Assessing the Effects of Low Academic Performance from Secondary Education on the Professional Ability at the Tertiary Health Education; Correlational Case Study at Manyara Region

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ARTICLE INFORMATION	ABSTRACT
Article history: Published on 2nd Jan 2026 **Keywords:** Low Academic Performance Secondary Education Professional Ability	In various health training institutions in Tanzania, the failure to achieve a required level of pass among middle health programs is about 18% in continuous assessment tests (CATs) and end of semester examinations. This situation raises question to many academicians that "Do grades of academic performance from secondary education matter towards professional ability at tertiary health education? This study aimed to assess the effects of low academic performance from secondary education on the professional ability at the tertiary health education. A cross-sectional explorative design was employed whereby secondary data from both secondary and tertiary academic performance were retrospectively collected from three (3) health-training institutes at Manyara region. The sample size of 274 was drawn from an estimated total population of 1000 students. Of all enrolled students to the study, (46%) were those with D grades in science subjects from secondary education. Those with poor academic performance from secondary education have higher twice proportion of lower academic performance at tertiary education in all semesters and NTA levels. Similarly, those with good academic performance from secondary education had double higher proportion of good academic performance at tertiary education (66.4% Vs 33.6% p-value<0.001). On the impacts of low academic performance, those with poor academic performance from secondary education have higher twice percentages of supplementary, repeat modules and discontinued for both semesters of all NTA levels compare to their fellow counterparts of good academic performance. Students with D grades in science subjects from secondary education have high rate of failure in tertiary education. Those with good academic performance have double higher proportion of good academic performance at tertiary education. The authors recommend to the responsible selection authorities (NACTVET and MoH training sector) including other stakeholders to review and uplift the minimal admission requirement grades from D; the currently operating one to C so as to improve academic performance among health training institutes.

1. Introduction

1.1 Background

The core goal and expectation of student at any given learning environment is to achieve the required level of academic performance. This is also true for both educators and parents/guardians belonging to their particular students (Tadese et al, 2022). However, sometime this ambition comes unrealistic from their former expectation due to different factors that affect students' performance (Ombay, 2018).

According to the Bloom Taxonomy concepts, many formal educational systems have been made in the trend of chain that realizes a Bloom theory of knowledge acquisition. This theory recognizes knowledge as building blocks that regard the lower blocks as essential for the stability of the upper blocks. Elsewhere in the world, educational systems are synchronized in this nature; that learner must intellectually mature through a simple level of knowledge to a complex level (Armstrong, 2010, Lee, 2023).

According to Ministry of Education, Science and Technology (MEST) (2023), Education and Training Policy of 2014, the educational system in Tanzania is principally organized in hierarchical three orders; primary, secondary and tertiary. The existing structure of the formal education system is 7-4-2-3+, meaning that 7 is years of primary education, 4 years of secondary education at the Ordinary level, 2 years of secondary education at the Advanced level and 3+ means tertiary level, years of college and university education (Tilya, 2003, PO-RALG, 2017). However, there is other informal educational system including Pre-primary or kindergarten schools that accords with those children below 7 years (PO-RALG, 2017).

Moreover, after secondary education; whether ordinary or advance level, the successful students proceed either to join the colleges or Universities for professional training. Those students may either have acquired their performance at grading system of A, B, C, D and F or division I, II, III, IV or 0 from secondary education (MEST 2023). At this stair, many professional training institutions struggle to obtain the best-performed candidate from secondary school to be enrolled into their different programs. However, in many circumstances, the tertiary training institutions obtain uneven allotment of candidates with undesirable performance they wish despite the qualification they stipulated in their admission guideline. In this situation, many institutes enroll the candidates with varieties of grades; ranging from division I – IV into their different programs; depending the credits the program requires.

One among other roles of the National Council for Technical and Vocational Education and Training (NACTVET) is selecting and allocating the students to the training colleges and institutions that deliver tertiary technical and vocational education over the country through Central Admission System (CAS) (NACTVET, 2023). According to the NACTVET and MoH training sector guidelines, the minimum academic requirement for joining diploma in health programs is at least candidate having grade D in three (3) science subjects including biology, chemistry and physics (NACTVET, 2020).

In real situation, in many Technical and Vocational Training Institutes, a big number of candidates with grade Ds are easily accessible than those with higher performance who go the advance level or Universities.

1.2 Statement of Problem

The effects of low intellectual ability to achieve a required academic standard have been reported among number of candidates in tertiary education. In health training institutions for instead, this is even more sensitive as those candidates being expected professionals who deal with human life. In various tertiary health training institutions in Tanzania, the failure to achieve a required level of pass among all programs is about 18% in Continuous Assessment Tests (CATs) and End of Semester Examinations (ESE) (2022, Ombay, 2018). With other possible reasons for this low achievement, doubt about academic background from secondary education performance has been incorporated in mind of academicians. With all other various efforts done by the institutes to uplift the students' performance, the progress is steadily low. This study is aiming to investigate the relationship between students' low academic performance from secondary education towards professional ability of academic performance at tertiary health education.

1.3 Objectives
   i. To review the students' categories of academic performance from secondary and tertiary education among enrolled students at Health training institution
   ii. To compare secondary education academic performance with professional academic performance at tertiary health education among enrolled students at Health training institution
   iii. To evaluate the impact of low academic performance from secondary education towards professional performance among enrolled students at Health training institution

2. Methodology

A cross-sectional explorative design was employed whereby students' secondary data from both secondary and tertiary academic performance were collected from three institutes in Manyara region; including Dareda School of Nursing, Bishop Nicodemus Hhando Health and Allied Sciences and Haydom Institute of Health Sciences (HIHS). The total population of 1000 students were involved. A sample size was drawn from total population of 1000 students of the four (4) Health institutes from Manyara Region and sample size 278 was drawn from this population. Document review checklist was designed to collect required information from students' academic transcripts so as to sort out grading categories of science subjects of enrolled candidates in tertiary health training programs. In this study, those with grade A – B on science subjects were ranked as good grade, those with grade C were ranked as average grade and those with grade D were ranked as poor grade. In tertiary education, secondary data about students' performance was collected from the responsible institutes' database. This data was grouped into two categories; Pass (100 - 50% - regarded as good performance or ability) and Fail (0 – 49 – regarded as poor performance or ability). Data entry was done before analysis and data was systematically analysed using SPSS programs. The degree of correlation between secondary academic performances and tertiary professional ability have been statistically assessed by Pearson Correlation Coefficient, cross tabulation, univariate and multivariate analysis in SPSS software program (MM Mukaka 2012). The legally and ethically required protocols and procedures were considered and attempted as per NIMR and President's Office Regional Administration and Local Government (PO-RALG) and Lo. Permission on reviewing institution academic database was obtained from Authority of responsible Institutes by gaining a written letters.

3. Results

3.1 Sociodemographic Characteristics of Study Participants

In all three institutes, a total of 282 student files were reviewed and enrolled in the study, but of this total, 15 cases we re found incomplete and have been excluded during the analysis process that make only total of 274 be utilized for data analysis.

3.2 The students' academic performance categories from secondary education among enrolled students at Health training institution

Of all enrolled students in the health training institution, majority of them, 135 (49.3%) falls on division III while only 10 (3.6%) falls on division I of their CSEE examination results. In further exploration on students grading system categories of science subjects as per NACTVET and MoH requirement for programs in tertiary health training education, 126 (46%) students were found with poor grades (Ds) on all three sciences subjects that are Physics, Chemistry and Biology. According to NECTA and MEST definition, D grade is considered as poor performance. However, on those enrolled in the programs, majority 142 (51.8 %) had average performance of at least two science subjects with grade C whereas only six (2.2%) had good performance that of at least two subjects with Grade B or higher. The details of results are more stipulated in figure 1 below. About tertiary education, the study further reviewed an academic performance on various semesters basing on the MoH training curriculum and NACTVET assessment guideline where the main categories of examination outcome is pass and fail; Pass (50 -100%) and Fail (0 – 49 %). In this review, the study revealed that, on both semesters, the higher performance was significantly seen in first semester compare to the second semester across all programs and NTA levels with range of 69 - 89.8% and 53.3 - 82.4% respectively. When looking at the lowest performance as per both semester and NTA levels, it ranges from 17.5 – 46.7% and 10.2 – 31.0% respectively. However, the lowest performance for both semesters was certainly observed in NTA level 5 at the second semester that, 37.7% of students failed during their examination. When the follow-up was made throughout all programs in whole periods of course, it was revealed that 68 (24.8%) students were dropped-out from school due to academic reason.

More information is seen on Table 1 below.

Table 1: Secondary education performance and tertiary education of study participants (N=274)

Variable	Frequency	Percentage
Secondary performance		
Division in CSEE		
Division I	10	3.6
Division II	83	30.3
Division III	135	49.3
Division IV	43	15.7
Science subject performance		
Poor (3 D)	126	46.0
Average (2 C)	142	51.8
Good (B – A)	6	2.2
Tertiary performance		
NTA Level 4		
Semester 1		
Pass	246	89.8
Fail	28	10.2
Semester 2		
Pass	226	82.5
Fail	43	15.7
Dropped	5	1.8
NTA Level 5		
Semester 1		
Pass	199	74.0
Fail	48	17.8
Dropped	22	8.2
Semester 2		
Pass	146	59.1
Fail	93	37.7
Dropped	8	3.3
NTA Level 6		
Semester 1		
Pass	189	79.1
Fail	34	14.2
Dropped	16	6.7
Semester 2		
Pass	172	77.1
Fail	34	15.2
Dropped	17	7.7

*Pass = 50 – 100, Fail = 9 - 49

3.3 Comparison of secondary education academic performance and professional performance at tertiary level

On the measurement of the variable for comparison of Secondary and Tertiary academic performance, across all programs and NTA levels of tertiary education, it was evidently revealed that those who had poor (with three grade Ds in science subjects) academic performance from secondary education have higher proportion of lower academic performance at tertiary education. In the first semester of NTA level 4, the study showed a statistically significant result that those who had good academic performance (grade C and above in science subjects) on secondary education had higher level of academic performance compared to their counterparts (56.9 Vs 43.9 p-value 0.04). On the other side of the coin, those with poor secondary performance (with 3 Ds in science subjects) showed a nearly double higher proportion of low academic performance at tertiary education compare to their fellow counterparts with good secondary performance. (35.7 Vs 64.3 p-value 0.04).

The similar results were realized on the second year (NTA level 5) were those who had good academic performance (grade C and above in science subjects) at the secondary education had a double higher proportion of good academic performance at tertiary education (66.4% Vs 33.6% p-value<0.001). Not only that, but at the final year of NTA level 6 in 1st semester, at tertiary education, those who had poor secondary education performance had also revealed to have lower academic performance results than their counterparts (38.2% Vs 61.8% p-value 0.01). More results are shown in table 2 below.

Table 2: Comparison of secondary education academic performance and professional performance at tertiary level

Variable (Secondary academic performance)	Tertiary performance		p-value
	Pass No (%)	Fail No (%)	
NTA Level 4			
Semester 1			
Good (C Grade <)	138(56.1)	10(35.7)	0.04
Poor (D grade)	108(43.9)	18(64.3)	
Semester 2			
Good (C Grade <)	126(55.9)	20(46.5)	0.27
Poor (D grade)	100(44.2)	23(53.5)	
NTA Level 5			
Semester 1			
Good (C Grade <)	109(54.8)	27(56.3)	0.85
Poor (D grade)	90(45.2)	21(43.8)	
Semester 2			
Good (C Grade <)	97(66.4)	34(36.6)	0.00*
Poor (D grade)	49(33.6)	59(63.4)	
NTA Level 6			
Semester 1			
Good (C Grade <)	112(59.3)	13(38.2)	0.02
Poor	77(40.7)	21(61.8)	
Semester 2			
Good (C Grade <)	99(57.6)	18(52.9)	0.61
Poor (D grade)	73(42.4)	16(47.1)	

*p-value<0.001

3.4 Impact of low academic performance from secondary education on professional ability at tertiary level

In this variable, various examination outcomes such as supplementary, repeat modules and discontinuous from study were statistically measured using Univariate and Multivariate analysis.

For example, on the second semester of NTA level 5, those who had poor performance (D grades) had higher percentage of being discontinued than their fellow counterparts of good performance (C < grades) (28.6% Vs 71.4% p-value<0.001). Furthermore, on the second semester of the final year (NTA level 6), those who had poor secondary performance had higher percentage of repeating modules compared to those who had good secondary performance (35.7% Vs 64.3% p-value 0.00). However, unexpectedly, those who had good performance at secondary level had higher percentage of supplementary compared to those who had poor secondary performance (86.7% Vs 13.3). More results are seen in table 3 below.

Table 3: Impact of low performance on professional performance at tertiary level

Secondary performance	Discontinued	Repeat Module	Supplementary	p-value
NTA Level 4				
Semester 1				
Good	2(33.3)	0	8(38.1)	0.19

Poor	4(66.7)	1(100%)	13(61.9)	
Semester 2				
Good	7(43.8)	3(37.5)	10(52.6)	0.69
Poor	9(56.3)	5(62.5)	9(47.4)	
NTA Level 5				
Semester 1				
Good	4(57.1)	1(100.0)	22(55.0)	0.75
Poor	3(42.9)	0(0.0)	18(45.0)	
Semester 2				
Good	2(28.6)	7(58.3)	25(33.8)	0.00*
Poor	5(71.4)	5(41.7)	49(66.2)	
NTA Level 6				
Semester 1				
Good	7(43.8)	1(100.0)	5(29.4)	0.05
Poor	9(56.3)	0(0.0)	12(70.6)	
Semester 2				
Good	0(0.0)	5(35.7)	13(86.7)	0.00
Poor	5(100.0)	9(64.3)	2(13.3)	

*p-value<0.001   Good – A, B, C performance   Poor – 3 Ds performance

Univariate analysis in first semester of NTA level 4, showed that those who had poor secondary performance were 2 times more likely to have lower professional performance at tertiary level (cOR 3.44, 95% CI 1.99-5.92, p<0.001). Furthermore, in the second semester of NTA level 5 it was seen that those who had poor secondary performance had three times higher odds of lower performance in the tertiary level (cOR 3.44, 95% CI 1.99-5.92, p<0.001). Nevertheless, in the first semester of the final year similar information were unmasked where poor performing students at the secondary level had twice higher chance of having lower performance at their tertiary level training (cOR 2.35, 95% CI 1.11-4.98, p<0.02). Other semesters didn't show statistically significant results.

In multivariate logistic analysis upon adjusting for possible confounders, it was significant statistically only during the second semester of the second year whereby those who had poor secondary performance had three times higher odds for lower professional performance at the tertiary training (aOR 3.73, CI 2.07-6.73, p<0.001). Other semesters didn't show statistical significance. Results are as stipulated in Table 4 below.

Table 4: Univarate and multivariate analysis of effect of low academic performance on professional performance at tertiary level

Secondary academic performance	Univariate analysis			Multivariate analysis		
	cOR	95%CI	p value	aOR	95%CI	p value
NTA Level 4						
Semester 1						
Good	Ref					
Poor	2.30	1.02-5.19	0.04	2.09	0.92-4.99	0.08
Semester 2						
Good	Ref					
Poor	1.44	0.75-2.79	0.27	1.60	0.75-3.42	0.23
NTA Level 5						
Semester 1						
Good	Ref					
Poor	0.94	0.50-1.78	0.85	1.17	0.56-2.45	0.70
Semester 2						
Good	Ref					
Poor	3.44	1.99-5.92	0.00*	3.73	2.07-6.73	0.00*
NTA Level 6						
Semester 1						
Good	Ref					
Poor	2.35	1.11-4.98	0.02	1.91	0.89-4.13	0.09
Semester 2						
Good	Ref					
Poor	1.21	0.58-2.52	0.62	1.94	0.60-6.31	0.27

cOR- Crude odds ratio   Good – A, B, C performance
aOR- Adjusted odds ratio   Poor – 3 Ds performance
*P-value<0.001

3.6 Influence of sociodemographic data on tertiary level performance

On the trends of project assessment, the study reviewed whether sociodemographic factors might have an influence on tertiary education performance. In these variables, gender and educational level were seen associated with academic performance at both secondary and tertiary education level. Female students were seen to have nearly double higher good performance than males (60.5% Vs 39.5% p-value 0.01). When cross tabulation was done upon secondary educational level of ordinary and advance level, rate of failure was observed more higher at ordinary level than advance level/ however, this was not statistically significant. More results are seen in table 5 below.

Table 5: Tertiary performance by sociodemographic data of study participants

Variable	Tertiary performance N (%)		p-value
	Pass No (%)	Fail No (%)	
Sex			
Male	68 (39.5)	22(64.7)	0.01
Female	104 (60.5)	12(35.3)	
Education level attained			
Form IV	146(84.9)	33(97.1)	0.06
Form VI	26(15.1)	1(2.9)	

*p-value <0.001

3.7 Trends of performance according to program

Upon the follow-up trends of performance in all six (6) semesters at all programs enrolled in the responsible institutes, it has been found that NMT program was leading in good performance throughout all semesters across other programs by average of 55.3% pass. The LMT program was found to have low performance by average of 16.1%. However, in detailed analysis, failure status of study participants according to their respective programs had a mixed result. Majority of candidates in CMT program had averagely higher proportions of failure status in the first three semesters but dropped drastically on the remaining three semesters whilst LMT showed a step-up pattern of failure status from the fourth semester onward. NMT had epileptic pattern, which dropped from the first semester, stepped up on four semesters and dropped on the last semester. The results are stipulated on figure 1.
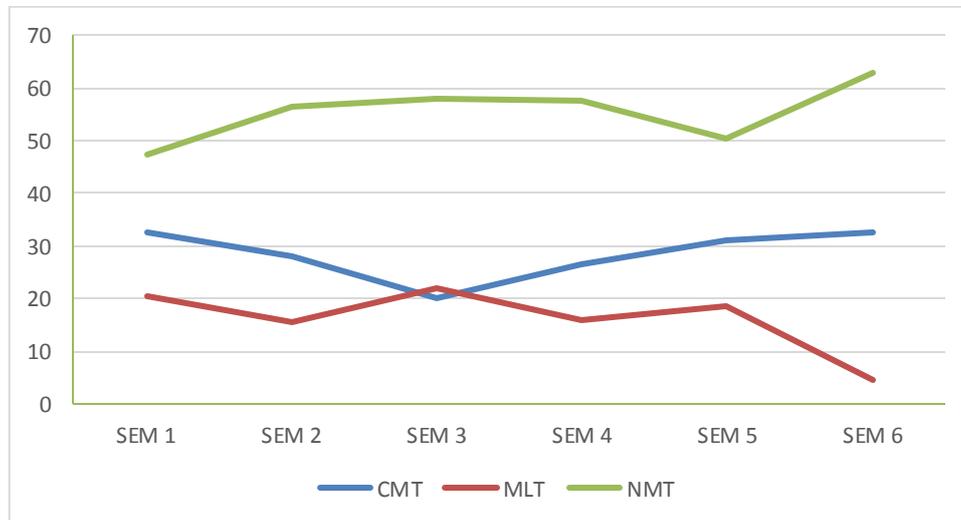

Figure 1: Trend of pass status of study participants according to program

4. Discussion, Conclusion and Recommendations

4.1 The students' categories of academic performance from secondary education among enrolled students at Health training institution

In this variable of categories for academic performance of students from secondary education who were enrolled in tertiary health training institution, the study found that, of all 274 enrolled students, 126 (46%) were confirmed with grades 'D' in all three science subjects which are Physics, Chemistry and Biology. This finding provides depiction about the real situation on group of candidates' performance who are enrolled in our health training institutes over the country. The finding shows that, nearly half of total of candidates enrolled in health training institutes are those with D grades in science subjects. According to NACTVET admission criteria, regardless of division and other subjects, the candidates should have at least D grades on three science subjects Physics, Chemistry and Biology.

As per (NECTA, 2024, URT, 2012, Jacob and Lehner, 2011, MEST 2023, Nyamizi, and Lotto, 2018) D grade is considered as poor performance in CSEE.

The value of secondary educational performance for tertiary education is significantly noted in various literatures. The results from study by Michaelowa, (2007), suggest that certain minimum levels of enrolment at primary and secondary level represent a necessary condition for the development of functioning higher education. The further analysis of this study says that strong differences between educational institutions at secondary level may be unfavorable for tertiary education quality when basic performance is unsatisfactory (Michaelowa, 2007). A study by Eckland, (1965), revealed that 'Inadequate academic preparation of students from lower level of education is among the major factors contributing to poor academic ability in tertiary education'.

4.2 Comparison of secondary education academic performance and professional performance at tertiary level
In this variable, those students with poor academic performance from secondary education have higher twice proportion of lower academic performance at tertiary education in all semesters and NTA levels; and those with good academic performance from the secondary education had double higher proportion of good academic performance at tertiary education (66.4% Vs 33.6% p-value<0.001). According to the finding of this variable, it has evidently proved that, there is correlation between secondary education performances with ability of students at tertiary health education level. This finding is supported by other authors who say, education of secondary school level is supposed to be the base and the foundation towards higher knowledge in tertiary institutions (Asikhia O. A, 2010). A major hypothetical behind the minds of academicians and other educational stakeholders is that; a student's with low entry grades to the higher program from secondary education maybe those with low performance or low ability at the tertiary school (Lamas, 2015, Husaini and Shukor, 2022). These studies further says, students enrolled in Higher Education Institution's with poor grades are more likely for poor academic performance and dropout than students with good entry grades.

4.3 The impact of low academic performance from secondary education on professional ability at tertiary level
When reviewing the impacts of low academic performance the study found that, those students with poor academic performance from secondary education have higher twice percentages on supplementary, repeat modules and discontinued at both semesters of all NTA levels compare to their fellow counterparts of good academic performance at the tertiary health education (28.6% Vs 71.4% p-value<0.001). Likewise, those with good academic performance have higher percentages of good performance at the tertiary health education (35.7% Vs 64.3% p-value 0.00). However, the study didn't tested the aftermaths of these supplementary, repeat modules and discontinued on the future progress of those students who have countered across them.
Reviewing the authors' idea in the carrier aspect, majority with impacts of low academic performance may evidently face a low competence, high cost for both parents and government, limited employment, restricted carrier development, potential for mental health issues, undesirable behaviours and ext. (Wan et al, 2021). These impacts are sturdily linked with negative outcomes in the job market or higher studies, economic deficiency, affecting concentration on studies and the completion of assigned tasks (OECD, 2022). A study of Van et al, (2002) further says that, a low-grade repetition has negative long-term consequences after leaving secondary education, which raises questions about a justified policy regarding students that are at risk of academic failure.

4.4 Influence on sociodemographic data on tertiary level performance
Looking at the variables of gender and educational level, it was observed that there is association between those variables and academic performance at both secondary and tertiary education level. In this study, female students were seen to have nearly double higher good academic performance than males (60.5% Vs 39.5% p-value 0.01). This finding is supported by the study done in Nepal by Parajuli, (2017), which says that gender differences in the academic performance of students is obviously significant. In this study, the female students were found outperforming than their male counterparts. Furthermore, study in Rwanda of Muhawenimana and Mutarutinya, (2023) revealed that girls score better in mathematics than boys. In the mathematics test, girls achieved an average of 12.42 while boys scored an average of 10.82. This demonstrated that there were large disparities between boys' and girls' performance. However, the finding from study by Mwihia, (2020) differently says, in Kinangop Sub County Kenya secondary schools, the male students performance more better than their counterparts girls by range of mean 67.89, SD – 4.92 in Kenya Certificate of Secondary Education (KCSE).

4.5 Conclusion
The finding of this study shows that, nearly half of students enrolled in health training institutes are those with D grades in science subjects from secondary education. The study further proved that those with poor academic performance from secondary education have higher twice proportion of lower academic performance at tertiary education in all semesters and NTA levels. In other hands, those with good academic performance from the secondary education had double higher proportion of good academic performance at tertiary education.
On the impacts of low academic performance from secondary education on professional ability at tertiary health education, those with poor academic performance from secondary education have higher twice percentages of supplementary, repeat modules and discontinued for both semesters of all NTA levels compare to their fellow counterparts of good academic performance. Likewise, those with good academic performance from secondary education have higher percentages of good performance at the tertiary health education.
At the variables of gender and educational level, female students were seen to have nearly double higher good academic performance than males. The students with advance level of secondary education have good performance compare with those of ordinary level. In other view of programs, NMT program has higher performance compare with other programs throughout the course.

4.6 Recommendations

Basing on the findings of this study, the authors provide suggestion and recommendation to the responsible selection authorities (NACTVET and MoH training sector) including other stakeholders to review the admission criteria on subjects' requirements for joining diploma in health programs at tertiary education. The authors suggest the responsible authority to uplift the minimal admission requirement grade from D; the currently operating one to C to improve academic performance among health training institutes. Furthermore, emphasis should be made on the male gender to improve of their academic performance. Strategies should be enacted to cater for discrepancies of performance among different professional programs such as interdisciplinary collaboration and sharing of experiences. However, further studies may be needed to increase the scope of understanding the real situation over the country.

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