Predictive Validity of Admission Tests on graduates' GPA at Physical Education and Kinesiology Program, Qassim University

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Abstract

This research aims to predict the graduates' GPA of the Physical Education and Kinesiology Program at Qassim University by using the following admission tests results (High school Rate -Academic Achievement Test- General Aptitude Test-Program Admission Tests). The correlational approach was used. The sample included (115) graduates from the Physical Education and Kinesiology Program at Qassim University for the academic year May 2020 AD, and they achieved the required number of credit hours (134 CH), and they exerted the admission tests for the program in May 2017. The Multiple regression coefficient analysis was applied to study the predictive relationship between research variables. The results indicate that the high school rate and the AAT interpret (29%) of the variance in the graduates' GPA. The predictive equation stipulated: Predicted graduates' GPA = 0.307 +.042 (High school rate) + .005 (AAT).

Keywords: ***Multiple regression coefficient; Correlational approach; Predictive equation***

Introduction

Brinkworth et al. (2009) denote that students' transition from high school to college is difficult, and many university professors feel that students are often unwilling to change. **Harman (1994)** indicates that effective student admission criteria are important in any higher education system because it improves student quality, raises the internal efficiency of education in the programs offered, reduces the gap between school and university education, enables students to learn responsibly, and ensures the admission of students who possess knowledge, skill, competence, and ability to fully benefit from their studies. Moreover, the accurate predictive validity of the admission criteria in university education programs provides more opportunities to students who are most likely to benefit academically and can do best when they take courses that suit their abilities and interests.

Strenze (2007) explains that the Grade Point Average (GPA) is a commonly used measure to evaluate the students` academic performance by calculating the average grades in weighted courses that contribute to the evaluation of the final grade. it is also the most common measure of employment and graduate studies admission and associated with both success and competence in performing professional tasks in the Labor market.

Arnold (2015) continues that students may have to drop out of the academic program if their GPA falls below a certain level or when they fail to accumulate a minimum credit hour. This confirms the importance of the predictive relationship between the admission criteria and the student's GPA.

Saudi Arabia established in (2000) The National Center for Assessment and Evaluation in Higher Education affiliated to The Education and Training Evaluation Commission, which is an administratively and financially independent affiliated with the Prime Minister. The most important Center goal is designing and implementing educational standards and tests such as university admission tests and other national tests to evaluate Public Education. The center has launched a mandatory tests package for all students who have finished high school and want to enroll in university studies, to enable universities to select students who have

achieved the highest school courses and measure their analytical and inferential abilities to find out the extent of their ability to learn. (Education and Training Evaluation Commission, 2021a)

This package includes the Academic Achievement Test (AAT), which is a standardized criterion for all high school graduates in Saudi Arabia, to be a fair and accurate criterion for all, which helps the post-secondary educational authorities to select the students who have better-achieved courses at high school. There are two types of it for scientific and literary fields, and the test questions cover the courses the student studied in the three high school grades with the following rates (20% from the first grade - 30% from the second grade - 50% from the third grade). The Package also includes the General Aptitude Test (GAT), which is a test that measures a number of abilities related to the learning process, such as the analytical and the inferential ability of the student, in two parts: one is verbal (linguistic) and the other is quantitative (mathematical) regardless of the special proficiency in a particular topic. It aims to measure some abilities like reading comprehension, perceive logical relationships, solve problems based on

basic mathematical concepts, conclude, and evaluate. (Education and Training Evaluation Commission, 2021b)

In addition to those standardized tests, there are many academic programs in universities with qualitative and professional specializations that required their own admission tests to verify select students with special competencies to ensure their continuity in the program and achieving learning outcomes efficiently.

The Physical Education and Kinesiology program at Qassim University has set its own admission requirements, which are considered the main criterion that must be passed by students who wish to join the program. Because the program requires the availability of good health status, physical abilities, and athletic movement skills, and Leading personality traits for students enrolled. In addition to the analytical and inferential knowledge that can be verified from the high school rate, AAT, and GAT results. (Salah, 2020)

Physical Education and Kinesiology Program Admission Tests (PEKPAT) divides into three phases: Medical tests, Physical tests, and Personal Interview.

Physical tests aim to measure some physical abilities such as (Max Speed, Endurance, Flexibility, Agility, Muscle Power, and Endurance). The Raw scores are converted into standardized scores from 10 degrees by using standardized tables. The Medical test and Personal Interview are evaluating through the examination procedures of the specialized committee.

After the student passes the admission requirements for the program, they are arranged according to weighted ratio, which is determined by each university, and Qassim University approves the calculation of that weighted ratio as follows (weighted ratio = high school average score *30% + GAT*50% + AAT*20%).(Admission and Registration Deanship QU, 2021)

This research aims to predict the graduates' GPA of the Physical Education and Kinesiology Program at Qassim University by using the following admission tests results:

- High school rate.
- Academic Achievement Test (AAT)
- General Aptitude Test (GAT)
- Physical Education and Kinesiology Program Admission Tests (PEKPAT)

This aim can be achieved by answering the following questions:

- Is there a statistically significant correlation between the admission criteria results and the graduates' GPA?
- What is the predictive ability of the admission criteria results for the graduates' GPA?

The importance of this research lies in discovering the effectiveness of the admission criteria and formulating a predictive equation that enables program administrators to predict the graduates' GPA upon passing the program's learning outputs in a manner that meets the need of the labor market. This research is distinguished as a long-term study as the multiple regression coefficient was applied between graduates' GPA who completed the program's credit hours (134 CH) and the admission criteria results they achieved from 4 years ago. This gives more enhanced Predictive Validity of Admission Tests on graduates' GPA.

Method

The correlational approach was used, which aims to reveal the relationships among variables, in order

to interpret them and reach conclusions. (Creswell, 2014)

Sample

The sample included (115) graduates from the Physical Education and Kinesiology Program at Qassim University for the academic year May 2020 AD, and they achieved the required number of credit hours (134 CH), and they exerted the admission tests for the program in May 2017. The admission tests results were obtained from the admission tests committee`s database, and obtaining their GPA from the Student Affairs Deanship academic system at Qassim University, and Table (1) showing the descriptive statistics of the study sample.

Table (1) shows that the research sample included (115) students at physical education and kinesiology department, college of education at Qassim University. The mean of students` GPA was ($M = 3.96$, $SD = 0.60$) as a depended variable. The independent variables included the department's admission tests, including six physical tests and one skill test,

which applied for admission to the academic year 2016-2017. And, the results of high school percentage. Moreover, the Education and Training evaluation Saudi commission tests that including the general achievement test and aptitude test, which the student performs after completing high school for admission to Saudi universities.

Statistical analysis

IBM SPSS Statistics for Windows, released (2017), version 25 (IBM Corp, Armonk, NY, USA) was used for multiple regression coefficient analysis. The regression coefficient is considered one of the important tests in statistics, which work to clarify the relationship between the dependent variables and the extent to which those variables contribute to determining the independent variable. (Benesty et al., 2009; Judd et al., 2017)

Figure (1) shows the Normality of variables data and Figure (2) shows a normal P-P Plot of Regression Standardized Residual, which is the basic condition for applying multiple regression coefficient analysis.

Table 1. Descriptive Statistics of the study sample

N	SD	M	Measuring unit	Descriptive Statistics
115	.60	3.96	Grade Points Average	University GPA
115	.32	6.70	Second and milliseconds	50m Sprint Test
115	5.49	11.12	Centimeter	Baseline Standard Flexibility Test
115	.48	7.34	Second	The Slalom Agility Test
115	.17	1.95	Meter	Standing Broad Jump Test
115	5.47	26.60	Count	Push Up for a 30 second Test
115	.29	1.80	Minutes and seconds	800m Run/Walk Test
115	4.73	44.35	Degree	Physical Ability
115	5.04	16.62	Degree	Skill Ability
115	5.12	89.36	Percentage	High school rate
115	27.46	47.09	Out of 100 points (Degree)	Academic Achievement Test
115	7.32	71.42	Out of 100 points (Degree)	General Aptitude Test (GAT)

Figure 2 represents the normal P-P plot of regression Standardized residual and dependent variable, which indicates that the dots to be on, or close, to the line running diagonally across the figure. Hence, the error terms follow the normal distribution.

Figure (1) Shows a normal distribution curve superimposed over a bar chart of research data. Then this means that data has met the assumption of normally distributed residuals.

Table 2. Correlations between GPA and Admission tests, High School Percentages, Academic Achievement Test, and General Aptitude Test

GPA	Variables	
1.000	Pearson Correlation	GPA
.	Sig(1-tailed)	
-.111-	Pearson Correlation	50m Sprint Test
.119	Sig(1-tailed)	
.183	Pearson Correlation	Baseline Standard Flexibility Test
.025*	Sig(1-tailed)	
-.079-	Pearson Correlation	The Slalom Agility Test
.199	Sig(1-tailed)	
.048	Pearson Correlation	Standing Broad Jump Test
.307	Sig(1-tailed)	
.141	Pearson Correlation	Push Up for a 30 second Test
.066	Sig(1-tailed)	
-.013-	Pearson Correlation	800m Run Test
.447	Sig(1-tailed)	
.129	Pearson Correlation	Physical Ability Degree
.085	Sig(1-tailed)	

.184	**Pearson Correlation**	**Skill Ability Degree**
.025*	**Sig(1-tailed)**	
.401	**Pearson Correlation**	**High school rate**
.000*	**Sig(1-tailed)**	
.318	**Pearson Correlation**	**Academic Achievement Test**
.000*	**Sig(1-tailed)**	
.120	**Pearson Correlation**	**General Aptitude Test (GAT)**
.101	**Sig(1-tailed)**	

Results

First: The results related to the first question, "Is there a statistically significant correlation between the admission criteria results and the graduates' GPA?"

Table (2) shows that Pearson`s r data analysis revealed a moderate positive correlation between GPA and High school Percentage $r$ (113) = .40, $p$ = .000. And also, Academic Achievement Test $r$ (113) = .32, $p$ = .000. While, Pearson`s r data analysis revealed a weak positive correlation between GPA and Baseline Standard Flexibility Test r (113) = .18, p = .025. And also, Skill Ability Degree r (113) = .18, p = .025.

Second: The results related to the second question, "What is the predictive ability of the admission criteria results for the graduates' GPA??"

Table (3,4) shows a multiple linear regression was calculated to predict University GPA based on their department Admission tests, High School Percentages, Academic Achievement Test, and General Aptitude Test results. Tables (3) and (4) indicates A significant regression equation was found (F (11, 103) =3.740, p < .000), with an R^2 of .29.

Table 3. Regression analysis model of GPA and Admission tests, High School Percentages, Academic Achievement Test, and General Aptitude Test (n= 115 students)

Std. Error of the Estimate	Adjusted R Square	R^2	R	Model
.54	.21	.29	.53 [a]	Enter
a. Predictors: (Constant), All requested variables entered				
b. Dependent Variable: University GPA				

Table 4. ANOVA (Analysis of Variance) test (n= 115 students)

Sig.	*F*	Mean Square	df	Sum of Squares	Model	
.000[b]	3.740	1.079	11	11.873	Regression	Enter
		.289	103	29.723	Residual	
			114	41.596	Total	

a. Dependent Variable: University GPA
b. Predictors: (Constant), All requested variables entered

High school Percentage is measured in Percentage, and Academic Achievement Test is measured in degree.

Table (5) indicates that predicted graduates' GPA is equal to 0.307 +.042 (High school rate) + .005 (AAT), where

Table 5. Multiple linear regression Coefficients (n= 115 students)

	Coefficients[a]								
	Correlations			Sig.	*t*	Standardized Coefficients	Unstandardized Coefficients		Model
Part	Partial	Zero-order				Beta	Std. Error	*B*	
			.932	-.086-			3.575	-.307-	(Constant)
-.066-	-.078-	-.111-	.430	-.792-	-.085-	.202	-.160-		50m Sprint Test
.068	.080	.183	.419	.812	.107	.015	.012		Baseline Standard Flexibility Test
-.049-	-.058-	-.079-	.560	-.585-	-.088-	.188	-.110-		The Slalom Agility Test
.123	.144	.048	.143	1.477	.225	.536	.791		Standing Broad Jump Test
.075	.089	.141	.369	.902	.115	.014	.013		Push Up for a 30 second Test
.013	.015	-.013-	.878	.153	.019	.252	.039		800m Run Test
-.049-	-.058-	.129	.555	-.592-	-.187-	.040	-.024-		Physical Ability Degree
.079	.094	.184	.343	.953	.083	.010	.010		Skill Ability Degree
.315	.349	.401	.000*	3.777	.357	.011	.042		High school rate
.199	.229	.318	.019*	2.388	.215	.002	.005		Academic Achievement Test
.153	.178	.120	.069	1.836	.165	.007	.014		General Aptitude Test (GAT)

Discussion

student's teaching motor skills performance, and the student is not evaluated on the basis of his physical abilities or skills in performing motor skills, as the program's mission focuses on preparing graduates as physical education teachers.

Consequently, the program study depends on cognitive achievement more than the psychomotor side, which explains the correlation between the high school rate, AAT and their predictive abilities in interpreting the graduates` GPA. This calls for the need to reconsider the development of Physical, skill, and personal admission tests in line with the program's mission and outputs, as well as developing the study plan, teaching, and evaluation strategies, so that a balance is achieved between the inputs, processes, and learning outputs of the program.

Conclusions

The research clarified that the graduates` GPA can be predicted through the results of the high school rate and AAT prepared by The National Center for Assessment and Evaluation in Higher Education. The predictive equation was extracted from the

The results indicate that the high school rate and the AAT interpret (29%) of the variance in the graduates' GPA. On the other hand, the results show that PEKAT and GAT did not contribute to predicting the graduates' GPA. These results are consistent with the results of (Geiser & Santelices, 2007),(Ogg et al., 2009), (Murshid, 2013), and (Vulperhorst et al., 2018), which indicated that the High school rate is the most admission criteria to predict the student's (GPA).

The researchers attribute the loss of a predictive relationship between PEKAT, GAT and the graduates` GPA for several reasons, the most important of which are: (1) The practical courses credit hours represent (31.08%) of the total program credit hours, and the rest of the credit hours include Theoretical courses (basic, human and specialized sciences) and field training. (2) By referring to the practical courses descriptions, it is clear that the practical course is calculated from 100 points divided into 40 points written tests to assess the knowledge that included in the course subjects, and 60% practical tests to assess psychomotor skills and personality traits. Moreover, practical tests depend mainly on evaluating the

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statistical analysis of the multiple regression coefficient, which stipulated:

−Predicted graduates' GPA = 0.307 +.042 (High school rate) + .005 (AAT)

Thus, one of the most important admission criteria that the program administration should focus on in selecting students is the high school rate and the AAT score, to ensure that students 'abilities are compatible with teaching and evaluation strategies, achieve program learning outcomes and achieve the highest possible GPA after completing the program's credit hours.

Conflicts of Interest: The authors declare no conflict of interest.

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