

Does REQV make a difference to learner performance?

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An analysis of the 2004 Systemic Evaluation data suggests that the impact of REQV on learner performance (either the language or the mathematics score) is not significant, at least not in primary schools. It is true that when we view the primary schooling system as a whole, learner scores tend to be substantially higher when the teacher is an REQV 14 as opposed to an REQV 13 teacher (these two qualifications levels cover 80% of teachers). However, if we focus on just historically disadvantaged schools, this difference in learner scores becomes much smaller (and virtually disappears in the case of mathematics). This suggests that it is not REQV as such, but other factors such as the socio-economic background of learners and where the teacher obtained her training that are the important variables. A regression analysis of the data focussing on just historically disadvantaged schools confirms the non-significance of REQV. This finding is similar to what was found in a separate analysis of primary schooling, using the SACMEQ dataset. Separate analyses of the impact of REQV in secondary schools indicate that REQV may be a more significant quality improvement lever at that level of the schooling system.

1 Introduction

ELRC resolution 3 of 1996 introduced the Relative Education Qualification Value, or REQV, as a new system for classifying educator qualifications for the purposes of remuneration and promotions. Though detailed information on teacher qualifications is not what it should be, the data we have on REQV is relatively sound in the sense that Persal has REQV values on virtually all publicly employed educators, and these values are being updated on Persal in all provinces and to a fairly high degree¹.

A key question that is often asked in relation to the current restructuring of the educator salary scales is how important the REQV of classroom-based teachers is in determining learner performance. This brief analysis provides some answers using the DoE's 2004 Systemic Evaluation (SE) dataset, which contains learner performance and contextual information relating to a representative sample of Grade 6 learners.

2 Obtaining REQV values from the Systemic Evaluation data

The Systemic Evaluation educator questionnaire includes two key questions relating to the educator's qualification. One asks about the highest academic qualification of the educator (the row headings in Table 1), and the other about the years of professional (or teacher) training (column headings in Table 1). The 2,232 educators broken down in Table 1 are all the teachers across all subjects recorded in the SE dataset (with teachers teaching more than one subject counted just once).

¹ For example, between 2005 and 2006, 8% of educators experienced a change in their REQV value, with the provincial figures varying from 3% (WC) to 11% (EC).

Table 1: Qualifications breakdown of SE educators

	0	<1	1	2	3	>3	Total
< Gr 12				39	9	8	56
Gr 12	10	4	16	163	774	369	1,336
Bachelors		2	23	40	246	329	640
Honours			5	22	68	95	190
Masters				2	2	6	10
Doctorate							0
Total	10	6	44	266	1,099	807	2,232

The next table indicates how cells from the above table were counted to obtain a teacher breakdown by REQV (the values in Table 2 are REQV values).

Table 2: Translation of SE statistics to REQV

	0	<1	1	2	3	>3
< Gr 12				10	10	10
Gr 12	10	10	11	12	13	14
Bachelors		14	14	14	14	14
Honours			15	15	15	15
Masters				16	16	16

The result was the breakdown in the left-hand side of Table 3. The right-hand side indicates the breakdown according to Peral of teachers (not managers). The SE statistics and the Peral statistics tally well with each other.

Table 3: SE to Peral comparison

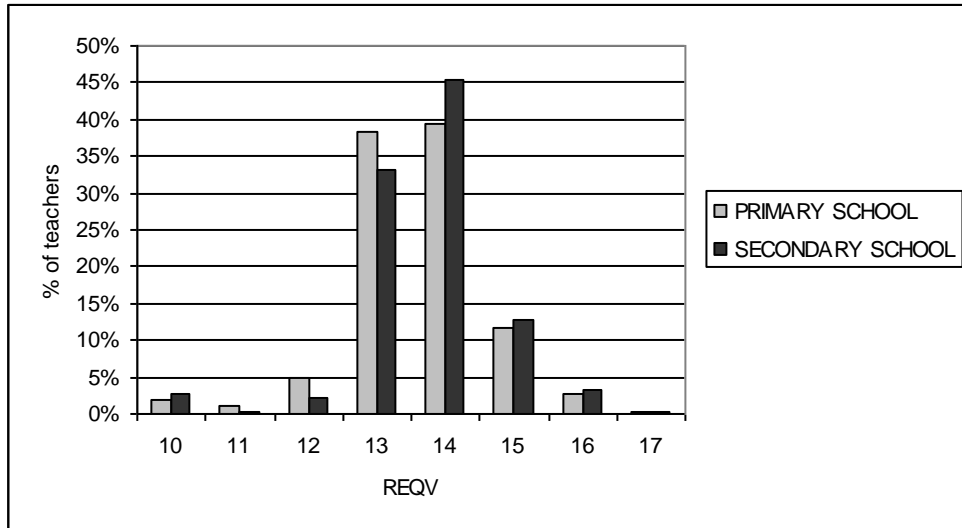
REQV	Systemic Evaluation		Peral	
	Headcount	%	Headcount	%
10	70	3%	8,100	3%
11	16	1%	3,311	1%
12	163	7%	11,873	4%
13	774	35%	108,563	37%
14	1,009	45%	117,426	41%
15	190	9%	31,767	11%
16	10	0%	7,990	3%
17		0%	627	0%

Source: 2004 Systemic Evaluation dataset and August 2007 download of Peral.

3 REQV and level of schooling

Given that the 2004 Systemic Evaluation dataset focuses on Grade 6, patterns revealed by the data are more likely to represent the situation in primary schools than in secondary schools. Figure 1 indicates that the REQV pattern is similar in primary and secondary schools, though teachers in secondary schools tend to have a slightly higher REQV. Specifically, REQV 13 teachers have a strong presence at both of the schooling levels. Whilst the SE data can provide important policy information on, for instance, the impact of upgrading REQV 13 teachers in primary schools, it will be limited in terms of what it can say about the impact of a similar intervention in the secondary level.

Figure 1: REQV and level of schooling

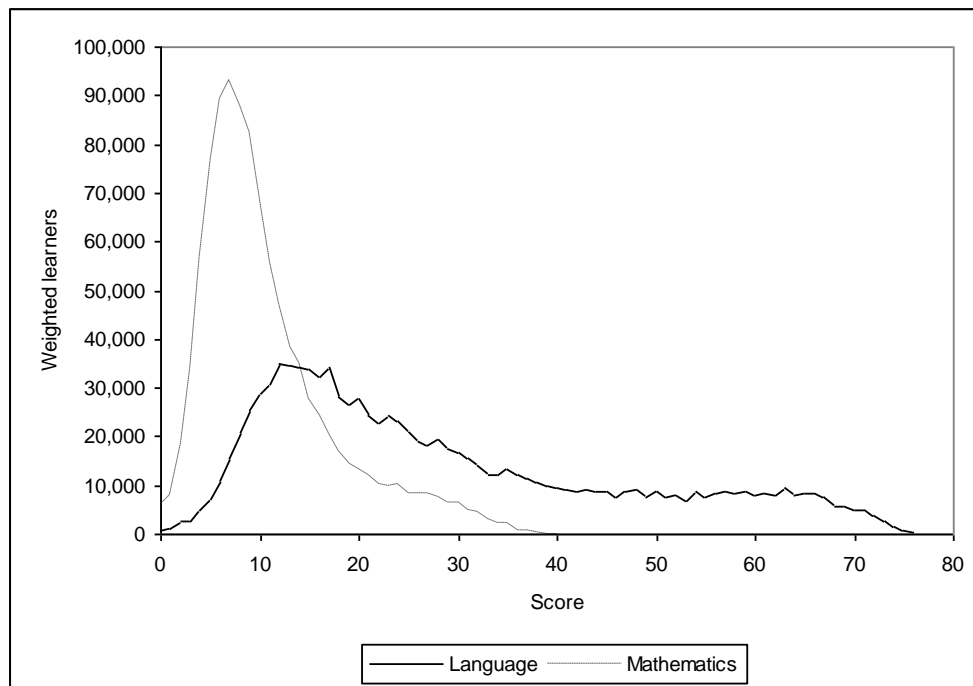


Source: August 2007 download of Persal. 143,000 educators are described in this graph. This number is low partly because Persal uses a variety of fairly non-standardised school classifications other than the two shown above (e.g. 'INTERMEDIATE SCHOOLS').

4 REQV and learner performance in primary schooling

Figure 1 illustrates the distribution of language and mathematics score in the SE data. The concentration of poor learners on the low-score (left-hand) side of the graph is very clear. Moving the peaks towards the right should be the outcome of government's programmes to improve the quality of learning for the poor.

Figure 2: Distribution of SE scores



A common mistake when people analyse the linkages between inputs and performance in the schooling system is to ignore the linkages *between the various inputs*. For example, having teachers with a higher REQV may be associated with better learner performance, but a higher REQV may also be associated with a teacher’s race (and hence historical advantage in the teacher training process), or it may be that schools with higher REQV values may also be those schools catering for better off learners, who face fewer learning barriers. What may look like a positive impact of REQV may in fact be a positive impact of something else. As we shall see, there are statistical methods for dealing with this problem. However, it is useful to first view the ‘unconditional’ relationship between REQV and learner performance (that is the relationship without taking into account other inputs), partly because this basic picture often influences people’s perceptions.

The Table 4 mean scores for all schools appear to rise substantially when the teacher has an REQV of 14 as opposed to an REQV of 13. This REQV improvement is associated with an 8.6 improvement in the language score (32.8 minus 23.2). However, if we look at the poorest 80% of schools (using home background variables of the learner to determine poverty) only, then the performance improvement associated with a move from REQV 13 to REQV 14 is only 2.0 (24.1 minus 22.1). This suggests that improving REQV is not a strong lever, at least not on its own, for improving the quality of schooling for the poor. This will become clearer below.

Table 4: Language performance by REQV (basic analysis)

REQV	All schools			80% poorest schools		
	Mean score	95% confidence interval		Mean score	95% confidence interval	
10	24.9	23.9	25.9	23.0	22.1	23.9
11	25.9	23.3	28.5	12.4	11.5	13.3
12	23.2	22.7	23.8	21.9	21.4	22.5
13	24.2	23.9	24.5	22.1	21.9	22.4
14	32.8	32.5	33.1	24.1	23.8	24.4
15	29.3	28.6	30.0	25.2	24.6	25.9
16	24.5	22.1	26.8	24.5	22.1	26.8

The situation for mathematics, illustrated in the next table, is similar to that for language. A substantial difference in results for REQV 13 and 14 teachers is only visible when we consider the schooling system as a whole. If we consider only historically disadvantaged schools, the impact of REQV appears small (and virtually non-existent if we compare REQV 13 and 14).

Table 5: Mathematics performance by REQV (basic analysis)

REQV	All schools			80% poorest schools		
	Mean score	95% confidence interval		Mean score	95% confidence interval	
10	8.5	8.2	8.9	7.8	7.5	8.1
11	8.2	7.4	9.1	8.2	7.4	9.1
12	9.2	9.0	9.4	9.1	8.9	9.3
13	9.5	9.4	9.6	8.6	8.6	8.7
14	12.0	11.9	12.2	8.7	8.6	8.8
15	11.7	11.4	11.9	9.2	9.0	9.3
16	7.2	6.4	8.0	7.2	6.4	8.0

One key underlying policy question here is of course whether upgrading all REQV 13 and below teachers to REQV 14 is an effective way of tackling the quality problem in poor schools. The implications of this policy question are great if we consider that 54% of educators in historically disadvantaged schools are below the REQV 14 level (of the remainder, 38% are on REQV 14 and 8% are on REQV 15).

Table 6 provides the result of a regression analysis of the SE data that focuses just on the non-rich schools in the system (excluding rich schools has been shown to be important in these kinds of models for arriving at credible policy conclusions). A regression analysis allows us to look at the impact of various inputs (such as REQV) simultaneously, to see what effects individual inputs have independently of other inputs. REQV, and even educator age, should in fact not even be included in the analysis results, because they are so statistically insignificant (their t-statistics are neither greater than 2.0 nor less than -2.0). But they are included to illustrate their insignificance. Alternative ways of treating REQV and the closely related variable teacher age in the model did not improve their significance². The other input variables included in the model are all significant. For example, if a teacher has access to the internet, this is associated with a language score increase of 6.6 points (12% of educators in the poorest 80% of schools reported that they had internet access)³.

Table 6: Determinants of language score (80% poorest schools only)

<i>Explanatory variable</i>	<i>Coefficient</i>	<i>t-statistic</i>	<i>95% confidence interval</i>	
Educator age	0.02	1.1	-0.01	0.05
REQV	0.10	0.9	-0.11	0.30
Teacher has internet access	6.63	16.9	5.86	7.40
School fees	0.01	7.5	0.00	0.01
Tuckshop	2.75	5.1	1.70	3.79
Ratio of learners to toilets	-0.02	-10.3	-0.02	-0.02
Telephone	2.99	12.7	2.53	3.46
Parent years of education	0.16	6.4	0.11	0.21
Parent uses test language	1.49	13.2	1.27	1.71
Newspapers in home	1.84	7.1	1.33	2.35
Learner SES	1.64	14.5	1.42	1.86
Feeding scheme exists	-1.46	-17.1	-1.63	-1.30
Meals per day	1.84	7.7	1.37	2.31
Learner age	-1.87	-23.5	-2.03	-1.72
Intercept	33.36	16.2	29.33	37.39

R² = 0.238⁴. N = 13566.

A regression model using the mathematics score as the output variable was similarly unable to indicate that REQV was a significant contributor to the quality of learning.

5 Other input-output analyses dealing with teacher qualification

Are the conclusions arrived at in the previous section contradicted by other similar analyses using different datasets?

Gustafsson (2007), in an analysis of the 2000 SACMEQ II data (which, like the SE data, covers Grade 6) finds years of pre-service training of teachers to have no significant impact on learner results.

Crouch and Mabogoane (1998) find the impact of REQV on Senior Certificate pass rates to be highly significant and positive. This could point to a different REQV impact in secondary schools, as opposed to primary schools. However, as the authors concede, there could be

² REQV was broken down into several dummy variables, and an interaction variable using the product of age and REQV was tested. None of these approaches succeeded in revealing REQV as a significant contributor to quality learning.

³ This does not necessarily mean that providing all teachers with internet access will improve results substantially. It could simply be that good teachers ensure that they have internet access. Nevertheless, the teacher internet access variable, which shows up significantly in both the language and mathematics models, seems important from a policy perspective.

⁴ The low R² value is largely a result of the fact that a sub-section of schools is considered. Were all schools considered, the same variables would result in an R² of 0.575.

factors that the REQV variable is masking, and so they only cautiously advocate qualifications improvements as a policy priority.

Van der Berg and Burger (2003), focussing on secondary schooling, find a significant positive association between teacher salary (drawn from Persal) and learner performance (reflected in the Senior Certificate results). However, whilst it may be true that higher REQVs are associated with higher salaries, salary is also linked to race (and hence historical advantage) and years of experience. That study does not seem to permit any hard conclusions around the independent impact of qualifications (in fact the authors are sceptical that qualifications on its own has a major impact).

There are a number of other input-output analyses that have been undertaken on South African schooling data, but they do not seem to have included variables that could be regarded as equivalents of the REQV variable.

References

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