

Makoyd

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Considering the case for language compensation

The role of statistical support and research in Monitoring and Evaluation

Remote teaching and learning during COVID-19: a call to rethink educational approaches

UMALUSI



Quality Council for General and Further Education and Training



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Editor's Note

Kgaugelo Sekokotla



Dear stakeholders,

Welcome to this edition of Makoya, Umalusi's official newsletter. I am delighted to bring you this informative edition of our newsletter about developments within Umalusi. Our mission as a quality assurance council is to assure education standards on the National Qualifications Framework (NQF) levels 1–4.'

This year has been unprecedented for the Basic Education sector, a result of the mayhem caused by the novel coronavirus. In the midst of the challenges brought by COVID-19, the men and women at Umalusi navigated through this storm to ensure that Umalusi continued to deliver on its mandate as outlined in its founding Act. In the face of significant challenges, we made significant progress.

In this edition you can look forward to insightful articles from our Statistical Information and Research (SIR) Unit, whose research and activities have included the following:

- A Southern Africa Association for Educational Assessment (SAAEA) Research Forum Webinar;
- Curriculum appraisal intrinsic to a quality qualification;
- How to quality assure statistical data for monitoring and evaluation;
- How unbundling unlocks value for examinees in times of the pandemic, with a managed separation of Business Studies' examinable content as a case study;
- Exploring the use of machine learning for predicting student performance for academic years that are interrupted by natural disasters;
- How remote teaching and learning during Covid-19 has brought about a call to rethink educational approaches.

In conclusion, Umalusi wishes the cohort of 2021 the best of luck with their examinations. We would love to hear from you, our readers. Kindly forward your comments and feedback to the editor, at info@umalusi.org.za



From the CEO's Desk

Dr Mafu Rakometsi



Warm greetings to all our stakeholders,

It gives me great pleasure to engage with you on the work of Umalusi.

Education standards are a catalyst for the upliftment of a nation and Umalusi plays a vital role in setting education standards, guided by its founding legislation: the National Qualifications Framework (NQF) Act No. 67 of 2008 and the General and Further Education and Training Quality Assurance (GENFETQA) Act No. 58 of 2001. The challenges brought by COVID-19 have provided Umalusi with the opportunity to implement various administrative initiatives and explore different technological solutions to continue delivering on our mandate. These initiatives have resulted in Umalusi serving the nation with diligence and efficiency.

Notwithstanding the fact that there remains much work to be done, the Umalusi would like to assure the nation that we are working very hard to ensure that the system is ready to administer the 2021 national examinations. At the same time, I urge the 2021 cohort to make use of the additional enrichment lessons made available to them by relevant departments to prepare them for examinations.

On that note, I wish the class of 2021 the best of luck in their final examinations.

Dr Mafu Rakometsi
CEO



SADC teaching and learning in the time of COVID-19: lessons learnt

By Nonhlanhla Shozi



Umalusi hosted a successful Southern Africa Association for Educational Assessment (SAAEA) Research Forum webinar on 8-9 October 2020. The aim of the webinar was to share countries' experiences with different approaches to high-stakes decision-making in the COVID-19 context, including the considerations that guide the choice of approach, challenges, successes and implications for future rounds of high-stakes decision-making. Lesotho, Eswatini, Namibia, Malawi, Zambia, Botswana and South Africa participated and presented in the webinar. All schools in countries that took part had closed between March and June 2020. All presentations indicated that with the right tools and proper planning, productivity does not necessarily depend on working within the confines of a traditional office.

To highlight the findings that emerged, this article discusses the approaches adopted, challenges experienced and lessons learnt by the SADC countries during the COVID-19 pandemic.

Approaches taken

Since learners were no longer physically accessible to teachers, countries adjusted the physical interaction approach towards digital and mass media modes of teaching. Curriculum and assessment programmes were revised for grades below Grade 12. Additionally, there were long delays in reopening schools, driven by the rate of infections in each country, so school calendars were extended to match the postponements.

With the relaxation of restrictions, learners returned to school in a phased manner. Those grades that were to sit for end-of-year national examinations opened earlier to ensure that these candidates were ready for the examination.

Examinations had to be administered at more venues than usual to provide for social distancing. This had financial implications for schools as procuring more resources was required.

Markers were reluctant to avail themselves for fear of contracting COVID-19, confined as they would be in cramped venues. To alleviate these fears, marking

conditions were reviewed. This put pressure on resources, as more marking venues were required to be sourced to ensure that markers were sufficiently spaced to conform to COVID-19 protocols.

Umalusi conducted online standardisation/grading for all the qualifications offered on the sub-framework with great success.

Challenges commonly experienced

The countries that participated used TV, radio and online teaching approaches. However, these methods were not successful in remote areas where technological resources were inadequate for online learning and examinations.

Meeting standards in schools was difficult because many public schools needed to rehabilitate their infrastructure. There were great shortages of both water and space in many public schools that impacted the ability to observe the required continuous washing of hands and social distancing. Another challenge experienced by most countries in the region was that the decision for reopening was socially sensitive as some parents did not want their children to return to school.

While schools were closed, countries found that learners were exposed to increased violence, abuse, exploitation and gender-based violence.



In this region, many learners come from poor households and rely on the support they receive from schools. The closure of schools came with reduced access to nutrition for those children who depend on school feeding programmes.

The pandemic further indicated the importance of capacity building and sensitising parents and guardians so as to enhance support for home learning and schools' reopening preparedness.

Lessons learnt

Countries learnt, too, that there was a greater need for harmonisation of the whole education sector in the region. When learners who study in other countries returned to their countries of origin during the pandemic, they experienced difficulties as they were not automatically absorbed into schools, given the differences in education systems.

The pandemic prevalence showed that teachers needed to be upskilled in new technologies for learning and that governments have to prioritise the strengthening of IT solutions for public schools. In addition, the education sector needs to improve technology so that most activities can be done online: a system should be put in place for all examination processes from registration to writing of examinations, marking, grading, releasing results and producing certificates.

There is a great need for infrastructure improvement and a review of teacher-learner ratios in public schools. The continued use of blended learning, which is the use of both online and physical lessons together with homework, to promote learning has to be practised regularly to prepare for unforeseen circumstances.



The 'C' in Robotics: curriculum appraisal, essential to a quality qualification

By Katlego Leshabane



As curriculum is essential to determine the breadth, depth and level of certification of a qualification, the quality assurance of underlying curricula is required.

The Department of Basic Education (DBE) submitted the curriculum and assessment policy statement (CAPS) for the General Education Band (GET) for Coding & Robotics Grades R-9 to Umalusi for approval. In addition, the Department of Higher Education and Training (DHET) has also embarked on a process to introduce Robotics in the programme qualifications mix (PQM) of Technical and Vocational Education and Training (TVET) colleges. This will include subjects such as Electronics and Digital Concepts for Robotics, Robotics Fundamentals and Robotics and Industrial Automation. Umalusi has been requested by the DBE and DHET to evaluate the curricula and the outcome of the evaluation process will be used to strengthen the curricula before promulgation as policy.

Umalusi's Directives for the Quality Assurance of Curricula (2020) provide a framework and guiding principles for curriculum development. In terms of a broad curriculum conceptualisation, the following key question needs to be answered in the Robotics curriculum:

What does the appraisal of the Grade R-9 Coding and Robotics/NC(V) level 2-4 curriculum reveal about the extent to which the curriculum prepares learners for the 4IR?

According to Butler-Adam (2018), a curriculum that is responsive to 21st century skills should prepare students to be problem solvers, adaptable and able to express themselves in both written and spoken language, as well as to make ethical and moral decisions that are unlikely to be successful

elements of artificial intelligence (AI) in the fourth industrial revolution (4IR). The South African Robotics curriculum must provide learners with the knowledge and abilities to implement, manage and collaborate with new technologies and with one another.

21st century skills and general capabilities

AI, big data, virtual reality, blockchains and other technological advances are driving the fourth industrial revolution. This implies that everyone will require a certain level of familiarity when it comes to technology. In addition to technical skills and digital capabilities, creativity, problem-solving, critical thinking, interpersonal communication skills, social diversity and collaboration are some of the key skills required for a Robotics curriculum. Van Laar, van Deursen, van Dijk & de Haan (2020) posit that the curriculum should also equip learners with analytical thinking, critical thinking and problem-solving skills. A critical thinker may generate new ideas and answers, solve complicated issues using logic and reasoning, and analyse circumstances. During the curriculum evaluation process, research teams investigate the different curriculum dimensions to identify if the curriculum indicates:

- Whether learners are required to break down problems into specific steps, to come up with analytical ways to deal with problems;
- Are the elements of computational thinking evident in the curriculum? (specifically for Grades R-9); and



- Are the elements of design thinking evident in the curriculum? Are learners given the opportunity to design something, test it, seek feedback, make improvements and adjustments and re-test it?

Creativity is one of the skills that many researchers (Lai & Viering, 2012; Stabback, 2016; Stehle & Peters-Burton, 2019) have identified as a critical 21st century skill. Creativity is the capacity to develop or recognise ideas, alternatives or possibilities that might be beneficial in solving issues, and to connect with others. A curriculum that is responsive to general capabilities must give learners an opportunity to design or create so as to develop creativity skills.

Learners in the 4IR industry must be able to transmit knowledge and make sense; therefore learners must have interpersonal skills (van Laar, et. al, 2020). This means that students should be able to communicate effectively with others so that they can utter the right words in the right tone of voice and with the right body language to get their points through. A quality curriculum must afford learners the opportunity to present their ideas or evidence of learning in different formats.

A quality Robotics curriculum should include elements that educate learners on how to comprehend and adapt to people who may have different perspectives on the world. The information should also be relevant to contemporary concerns, whether social, personal, local, regional or global. The World Economic Forum (2020) identifies diversity and cultural intelligence as one of the critical soft skills of the future: one ought to be understanding, respectful and cooperative with people despite differences in race, culture, language, age, gender, sexual orientation, political or religious convictions, etc.

Umalusi is in support of the development of a Coding and Robotics curriculum, as well as the NC(V) Electronics and Digital concepts for Robotics, Robotics Fundamentals and Robotics and Industrial Automation, to equip learners with the required competencies and skills to function in a digitalised global economy.

References

Butler-Adam, J. (2018). *The Fourth Industrial Revolution and education*. *South African Journal of Science*, 114(5/6), 1.

Lai, E. R., & Viering, M. (2012). *Assessing 21st Century Skills: Integrating Research Findings*. *National Council on Measurement in Education*.

Stabback, P. (2016). *What makes a quality curriculum?* UNESCO IBE.

Stehle, S. M., & Peters-Burton, E. E. (2019). *Developing student 21st Century skills in selected exemplary inclusive STEM high schools*. *International Journal of STEM Education*.

Van Laar, E., van Deursen, A. J., van Dijk, J. A., & de Haan, J. (2020). *Determinants of 21st Century Skills and 21st Century Digital Skills for Workers: A Systemic Literature Review*. *SAGE-Open*, 1-14.

World Economic Forum. (2020). *The Future of Jobs Report*. *World Economic Forum*.

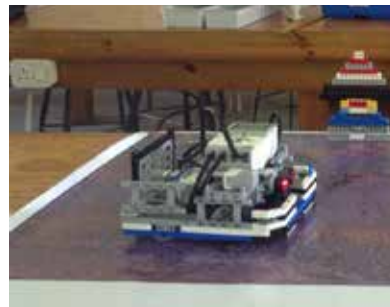
Annexure A: Images



Robotics activities encourage collaboration where children learn how to organise work, how to communicate with peers and how to give constructive feedback



Problem-solving activities with Robotics



Robotics activities allow learners to build and program their robot using a block-based (BB) programming EV3 interface



LEGO Mindstorms EV3 Edition



The role of statistical support and research in Monitoring and Evaluation

By Nthabeleng Lepota



Umalusi is mandated to provide research-based advice to the relevant education ministers on matters pertaining to the General and Further Education and Training Sub-framework. Over and above advising the two education ministers, the organisation conducts and commissions research to enhance quality assurance processes and inform the organisation 's strategic direction.

Leading the organisation in its research initiatives is the Statistical Information and Research (SIR) Unit. As a quality council, Umalusi prides itself on grounding its work in research to ensure that it takes educated positions informed by research. This article demonstrates how Umalusi units collaborate to deliver on the work of the organisation.

Annually, the SIR Unit collaborates with the Quality Assurance of Assessment (QAA) Unit on school- and subject-sampling projects for monitoring and evaluation purposes. Quality assurance is achieved through processes that include, among others, moderating examination papers, school-based assessment (SBA) and practical assessment tasks (PAT); monitoring the conduct, administration and management of examinations and assessments; and moderating the quality of marking. The QAA Unit is responsible for these functions.

Considering the number of subjects offered at schools that must be monitored across different qualifications and assessment bodies, monitoring becomes costly, time-consuming and virtually impossible. The two units therefore work collaboratively to select a sample of centres, taking into consideration the subjects. The identified sample is, consequently, used to gain insights into the quality of assessments conducted. A list of all schools, known as the population, is considered during sampling. Taking a sample of these schools means using a reduced proportion of all schools and represents a subset of all schools. These are often randomly selected and contain attributes of the population.

To date, the two units have collaborated in three activities, particularly on monitoring the conduct of examinations, SBA and PAT moderation, as well as the verification of marking for the Senior Certificate (amended) (SC(a)) and the National Senior Certificate (NSC) offered by the Department of Basic Education (DBE).

When a request for selecting a sample is made, the process starts with the statisticians understanding the requirements of the requesting unit to generate a representative sample, considering variables of interest. A good sample is representative of all schools of interest, mirroring every characteristic of all schools, in the sense that all characteristics of interest in the population are estimated from the sample with a known degree of accuracy.

Depending on the criteria and characteristics based on the requirements, a suitable sampling method, free from selection bias and sampling error, is identified. The commonly used sampling methods include clustered sampling and simple random sampling (SRS). An SRS is the simplest form of sampling. With SRS, every unit in the population has an equal chance of selection into the sample. With clustered sampling, the population is divided into subgroups according to characteristics of interest and a random sample is selected from each subgroup. With this sampling method, data is usually grouped according to homogeneity e.g., geographic location, such as a province in which a candidate resides.



For the monitoring of the conduct of examinations, the unit requested a sample representing part-time and full-time schools for the June and November 2021 monitoring respectively, without taking into consideration schools that had been monitored previously. The criteria focused on all subjects offered. Since the monitoring is conducted provincially, all centres were clustered by province and a proportional random sample was selected provincially. For accurate results an integrated

software package, Statistical Analysis System (SAS), was used.

It is important to work collaboratively across units to ensure that the mandate of the organisation is delivered. It is through collaboration that Umalusi can implement its strategic goals and meet its targets successfully.



Quality assuring statistical data for monitoring and evaluation

By Paulina Rantho



Statistical analysis and quality assurance are two essential aspects of monitoring and evaluation. Many statistical procedures are used to analyse data. These include descriptive summary measures, graphical techniques, confidence intervals and hypothesis-testing using distributions. For an organisation to conduct monitoring and evaluation, data of high quality is required because the data will contribute towards evidence-informed decision-making. For example, Umalusi conducts site visits and data collected from these processes assist in deciding on the accreditation status of an institution. Consequently, it is important to have reliable data with attestable quality.

Data quality can be defined in terms of its fitness for use. There are eight dimensions of data quality used to attest to its fitness, addressed in the South African Statistical Quality Assessment Framework (SASQAF). These include its relevance, accuracy, timeliness, accessibility, interpretability, coherence, methodological soundness and its integrity. It is important to understand these data quality dimensions since the information derived from data is used to assist in planning, decision making and monitoring and evaluation.

Many organisations have established monitoring programmes that generate large amounts of data, which can provide much information about trends and the effectiveness of policies. Data mining can be done, using suitable statistical analysis, to achieve meaningful statistical outputs. The data used for the analysis must be accurate, reliable and meet certain data quality dimensions.

Data must be relevant for it to reflect the degree to which it meets the real needs of stakeholders. At Umalusi, there is a lot of data generated from quality assurance processes. This implies that, as an organisation, reports generated should be relevant and can be shared with stakeholders to improve processes that ensure and improve quality assurance for the betterment of the education system. The data that is shared with stakeholders must be accurate so as to reflect the degree to which an output correctly describes the phenomenon it

was designed to measure. Another dimension of data is its timeliness, that is, the delay between the reference points to which the information pertains and the date on which the information becomes available. It is important to conduct monitoring and evaluation and provide feedback to stakeholders by providing recommendations and sharing lessons learned from activities. It is important to provide feedback timeously so that when the next project/activity starts, stakeholders have received feedback on similar activities. This also talks to accessibility of the data, or the ease with which data can be obtained by the stakeholders from organisations providing the information. This implies that data must be accessible in different formats i.e., newsletters, hard copy reports and digital reports, among others. The data shared in these reports must be understandable and interpretable, that is, users must understand the information that has been published in the reports. One way of ensuring interpretability is through the provision of metadata, which is a set of data that describes and gives information about data contained in these reports.

Coherence of data is another dimension that reflects the degree to which it can be successfully brought together with other information with a broad analytical framework and over time. When data is collected, it must have a primary key, an identifier that is unique, to link it to the data. For example, when data is collected about schools, a school number can serve as a primary key and this



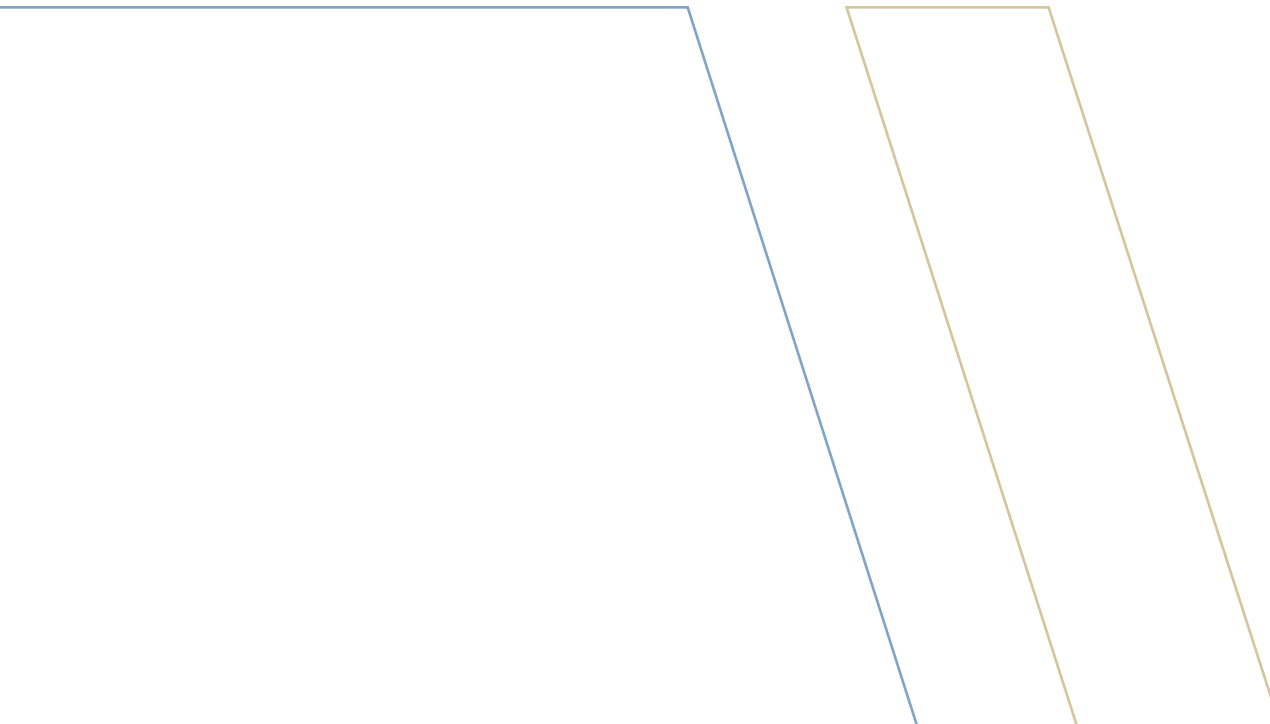
key can never change. If there are other sources that contain information about variables of interest that Umalusi would be interested in, both data must contain this key to enable linkages. This will attest to the coherence of the data. The methods used to mine data are also important because they attest to the methodological soundness of the data. Methodological soundness refers to the application of international, national or peer-agreed standards, guidelines and practices to produce statistical outputs.

Monitoring and evaluation are conducted independently. Monitoring is the systematic process of collecting, analysing and using information to track a programme's progress towards reaching its objectives and to guide management decisions. This process usually focuses on processes like activities to be done, deliverables and how many people or entities they reach. Monitoring is conducted after a programme has begun and continues throughout the programme implementation period. Monitoring

is sometimes referred to as process, performance or formative evaluation.

On the other hand, evaluation is the systematic assessment of an activity or institution's performance. Evaluation focuses on expected and achieved accomplishments. It examines the inputs, outputs, outcomes and impacts to understand achievements or the lack of achievements. Evaluation aims at determining the relevance, impact, effectiveness, efficiency and sustainability of interventions and the contributions of the intervention to the results achieved.

Data quality is essential in monitoring and evaluation as it assists in learning from past successes and challenges and informs decision making, so that current and future initiatives are improved. As a result, it is important to ensure data quality by considering each of the eight dimensions, as outlined.





Considering the case for language compensation

By Shilela Nkadimeng



The true nature of an effective system is measured by its ability to identify and isolate variables and their influence on the stability of that system. Education is a complex system with many interacting factors that make outcomes from interventions unpredictable.

There are different frameworks that can help determine potential interventions to address educational problems globally. Some indicate causal pathways and behavioural theories and models to assess the desired outcomes of change and how particular interventions might (or might not) help change the identified outcomes.

The South African education sector is comprised of many tentacles, ranging from education departments and assessment bodies to provincial offices and district offices. However, the ultimate end-user that all these different layers target is the classroom. In the main, most interventions in the system must demonstrate translation into learning outcomes and practical capital for teachers implementing the curriculum.

In more obvious terms, what this article is premising is that the South African education system must design systemic interventions in ways where the isolation and treatment of variables is clearly accounted for, such that the monitoring and evaluation of the hypothesised impact can be better understood. Systemic interventions must be subjected to necessary rigorous reviews in transparent ways to pave the way to reproducible and updateable models. If they do not, they are simply occupying space with no real and addressable indicators to their impact.

One such intervention in the South African educational landscape, among a few, is that of language compensation. Language compensation is a system intervention implemented at Grade 12. Eligible candidates for this intervention are learners whose home language is neither English nor Afrikaans.

The intervention currently offers an additional 3% to the final mark of qualifying candidates in all subjects being offered in a language that is not their home language. It is only offered to NSC candidates in public schools and has been in the system as a compensatory measure since 2008, now lapsing 22 years and counting. The compensation has varied between 5% and 3%, with the approval of Umalusi. If closely examined, these figures, whose justification remains to be shared, do not align with linguistic thresholds for proficiency, normally set at 75%. This would justify an estimated 25% for language compensation, currently not the practice.

Arguments to maintain the language compensation policy have centralised the compensatory element of the intervention at the expense of the implied linguistic benefits. The founding rationale was, seemingly, transformational in nature. However, since its implementation in 2008, language research globally has taken multiple turns in understanding socio-cultural elements that would situate, practically and as dictated by context, suitable teaching strategies to empower teachers in multilingual classrooms. These are readily available and some have already proven successful in the system i.e., Eastern educational department's adoption of bilingual education.

What the language compensation policy, as a systemic intervention, fails to do is to demarcate a clear intervention and outcome. What is required is an educational research intervention in the sense of variable x leads to y . Many reviews in the evaluative processes of systemic interventions often deal with questions that begin with how, what, and why: How is the language problem conceptualised? What kind



of linguistic intervention/s can be used to support learners' proficiency levels? Why and under which conditions do language interventions lead to higher attainment of linguistic proficiencies? Systematic reviews of such questions are therefore more configurative than aggregative in nature. What the language compensation policy has adopted is the latter.

Failure to intervene early and mitigate against the cumulative functional illiteracy of African learners at Grade 12 is what sustains the existence of the language compensation policy. The compensation is continued in the face of a continued linguistic injustice in the public schooling sector. Analogically, it is a planned annual apology where the offense is sustained.

The question, then, is how should we be dealing with language compensation as a systemic intervention from a research perspective? The first point, if we are to level the impact of the intervention, is to discontinue it and monitor the systematic response across at least a three-year period. This is to create a norm of three years towards standardisation. This would serve as a pyramidal framework to guide the evaluation of the effectiveness of the intervention on the performance of learners in the public schooling system.

Secondly, there is a dire need to operationalise trendy terms like 'transformation' in any given setting. The political needs to be separated from

the educationally sound. The exploration of broad concepts requires an open and iterative review approach. It is crucial to find the right balance between comprehensiveness and relevance, or sensitivity and precision (Brunton et al. 2012).

Thirdly, language matters in the South African context remain tilted towards a monolingual bias. The offering of indigenous South African languages remains versioned from English. Little critical and honest conversation is held about the tantamount long-term benefits of accessing knowledge in one's mother tongue. This applies even at assessment level, as is the case for English and Afrikaans Home Language learners, and at decision- and policy-making level, especially the social and psychological affirmation components.

It must be strongly emphasised that the contextual climates that give precedence to educational interventions change. The notably increased uptake of both English and Afrikaans at Home Language levels by learners whose mother tongues are indigenous South African languages must also be a factor in the relevance of this systemic intervention. In more ways than one it consequently disqualifies the premise that underpins the language compensation policy in the public schooling sector.



Unbundling unlocks value for examinees: a managed separation of the Business Studies examination

By Biki Lepota



The context of this article is the policy adjustment that resulted in a change in the structure of Business Studies' National Senior Certificate (NSC) examination, administered by the Department of Basic Education (DBE). The specific change relates to the splitting of the examinable content in this subject into two papers in 2020. In 2018 there was a national outcry, which was sparked by the declining trend in the results of the Business Studies examination administered by the DBE. In that year, the proportion of examinees who passed declined to 64.9% from 75.7% in 2015. This drop in performance fuelled speculation that examinees may have been prejudiced by standardisation decisions made by Umalusi. As a result, some stakeholders even suggested that perhaps the external component, which contributes 75% towards the final marks, should be discarded. Consequently Umalusi conducted its own research, which concluded that there was nothing untoward regarding its standardisation processes.

Background

Two years after the outcry, in 2020 to be more specific, the performance of examinees in Business Studies showed a significant improvement. This type of improvement has also been observed in Accounting, which, like Business Studies, had its examination split into two papers for the first time in 2020. The DBE's Diagnostic Report 2020 showed that the performance trend was reversed from decreasing to increasing performance:

*The number of candidates who wrote the Business Studies examination in 2020 **increased significantly by 45 821** compared to that of 2019. **There was also a pleasing improvement in the pass rate this year.** Candidates who passed at the 30% level comprised 77,9% of the cohort in comparison to 71,0% in 2019, while 57,0% achieved at the 40% level compared to 46,2% in the previous year" (DBE, 2021: 53 – own emphasis).*

It is very encouraging to note this improvement given the COVID-19 situation. That notwithstanding, the question that arises is whether the improved performance was attributable to improved quality of teaching and learning, including good examination preparation, or whether there were other factors at play.

Purpose

Bearing the above in mind, the purpose of this article is to demonstrate that a reduction in content has a positive effect on performance. There are a few interventions that can make examination outcomes more beneficial to examinees. One such intervention is to split an examination paper into two papers written in different sittings. In addition, if the split results in more time being allocated, that could raise issues in respect of fairness.

This article considers Business Studies examinations administered in 2020. To lead a clear discussion, it is necessary to briefly discuss how the two examinations were structured in 2020, in comparison with previous years.

The design of the examination

Prior to 2020, the DBE's Business Studies examination allowed examinees three hours during which to acquire 300 marks in one examination session. Since 2020, one examination paper was demerged to form two papers of 150 marks each. The four Business Studies disciplines, viz. Business Environments, Business Operations, Business Ventures and Business Roles, which were previously examined in one sitting, have now been distributed across the two papers.



Paper 1 is now based on Business Environments and Business Operations while Paper 2 focuses on Business Ventures and Business Roles. Each paper is written over two hours and is written on different days. These changes imply that examinees have four hours – one additional hour – to engage with the examination content.

Data and methods

In an attempt to provide evidence for the above argument, an analysis of performance trends was conducted on the NSC performance data. The DBE's 2018 and 2020 diagnostic reports and technical reports were the sources of the data. Specifically, a comparison of examinee results in

Business Studies over two periods was done: the 2015–2019 data was compared to the 2020 data (pre- and during COVID-19). The analysis is based on five indicators: candidature, failure and pass rates, distinction rate and mean scores. These indicators, which are considered appropriate for the purposes of this article, provide guidance on measuring shifts in performance over time.

Results and discussion

The information in Table 1 compares shifts in performance in terms of failure rates, proportion of passes at 30% and 40%, distinction rates and average marks (mean) between 2015 and 2020.

Table 1: Comparison of Business Studies results, 2015–2020

	Learners	% Failures	Pass % at 30%+	Pass % at 40%+	Pass % at 80%+	Mean
2015	247 800	24,3%	75,7%	51,4%	2,3%	32,88%
2016	234 085	26,3%	73,7%	49,5%	2,2%	33,07%
2017	204 997	32%	68,0%	42,7%	1,2%	36,03%
2018	192 248	35,1%	64,9%	40,1%	1,4%	34,99%
2019	186 838	29,0%	71,0%	46,2%	1,5%	40,72%
2020	206 783	22,2%	77,9%	57,0%	3,9%	47,03%
Average	212 125	28,0%	72%	48%	2%	37%
Ave y/y chg	-8 203	-0,42%	0,44%	1,12%	0,32%	2,83%

There are several noteworthy shifts that occurred in 2020 relative to prior years. Firstly, while the candidature had been on a downward trajectory since 2015, that trend was reversed for the first time in 2020. The subject experienced a significant increase in candidature.

Secondly, in contrast to the widely accepted inverse relationship between an increase in student numbers and performance (Ramchander and Naude, 2018), there was a significant upward shift in the proportions of passes at 30% and above, 40% and above, the distinction rates as well as the average performance (mean).

Thirdly, whereas the average performance (mean) in the subject is 37%, that improved by 6,31 percentage points in 2020 from 40,72% in 2019. Similarly, the proportion of examinees obtaining 30% and above increased by 7 percentage points, while that of 40% passes shifted upwards by a whopping 11 percentage points.

Finally, an overall analysis of distinction rates in 10 high enrolment subjects shows that an upward shift was experienced in six subjects, including Business Studies, from 2019 to 2020. However, a noteworthy observation was that Business Studies was the only subject to record more than twice as much as the

2019 distinction rate. Thus, for the first time, in 2020 this indicator bridged the 3 percentage points mark. On average, the distinction rate hovers at around 2%. These are significant improvements in performance. To sum up, the 2020 examinees experienced the best performance ever over the six-year period.

Conclusion and recommendations

In general, when there are observed improvements in examinee performance it is sometimes claimed that that may be due to improved quality of teaching and learning, easier examinations or relaxed marking. The foregoing improvements were observed in spite of (a) the disruptions in teaching and learning owing to the COVID-19 outbreak and (b) Umalusi's 2021 quality assurance of assessment report indicating that the question paper and the accompanying marking guidelines were externally moderated to ensure that the standards for the examinations were upheld; and that the examinations were conducted in a credible manner.

On that basis, the article concludes that the unbundled Business Studies examination and the resultant additional hour had a positive effect on examinees' performance. This is something that the DBE acknowledges: "The split papers provide ... distribution of content over two days: The decision to write the two papers on different days enables



candidates to focus their last-minute preparations for each day on only 50% of the curriculum" (DBE, 2021: X).

Although this article has determined that student performance improved significantly in 2020 because content was stretched over two days with an additional hour given, the article encourages further research that can lead to confirmation or refutation of the conclusions reached. One way to achieve that could be by conducting a similar analysis in relation to subjects which experienced similar changes. Alternatively, one could analyse performance trends in a subject where the reverse occurred (where two papers were merged into a single paper).

References

Department of Basic Education. 2018. *National Senior Certificate 2018 National Diagnostic Report on Learner Performance*. Pretoria: DBE.

Department of Basic Education. 2021. *National Senior Certificate 2020 National Diagnostic Report on Learner Performance*. Pretoria: DBE.

Ramchander, M., and Naude, M.J. 2018. *The relationship between increasing enrolment and student academic achievement in higher education*. *Africa Education Review*, 15(4): 135-151.

Umalusi. 2020. *Quality Assurance of the November 2020 National Senior Certificate Examination of the Department of Basic Education (DBE)*. Umalusi: Pretoria.



Exploring the use of Machine Learning for predicting learner performance for academic years interrupted by natural disasters

By Matome Sebola



The novel coronavirus 2019 spread like wildfire across the globe. By the end of March 2020, more than 200 countries (OECD, 2020) had instituted total lockdowns to regulate citizen movement and attempt to avert a catastrophic disaster wrought by the new, deadly virus for which there was no remedy. For countries that commence an academic year from September to June, the closures meant they could not complete the summative assessments in the form of exit-level examinations. The secondary school-leaving examinations are used for the allocation of educational opportunities in institutions of higher learning and further education. As such, the consequences and stakes associated with performance in such examinations are high.

How different countries reacted to the COVID-19 disruptions.

The response to challenges brought by COVID-19 to the schooling system differed across social clusters. Students from privileged backgrounds, supported by their parents and eager and able to learn, could find their way past closed school doors to alternative learning opportunities. Those from disadvantaged backgrounds often remained shut out when their schools shut down. In Africa, some countries, like Kenya, decided on a total cancellation of the academic year, while most decided to delay the restart of the academic year and adjusted the curriculum for a shorter year. For systems due to complete the academic year with only the high-stakes examination still to be written, an alternative assessment, such as teacher judgements, was implemented, e.g., Ireland. The schools in the United Kingdom made use of a statistical algorithm to determine student performance, based on the historical data of student, school and district or region. The results of the two approaches were widely criticised and not accepted by the public and students. In the United Kingdom, Northern Ireland and Wales politicians had to intervene following public demonstrations (BBC, 13 August 2020).

South African context

The COVID-19 pandemic erupted in South Africa at the beginning of 2020, leading to a total lockdown on 27 March 2020. The public schooling system was

at the end of the first quarter, which meant about 25% of the curriculum coverage and assessment tasks had been completed at the time. The school's system had to return to complete the academic year, which eventually happened in July, almost three months after the initial lockdown. The summative assessment approach in the South African schooling system for an all-important, secondary school-leaving certificate, commonly referred to as matric, consists of 75% written work and 25% school-based assessment (SBA). For a learner to receive the complete result, both components had to be made available, using statistical moderation. This calibrates the marks of an assessment based on a statistical relationship with another assessment. Its validity depends on the two assessments having a strong relationship in both assessment content and candidate performance; however, these need not measure precisely the same construct.

The question is, if the pandemic had occurred in the third semester, when the SBA component would have been completed and a decision taken to use alternative assessment to cater for the written work, which possible approach would have been suitable to our context? The SBA component is often inflated by teachers and, as such, its use can affect the reliability of the assessment. Claims have also been made that it can affect public confidence and impact the credibility of the certificate (Poliah, 2009). As a result, the teacher-judgement approach would have experienced much criticism and rejection by



learners and the public. Statistical moderation relies on both the written examination and SBA being available.

This article explores the possibility of using Machine Learning as an alternative to predicting student performance in academic years disrupted by natural disasters.

What is Machine Learning?

Machine Learning is a set of techniques that gives computers the ability to learn without the intervention of human programming. The techniques are supported in a wide range of applications in fields like medical, finance, sport, robotics and predictive analysis. This article is particularly focused on exploring predictive analysis techniques, where Machine Learning could be used to implement complex models to generate learner grades.

Machine Learning models .

In an attempt to provide evidence for the above argument, an analysis of performance trends The Machine Learning framework entails capturing and maintaining a rich set of information and transforming it into a structural knowledge base for different uses in various fields. A brief overview of possible Machine Learning models is provided, which could be used to implement an alternative assessment.'

Decision trees

Decision trees are a popular model used in many topics, such as operations research, strategic planning, and Machine Learning. Each square above is called a node, and the more nodes you have, the more accurate your decision tree will be generally. The last nodes of the decision tree, where a decision is made, are called the leaves of the tree.

Artificial neural networks

A neural network is essentially a network of mathematical equations. It takes one or more input variables and by going through a network of equations, results in one or more output variables.

Logistic regression

Logistic regression is like linear regression but is used to model the probability of a finite number of

outcomes, typically two. There are several reasons why logistic regression is used over linear regression when modelling probabilities of outcomes.

Random forest

Random forests are an ensemble learning technique that builds off decision trees. Random forests involve creating multiple decision trees using bootstrapped datasets of the original data and randomly selecting a subset of variables at each step of the decision tree. The model then selects the mode of all of the predictions of each decision tree.

Conclusion

The education sector and especially Umalusi, as quality assurer, should investigate, through research, possible algorithms defined within the Machine Learning area as a form of alternative assessment. Machine Learning could also be used to predict learner performance, which can enhance pedagogical approaches and redirect focus to learners that require more assistance; or offer support to high performing candidates.

References

The impact of COVID-19 on education, Insights for Education at a Glance, 2020 OECD.

All Machine Learning Models Explained in 6 Minutes | by Terence Shin | Towards Data Science accessed 01 September 2021.

Poliah, R.R., The management of the Quality Assurance of School Based Assessment at national level in South Africa, 2009. University of Johannesburg. South Africa.

Agrawal, H. & Mawani, H. Student performances prediction using Machine Learning with machine learning, 2015. International Journal of Engineering Research & Technology (IJERT).

Pojon, M. Using Machine Learning to predict student performances, 2017, University of Tampere, Faculty of Natural Sciences, Finland.

Sean Coughlan, Katherine Sellgren and Judith Burns, A-Level: Anger over 'unfair ' results this year, BBC News, 13 August 2020



Remote teaching and learning during COVID-19: a call to rethink educational approaches

By Tsholofelo Madise



This article discusses the educational challenges highlighted by COVID-19 and poses some questions to spark discussions and investigations for a holistic education, post COVID-19.

In response to drastic lockdown regulations, that is, closure of schools, social distancing and prohibition of public gatherings, the education system endorsed remote teaching and learning as the main alternative to the disrupted traditional classroom learning (Dube, 2020). Schools nationwide resorted to different kinds of remote teaching and learning, such as Zoom classes, activities and assignments sent through WhatsApp, SMSs, and email for learners to work on with the assistance of parents and guardians. While these were, and seem only, innovative emergency alternatives, they excluded most learners, specifically those in rural areas and from lower economic backgrounds.

South Africa is rife with inequalities. At the dawn of democracy, education was meant to be one of the tools to eradicate inequality. However, the pandemic has, sadly, highlighted the country's growing inequalities in the education system. Despite many government interventions, many learners from poorer economic backgrounds and in rural areas were unable to access remote teaching and learning (Dube, 2020). This was mainly due to lack of electronic gadgets, poor network coverage and lack of electricity. The alternatives excluded these learners, further widening the inequality gap. Moreover, these alternatives required that parents and guardians act as 'teachers' to administer and oversee the teaching and learning as an emergency measure to mitigate against learning losses in the face of uncertainty. This also presented challenges; that is, parents who do not have the skills to teach. This is supported by the system's cry for parents' participation in their children's classroom activities and the psycho-social elements: home schooling is a foreign aspect to the majority.

With that said, is it clear that the pre-COVID-19 education system and the learner's home and socialisation had two different realities. The classroom space was the centre of education. Now, with emergency education, this became problematic for parents and guardians ill-equipped to support learners. For learners, the required support is based not only on the set-up of the system, but also, and mainly, on inaccessibility of the curricula to the parents. A consciousness must be created among both children and adults so that they can be encouraged and enabled to think positively and actively participate as social agents. For this to be realised it must be accessible to all.

With socio-economic problems becoming more diverse and complex, this calls for the education system to consider and develop other systems of knowledge to deal with emerging and persistent challenges. There is a clear need for an inclusive educational approach that caters for the lived realities of all citizens. This article views these challenges as an opportunity to rethink the current Eurocentric educational approach and incorporate alternatives. Given the contextual realities and diversity of the country, this article suggests that psycho-social, cultural and cognitive justice elements be considered in the traditional teaching and learning space.

Another alternative that embeds the above is Ubuntu philosophy. Ubuntu has a vast potential to be a cornerstone to narrow down the inequality gap. Firstly, it allows the system to view school holistically, as part of the community. Moreover, Ubuntu is mainly humanistic: it knows no colour, nor race, nor economic status. Some of the arguments leading to the reopening of schools positioned schools as a



safe space for learners. It also provides nutrition for children who are in poorer economic conditions. The school doesn't only provide the space for education but also counteracts the defects of the home space. This, together with the challenges of remote learning mentioned above, suggest that the home is not a space for education.

This article suggests that whatever the school gets right in terms of safety and positive social participation is transferred into the home; just as learning and socialisation are not only confined to the school. The school is just one space of what makes up a community. This is necessary so that we have a holistic, sustainable, functioning environment for the 21st century learner.

Similarly, the National Development Plan (NDP) 2030 prioritises the schooling system (Chapter 15) in fostering constitutional values using schools and the school curriculum. The NDP states that schools have an important role to play in building social cohesion, particularly given near-universal school enrolment; and that schools can foster common values across language, culture, religion, race, class and space.

Along with recommendations for further research, this article poses the following questions:

- What is the ideal positioning of school and home, post emergency teaching and learning strategies?
- How can we merge home and school as spaces of education, respectively?
- What elements of Ubuntu philosophy are missing from the school system?

- How do we reconceive Ubuntu in the space where it looks impractical (from societal data that we have)?
- How do we reproduce home in the school environment while we view home to be defective?
- How do we make sure that schools do not only absorb the defects of a community; but resolve to feed positivity into the community, such that the home also feeds positively into the school?

The article concludes by suggesting further investigations in answering the questions above. Moreover, it is time for the South African education system to rigorously transform its approach to offering space for other ways of teaching and learning. The post-COVID-19 education system must be equipped with alternatives to cater for all learners. These must take into consideration the psycho-social, cultural and cognitive justice elements through Ubuntu philosophy and across all areas of the country, from rural to urban.

References

Dube, B., 2020. *Rural Online Learning in the Context of COVID-19 in South Africa: Evoking an Inclusive Education Approach*. *Multidisciplinary Journal of Educational Research*, 10(2), 135-157.

National Development Plan 2030: Our Future – make it work, 2012. The Presidency: National Planning Commission. Republic of South Africa.

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