MOT student success -

A comparative case study

RESEARCH REPORT

Institute for Post School Studies

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EXECUTIVE SUMMARY OF RESEARCH REPORT

This research report outlines an empirical study undertaken to determine whether the MOT (which means 'Have Courage') programme delivered in TVET colleges for a number of years to date, has had any impact on college students' performance. MOT in South Africa has annually trained college facilitators who have delivered the programme to thousands of college students across college campuses particularly in the Western Cape, often with the assistance of donor funding to sustain the programme.

The analysis of student evaluations upon completion of their MOT sessions has pointed to the positive impact of MOT in terms of behavioural changes that have enabled students to persist with their studies. Given this indication of potentially positive outcomes for students involved in the MOT programme, the organisation sought to obtain a more systematic and research-based picture of the relationship between MOT and student performance, which is the topic of this report.

The methodology adopted was one of a comparative quantitative approach that would compare MOT students' performance with that of non-MOT students, across the same TVET college programmes. Public colleges that have historically offered the MOT programme were approached for performance statistics in selected programmes, for MOT and non-MOT students. Data was also requested from the MOT organisation itself, but this data could only identify students who had completed MOT, rather than provide performance data for MOT and non-MOT students, which was held by the colleges. Significant challenges were experienced with data collection, exacerbated too by the recently enacted POPI Act that resulted inter alia in hesitancy on the part of colleges to release any student related data. After some delay, data was received from four colleges, but there were difficulties with disaggregating the MOT and non-MOT students' data, which confounded a comparative analysis. Only one large college was able to provide the comparative statistics in a large enough dataset i.e. 4363 records for 641 students, to enable comparative analysis to be conducted, and the results of this analysis have formed the basis of this report.

Three questions were asked of the dataset for MOT and non-MOT students, namely: To what extent are MOT students more or less likely to pass examinations?; To what extent do MOT students score higher or lower on examinations?; and, To what extent are MOT students more or less likely to complete their programme of study? The answers to these questions would ultimately lead us to answer the main research question which was: 'How did TVET college students who participated in the MOT programme perform in their examinations, in comparison with non-MOT students?'

Using a variety of cross-tabulation strategies and statistical tests for equivalence, the results of the analysis showed that:

- MOT students passed 81% of their subject exams, whereas non-MOT students passed 63%, a difference of 18%. From the result it was apparent that MOT students performed better.
- There was a substantial gap of one letter grade between the MOT students' performance and that of the non-MOT students, albeit that this conclusion was complicated by the high level of absenteeism amongst both MOT and non-MOT students.
- The completion rate of MOT students in the sample was considerably higher than that of non-MOT students. There was thus a substantial and significant difference between the level completion of MOT students and non-MOT students in the sample.

As with all research there are limitations, but this study offers a foundation for further and more fine-grained exploration to be undertaken. In the final analysis, the evidence garnered for this study suggests that students who participated in MOT indeed performed significantly and substantially better overall than their non-MOT counterparts studying the same TVET programme.

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INTRODUCTION AND BACKGROUND

This research was undertaken by the Institute for Post School Studies (IPSS) of the University of the Western Cape, in terms of a study requested by MOT. The project sought to evaluate the impact of the MOT programme on TVET college students, particularly with regard to academic performance.

Whilst the MOT programme was not specifically designed to have an academic impact, one of the areas of potential impact identified from previous student feedback on MOT, had been anecdotal evidence of a positive influence of MOT on student outcomes. This study therefore focused on comparing MOT and non-MOT TVET college students' results in an attempt to empirically ascertain the impact of the programme on academic success.

Background to the study

With the introduction of new programmes and increased fiscal funding to the TVET college sector, student numbers have increased markedly since the advent of democracy. The student profile has also shifted as TVET provision began targeting younger, pre-employed students, typically from more deprived backgrounds, who were able to secure NSFAS bursaries after 2007. The shift to pre-employed students post-apartheid marked a significant shift in the profile of TVET students, TVET college purpose, and mode of programme delivery.

Whilst participation in TVET improved significantly, there have been some concerns about students' graduation rates. More recently there has been greater emphasis on reporting student pass rates in addition to student participation. Academic success rates are important for the life courses of students. The issue of academic success also has relevance to the sustainability of the TVET college sector, and for industry employers who are the beneficiaries of skills supplied by colleges in the formation of skilled workforces.

TVET college students, particularly those with incomplete schooling and those out of school for periods of time, require ongoing support in their personal and academic capacities. The DHET Student Support Annual Plan 2020 advocates that:

> Personal support aims to minimise barriers to academic success by empowering the student either through individual or group activities that promote positive coping skills to life's challenges, encourage individual student responsibility, promote self-leadership before one can lead others and positive healthy lifestyle (Department of Higher Education and Training 2017, p. 18).

As success is increasingly being recognised as an essential outcome of participation, there is a need for student performance to be researched in order to understand which students are performing well, under which circumstances, and how performance of TVET students can be enhanced.

With the growth of management information systems, the possibilities for tracking the academic performance of large numbers of students in fine-grained analyses have improved. Whereas previously the dearth of data on the TVET sector had been lamented, there have been incremental improvements to the quality and quantity of data gathered in national administrative systems. For more fine-grained analyses of under-researched groupings however, it is still necessary to undertake primary data collection and obtain the data at its source, an exercise which is often fraught with obstacles. The availability of such data enables tracking academic success and an investigation of the 'student walk' ((Subotzky and Prinsloo 2011) of select populations such as the MOT programme for instance, in relation to a larger population.

Once there is more fine grained data available, it would be possible not only to track students' overall performance as categorical variables (those who registered, wrote, passed), but also to conduct research into the quality of these passes (eg letter scores), and the distribution of these passes by level and

subject using scalar variables (for example, percentages). Given sufficient information, longitudindal studies such as cohort studies and event histories also become viable.

Conducting secondary analyses

Secondary data analysis is one of the more practical and reliable methods for gathering data on student academic performance. Firstly, advancements in information processing technology and its increased availability has made statistical analysis more attractive and accessible.

Over time, the number of indicators has grown. Whilst indicator-led approaches have their drawbacks and pitfalls (Ozga 2009), their use has become increasingly widespread, with benefits for both administration and research. As data has grown increasingly sophisticated, indicators have been proposed. Initially, in the early DOE reports, subject pass rates were provided. Later there was increasing concern with dropouts and the department introduced the 'registered, wrote, passed' triad, bringing it closer to the industry definition of throughput as units produced in a period. Cohort survival rates (Bunting 2004) were introduced in the higher education sector to measure students to consider student completion from initial registration, which may be similar to 'completion rate' studies in Australia (National Centre for Vocational Education Research 2019).

More recently minimum time to completion (MTC) and time to completion (TTC) using 3- and 5-year charts have been mooted by United Nations Educational Scientific and Cultural Organization and UNESCO Institute for Statistics (2018). A few reconstructed cohort studies have been published in South Africa (DNA Economics 2015), and used by the National Treasury, however, it was not until recently that the DHET has published a 'true cohort' study (Khuluvhe and Mathibe 2021). Part of the difficulty has been disentangling programme and level completion rates from subject results, though the DHET has been doing this with increasing effectiveness and publishing the results every year, two years retrospectively.

In recent years, quality data sets have become increasingly available within South African TVET, and provide avenues for analysing larger and more comprehensive datasets. The DHET has been particularly proactive in this regard and has to date linked the enrolment and examination databases. In administrative datasets the samples are more reliably representative, and the scale of data enables accessing under-researched groups and patterns within the data. The barriers to samples are less prohibitive and enables a greater focus on data analysis.

While secondary data analysis is limited to the assumptions and data fields of the original dataset, as well as requiring an understanding of the assumptions and idiosyncrasies of the original dataset; secondary data analysis provides access to more robust and complete samples of the population, offering significant scoping considerations for further research as well as providing insights inog otherwise under sampled groups. Access to these datasets however remains a challenge, complicated by differing understandings of the Protection of Private Information (POPI) Act.

TVET Data Challenges

The challenge with TVET data is that student participation is not linear. On the one hand, students enter and exit the programme on a flexible basis. This makes reconstructed cohorts unreliable since it has to disaggregate failures and dropouts, while at the time allowing for transfers from other sectors into the system (i.e. second or third learning cycle registrations), and it appears that individual level data is required to trace student flows.

On the other hand, stringent requirements for promotion prevent students from proceeding even though they receive high average results. Unlike higher education, for instance, students are typically required to pass each subject before being permitted to proceed. Student pass rates thus provides a limited basis for evaluating level progression or completion and needs to be separately measured. This had presented difficulties for management information systems

in calculating certification on a mass scale, though it seems that the resulting backlog in certification is approaching resolution through sustained discussion between the DHET and SITA (the state information systems service).

Compared with higher education, TVET indicators are more complicated, and the accompanying IT infrastructure may be less well-resourced and developed, though from the meetings conducted with the respective colleges, colleges appear to have made strides in the direction of MIS development. For ease of use, this study employed a simpler system for calculating completion rates which will be elaborated later herein.

Research questions for this study

In seeking to do the research that would assist MOT, a set of research questions were posed.

The main research question for the study asked:
> How did TVET college students who participated in the MOT programme perform in their examinations, in comparison with non-MOT students?

Sub-questions arising from the main question, and anticipated to be answered from the data to be obtained were:

1. To what extent are MOT students more or less likely to pass examinations?
2. To what extent do MOT students score higher or lower on examinations?
3. To what extent are MOT students more or less likely to complete their programme of study?

Research Design and Methodology

Scope of the study

Public TVET colleges offer a range of vocational and occupational programmes. National officially funded programmes are the year-long, full-time National Certificates Vocational (NCV), and trimester or semester NATED programmes. In the period under review, each of these levels were certificated individually. The NCV and NATED programmes however have different pass marks and progression requirements.

The research was intended to cover all public TVET colleges in the Western Cape where the MOT programme had been delivered over a number of years.

Targeted Sample

The population for this study was TVET students enrolled for NATED and NCV programmes, that included MOT and non-MOT students. The unit of analysis for the study was the individual result obtained per student, per subject, at each level of their studies. Students within the study would typically have enrolled for more than one subject per level, and in many cases, students would have enrolled for many levels as well. Thus, several subject results (as the unit of analysis) exist per student. Students who were absent, failed or passed were included in the sample.

The sampling frame for the study was the TVET management information systems located at the colleges involved in the MOT programme. Colleges maintain their own databases (management information systems) of student results, primarily for administrative and managerial purposes. These management information systems have increasingly been used to report student progress to the national DHET, and are captured on the national TVETMIS system. A comprehensive sample (census) was taken from the sampling frame consisting of all students within the identified population.

Colleges identified programmes which involved MOT students and the time frames within which these students attended the college. The student results for these identified programmes were selected for inclusion within the sample.

In consultation with MOT staff and Management Information Systems (MIS) staff at the colleges, results were provided for students in the following programmes for the period 2018-2020.

- Business Management N4 - N6
- Educare N4 - N6
- Financial Management N4 - N6
- Management Assistant N4 - N6
- Public Management N4 - N6
- Electrical Infrastructure Construction NCV2 - NCV4 2016 -2018
- Office Administration NCV2 - NCV4 2016 -2018
- Primary Health NCV2 - NCV4 2016 -2018
- Safety In Society NCV2 - NCV4 2016 -2018

Students who participated in the MOT programme were identified and were coded as MOT students within the final dataset. All MOT students were coded in the sample as a simple dichotomous variable, and no differentiation was made with regard to the duration or quality of student participation on the MOT programme. Non-MOT students, by default, were those students in the same programmes as MOT students, attending college over the same time-period.
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Data Gathering

Ethical clearance had been sought from the university as part of the broader proposal. Permission was obtained from college principals using the standard DHET permission form. During the period of the study, POPI legislation and the DHET guidelines for research were enacted. The initial ethical statement had already stipulated however that the results would be anonymised, and data housed securely.

Meetings were held with college staff to obtain the data. It became clear from initial meetings with MOT staff at the colleges that MIS staff needed to be involved. Proposals were made to colleges as to the programmes and dates to be included based on initial work done by MOT to identify MOT students. However, due to college logistics, colleges proposed lists of programmes. A data template was provided to colleges and the requirements of this template discussed with the college MOT staff and the MIS representative for the provision of data. MOT lists were provided by MOT staff at colleges and MIS staff provided examination records for all students involved in those programmes on the MOT.

The complexities of college student data should be noted. Firstly, college staff indicated that MOT students did not necessarily participate in all MOT sessions. It was however agreed that any student participating in MOT would be included so that there was uniform practice across the different college datasets. Secondly, pilot exercises with the data during the data collection meetings emphasised that students lived the complex lives and 'student walks' (Subotzky and Prinsloo 2011) that students navigate through post school study, where students' trajectories do not necessarily coincide with policy trajectories.

Four of the six public TVET colleges in the Western Cape offered the MOT programme at the time of this research. Of the four colleges, three colleges provided data. 23218 records from 2802 students were gathered for this report. However, only the data from one of the colleges was able to be used for this study, since the other colleges had not distinguished between MOT and non-MOT students in their programmes data, and there could thus be no basis for comparison, which was a critical feature of this research.

Only one college therefore provided disaggregated data for both MOT and non-MOT students, which resulted in **4363 records for 641** students. This data was accepted as constituting an adequate sample for the study, since the sample was drawn from students who were in the same programme of study. In addition, the size of this sample, albeit from one college, was the size of the total sample that had been anticipated to be obtained across colleges, in the

initial research proposal. The college providing the records for 641 students was thus a case study of the larger population of MOT and non-MOT students.

The results obtained for other programmes from other colleges were analysed, but could not be included in this study since there was no non-MOT population with which to compare results, and that data would then have contaminated the case study data. The preliminary analysis of that data however, suggests that the results followed a similar pattern to those identified for the MOT students in the case that is described in this report.

Constructing the dataset for this research

Colleges were asked to indicate MOT and non-MOT students. Since these results were not readily available on the MIS, separate lists were compiled and linked via query with a common identifier field (student number) to the master table provided by the MIS. Student lists were compiled from the examination lists using a crosstab query in MS Access, which then formed the basis for a student table linked to the master table. Equality of variances between the resulting two lists were tested using Levene's test in SPSS.

Student results were visually inspected. Results were later checked during the analysis using distinct counts to test for the independence of the data. Initially it had been assumed that MOT students could only be dichotomously classified as MOT or non-MOT, but analysis found 4 students who had been classified as both, which had to be corrected by visual inspection, and then analysis and tests rerun. As mentioned earlier, students had different levels of engagement in the MOT, and as such MOT participation is not entirely a dichotomous variable. Visual inspection also showed that all groups were larger than 25, and therefore met normality assumptions.

For the purposes of this research report, only the data from NATED programmes were used, as these were the programmes that offered MOT in the college from which comparative data could be obtained. The resulting

master table was tested for assumptions of homogeneity, independence and normality, enabling parametric tests assuming equality of variance.

Research population

As indicated above, the unit of analysis was individual subject examination results. The table below shows the number of examinations that were written per subject. Note that these have not been disaggregated by level and reflects the total number of examinations for which students were registered. Sample sizes were above 25, so normality was assumed. Equal variances were assumed following a Levene test for equality of variance $F_{(4627)} = 158.96$ ($p < 0.001$).

The table below shows the size of the comparison groups. In total 641 individual students were included, 309 MOT and 336 non-MOT students spread across five TVET college NATED programmes.

Programme	MOT	Non-MOT	Total
BUSINESS MANAGEMENT	86	124	209
EDUCARE	64	54	118
FINANCIAL MANAGEMENT	43	42	84
MANAGEMENT ASSISTANT	41	49	90
PUBLIC MANAGEMENT	75	67	140
Total	309	336	641

Research instrument

A template data spreadsheet matrix was distributed to colleges requesting individualised records and meetings were held with college MOT and MIS staff to discuss and clarify the format and the available data.

Student numbers were used as the unique identifier. Colleges were requested to provide a separate record (row) for each examination subject written. Thus one student would have several rows of records.

The following fields (columns) were requested. Student number (as identifier), subject written, and level and programme to which that subject belonged, the final mark obtained for that examination for that subject, and whether the student passed or failed.

The college used for analysis in this study provided the information for students in a different, pre-analysed format. These results then had to be 'reverse engineered' to fit the template by 'unpivoting' the data with MS Excel to make the analysis more flexible.

Analysis Procedure

An initial research framework had been discussed with MOT and DGMT. The intention had been that students should come from the same or similar programmes so as to establish a valid basis for comparison. Initially, equal numbers of students would be chosen from each programme. This however would require a further sampling methodology, and statistical tests for equivalence (Levene's test in this case) were used instead to establish equivalence between the MOT and non-MOT population used.

Data Analysis

For this study, three dependent variables were used. To evaluate the first research objective as to whether there was a difference in student pass rates, the 'count' variable served as categorical variable to count the number of subjects that were written.

To evaluate the second research objective as to whether MOT students performed better or worse than non-MOT students, the raw mark was used as a scalar variable in order to establish there was a difference in average scores. The third research objective on differences in completion rates between MOT and non-MOT students, was calculated using 'distinct counts' of students which counted the number of students meeting a particular condition, rather than the subjects. This variable avoids duplicate counts of students when counting subjects, requires further development in the statistical space and uses logical rather than statistical inference. However, distinct counts can be used to count the number of students in a category, and how many of that number meet a particular condition (thereby enabling a percentage calculation).

The main independent variable for this study was students' MOT status. In this case this was expressed as a dichotomous categorical variable. However, as was pointed out in meetings with colleges, student attendance at MOT varied. This varying attendance was not factored into this research, as this data could not be reliably collected, and is thus a limitation of the study.

Data management and analysis was performed using MS Access, MS PowerPivot (an MS Excel add-in) and SPSS 28 (2022). Data was received in MS Excel format. MS Access was used to capture and to combine the data using append queries as there were typically small differences in the arrangement of data received. Data was also coded in MS Access in order to 'normalise' data (in the database sense of the word), so as to promote consistency across categories. Coded sheets enabled elaboration of the data and a Master Table was created in MS Access. Numerical values were associated with enrolment/examination cycles and with levels. This was done to assist with cohort studies calculations using Glenn's (2005) Age = Period - Cohort formulation for cohort studies. Cross tabulations were conducted to arrive at coding sheets for each of the categorical fields, which enabled further coding of these categorical fields (notably subjects, students and enrolment cycles). Calculated fields were programmed for students' first registration, and number of enrolments using cross tabulates). The coding sheets were copied

and linked back to the master table. Eventually a Master Query was created which could be imported into PowerPivot and SPSS 28. This data was imported to MS Power Pivot so as that it could manage the volume of data that was transferred. Data was imported into SPSS 28 from MS Access and was auto - recoded for analysis.

Limitations

There are certain limitations to this study. As mentioned earlier, the study did not differentiate between MOT students who attended the whole MOT programme, and those who attended only some sessions. The study is also limited to one college, due to near universal MOT enrolment on particular programmes at other colleges, or data for MOT and non-MOT students not being disaggregated. Thus, there may be other college specific factors that may have contributed to the obtained results, which could be the brief of further research. There is also a standard rider to statistical studies which states that 'correlation is not causation'.

This study has not disaggregated cohort, subject, student, or level effects. The study has also grouped failures and absenteeism in the 'did not pass' category as it did not want to overload the analysis. Current theory on student engagement however, distinguishes between different types of student departure as 'drop-out' or 'stop-out' where students leave for both academic or non-academic reasons (for example academically successful students also depart programmes) (Tinto 2017).

The study is also confined largely to a period in time. It is also outside the scope of this study to report on how students navigated the system (although some interesting vignettes arose when testing the data with college staff), thus analysing the 'student walk' or engaging in 'learning analytics' (Prinsloo et al. 2018) falls outside the scope of this analysis. The study is limited to whether MOT students overall passed more subjects, obtained higher marks, or were more likely to complete their programmes, in comparison with non-MOT students.

PRESENTATION OF FINDINGS

The previous section discussed the methodology for collecting and analysing the data. This section presents the data according to the three research objectives of differences in pass rate, average performance, and completion rates between MOT and non-MOT students.

Research Objective 1: Differences in pass rate

This first research objective was to establish whether there were differences between MOT and non-MOT student passes. The study sampled 4636 exam results and evaluated whether exam results differed by MOT status. In order to assess difference, the total number of exams written by MOT and non-MOT students were taken, and the percentage of passes in each case was calculated. The results obtained from the preliminary analysis percentage of exams passed are compared in the figure below.

As shown in the Figure, MOT students passed 81% of their subject exams, whereas non-MOT students passed 63%, a difference of 18%. From the results it is apparent that MOT students performed better.
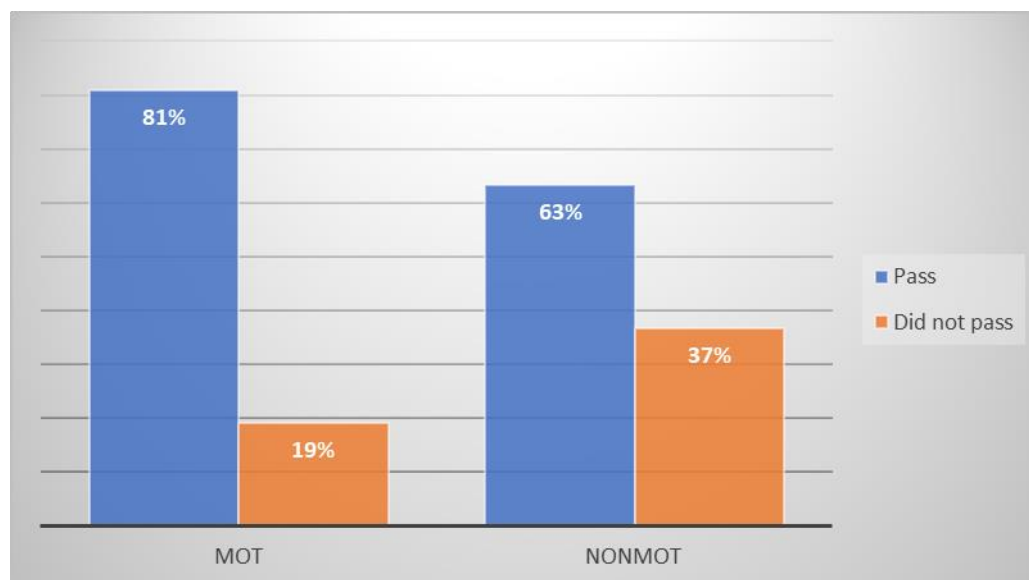
However, the existence of a difference is insufficient basis for estimating difference between two populations. In order to evaluate statistical significance. A chi-square test for association was conducted between MOT status and participants' exam results. All expected cell frequencies were greater than five.

There was a statistically significant association between MOT status and exam result, χ^2 (1)=173,372, p<0,001. As indicated earlier, Levene's test was conducted to establish equality of variance. In addition, a Cramer's V test was conducted to evaluate the strength of the association. There was a positive association between MOT status and exam result, albeit weak, φ= 0,193, p< 0,001. There was thus a weak, but statistically significant positive association between MOT and subject examination pass rates.

Thus, in terms of the first research objective of whether MOT students are more likely to pass their subjects than non -MOT students, this sample had an 18% difference, and the result was statistically significant, albeit that the positive association was weak.

Whilst MOT students seem to have performed considerably better overall, not all MOT students passed. Further study is required to assess the impact of failure on MOT students' ability to progress, in particular to evaluate how many individual students were affected. Incidentally, such a calculation was done, and 208 out of 309 (67%) individual MOT students did not pass a subject at some point during the period under study. This is as compared to 254 out of 332 (76%) for non-MOT students.

TVET studies are arranged such that students typically need to pass all their subjects to pass the level (the NATED programmes sometimes allow 3 out of 4 subjects passed for progression). Thus, if 67% of students were affected, it is likely that their progression to the next level had been affected somewhere along their 'student walk' (Subotzky and Prinsloo 2011). It may be interesting from a resilience point of view to examine student persistence (for example their willingness to repeat), and understanding how students cope with 'failure'. The issue of completion rates is calculated later.

Caution should be exercised in interpreting these outcomes however, since the measure used here shows the percentage of subjects passed only for those subjects for which students enrolled, it does not include those subjects for which students did not enroll (for example when they departed, or when they enrolled later). The study sampled 4636 examination results out of a possible 7692 (= 641*4) should all students have completed their full complement of subjects.

Notwithstanding the above, perhaps the most striking result of this section is the difference between 81% pass rate by MOT students and the 63% pass students by non - MOT students, and that this result is statistically significant. This suggests that MOT students in the sample are more likely to pass their subjects than non-MOT students.

Having established that MOT students in the sample are more likely to pass their subjects, the next section considers the difference in subject performance.

Research Objective 2: Difference in quality of passes

The previous section established that MOT students passed 81% of their subjects compared with the 63% of their non-MOT counterparts doing the same programmes, and that this result was statistically significant (i.e. not a fluke occurrence). However, there is a difference between passing and the quality of students' pass. This section attempts to answer the second research objective as to whether there was a difference in the overall marks between MOT and non-MOT students.

The second research objective was to establish whether there was a difference between MOT and non-MOT exam scores. As indicated earlier, the study sampled 4636 results. The figure below depicts a histogram of MOT and non-MOT results. There are several points of interest in this figure. Firstly, there are a number of distinctions in the sample. In fact, 74 out of the 328 N6 students (distinct count) had one or more result over 75%. This suggests some further work into pockets of excellence.

Secondly, at the other end of the spectrum was the high number of examinations from which student absented themselves. This has an influence on the results for this section, since the performance mean may be linked to the high level of absenteeism amongst non-MOT students (which is in itself perhaps indicative of a phenomenon worth investigating). Third, the distribution curve of the non-MOT programme is flatter (probably due to the high absenteeism rate, but the mean is also lower.
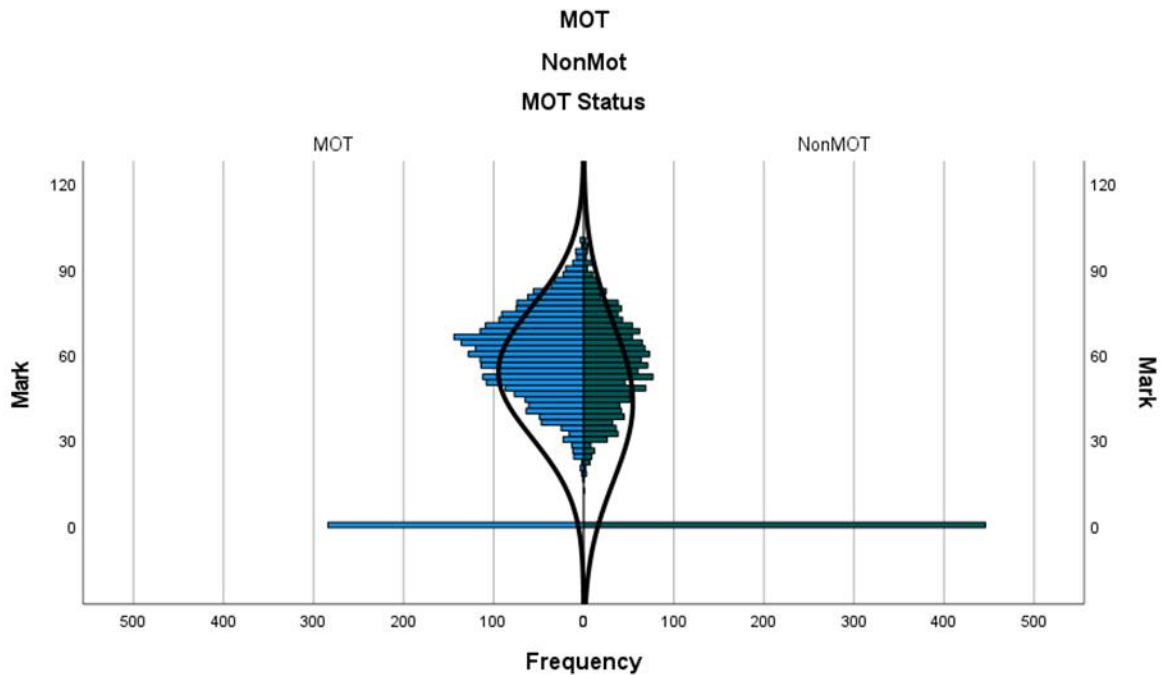
The average mark for MOT programme students was 54%, whereas the average mark for non-MOT students in the sample was 43%. This represents an 11% point difference (or a full grade difference) between the two means. The difference between the marks is provided in the figure below for emphasis. However, there are a few cautionary notes.

Both figures contain a high number of absentees, with the non-MOT group containing a higher percentage of absentees. Such absenteeism is not limited to a small number of individuals as a number, 306 students out of the 641 have missed one or more examination over the course of their programme (excluding subjects where they had dropped out). A number of students wrote some subjects and did not write others. This observation makes an assessment complex. Curbing absenteeism itself seems to be an issue within the TVET

college sector, so in that sense the difference in the results are valid, also students may have self-excluded.
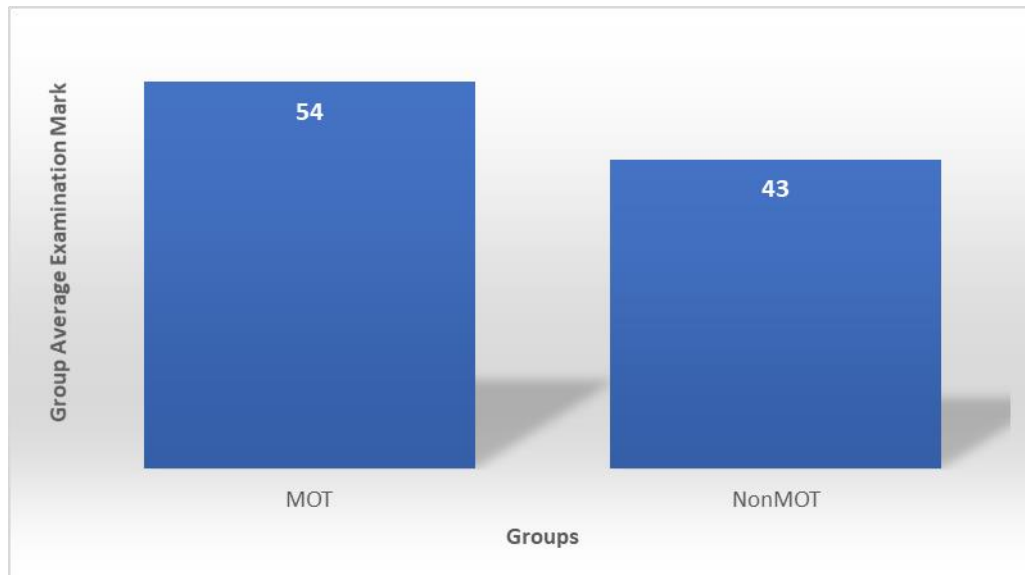
Is the difference real then? An independent means t-test was conducted to establish statistical significance of the difference. Sample sizes were above 25, so normality was assumed. Equal variances were assumed following a Levene test for equality of variance $F_{(4627)} = 158.96$ ($p < 0.001$). The difference was statistically highly significant and there was a modest effect size too, $t(3573) = 13.70$, $p < 0.001$, $d = 0.423$. The effect sizes varied by programme with Educare showing modest effect sizes, and the rest smaller effect sizes. However, once the absentees were excluded from the equation, effect sizes became small $d = 0.23$, though Management showed a large effect size of 0.78.

The second research objective was to establish whether MOT students did better at examinations than non-MOT students. *In terms of the evidence here, it was possible to conclude that there was a substantial gap of one letter grade between the MOT students' performance and that of the non-MOT students. However this conclusion was complicated by the high level of absenteeism amongst both MOT and non-MOT students.*

Taken at face value, the MOT programme participants scored a letter grade above their non-MOT counterparts. However both grades were relatively low. Having considered the difference in overall scores, the next section considers programme completion within the population.

Research Objective 3: Differences in Level Completion

The third research objective was to determine whether there was a difference in level completion between MOT and non-MOT students. As indicated earlier, there were 641 distinct students in the sample. In order to assess level completion, a number of variables make the assessment difficult, as is explained below.

TVET students enter and exit the TVET system flexibly, leaving early or entering late. Thus not all students do the full complement of subjects. The matter was approached by using the 'distinct count' function in order to determine the total number of students entering via the MOT route, regardless of when students entered or left the system. Secondly, a distinct count was done of students who had not passed all their N6 subjects, since students who had passed had not necessarily passed all their subjects. This system has a margin of error for students who repeated N6, and this had to be eliminated by visual inspection of the data. Students who had failed subjects were deemed not to have passed the N6 level, unless they had repeated. The table below represents the results of the calculation.

Group	Incomplete	Passed N6	Enrolled	Level completion
MOT	213	96	309	31%
Non-MOT	269	63	332	19%
Total	482	159	641	25%

Next, the figure below compares the level completion as per the extrapolated calculation given above. MOT students in the sample were found to have a 31% completion rate - that is, 31% of all MOT students who enrolled at any point would have completed their studies in the period under study. By contrast 19% of non-MOT students in the sample completed their - a 12% difference in the number of students completing their qualification.
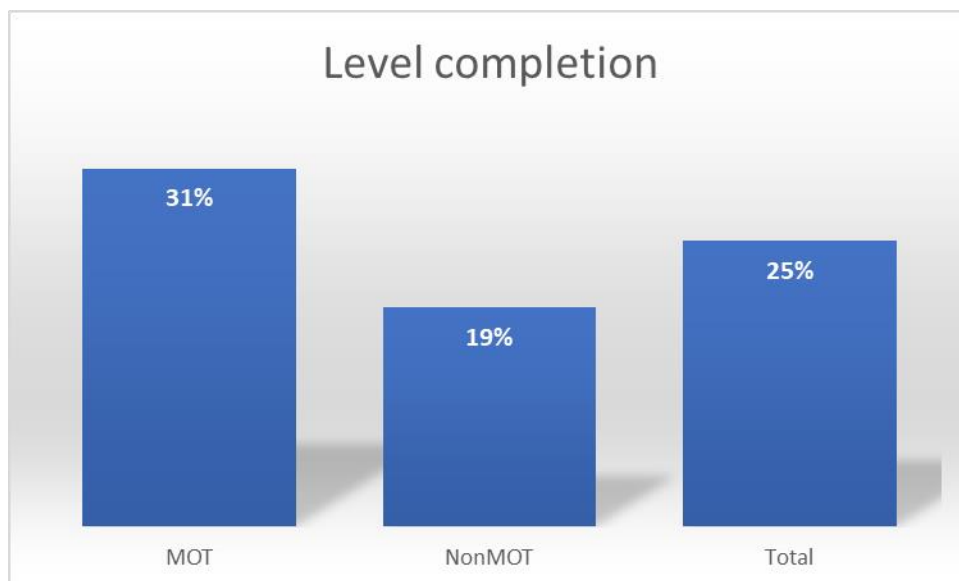
As indicated earlier, level completion rates are low for a number of reasons. These reasons include the strenuous TVET criteria for progression, as well as the diverse and divergent trajectories that TVET students' life trajectories take.

As shown in the figure above however, the completion rate of MOT students in the sample was considerably higher than that of non-MOT students. A chi-square test for association was conducted between completion and MOT participation. There was a statistically significant result, $\chi2(2) = 12.5$, at $p < .01$. There was thus a substantial and significant difference between the level completion of MOT students and non-MOT students in the sample.

CONCLUSION

This study set out to evaluate differences in student success between MOT and non-MOT students. This larger task was evaluated in terms of three research objectives: First, whether there was a difference between pass rates of the comparative groups; second, whether there was a difference in terms of marks; and third, if there was a difference in terms of completion rates.

The study found that in terms of all three objectives MOT students performed better, and that the results were statistically significant. In the first instance, MOT students had an 81% examination pass rate compared with 63% of non-MOT students in the sample. In the second instance, students performed on average one letter grade better than their non-MOT classmates (though this may be affected by the higher exam absenteeism of non-MOT students). In the third instance, 31% of MOT students completed their programmes, compared with 19% of non-MOT students.

Whilst the MOT programme has not solved the whole of the TVET college sector's student success problem, the evidence garnered for this study suggests that MOT students' indeed performed significantly and substantially better overall than their non-MOT counterparts studying the same TVET programme.

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