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Research Article
Longitudinal Evaluation of University GPA and Real Performance of Mathematics Graduates

[1]Mubarak Alkahtani and [2]Adam Sbeil

[1]College of Education, Prince Sattam bin Abdulaziz University, P.O. Box 422, 11942 Alkharj, Saudi Arabia
[2]Public Administration for Information and Performance Measurement, Ministry of Education, Riyadh, Saudi Arabia

Abstract

Background and Objective: Saudi Arabian university graduates are required to qualify a national examination test related to their field in order to ratify their degrees. The results of mathematics graduate in this exam were not appreciable. Therefore, this study aimed to identify the reasons of low success rate of the students besides having higher Grade Point Averages (GPAs). This research constituted a longitudinal performance analysis of mathematics students who graduated during 2010-2014 from the Department of Mathematics, College of Sciences and Humanities, Prince Sattam Bin Abdulaziz University, Alkharj, Saudi Arabia. **Materials and Methods:** The study population comprised of 97 graduates who belonged to either government schools or private schools at secondary level and admitted to the University for Bachelor degree, which they qualified. The mathematics skills of these graduates were tested at four levels; firstly, skills before entering to the university; secondly, at the entry levels in the university; thirdly, after graduation from the University and fourthly; during their employment in the various organizations level. A longitudinal, correlative and case study research methods were employed to obtain descriptive statistics such as correlations and multiple regressions analysis. **Results:** There appeared a significant positive and weak relationship between the high school grades averages and the university GPA. The students who secured good grades in school also secured good grades in university and vice versa. The students who graduated from the government schools performed better in mathematics skills as compared to the students who came out from private schools. There was inflating tendency of grades to the students in university as compared to their actual mathematical skills because the students who obtained 3.0 GPA in the university successively failed even in their seventh attempt to pass compulsory national aptitude test in order to ratify their degrees. **Conclusion:** It was recommend that the university authorities must devise strategies to linking grades to actual skills of students and tendency to inflate grade must be restricted and a comprehensive study be undertaken at whole of the university level as well as at all universities level to generalize these results.

Key words: Mathematics skills, aptitude test, university GPA, longitudinal performance analysis, inflated grades

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Corresponding Author: Mubarak Alkahtani, College of Education, Prince Sattam bin Abdulaziz University, P.O. Box 422, 11942 Alkharj, Saudi Arabia
Tel: 00966504412416/00966115881122

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Data Availability: All relevant data are within the paper and its supporting information files.

INTRODUCTION

The education system network in Saudi Arabia includes schools, colleges, universities and graduates are tested through examinations at each level separately by respective institutions. The first level is the secondary school level for which the schools conduct their examinations and declare students as pass or fail at each school level. After passing the school examination, students are supposed to enter in university education or opt for some technical education. The higher education infrastructure includes twenty-four governmental universities, eight private universities and twenty private colleges (The Ministry of Higher Education Report)[1]. There is no central system of examination in Saudi Arabia in order to assess the student's skills and competencies to qualify each level of education. However, at the same time, there is a National Centre for Assessment of Higher Education (NCAHE) (Qiyas: www.qiyas.sa) under Ministry of Higher Education (MHE) which carries out respective test for each level in order to ratify their degrees. The students who qualify the school exam are supposed to pass through a general aptitude test before entering into university education. Likewise, the students who qualify bachelor degrees program from the universities are also required to qualify aptitude test conducted at the national level in order to ratify their degrees. In absence of this qualification, their degrees are not valid for any further education. The National Centre for Assessment conducts multiple tests such as General Aptitude Test (GAT) that evaluates the secondary school graduates' capacity for learning in general regardless of student specialization. The test assess the analytical and deductive abilities of the graduates. These abilities include reading comprehension, recognizing logical relations, solving problems based on basic mathematical notions, inference skills and measuring capacity. The second type test is Achievement test for Science Colleges (ATSC) that assesses the General Secondary School graduates in five disciplines (20% each): biology, chemistry, physics, mathematics and English. The third category test is General aptitude test for university graduates (POSTGAT) that aims to assess the university graduates in three skills: linguistic, mathematical and the logic. POSTGAT test is similar to Graduate Record Examination (GRE) in USA. The fourth category test is General Competence Test (GCT) that includes general knowledge, science and basic teaching skills and it assesses graduates who apply for teaching jobs. The test composed of four sets of standards to assess the educational, linguistic and numerical as well as specialization skills of the candidates. The last category of test is Specialty Competence Test (SCT) that intends to evaluate graduates in the core areas of the specialty. It has core components from primary, middle and high school mathematics and under every level.

In this study, the researchers noticed that 88.5% of the bachelor degree holders of the Department of Mathematics, College of Science and Humanities, Prince Sattam Bin Abdulaziz University (PSAU), Alkharj, did not pass the Specialty Competence Test (SCT) in the first attempt and 80% of those who took the exam in their second attempt, did not pass the test. 89.8% of the graduates who obtained university GPA greater than 3.0 were not able to pass the SCT test in first attempt. 72.5% of those who made second attempt also did not pass the test. Furthermore, 83.3% of graduates who appeared for SCT in third and fourth attempt were unable to pass the test. The worst scenario appeared when 100% of those who appeared in their fifth, sixth and seventh attempt in the STC test, did not pass the test. A need existed to analyze this situation deeply specially to see why the graduates were unable to pass the specialty tests in order to ratify their degree and to make their degrees valid for any future purposes. Was there a failure of admission criteria or the failure of university quality of education or there was a lack of ability in students? PSAU admission criteria includes eligibility test score ratio (30%), aptitude test ratio (30%) and cumulative overall high school grades ratio (40%). The question of admission criteria is always under discussion and improvement among the educationist and so far, a multiple set of criteria are applicable worldwide. A number of researchers have investigated the predictive ability of the General Certificate of Secondary Education (GCSE) in relation with the Cumulative Grade Point Average (GPA) and reported a weak and significant relationship between GCSE and GPA (Popham)[2]. Gonnella *et al.*[3] carried out a detailed longitudinal study comprising the data of three decades and reached to the conclusion that high school grades were the best predictors of university grades[3]. Geiser and Santelices[4] elucidated about the predictability of high school grades vis-a-vis university grades and recommended the authorities to make more reliance on high school grades for any further evaluations[4]. Talento-Miller[5] reported that the Graduate Management Admission Test (GMAT) could predict the GPA for graduate students[5]. Whereas, Scogin[6] compared the predictive validity of first year GPA for student athletes as this study documented a significant model including three variables that explained 50% of the total variance in first year GPA[6]. High school GPA (42%), ACT composite (5%) and aid status (2.5%) were significant predictors of first year academic performance for students. Most of previous studies have focused on the predictive ability of the GCSE, GPA, PGA and showed different variations regarding the ability of GCSE to predict student level

in college or master level. Zwick and Sklar[7] study tested the relationship between SAT scores and high school grades with the attainment of college degree and found that percentage of grades in high school could predict the degree attainment in college[7]. Kobrin *et al.*[8] also studied the relationship between high school grades, SAT test scores and college performance of the students and concluded that combination of high school grades and SAT scores were the best predictors of the attainment of college grades[8]. Green *et al.*[9] noted that GRE in comparison with GMAT was the best predictor of graduate's future academic performance[9]. Fenster *et al.*[10] carried out a detailed study to evaluate the predictability of GRE scores, undergraduate college grades and MA program in forensic psychology and rated GRE scores and undergraduate grade point averages were the best predictors of student's performance in forensic psychology as compared to any other fields in social sciences[10]. Garwood[11] also found a positive correlation between school grades and university GPA[11].

The current study has four years data of Mathematics student's grades as well as their secondary schools grades in second and third levels in addition to the GCSE, Percentage of Competence Test (GAT), ATSC test, GPA, percentage of general aptitude test (GCT), percentage of specialty competence test (SCT) and percentage of general aptitude test for university graduates (POSTGAT). It is planned to find out the reason of poor performance of students at the national level tests. This study will provide vital information that will help development planners, human resources practitioners responsible for public education to make justifiable scientific decisions to incorporate efficiency in the educational system in general and at the university levels specifically. In addition to these, the study will also provide feedback to the MHE and NCAHE. Given this scenario, following were the significant questions:

- Does there exist a significant relationship among the variables which include in secondary school results and GPAs obtained in mathematics in the university as well as percentage of admission equivalency test (AET), percentage of combined admission test (CAT), GCSE, GAT, ATSC, GPA, SCT, GCT and POSTGAT?
- Does there exist a significant effect among the variables, which include in secondary school results and their average results in mathematics in the university and the scores under GCSE, GAT, ATSC; taking each one separately or together on variables which include GPA, SCT, GCT and POSTGAT?
- Are there significant differences among the variables which include in secondary school results and the average results in mathematics in the university and the variables included in AET, CAT, GCSE, GAT, ATSC, GPA, SCT, GCT and POSTGAT based on school type (Government/private)?

MATERIALS AND METHODS

Research population and sample: The research population consisted of all the students who graduated from the Mathematics Department of College of Science and Humanities Studies, Prince Sattam Bin Abdulaziz University during 2010 to 2014. The total number of passing out students were 97. The researchers obtained their past results from the schools and obtained their scores from NCAHE databases. Two questionnaires designed separately for faculty members and the students. The student's questionnaire focused on the reasons of student's poor performance at NCAHE tests, while faculty member questionnaire focused on the results of students. A total of 30 students and 15 faculty members participated in the research that constituted 31% representation from the student side of the original population and 45% representation from the faculty members out of the total strength of 33 faculty members. Thus, a total of 45 persons participated in this research.

Secondary data: The researchers collected complete student record of their grades from their respective schools as well as they obtained university grades data from each semester till their graduation period and also collected data for the students who appeared in the National Center for Assessment in Higher Education examination to be used it for further processing and analysis (NCAHE)[12-14].

Correlative methodology: In order to determine the quantitative relationship between variables and to determine the degree of relationship between them, a correlation study was applied.

Case study methodology: Every single graduate student performance was evaluated in mathematics at each level starting from school grades to university to post university national tests.

Statistical methods: The statistical methods used in this study include descriptive statistics measurements (Mean, Standard deviation, Maxima, Minima and Range), t-test conducted for independence of samples. The statistical software (Statistical Package for Social Sciences (SPSS, version 20) was used in this study.

RESULTS

Performance evaluation of graduates of mathematics department was carried out by using different test. Table 1 illustrated the student's results for 12 types of tests. The highest percentage was in GCSE test result 87.4±5.2 (74.8-99.2) while the lowest percentage was SCT test with scores 52.2±7.7 (36.0-88.0).

Student results variables: The data in Table 2 presented correlations matrix among all the variables as a part of descriptive statistics. There was a significant positive and weak relationship at significance level ($p<0.05$) between high school grades and university GPA except for the test ATSC. There was no significant relationship at significance level ($p>0.05$) was found between the academic grade point average and the tests of postgraduates.

Correlations matrix among all the variables: Table 3 showed the statistical results of multiple linear regression analysis. At significance level ($p>0.05$) there was no significant effect was observed on GPA for the test such as GAT, ATSC, PMTS and PMSTS. In contrast, there was a significant effect found at significance level ($p<0.05$) of these tests on GPA. There was no significant effect observed at significance level ($p>0.05$) from GPA, GCSE, GAT, ATSC, PMTS and PMSTS on GCT and POSTGAT. There was also no significant effect observed at significance level ($p>0.05$) from GPA, ATSC, PMTS and PMSTS

Table 1: Students results variables

Variables	Mean±SD (min-max)
Percentage of specialty competence test (SCT)	52.2±7.7 (36.0-88.0)
Percentage of general competence test (GCT)	61.6±6.4 (41.0-79.0)
Percentage of general aptitude test for University graduates (post GCT)	63.3±4.8 (50.0-76.0)
Cumulative grade point average (GPA)	62.6±12.1 (42.2-96.2)*
Percentage of admission equivalency test (AET)	77.8±4.6 (67.9-90.0)
Percentage of combined admission test (CAT)	71.1±3.8 (62.6-80.6)
Percentage of general certificate of secondary education (GCSE)	87.4±5.2 (74.8-99.2)
Percentage of general aptitude test (GAT)	68.2±6.1 (55.0-86.0)
Percentage achievement test for science colleges (ATSC)	61.0±5.2 (47.0-75.0)
Percentage of pass in mathematics in third year at school (PMTS)	77.9±6.7 (60.0-100)
Percentage of pass in mathematics in second year at school (PMSS)	71.0±8.4 (49.0-99.0)
Percentage average of pass in mathematics in second and third year at school (PMSTS)	74.5±6.4 (55.0-97.5)

*GPA was multiplied by 20 to convert it to percentage

Table 2: Correlations matrix among all the variables

Variables		SCT	GCT	Post GAT	GPA	AET	CAT	GCSE	GAT	ATSC	PMTS	PMSS	PMSTS
SCT	Correlation	1.000											
	p-value												
GCT	Correlation	0.153	1.000										
	p-value	0.067											
Post GAT	Correlation	0.084	0.064	1.000									
	p-value	0.206	0.267										
GPA	Correlation	0.047	-0.086	-0.054	1.000								
	p-value	0.325	0.2	0.301									
AET	Correlation	0.123	-0.002	0.033	0.330**	1.000							
	p-value	0.114	0.491	0.374	0.000								
CAT	Correlation	0.08	0.043	0.026	0.298**	0.842**	1.000						
	p-value	0.219	0.339	0.401	0.001	0.000							
GCSE	Correlation	0.094	-0.187*	-0.074	0.361**	0.775**	0.580**	1.000					
	p-value	0.179	0.033	0.237	0.000	0.000	0.000						
GAT	Correlation	0.106	0.154	0.112	0.191*	0.846**	0.774**	0.320**	1.000				
	p-value	0.152	0.066	0.138	0.03	0.000	0.000	0.001					
ATSC	Correlation	-0.018	0.08	0.003	0.106	0.209*	0.703**	0.031	0.287**	1.000			
	p-value	0.43	0.217	0.488	0.152	0.02	0.000	0.383	0.002				
PMTS	Correlation	-0.054	-0.051	0.032	0.170*	0.506**	0.408**	0.548**	0.296**	0.073	1.000		
	p-value	0.301	0.309	0.379	0.048	0.000	0.000	0.000	0.002	0.238			
PMSS	Correlation	-0.129	0.11	0.068	0.187*	0.307**	0.254**	0.343**	0.172*	0.056	0.422**	1.000	
	p-value	0.104	0.141	0.253	0.033	0.001	0.006	0.000	0.046	0.292	0.000		
PMSTS	Correlation	-0.113	0.045	0.061	0.212*	0.468**	0.382**	0.514**	0.269**	0.076	0.805**	0.878**	1.000
	p-value	0.136	0.33	0.275	0.018	0.000	0.000	0.000	0.004	0.231	0.000	0.000	

**Statistically significant relationship at the level of significance (0.01) or less, *Statistically significant relationship ATSC the level of significance (0.05) or less

Table 3: Multiple linear regression analysis to dependent variables (GPA, GCT, SCT and post GAT)

Independent variable	Dependent variables: Collinearity statistics VIF	Collinearity statistics Tolerance	p-value	T-value	Standardized coefficients Beta	Unstandardized coefficients Std. error	Unstandardized coefficients B
Percentage of general aptitude test (GCT)*							
Constant			0.052	1.97		23.99	47.30
GPA	1.18	0.85	0.881	0.15	0.02	2.07	0.31
GCSE	1.67	0.60	0.209	1.27	0.17	0.29	0.37
GAT	1.25	0.80	0.288	1.07	0.12	0.21	0.23
ATSC	1.10	0.91	0.692	-0.40	-0.04	0.23	-0.09
PMTS	3.11	0.32	0.934	0.08	0.02	0.30	0.03
PMSTS	2.93	0.34	0.167	-1.39	-0.24	0.31	-0.43
*R = 0.239, R Square = 0.057, Adjusted R-Square = -0.006, F-value = 0.906, p-value = 0.495, Durbin-Watson value = 1.943, Range of Durbin-Watson significance table (1.803-2.197), levene statistic value = 0.700, p-value of levene statistic = 0.624							
Percentage of graduate aptitude test (post GAT)**							
Constant	-	-	0.014	2.50	-	26.45	66.16
GPA	1.18	0.85	0.69	-0.40	-0.05	2.28	-0.91
GCSE	1.67	0.60	0.229	-1.21	-0.16	0.32	-0.39
GAT	1.25	0.80	0.185	1.34	0.15	0.23	0.31
ATSC	1.10	0.91	0.714	-0.37	-0.04	0.26	-0.09
PMTS	3.11	0.32	0.903	-0.12	-0.02	0.33	-0.04
PMSTS	2.93	0.34	0.451	0.76	0.13	0.34	0.26
**R = 0.197, R Square = 0.039, Adjusted R-Square = -0.025, F-value = 0.607, p-value = 0.724, Durbin-Watson value = 1.930, Range of Durbin-Watson significance table (1.803-2.197), levene statistic value = 0.700, p-value of levene statistic = 0.624, **Statistically significant at the level of significance (0.01) or less, *Statistically significant at the level of significance (0.05) or less							
Cumulative grade point average (GPA)#							
Constant	-	-	0.27	-1.11		1.21	-1.34
GPA	-	-	-	-	-	-	-
GCSE	1.53	0.656	0.004	2.98**	0.356	0.014	0.042
GAT	1.24	0.805	0.542	0.612	0.066	0.011	0.007
ATSC	1.10	0.912	0.447	0.764	0.077	0.012	0.009
PMTS	3.08	0.325	0.359	-0.92	-0.156	0.015	-0.014
PMSTS	2.91	0.344	0.426	0.80	0.132	0.016	0.013
#R = 0.388, R Square = 0.151, Adjusted R-Square = 0.104, F-value = 3.229*, p-value = 0.010, Durbin-Watson value = 2.140, Range of Durbin-Watson significance table (1.780-2.220), levene statistic value = 1.119, p-value of levene statistic = 0.347							
Percentage of specialty aptitude test (SCT)##							
Constant	-	-	0.018	2.42	-	26.66	64.47
GPA	1.18	0.85	0.583	-0.55	-0.06	2.30	-1.27
GCSE	1.67	0.60	0.028	-2.23*	-0.29	0.32	-0.72
GAT	1.25	0.80	0.042	2.06*	0.23	0.23	0.48
ATSC	1.10	0.91	0.835	0.21	0.02	0.26	0.05
PMTS	3.11	0.32	0.274	-1.10	-0.19	0.34	-0.37
PMSTS	2.93	0.34	0.083	1.75	0.30	0.35	0.60
##R = 0.344, R Square = 0.119, Adjusted R-Square = 0.060, F-value = 2.019, p-value = 0.071, Durbin-Watson value = 1.987, Range of Durbin-Watson significance table (1.803-2.197), levene statistic value = 0.700, p-value of levene statistic = 0.624, **Statistically significant at the level of significance (0.01) or less, *Statistically significant at the level of significance (0.05) or less							

Table 4: Number of test trials for SCT

Number of trials	Pass	Fail	Percentage of the sample (97)
First	10 (11.5%)	87 (88.5%)	97 (100.0%)
Second	16 (20.0%)	64 (80.0%)	80 (82.5%)
Third	4 (8.3%)	44 (91.7%)	48 (49.5%)
Fourth	7 (21.2%)	26 (78.8%)	33 (34.0%)
Fifth	0 (0.0%)	14 (100.0%)	14 (14.4%)
Sixth	0 (0.0%)	6 (100.0%)	6 (6.2%)
Seventh	0 (0.0%)	2 (100.0%)	2 (2.1%)

on SCT. In contrast, there was a significant effect found at significance level ($p<0.05$) from GCSE and GAT on SCT.

Table 4 showed the number of students passed or failed in SCT. No students passed the test after the forth trial.

Table 5 presented comparative opinions and reasons of students and faculty members about the failure of students in SCT from the first attempt.

Table 5: Reasons for not passing specialty aptitude test from the first attempt

Reasons	Agreed by student n = 30 (%)	Agreed by faculty members n = 15 (%)
Reason of students knowledge deficit in his academic specialty	21 (70.0)	14 (93.3)
Lack of training on understanding and deduction	19 (63.3)	13 (86.7)
Relative easiness of the tests at the university	17 (56.7)	5 (33.3)

Table 6: Reasons for poor performance of the department

Percentage of weakness as assumed by students	No.	Statement	Agreed by students n = 30 (%)	Agreed by faculty members n = 15 (%)
Faculty members (93.3%)	1	Faculty members communication with the students	10 (35.7)	6 (40.0)
	2	Weaknesses of faculty teaching performance	6 (21.4)	9 (60.0)
	3	Use of traditional teaching strategies that do not lead to improve the student's ability to understand and deduction	10 (35.7)	3 (20.0)
	4	Weaknesses of a faculty member in the area of specialization	2 (7.1)	6 (40.0)
	5	Faculty member assessments methods are discourage learning	6 (21.4)	8 (53.3)
Courses and academic plan (73.30%)	1	Changes of academic plan	24 (80.0)	7 (46.7)
	2	Weakness of the practical part (exercises+homework's+laboratory)	6 (20.0)	4 (26.7)
Department administration (73.30%)	1	Weak response of the department administration in solving students problems	21 (70.0)	5 (33.3)
	2	Continuous change of the department's managers	1 (3.3)	1 (6.7)
	3	Departments performance is weak in general	8 (26.7)	4 (26.7)

Table 7: Independent sample t-test to study differences in all variables according to school type (government/private)

Variables	Category	Mean	Std. deviation	t-test	df	p-value
SCT	Governmental	60.26	10.99	0.65	95	0.517
	Private	58.61	12.17			
GCT	Governmental	51.29	12.39	1.45	95	0.151
	Private	47.09	14.18			
Post GAT	Governmental	61.14	10.67	0.12	95	0.904
	Private	60.80	15.96			
GPA	Governmental	3.14	0.55	0.17	95	0.868
	Private	3.12	0.73			
AET	Governmental	77.60	4.73	-0.69	95	0.49
	Private	78.31	4.32			
CAT	Governmental	71.25	4.14	0.71	95	0.482
	Private	70.64	2.82			
GCSE	Governmental	86.72	5.08	-1.99*	95	0.045
	Private	88.99	5.13			
GAT	Governmental	68.48	6.31	0.61	95	0.546
	Private	67.64	5.74			
ATSC	Governmental	61.72	5.42	2.24*	95	0.027
	Private	59.14	4.34			
PMTS	Governmental	77.33	6.97	-1.38	95	0.171
	Private	79.40	6.02			
PMSS	Governmental	70.61	8.49	-0.77	95	0.442
	Private	72.06	8.09			
PMSTS	Governmental	73.97	6.27	-1.23	95	0.22
	Private	75.73	6.61			

*Statistically significant differences at the level of significance (0.05) or less

Table 6 presented the reasons of the poor performance of the department with the perspective of students and faculty. Wide variations were noticed between the two groups.

Table 7 illustrated the results of independent sample t-test to study differences in all variables according to school type (government/private). There were significant differences observed at significance level ($p<0.05$) in the GCSE scores based on school type in which private school achieved better scores. Moreover, there were significant differences at significance level ($p<0.05$) in the ATSC scores based on the school type, where governmental school students achieved better scores.

DISCUSSION

Evaluation of students and faculty member's performance is vital in order to improve the teaching outcomes. Student's poor performance in central examination system of Saudi Arabia ignited this research. The performance of the student's in different types of twelve national tests conducted at various stages of student's educational career from high secondary school to graduate level, was assessed and found not up to the mark. The highest percentage was in GCSE test result (74.8-99.2) while the lowest percentage was in SCT test (36.0 - 88.0). This performance indicates good performance of students at school level comparatively but it also indicates lack of central examinations system to rely on these results. Suhas and Pandya[15] indicate that anxiety affects students' performance, so it is an understandable finding that in specialty competency test students scored low due to central exam pressure[15]. In school system exams, every student is familiar with the easiness and everyone is comfortable with the environment which might have improved their results. Hattie *et al.*[16] also indicate that cognitive, social and self-management skills improve student's achievements[16]. Student's performance in mathematics in secondary school classes in relation with university GPA was much higher as mean student's performance was 71.0 and 77.9% for the 2nd and 3rd years of secondary school respectively. These results clearly illustrate that the student's performance was better in secondary schools as compared to university GPA. This finding is in contrast with Shin *et al.*[17] explanations which iterate that achievement orientation links to improved performance[17]. Students GPA at the university level must have been improved as graduating in mathematics was their choice as compared to other choices available to them. This indicates that students lacked achievement orientation in the university or there might have been the issue of instructional methods. Enu *et al.*[18] also reported that teaching and instruction methods turn the learner into passive participants in the learning process and these affect students' performance in mathematics[18]. There was also a weak and positive correlation between GPA and PMTS (p-value = 0.018) and there appeared no significant effect of PMTS on GPA (p-value = 0.426). This was an unexpected result because the student performance in mathematics should have been improved at university level but this appeared otherwise. This is an indication of some issues which might have been in place while studying in the university. A naive question can be raised on the admission criteria. Intake tests in university do not specifically evaluate students in mathematics, even aptitude test ratio was only 30%. Al-Rukban *et al.*[19] highlight the importance of achievement test as compared to school grades at the time of admission[19]. PSAU admission criteria incorporates 30% weightage of aptitude test and this needs to be revisited specially for admission in sciences subjects like mathematics. Betts and Morell[20] (1999) reported that the student background strongly affects their GPA as undergraduates and in particular, they found significant effect of high school grades on GPA[20]. In measuring the effect of the quality of a student's high school performance, they found that the experience level of the high school teachers had a positive small effect on the GPA. In this study, there appeared a weak and positive correlation between GPA and GCSE (p-value = 0.000) but the relationship existed significant between GCSE and GPA at (p-value = 0.004). This result is in agreement with Albishri *et al.*[21] which showed a positive weak relationship at significance level ($p<0.05$) between GCSE with GPA[21]. The relationship between the GPA and SCT was not correlated and there appeared insignificant effect of SCT on GPA (p-value = 0.583). This is an unusual finding because SCT test examined student's mathematics skills. Some students with GPA more than 3.0 failed to pass the STC test successively even in their 7th attempts. Furthermore, there also existed significant differences in the GCSE scores based on school type i.e., private schools and public schools. Students from public schools performed better in ATSC as compared to private schools graduates. These findings have congruency with the findings of Kumar[22]. These findings indicate that student's GPA was based on inflated marks in the university and in reality; it did not exhibit their real skills. In order to provide with justification of nonexistence of relationship between the GPA and SCT, students and faculty members were questioned and the majority of students and faculty members believed that the knowledge deficiency in mathematics was the main reason. Students lacked the skills of interpretation and analysis. Students (56.7%) reported that university exams were relatively easy that enabled them to obtain high GPA, likewise, the students also linked their poor performance to department administration, faculty members, academic plans and teaching environment. One third of the faculty members agreed to student's observations.

CONCLUSION

This study finding are indicative of flaws in the education process. There is a massive need to revise the study plans in the schools, colleges and in the universities in the light of the current results. The overall grades of the students not only in mathematics but also in other subjects should mirror their practical skills. Admission criteria in universities should be

based on the aptitude test in order to ensure a uniform intake. The universities are the last educational institutions before central exam and there should be developmental strategies to prepared students for any subsequent examinations. Application of this study is also recommended to all other disciplines at the university as well its replication at all kingdom level in order to ensure sufficient numbers of samples to make an informed decision for the future.

SIGNIFICANT STATEMENT

Saudi Arabia is now transforming to a knowledge society. The kingdom is striving to ensure quality of education at all levels. In this research, we have identified inflated grades of the passed out mathematics students who were unsuccessful in the following competitions such as passing essential tests at national levels and were unsuccessful to continue further higher education. We understand that these findings will let the Ministry of Education to form a task force to make immediate changes in the Saudi Arabian education system in order to address such lapses. Eventually we expect our passed out students to be competitive at all levels with the world. There are no such studies available specifically related to Saudi Arabia and this research is in itself is the first. We expect that this research will open a new area of research in Saudi Arabia for educationists, as the educationists so far have not given attention to these aspects of quality assurance in Saudi education.

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