this section.

2.1 Theoretical Literature

The theoretical literature section discussed the production function approach and considered how educational output could be best examined efficiently using production functions. In a production function there is a need to see which inputs can be combined to produce best outputs (Shephard, 1970; Glewwe & Lambert, 2010). According to Gustaffson (2007), education production functions are important for ranking schools based on performance or school outcomes. As alluded in Ncanywa (2014) that there are no well-defined production functions but most education production function studies depend on availability of data. So, different education outcomes can be obtained from a variety of inputs in diverse communities. Examples of education inputs found in literature are school resources, educator quality, families, peers, expenditures among others (Dewy, Husted & Kenny, 2000; Hanushek, 1979; Krueger, 1999; Angrist & Lavy, 1999; Hanushek 2008). The most frequently used outputs are dropout rates and standardized test scores (Hanushek 2020).

An education function can be represented as follows:

$$Y_i = \mathrm{f}(X_{1i\ldots\ldots\ldots\ldots X_{ni}}, \mathrm{A}, \mathrm{Z}) \quad (1)$$

Y, represents learner performance at the end of the year examination; X represents educator quality such as educator level of satisfaction, educator salary, educator qualification (REQV), educator experience and educator's age; A represent school characteristics that can be measured by the learner: educator ratios, quintiles and school condition; Z represents socio-economic status (SES) of learners such as parent education and poverty level.

2.2 Empirical Literature

Empirical literature is discussed according to the input variables adopted in the study such as educator quality, class size, gender, age, absenteeism and socio economic status. The section illustrates how these input variables transform in a production function into output variables.

Educator Quality: A number of studies in South Africa have been published today on educator quality of educational production functions (Ncanywa, 2014; Kimani & Bhorat, 2014; Bhorat & Oosthuizen, 2006; Makgato & Mji, 2006; Hanushek, 2020). For instance, Ncanywa (2014) using the production function approach found that more experienced and highly qualified educators can have a positive impact on the performance of learners. Therefore, educators need to be trained well as this also contributes to increase their salaries and ultimately retain them in the system. Additionally, Kimani and Bhorat (2014) found that the pupil: educator ratio was standardised in South Africa to bring equality in schools, as the ratio had significant effects on schooling outcomes. However, Bhorat and Oosthuizen (2006) did not find significant effects of the ratio and physical resources but found educator characteristics key to schooling outcomes. Couch and Mabogoane (1998) carried out the research and confirmed that more training and experience can yield positive education outcomes.

Class size: Kruger (1999) analyzed an experiment using the United States data on the Tennessee Student-Teacher Achievement Ratio (STAR). The results indicated that learners in small classes can perform better than those in large classes. Also, Nye, Konstantopoulos & Hedges (2004) in a STAR project found that educators in small classes are more effective to achieve education outcomes than those in small classes. Therefore, it can be seen that schools need adequate class size in order to yield better results.

Gender: Males and females are equal human beings, but they demonstrate different physical and mental features (Ghazvinia & Khajehpoura, 2011). So, they comprehend and perform differently especially in their learning patterns. Ghazvini and Khajehpour (2011) found that females perform better in languages and males in Mathematics. Lavy (2004) used a natural experiment to compare gender-blind test score and a non-gender-blind score, and found gender bias favoring females. However, Walla (2015) did not find any gender difference in reading performance. Holmlund and Sund (2005) investigated whether learner outcomes can be attributed from same-sex educator, and found that educators preferred learners of their sex.

Age: Eddy (2011) proposed a theory of the critical period hypothesis that learning is associated with a certain age. It is alluded in this paper that people can learn certain behaviors up to a certain age, and reaching that optimal level can result into difficulty to achieve anything. It has been found that older learners can perform better in reading (Lightbown & Spada, 1993; Walla, 2015). Though in Clark and Ramsay (1990), age was found to correlate with academic performance, some subjects such as Mathematics and Science, the learning speed of mature-age students tended to decrease with age, while the depth of learning increased.

Absenteeism: Having learners at school has a positive influence to education achievements. For instance, Aucejo and Romano (2014) suggested that increasing a school calender by 10 days was beneficial especially in studying subjects like Mathematics. This was reinforced by Gaete-Romeoy (2017), that strike actions that reduce school days have negatively impacted on learner performance. This has compromised learners to enter tertiary institutions and get better scores for Mathematics. Balkis, Erdinc and Arslan (2016) examined how education factors are related, such as learner absenteeism, learner attributes (such as perception, goal-setting and motivation), and some socioeconomic factors (such as parent's education and income) and learner performance. The findings revealed that learner absenteeism had a significant negative impact on learner perceptions, how they view their teachers and the school in general, intrinsic and extrinsic motivation, set goals and academic performance. Also, Klem and Connell (2004) came to the same conclusion that learners attending school regularly achieve better than those that are absent from school.

Socio-economic Status (SES): South African population is dominated by households that live below the poverty line, as there are many families that have children that are child-headed, some live with single parents, some live with grand-parents, some live with illiterate parents (Hedges & Greenwald, 1996; Khoza, 2007); this leads to families who cannot fully support the educational needs of their children. Even though the government subsidies poor schools with nutrition and transport needs, these families cannot assist their children on actual learning. Many family structures in South Africa are demotivated towards their children's performances in schools. To that note, there is an escalating difficulty in educating the higher population of the South African children. Van der Berg (2007) proved that the bad socio-economic status of South African citizens had a negative influence on learner performance. This dates back to the the country's history of poor and unequal family backgrounds and poor school resources that significantly affect learner performance. Additionally, it has been found that as much as South Africa performs better in other economic indicators, it performs worse than other poor countries like Tanzania and Seychelles. In the study by Van Der Berg and Low (2006) using regressions and hierarchical linear models, it was established that learners with parent with higher level of education performed better than those with lower levels. This makes sense as the support from educated parents in terms of homework and buying additional study material is possible.

Other SES factors come from learners that have unstable homes due to domestic violence and separated parents, learners engaged to drug abuse and some teenage pregnancies (Baker & Jones, 2005; Saiduddin, 2003). As much as the government has intervention programmes on teenage pregnancy in South African, it is gradually increasing in schools. This leads to learners dropping out of school, resulting in an on-going cycle of illiterate parents, poor homes and the country at large hence there is persistent low socio-economic status. Spaull (2012) noticed two schooling systems in South Africa, largely based on different socioeconomic issues. Worryingly, the wealthiest 25 percent of learners perform better that the 75 percent from poor families. Many researchers claim that this lead to poor performance in subjects like Mathematics and related subjects (Van der Walt, Maree & Ellis, 2008; Ndlovu, 2011; Khumalo, 2014). Crouch and Mabogoane (1998) argued that poor performance in South Africa of Mathematics and Science could be aligned with socioeconomic status of learners.

3. Methods and Material

This study is quantitative in nature, as informed by literature reviewed. This section deals with data, estimated model and estimation techniques employed in the study.

3.1 Data

This study used cross-sectional secondary data obtained from Bankfontein Combined School

Nkangala district in the South African Department of Basic Education in the Mpumalanga Province. South African School Administration and Management System (SA-SAMS) is utilized to obtain the learner and educator information. The study utilized the data on the learners from grade 8 to grade 12 and the educators who are teaching those grades at Bankfontein combined schools. The data that was taken into account due to its availability include the observations in the period 2018. For instance, SA-SAMS was introduced only in 2014 at Bankfontein Combined School.

Except for the educator quality variables (teacher experience and qualifications), data observed for all variables was in the learner-level form. The advantage of using learner-level data over aggregated data is to address issues of endogeneity and omitted variable bias (Glewwe & Lambert, 2010). However, the data used in this research suffered some drawbacks, as there is an element of incomplete information supplied by SA-SAMS. For example, there are intra-classroom variations in the FET band as learners are placed in different subject groups and some parent information such as parent qualifications is missing. Furthermore, the exclusion of dropout and grade repetition rates lead to selection bias as this exclusion might result in the overestimation of outcomes. The large sample of learner-level data of Bankfontein School made it possible to carry out the study. Also, this study has novelty on its contribution to education economics literature as it is unique especially to the South African education system. This is due to the benefits of the newly developed data base (SA-SAMS) which give information at learner level and this control for some biases to give better results (Bhorat & Oosthuizen, 2006).

3.2 Specification of the Model

In order to find the determinants of learner performance, based on some reviewed literature the following education production function was estimated (Hanushek, 2008; Bhorat & Oosthuizen, 2006).

$$Y_i = \mu_0 + \mu_1 E_i + \mu_2 A_i + \mu_3 Q_i + \mu_4 S_i + u \qquad (2)$$

Where Y is a dependent variable representing learner performance measured by the end of the year examination scores or grade attainment in this study. E represents a vector of educator quality such as educator experience and qualification; A is the school characteristics such as educator learner ratio, public or private, rural/ urban; Q is the parenting quality or socio-economic issues such as quintile category of the school; S represents learner quality like learner age, attendance, and gender; and u represents the error term to cater for measurement error.

3.3 Estimation Techniques

The study used descriptive statistics, ordinary least-squares (OLS), and quantile regression to test the input-output relationships of the education production function. According to Dodge (2003) and Mann (1995) some descriptive statistics are summary statistics that quantitatively describe collected information. Descriptive statistics reported in the analysis are mean, median, mode, standard deviation (or variance), the minimum and maximum values of the variables, kurtosis and skewness (Mann, 1995). However, this study used the bellow explained measures with regards to the relevance of the study.

Regression estimates employed are quantile regressions and the ordinary least squares (OLS) regression. The study complemented OLS with the quantile regression to ensure credible results. Moreover, quantile regressions are advantageous because they guard against the shortfall of mean OLS and address issues of heteroscedasticity. This is possible for quantile regressions because the focus is not in the mean but to the median as a measure of central tendency (Buchinsky, 1998; Montenegro, 2001). It is also alluded in Koenker and Bassett (1978) that quantile regressions do not have an assumption of distribution in the error term. Lee (2005) differentiates quantile regression from other regression with the following factors:

- There are different values that can define the whole conditional distribution of the dependent variable.
- Quantile regressions can easily detect heteroscedasticity, as if there is presence of heteroscedasticity in the series results can be more efficient than in the OLS.
- Quantile regressions use linear programming methods to solve minimization challenge found in OLS.

- They are also equivariant to monotone transformations. That is, for any function quantiles are robust in regards to outliers. The quantile classical regression model is based on quantiles of different orders.

The ordinal quantile as stipulated in Koenker and Bassett (1978):

$$F(y) = P_r(Y \leq y) \quad (3)$$

Then for $\tau \ \varepsilon \ [0;1]$

The τ^{th} quantile of Y is

$$Q(\tau) = inf\{y : F(y) \geq \tau\} \quad (4)$$

The middle is then $Q(0.5)$, the first quartile $Q(0.25)$, the first deciles $Q(0.01)$.

By minimizing the sum of residuals can result to the sample median which can be derived by minimizing the sum of absolute residuals. This can yield a function that is non-differentiable at some points and can have a flat optimum (Buchinsky, 1998):

$$R(e) = \sum_{i=1}^{N} \rho_\tau (y_i - e) \quad (5)$$

Considering a quantile simple model

$$y_i = \beta_0 + x_i\beta_1 + u_i \quad (6)$$

The conditional quantile function of y is

$$Q_i(\tau / x) = \beta_0 + x\beta_1 + F_u^{-1}(\tau) \quad (7)$$

4. Results and Discussion

To investigate the determinants of learner performance for General Education & Training and Further Education & Training in a combined school, the quantile and ordinary least squares regressions were applied in the estimation.

4.1 The General Education & Training (GET) Band Results

The descriptive statistics discussed in this section include the arithmetic mean, standard deviation, and the minimum and maximum values observed on each variable series of the dataset used in the study. Table 1 presents descriptive statistics of the GET band.

From the total 310 GET learners, 52% were females and 48% were males. The descriptive statistics results in table 1 revealed that from a sample size (n) of 310 learners, the youngest learner was 13 years while the oldest was 22 years with an average age of 16 years. While most learners were never absent from school at all, the maximum number of days one of the learners was absent from school was 36 days. On average, the average number of days the learners were absent was approximately 3 days. In terms of educational performance based on examination scores, the least mark obtained was 26% while the highest mark obtained by the learner was 67%. The average examination score of approximately 44% shows that academic achievement by the GET learners was generally poor. The approximate mean statistic of around 0.1 for socioeconomic status revealed that the majority of learners came from families whose household income levels were below the poverty line.

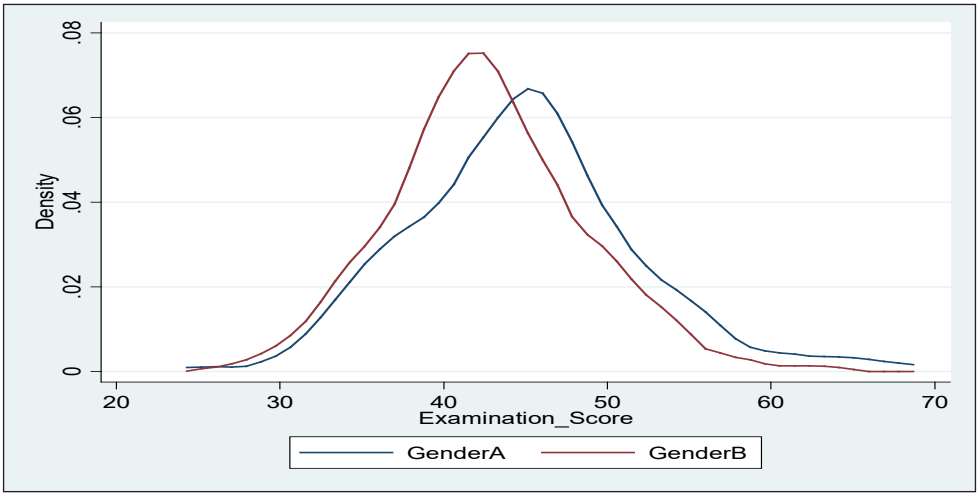
Descriptive statistics were followed by analysis of Kernel density distribution of the dependent variable according to gender. Figure 1 represents the Kernel density estimates of examination scores. Kernel density is useful to estimate the probability density function of the depended variable in a non-parametric (Botev, Grotowski, Kroese, 2010). The Kernel density uses the finite data sampling to smooth and make inferences about the population (Parzen, 1962). A normal distribution is one expectation about the Kernel density distribution, otherwise failure to yield normal distribution may yield partial information about the estimates of the independent variables.

Table 1: Descriptive Statistics for Bankfontein Combined School GET Learners, 2018

Factor	Observations	Mean	Standard Deviation	Minimum	Maximum
Age	310	16.283	1.872	13	22
Days absent	310	2.622	5.181	0	36
Examination score	310	43.803	6.463	26	67
SES	310	0.116	0.320	0	1

Source: Author's calculations using Stata version 14

Figure 1: Kernel Density of Examination Scores by Gender in Bankfontein Combined School GET Band, 2018



Source: Authors

Table 2: GET Learners' OLS and Quantile Estimates of Bankfontein Combined School, 2018

Depended variable: Examination scores							
VARIABLES	**OLS**	**.5**	**10**	**25**	**50**	**75**	**90**
Gender_2	-1.536**	-1.643	-0.459	-1.054	-1.054	-0.400	-1.313
	(0.712)	(1.027)	(0.995)	(1.171)	(1.190)	(1.243)	(1.056)
Age	-0.744***	-0.643***	0.0407	-0.315	-0.315	-1***	-1.438***
	(0.197)	(0.176)	(0.274)	(0.279)	(0.288)	(0.299)	(0.332)
Days absent	-0.245***	-0.214*	-0.378***	-0.261**	-0.261**	-0.200*	-0.125
	(0.0689)	(0.123)	(0.133)	(0.103)	(0.119)	(0.111)	(0.107)
SES	1.548	1.071	1.500	2.315*	2.315	2.800	1.312
	(1.074)	(1.200)	(2.308)	(1.321)	(1.459)	(1.968)	(0.972)
Constant	57.11***	55.29***	36.23***	46.04***	46.04***	64.20***	76***
	(3.105)	(2.760)	(4.608)	(4.638)	(4.767)	(4.613)	(5.691)
Observations	310	310	310	310	310	310	310
R-squared	0.139						
Note: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; OLS ordinary least squares, SES socioeconomic status.							

Source: Author's calculations using Stata version 14

The kernel density graphs in Figure 1 indicated a normal distribution of examination scores. As much as there is indication of the normal distribution, to ensure the robustness of results the OLS estimation should be supplemented by other methods, hence the quantile regression (Hanushek *et al*., 1990). Table 2 provided OLS and quantile regression estimates for the GET learner's education production function made up of examination score as the dependent variable, while gender, age, days absent and socioeconomic status are independent variables. Quantile regressions are estimated at 0.5%, 10%, 25%, 75% and 90% quartiles.

Table 2 provides the results of OLS and quantile regression estimates at different quartiles. In terms of gender, males turn out to have a generally negative impact on examination score with respect to females, though only significant in the OLS estimation. We can safely say gender generally does not influence learner performance in Bankfontein Combined School GET band. There were similar results with the findings of Ghazvinia & Khajehpoura (2011).

A stronger impact can be adhered to age and days absent from school. Learner age has a negative significant relationship at 1% with examination scores

Table 3: GET Kolmogorov-Smirnov Tests of Bankfontein Combined School, 2018

Two-sample Kolmogorov-Smirnov test for equality of distribution functions			
Smaller group	**D**	**P-value**	**Corrected**
1:	0.0062	0.994	
2:	-0.1948	0.003	
Combined K-S:	0.1948	0.006	0.004
Smaller group	**D**	**P-value**	**Corrected**
0:	0.1184	0.410	
1:	-0.0255	0.959	
Combined K-S:	0.1184	0.764	0.697
Note: Ties exist in combined dataset; there are 37 unique values out of 310 observations			

Source: Author's calculations using Stata version 14

Table 4: Descriptive Statistics of FET Learners of Bankfontein Combined School, 2018

Factor	Observations	Mean	Standard Deviation	Minimum	Maximum
Age	407	18.668	1.831	13	26
Days absent	407	3.518	8.590	0	87
Examination score	407	39.356	8.031	20	70
SES	407	0.228	0.420	0	1

Source: Author's calculations using Stata version 14

except for the 10th, 25th and 50th quantiles where age is insignificant. This relationship shares the same sentiments with Clark and Ramsay (1990), when it was found that performance of learners in Mathematics and Science subjects decrease with age. However, some studies of Lightbown & Spada (1993) and Walla (2015) believed that the older the learners the better their performance. Absenteeism seems to have negative effects on learner performance. In the GET band of Bankfontein Combined School both OLS and quantile regressions indicated negative effects of days absent from school on examination scores. This is in full agreement with studies of Aucejo and Romano (2014), Gaete-Romeoy (2017) and Balkis *et al*. (2016). Klem and Connell (2004) express a similar conclusion by suggesting that learners who regularly go to school perform much better that those with greater absences.

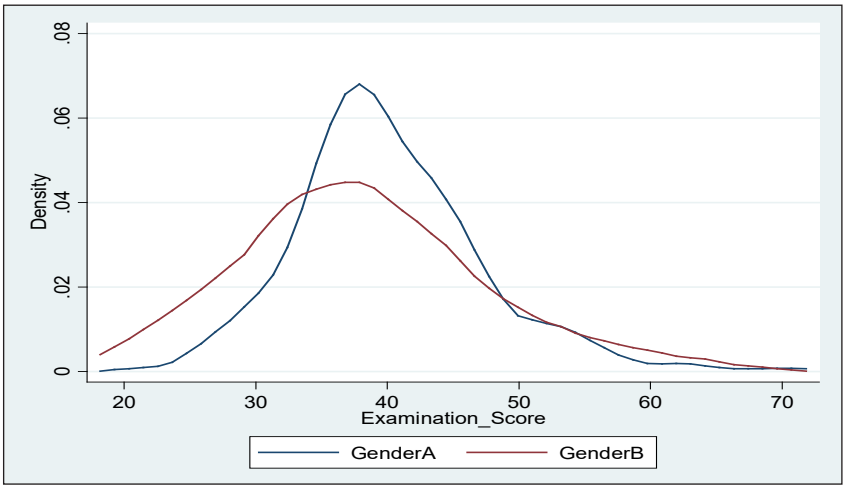
Though generally statistically insignificant except for the 25th quantile, the variable "socioeconomic status" exhibited a positive impact on learners' educational performance measured by the examination score. This result is consistent with the finding reported by Van der Berg (2007) that socio-economic factors can positively affect performance of learners in South Africa. Baker and Jones (2005) further emphasise existence of a statistically significant correlation between low socioeconomic status and learner's poor performance in schools. A reliability check was performed with the Kolmogorov-Smirnov tests, and the results in Table 3 show that ties exist in the combined data sets implying that our results are reliable.

4.2 The Further Education & Training FET Band Results

This sub-section provides an analysis for the FET learners beginning with the descriptive statistics. From a total of 407 GET learners, 61% of learners were females and the remaining 39% of learners were males.

Descriptive statistics results provided in Table 4 show that from a sample size (n) of 407 learners, the youngest FET learner was 13 years while the highest age was 26 years, and yielding an average age of approximately 19 years. Though some learners were never absent from school, the maximum number of days some of the learners were absent from school was 87 days in 2016. On average, the average number of days the learners were absent was approximately 4 days. With regards to

Figure 2: Kernel Density of FET Examination Scores by Gender of Bankfontein Combined School, 2018



Source: Authors

Table 5: FET Learners' OLS and Quantile Estimates of Bankfontein Combined School, 2018

Depended variable: Examination scores							
VARIABLES	**OLS**	**Q=.5**	**Q=10**	**Q=25**	**Q=50**	**Q=75**	**Q=90**
Gender_2	-1.781**	-1.892	-5***	-2.973***	-2.973***	-0.255	2.721
	(0.781)	(1.248)	(1.059)	(0.919)	(0.948)	(1.253)	(2.335)
Age	-0.989***	-0.581**	-0.982***	-0.743***	-0.743***	-0.945***	-1.836***
	(0.209)	(0.272)	(0.196)	(0.282)	(0.276)	(0.236)	(0.430)
Days absent	-0.0897**	-0.0538	-0.0355	-0.0601	-0.0601	-0.0909	-0.131**
	(0.0444)	(0.0633)	(0.0339)	(0.0543)	(0.0546)	(0.0591)	(0.0511)
SES	-2.626***	-2.634***	-1.964*	-2.514**	-2.514**	-3.818***	-4.344**
	(0.908)	(0.928)	(1.114)	(1.006)	(1.054)	(1.324)	(2.187)
Constant	59.42***	50.72***	51.72***	49.86***	49.86***	62.62***	84.74***
	(3.904)	(5.279)	(3.424)	(5.123)	(4.809)	(4.895)	(8.585)
Observations	407	407	407	407	407	407	407
R-squared	0.096						
Note: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1							

Source: Authors

educational performance based on examination scores, the least mark obtained was 20% while the highest mark obtained by the learner was 70%. Figure 2 presented the Kernel density graph of examination scores according to gender.

Although both graphs in Figure 2 indicate normal distribution in the examination scores, males have a flatter shape than females. This could alarm that females do matter more than males in influencing the results of the FET band. The Kernel density was followed by estimation of OLS and quantile regressions of explanatory variables on examination scores to see how they affect learner performance (Botev *et al*., 2010).

In the FET band of Bankfontein combined school, gender strongly and negatively explain learner performance with respect to males. This is shown by both the OLS and quantile regressions, and is not significant in the 0.5th, 75th, and 90th quantile. As alluded in Ghazvini and Khajehpour's (2011), there are significant differences in learner performance according to gender as learners are towards the end of schooling. It turns out that these results are in line with the findings of Lavy (2004) that females performed better than males.

The results in Table 5 for the FET band are similar to those in the GET band in terms of age and absenteeism, though absenteeism generally yielded

Table 6: FET Kolmogorov-Smirnov Tests of Bankfontein Combined School, 2018

Ksmirnov examination_score, by (gender)			
Two-sample Kolmogorov-Smirnov test for equality of distribution functions			
Smaller group	**D**	**P-value**	**Corrected**
1:	0.0306	0.834	
2:	-0.1956	0.001	
Combined K-S:	0.1956	0.001	0.001
Ksmirnov examination_score, by (ses)			
Smaller group	**D**	**P-value**	**Corrected**
0:	0.0052	0.996	
1:	-0.1945	0.004	
Combined K-S:	0.1945	0.009	0.006
Note: Ties exist in combined dataset; there are 44 unique values out of 407 observations			

Source: Author's calculations using Stata version 14

insignificant results. There is a negative and strong impact of age in the FET band. Furthermore, a reliability check was performed with the Kolmogorov-Smirnov tests, and the results in Table 6 show that ties exist in the combined data sets implying that our results are reliable.

5. Conclusion and Recommendations

The study aimed to find what determines learner performance in Bankfontein combined school by employing an education production function approach. In order to achieve robust results for the set aim, ordinary least squares (OLS) supplemented with quantile regressions at different quartiles were employed. The cross-sectional data were collected from Bankfontein combined school in grades 8 to 9 (general education & training band [GET]) and grades 10, 11 & 12 (further education & training band [FET]) in the year 2018.

Reviewing what the ideal schooling system should comprise, a well-equipped infrastructure, well-designed curriculum, sound teaching and learning culture, adequate learner support material and highly qualified educators, several interesting results were revealed (Makgato & Mji, 2006). Firstly, the gender variable indicated a negative and significant relationship with learner performance in both the OLS and the quantile regressions except for the upper quantiles. Secondly, there was a strong negative association of age with learner performance in all estimations. Thirdly, it turned out that the more students absent themselves from attending school the lesser they perform. Lastly, socioeconomic issues were negative and significant at 1% in the FET band and that contradicted with the OLS insignificant results.

As much as the Department of education ensures that schools get resources to provide quality education, schools perform differently. In this study, this behaviour can be attributed to different learner characteristics and unique socioeconomic issues. For instance, in this school it has been seen that gender, age, absenteeism and socioeconomic issues in some degree have a negative association with learner performance. Therefore, it is recommended that to improve learner performance in Bankfontein combined schools, the school management team should guard against gender issues and find ways to close the gender disparities. The school system should find ways to address learners that stay longer in the schooling system and become older learners than their peers. This needs intervention which is not limited to preventing learners from registering but redirecting learners to obtain necessary surviving skills such as entrepreneurship and artisans to name a few. Village schools have a number of socio-economic challenges ranging from many child-headed households, parents lacking adequate parenting skills especially to education matters, staying with old illiterate grandparents and others. In a nutshell, learners are expected to perform and exit the schooling system with good results that should take them to the tertiary level or make them better citizens.

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