

National Senior Certificate results: Steady improvement versus output quality

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Abstract. A country's global competitiveness is to a large degree intrinsically linked to good quality National Senior Certificate (NSC) Mathematics and Physical Science results. However, the quality of the NSC results in South Africa has been a highly contentious issue over many years. This article unpacks the dilemma of the continued steady improvement of the NSC results amid concerns raised by various key stakeholders about the quality of the output. In essence, output quality concerns appear to be more pronounced in the case of Mathematics and Physical Science results. The impact of this problem was specifically analysed in terms of input characteristics of first year Electrical Engineering students (National Diploma Programme) as a function of their overall academic performance at the University of Johannesburg.

Background and contextualization

Over the years, the publication of the National Senior Certificate results has always been accompanied by euphoria and anguish for a variety of debatable reasons. The results provide an ideal opportunity for the performance of Grade 12 learners to be put under the microscope as this level serves as the exit point in the basic education sector. More specifically, the performance in key subjects such as Mathematics and Physical Science is subjected to intense scrutiny. In the interest of quality improvement, the Annual National Assessment (ANA) and the National Senior Certificate (NSC) are viewed by the Department of Basic Education as key monitoring tools needed to provide valid and reliable data on learner performance [1]. Yet, the enrolment of Grade 12 learners has been characterised by puzzling features over the years. For instance, there has recently been a gradual decrease in the number of full-time candidates and an increase in the number of part-time candidates [1] as reflected in Figure 1 and Figure 2 below.

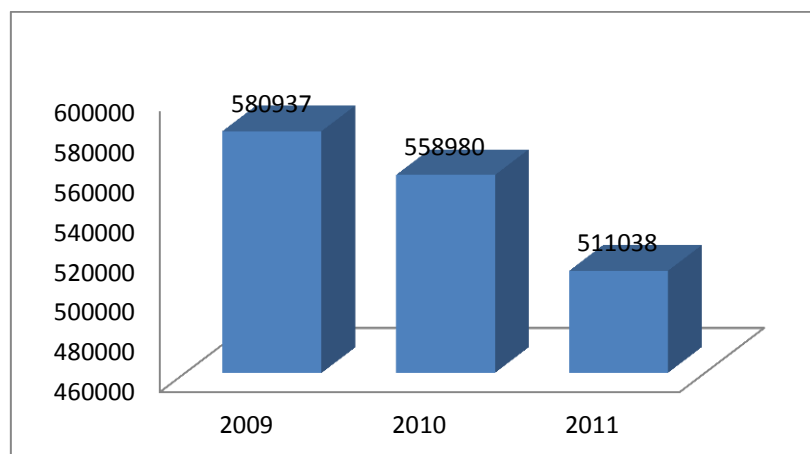


Figure 1: The number of full-time candidates enrolled for the National Senior Certificate examination (2009-2011)

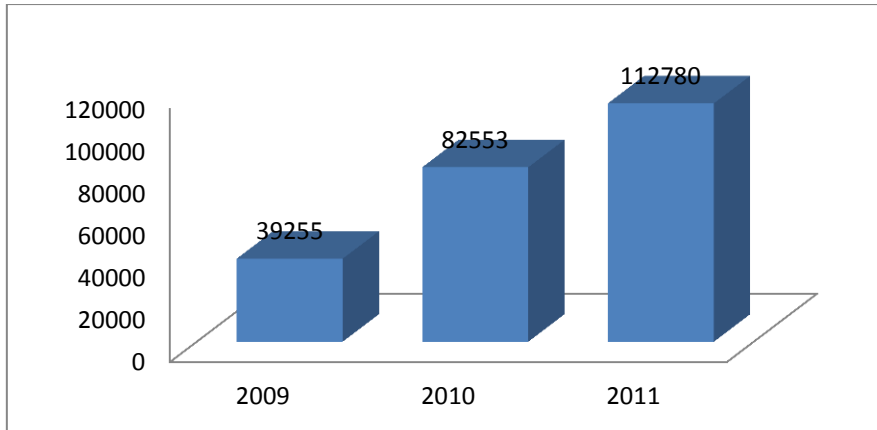


Figure 2: The number of part-time candidates enrolled for the National Senior Certificate examination (2009-2011)

What can this trend be attributed to? The dynamics associated with this phenomenon have to be fully unravelled in order to acquire a better understanding of its true nature and its potential impact on the South African basic education system. This essential process has to be undertaken with concrete aims in mind as part of the initiative of setting up key pillars to strengthen the basic education sector. Given this crucial need, a more nuanced approach is arguably a critical component for the realisation of the broad developmental objectives in this regard. In addition, a significant number of both full-time and part-time candidates who enrol do not eventually sit for the examination [1] as depicted in Figure 3 and Figure 4 below. Can this strange scenario be attributed to socio-economic adversities or other factors afflicting the learners?

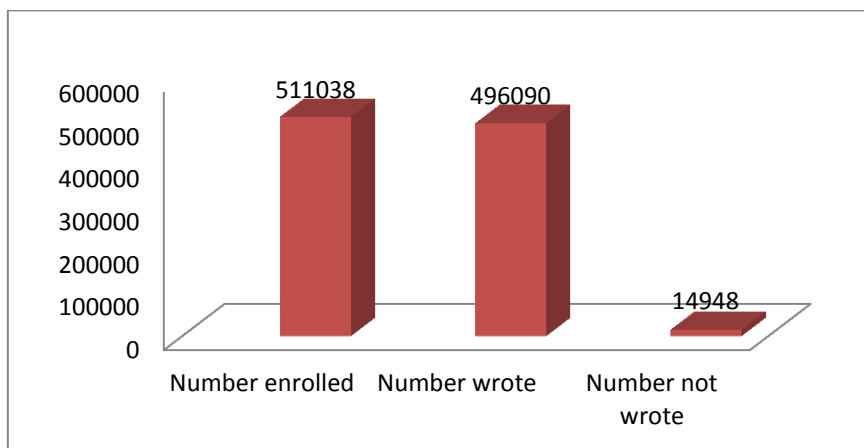


Figure 3: The number of full-time candidates that enrolled and wrote the 2011 National Senior Certificate examination

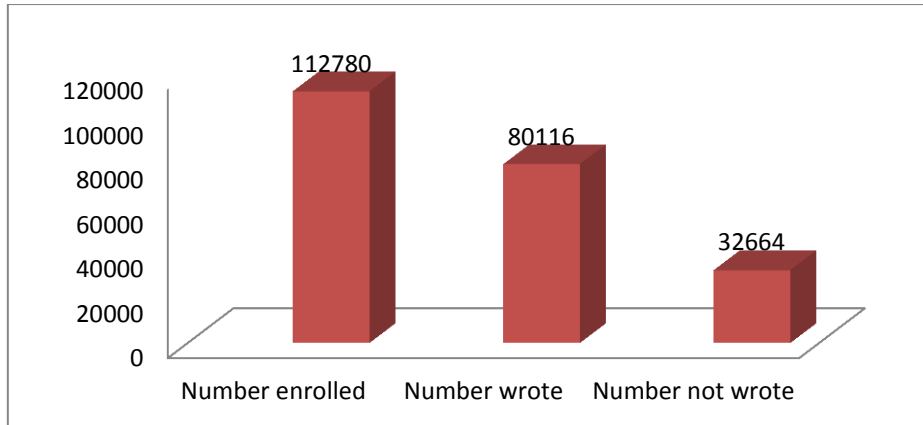


Figure 4: The number of part-time candidates that enrolled and wrote the 2011 National Senior Certificate examination

The learner performance in Mathematics and Physical Science during the period 2009-2011 has been unsatisfactory and significantly below expectation according to the statistical data provided by the Department of Basic Education [1] as indicated in Figure 5 and Figure 6 below. While the number of female learners who wrote Mathematics and Physical Science during the period under review has been higher than the number of male learners, the performance of male learners was better than that of female learners in Mathematics and Physical Science during the same period [1]. Does this suggest that Mathematics and Physical Science are not necessarily the favourite subjects for female learners?

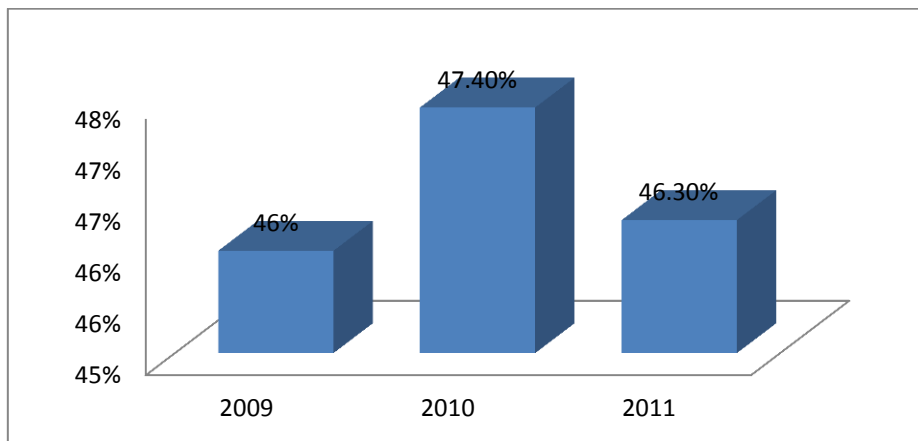


Figure 5: Pass rate in Mathematics (2009-2011)

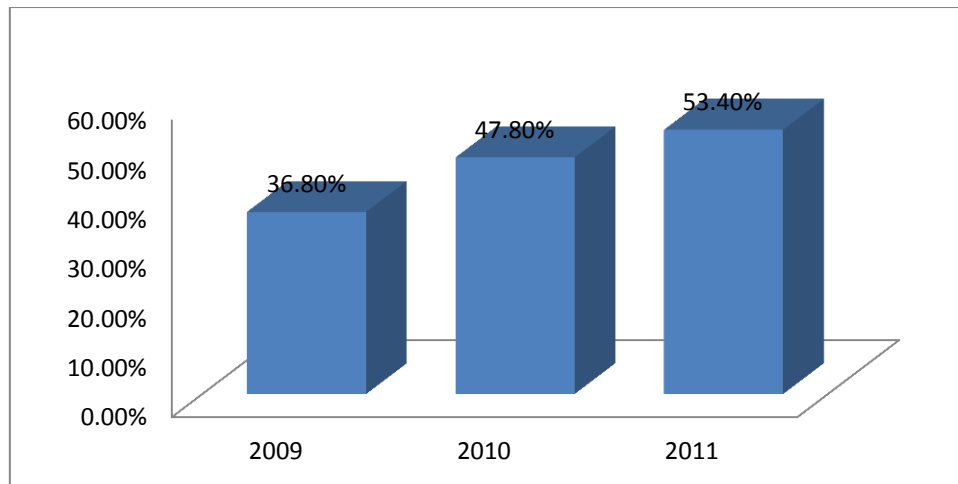


Figure 6: Pass rate in Physical Science (2009-2011)

Research studies based on the influence of gender in mathematics and science education can certainly provide useful intellectual perspectives in this regard [2, 3, 4]. Furthermore, the overall national pass rate stood at 70.2% in 2011 as compared to the 67.8% achieved in 2010 [5]. This represents an increase of 2.4%. In addition, the percentage of learners who qualified for degree studies increased to 24.3% in comparison with the 20.1% achieved in 2008 [5]. Is the steady improvement of the National Senior Certificate overall pass rate accompanied by quality erosion? It is against this background that we undertook to investigate the dilemma of steady improvement of the National Senior Certificate overall pass rate amid concerns raised by various key stakeholders about the quality of the output. The investigation was carried out by critically scrutinising the impact, if any, of the above dilemma as a function of the overall academic performance of first year Electrical Engineering students (National Diploma Programme) at the University of Johannesburg.

Focus on the analysis of data collected

This analysis is based on the data collected with the samples ($n = 303$) during 2011 and ($n = 186$) in 2012 of first year Electrical Engineering students (National Diploma Programme) at the University of Johannesburg. Figure 7 and Figure 8 below reflect the Grade 12 National Senior Certificate achievement levels for the 2011 [6] and 2012 cohorts as input characteristics. The achievement levels of the large majority of students from the 2011 and 2012 cohorts in Grade 12 Physical Science were in Level 4 and Level 5.

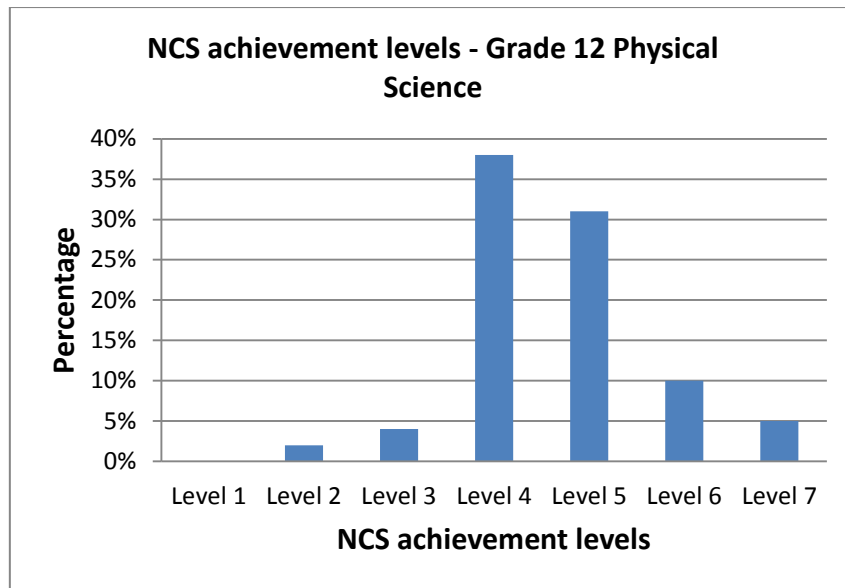


Figure 7: NCS achievement levels - Grade 12 Physical Science (2011 cohort)

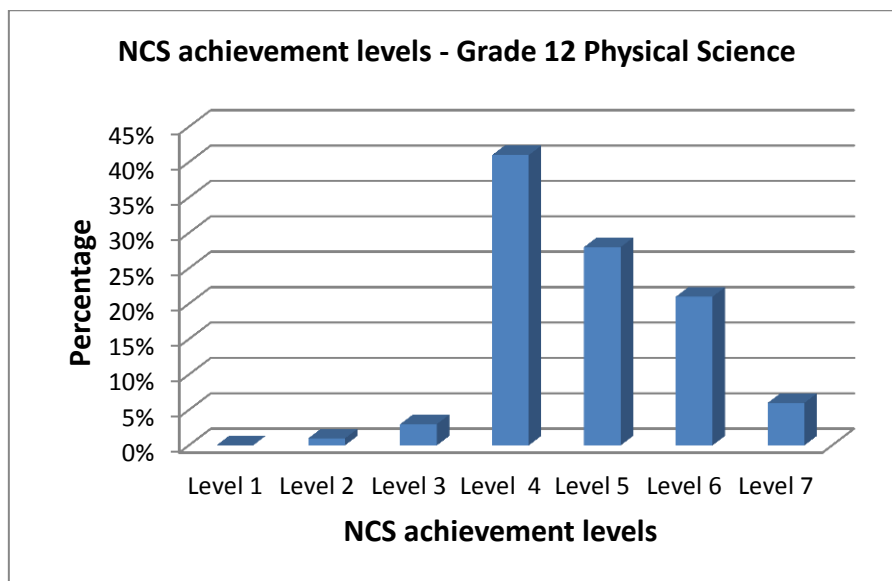


Figure 8: NCS achievement levels - Grade 12 Physical Science (2012 cohort)

Figure 9 below provides a breakdown in terms of students' semester performance across various percentage bands.

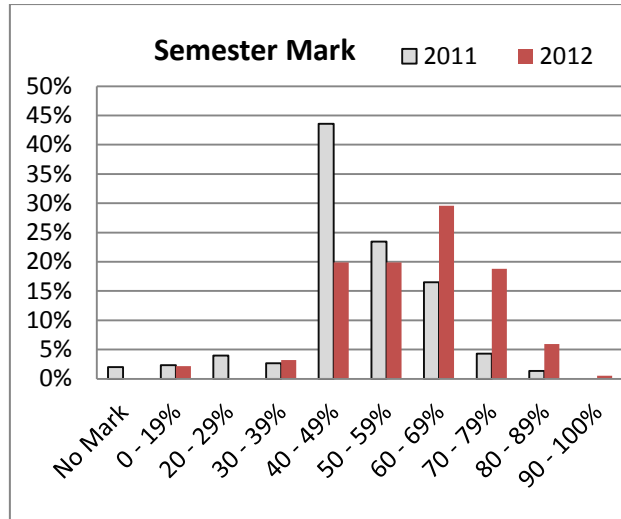


Figure 9: A breakdown in terms of students' semester performance across various percentage bands

There was a large majority of students whose performance fell within the 40% - 49% band during 2011 as compared to 2012. There was also a noticeable improvement in the performance of the students across the subsequent higher percentage bands in 2012 as compared to 2011. From the experiences gained from the 2011 batch, the instructors responsible for the group employed the same interventions and strategies in 2012 which appear to have paid off in the end. There was also a noticeable improvement in the performance of the students across the higher achievement (60%-80%) bands in 2012 as compared to 2011 (Figure 11). A breakdown in terms of students' examination performance across various percentage bands as shown in Figure 10 below reveals a trend similar to their semester performance.

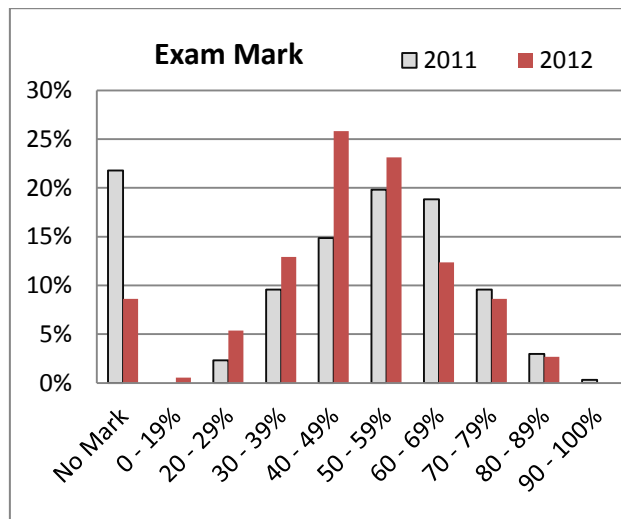


Figure 10: A breakdown in terms of students' examination performance across various percentage bands

As Figure 11 below indicates, there was no significant difference in relation to the breakdown in terms of students' overall performance across various percentage bands. In addition, the exam pass rate for 2011 (66%) was higher as compared to 2012 (51%) and this translates into a decrease of 15% (see Figure 12 below). This appears to be a further affirmation of the central argument with regard to the differences in terms of the quality of the students in the two respective years. It is appropriate to point out that the performance across the various percentage bands is characterised by a normal distribution curve in all the cases.

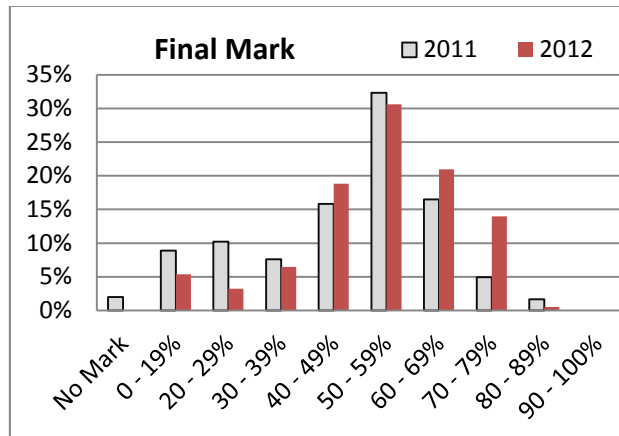


Figure 11: A breakdown in terms of students' overall performance across various percentage bands

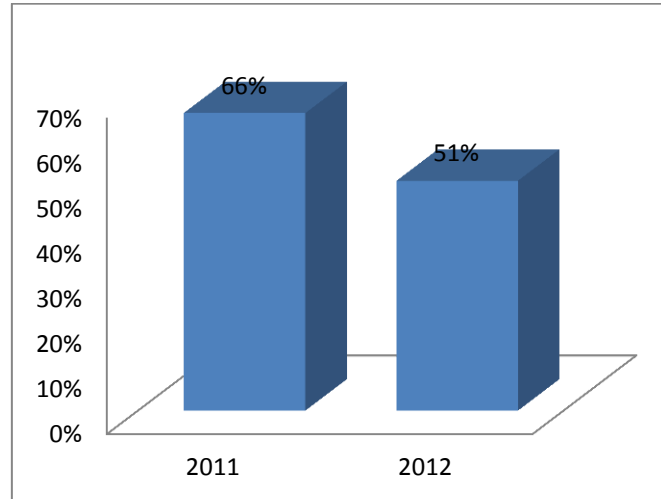


Figure 12: Exam pass rate for 2011 and 2012

There were no striking differences in terms of the overall performance in laboratory practical work during 2011 and 2012 (see Figure 13 below). The somewhat improved overall performance in laboratory practical work may be attributed to the strict measures which have been put in place according to which students' laboratory reports are thoroughly scrutinised during consultation sessions before submission for marking.

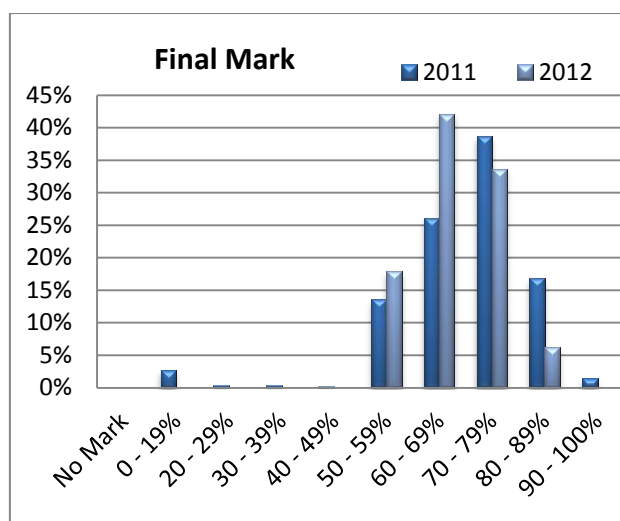


Figure 13: A breakdown in terms of students' overall performance in laboratory practical work across various percentage bands

Implications and recommendations

Quality is the heartbeat of any coherent system whether educationally inclined or not. Within the context of this article, it is recommended that constructive and meaningful strategic interventions may be deployed to restore appropriate quality in areas of need and these interventions can arguably serve as the cornerstone of any envisaged curriculum reform initiative. The South African basic education sector in particular is no exception in the light of the basic considerations alluded to in this article. Consolidated efforts are required to create a cohesive basic education system with the capacity to generate critical skills required by the mainstream economy. The onus is on South Africans themselves to play a pivotal role towards the full realisation of the strategic priorities and objectives that can set South Africa as a global player on a path for sustainable development.

Conclusion

A steady improvement in the National Senior Certificate overall pass rate appears to be accompanied by quality erosion which if not quantified and addressed will have undesirable consequences to the South African basic education system. Appropriate quality enforcement mechanisms have to be put in place in order to safeguard the integrity of the National Senior Certificate results.

Acknowledgements

The authors would like to express sincere gratitude to colleagues in the Physics Department at the University of Johannesburg for providing assistance during the course of this undertaking.

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