Journal of Education and Practice
ISSN 2222-1735 (Paper) ISSN 2222-288X (Online)
Vol.6, No.12, 2015

Predictors of First-Year Sultan Qaboos University Students' Grade Point Average

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Abstract

This study investigated predictors of first-year university grade point average (GPA) using academic and non-academic variables. Data were collected from 1511 Omani students selected conveniently from the population of students entering Sultan Qaboos University (SQU) in Fall 2010. Variables considered in the analysis were general education diploma average score, university readiness, critical thinking skills, motivational traits, learning strategies, gender, type of school education, type of first admitted college, and overall performance on the foundation placement tests. Results of the stepwise multiple linear regression analysis indicated that the final full model included general education diploma average score, gender, overall performance on the foundation placement tests, type of college, extrinsic goal orientation, university readiness, and critical thinking as collectively statistically significant predictors of the grade point average; accounting for 26.8% of the variance in the grade point average. Research and practical implications for the study of university student success are discussed.

Keywords: first-year university, academic achievement, university GPA, motivation, learning strategies, predictive validity

1. Introduction

The prediction of academic achievement of university students has been the interest of higher education administrators and researchers for a long time. Studies have identified several academic and non-academic predictors of university students' grade point average (GPA). Examples of these predictors include high school performance, gender, type of first-admitted college, admission tests, critical thinking, motivational orientations, college readiness, and academic adjustment (e.g., Arcidiacono, Aucejo, & Spenner, 2012; Bai, Chi, & Xiayoe, 2013; James & Chilvers, 2001). This kind of research might provide insights about increasing rates of retention and graduation in the university. As cited in Boulter (2002), theories of retention and academic success propose two types of factors affecting student persistence and university completion: (1) individual factors related to students' dispositions upon entering the university, which include students' intentions and attitudes about going to college, career goals, values, and sense of independence; and (2) interactional factors related to students' experiences after entering the college, which social support from family, instructors, and friends. According to Boulter (2002), these factors affect students' adjustment to college life which in turn might affect their academic success. Also, it has been documented that this relationship vary as a function of gender, favouring females. Further, students' confidence in their abilities predict their academic adjustment and success.

Along similar lines, Chemers, Hu, and Garcia (2001) showed that in addition to high school GPA, students' level of confidence in their ability is a powerful predictor of academic adjustment and achievement during the first year in the university. Another study by Choi (2005) found positive relationships between self-perceptions of efficacy and concept and academic achievement of university students. In addition, Vuong, Brown-Welty, and Tracz (2010) found that student self-efficacy has a direct impact on student persistence and university completion. They suggested that universities should provide an educational environment that offers social support for students and high quality curricula and allows students to have the autonomy to make choices regarding their programs of study in the university. Kitsantas, Winsler, and Huie (2008) found that self-regulation and motivational beliefs predicted academic performance of first and second year university students.

They suggested that first-year university students should be provided with time management and self-regulated strategies as well as adjustment to university life strategies to help them academically succeed in their programs of study.

When considering student university readiness, Kuh (2007) examined the extent to which high school students are ready for university level of work. Kuh found that although majority of students are highly motivated for going to university, they are not academically prepared for university level of work. In supporting this conclusion, Yamamura, Martinez, and Saenz (2010) asserted that teachers, counsellors, parents, and superintendents play a key role in preparing high school students for university. Likewise, Lee (2011) and Maruyama (2012) argued that there should be no large disparity between high school courses and university courses in the level of academic expectations. Overall, the aforementioned studies point to a conclusion that student academic success in the university tends to be associated with pre-university academic preparation and achievement as well as other personal factors. Given the cost of higher education, increasing number of general education graduates and applicants to higher education in the Sultanate of Oman, it is critical to identify students who are the most likely to academically succeed in the university. The present study aimed at identifying predictors of first-year university GPA at Sultan Qaboos University (SQU) using academic and non-academic variables.

1.1 Research Question

This study was guided by the following research question: Which combination of general education diploma average score, university readiness, critical thinking skills, motivational traits, learning strategies, gender, type of school education, type of college, and overall performance on the foundation placement tests contribute most to the variance explained in the grade point average at the end of the academic year in the university after the completion of the foundation program requirements?

2. Methods

2.1 Sample

Data included 1511 Omani students selected conveniently from the population of students entering Sultan Qaboos University (SQU) in Fall 2010. There were 751 (49.7%) males and 760 (50.3%) females. Of 1474 students indicating their type of school education, 476 (31.5%) were graduates of the basic education schools and 998 (66%) were graduates of the general education schools. Of 1511 students indicating their first admission college, 1259 (83.3%) were science colleges students and 252 (16.7%) were humanities colleges students.

2.2 Instrumentation

Three instruments were used in the study : The California Critical Thinking Skills Test (CCTSTT), the Motivated Strategies for Learning Questionnaire (MSLQ), and the College Readiness Survey Questionnaire (UR). Following is a description of the these instruments.

2.2.1 The Motivated Strategies for Learning Questionnaire (MSLQ)

This instrument was constructed by Pintrich, Smith, Garcia, Mckeachie (1993) to assess motivational and learning approaches of university students. The Arabic version of the MSLQ was used in this study, which was validated for SQU students (Alkharusi, Neisler, Al-Barwani, Clayton, Al-Sulaimani, Khan, Al-Yahmadi, & Al-Kalbani, 2012). It included 81 items grouped into 15 components measured on a 7-point Likert scale ranging from 1 (not at all true of me) to 7 (very true of me). These components were intrinsic goal orientation, extrinsic goal orientation, task value, control beliefs about learning, self-efficacy, test anxiety, rehearsal, elaboration, organization, critical thinking, self-regulation, time and study environment, effort regulation, peer learning, and help seeking. An average rating score was constructed for each component of the MSLQ. The internal reliability coefficients for MSLQ component scores ranged from 0.52 to 0.93 as computed using Cronbach's alpha.

2.2.2 The California Critical Thinking Skills Test (CCTSTT)

The CCTSTT was used to collect data on critical thinking abilities of the participants. It is an intellectually challenging standardized 34 multiple choice-items instrument administered over a 45 minutes period to test

cognitive skills. The items are based on common topics intended to be of short, discipline-neutral content; problem statements; and scenarios grouped into six subscales including analysis, evaluation, inference, explanation, interpretation, and self-regulation (Facione, 2000). Moreover, sub-scale scores on the instrument can range as follows: Analysis (0 to 9); Evaluation (0 to 14); Inference (0 to 11); Deductive reasoning (0 to 16); and Inductive reasoning (0 to 14). A total score on each component of the CCTSTT was computed by summing up the scores across all items of the sub-scale for each participant. The internal reliability coefficients for CCTSTT sub-scale scores ranged from 0.78 to 0.84 as computed using Kuder Richardson (KR-20) method.

2.2.3 The College Readiness Survey Questionnaire (UR)

This questionnaire mainly consisted of items adapted from the questionnaire developed by the TRiO Student Support Services program which is funded by the US Department of Education. The original college readiness survey consisted of 53 items measured on a 7-point Likert-type scale. The UR measured students' readiness for college in terms of their perceptions about academic confidence, financing college, reasons for going to college, tackling college, teachers, career awareness, reading and writing, math and science, and social support. The research team translated the questionnaire into Arabic. This Questionnaire was also modified by the research team with respect to some cultural issues and research aims. The reading and writing items included students' perceptions about their skills in Arabic and English since the population for this study are all having Arabic as their mother tongue. Additional items regarding students' perceptions about their computer skills were included in the questionnaire. The final version of the UR consisted of 67 items. An overall college readiness level was constructed by an average rating score across all items. The reliability coefficient was .76 as measured by Cronbach alpha.

2.3 Procedures

Permission was requested and obtained from the University Deanship of Student Affairs to collect data from the students during the orientation program, which was held two weeks prior to the semester. The research team explained the purpose of the study to the students. Then, the team requested the participation of the students. Emphasis was placed on the fact that information to be gathered would not influence their admission in the university in any way and that the study would hopefully lead to improve learning in the university. Students who agreed to participate in the study were provided the CCTSTT, MSLQ, and the UR.

2.4 Analysis

Means and standard deviations were computed to describe the sample in terms of the variables considered in the study. A stepwise multiple linear regression analysis was conducted to identify the factors that most contribute to the variance explained in the grade point average at the end of the academic year in the university after the completion of the foundation program requirements. Factors considered in the analysis were general education diploma average score, university readiness, critical thinking skills, motivational traits, learning strategies, gender, type of school education, type of college, and overall performance on the foundation placement tests. The dependent variable was the grade point average at the end of the academic year in the university after the completion of the foundation program requirements. Gender was dummy coded as 0 for males and 1 for females. Type of school education was dummy coded as 0 for graduates of the basic education schools and 1 for graduates of the general education schools. Type of college was dummy coded as 0 for students admitted at science colleges and 1 for students admitted at humanities colleges.

3. Results

Table 1 presents descriptive statistics of the variables considered in the analysis. A stepwise multiple linear regression analysis was conducted to identify which combination of general education diploma average score, university readiness, critical thinking skills, motivational traits, learning strategies, gender, type of school education, type of college, and overall performance on the foundation placement tests contribute most to the variance explained in the grade point average at the end of the second year in the university. The dependent variable was the grade point average at the end of the academic year in the university after the completion of the foundation program requirements.

Table 1. Descriptive statistics of the variables considered in the analysis (N = 1279)

Variable	*M*	*SD*
GPA	2.56	.51
General education average score	92.45	3.34
Overall foundation placement tests performance	6.28	2.76
University readiness	4.53	.48
Inductive reasoning-CCTST	6.07	2.09
Deductive reasoning-CCTST	5.18	1.88
Analysis and interpretation-CCTST	3.34	1.27
Inference-CCTST	5.07	1.87
Evaluation and explanation-CCTST	2.83	1.53
Intrinsic goal orientation-MSLQ	5.22	1.07
Extrinsic goal orientation-MSLQ	5.79	1.15
Task value-MSLQ	5.71	1.01
Control of learning beliefs-MSLQ	5.51	1.09
Self-efficacy for learning and performance-MSLQ	5.71	.98
Test anxiety-MSLQ	3.61	1.28
Rehearsal-MSLQ	5.45	1.15
Elaboration-MSLQ	5.27	1.15
Organization-MSLQ	5.34	1.23
Critical thinking-MSLQ	5.00	1.07
Self-regulation-MSLQ	5.23	.87
Time and study environment-MSLQ	5.15	.86
Effort regulation-MSLQ	4.88	1.04
Peer learning-MSLQ	4.39	1.32
Help-seeking-MSLQ	4.96	1.09

In seven steps, the full model included general education diploma average score, gender, overall performance on the foundation placement tests, type of college, extrinsic goal orientation, university readiness, and critical thinking as collectively statistically significant predictors of the grade point average. Table 2 summarizes the regression model of the grade point average at the end of the academic year after the completion of the foundation program requirements. The model accounted for 26.8% (Adjusted R^2 = .264) of the variance in the grade point average, $F(7, 1271) = 66.425$, $p < .001$.

Table 2. Regression analysis summary for predicting grade point average at the end of the academic year in the university after the completion of the foundation program requirements (N = 1279)

Variable	*B*	*SE B*	β
General education diploma average score	4.508	.458	.293
Gender	.173	.031	.169
Overall performance on the foundation placement tests	.024	.005	.127
Type of college	.104	.035	.075
Extrinsic goal orientation-MSLQ	.029	.011	.064
University readiness	.095	.028	.088
Critical thinking-MSLQ	.032	.013	.066

*p < .05. **p < .01. ***p < .001.

As shown in Table 2, each of the general education diploma average score, overall performance on the foundation placement tests, extrinsic goal orientation, university readiness, and critical thinking associated positively with the grade point average after controlling other variables. Also, females tended to have a higher grade point average than males after controlling other variables. Students in the humanities colleges tended to have a higher grade point average than students in the science colleges after controlling other variables. With the exception of the extrinsic goal orientation and critical thinking, the regression analysis excluded all CCTST components and MSLQ components as well as type of school education as having a statistically predictive value of the grade point average.

5. Discussion and Conclusion

Overall, the results contribute to the research literature investigating predictors of first year university GPA (Bai, Chi, & Xiaoye, 2013; Ibrahim, Yahya, & Al-Barwani, 1993; Nasir, 2012; Shulruf, Hattie, & Tumen, 2008; Wharrad, Chapple, &Price, 2003). These results allow researchers and educational practitioners to formulate a predictive model of academic success at university based on cognitive and motivational factors as well as background and demographic factors. For example, as shown in the present study, student performance on high school or general education diploma, gender, performance on foundation placement tests, type of first admitted college, extrinsic goal orientation, university readiness, and critical thinking are related to academic achievement in Sultan Qaboos University as measured by GPA at the end of the academic year in the University after the completion of the foundation program requirements. These factors are instructive for assisting students, specially male students and those entering science colleges, to achieve increased academic performance. Upon entry to the university, the students for instance can be asked to enroll in developmental programs designed to improve academic performance, motivational orientations, learning strategies, dedication and effort.

With regard to future research, it would be useful to consider whether the general education diploma grades are more valid predictors of university success than other alternatives. At present, the general education diploma grades are the only criterion for admission to the university in the Sultanate of Oman. Although the general education diploma grades are important and reflect the knowledge and skills acquired by the student, they represent the resulting product of a lot of considerable overlooked aspects of student behaviors (Kuncel, Credé, Thomas, Klieger, Seiler, & Woo, 2005). As alluded to by James and Chilvers (2001), admission criteria should not only applied without bias but also should be related to student success in the university. As such, future research might consider developing a taxonomy of cognitive and non-cognitive dimensions of student performance to be used for improving the quality of university admission. Also, future researchers might consider including other intrapersonal variables in the prediction model of the academic achievement in the university. Further, it would be useful to test the validity of the model using samples from other colleges and universities in the Sultanate of Oman.

The findings concerning student academic achievement in the university as a function of gender and type of first admitted college should be considered with caution. It has been documented that models of adjustment to university life and academic achievement in the university vary by gender (Credé & Niehorster, 2012; Palmer & Wright, 1999; Wintre & Yaffe, 2000). One possible explanation for the gender-based variation in the university academic achievement could be that males tended to be less motivated for learning than females (Shekhar &

Devi, 2012). Another possible explanation could be that female students tended on average to outperform male students in the secondary school (Fortin, Orepoulos, & Phipps, 2012). The college-based variation could be attributed to the issue that science colleges might be more demanding and using harsher grading standards than humanities (Arcidiacono, Aucejo, & Spenner, 2012). As such, academic policy makers in the university should ensure that all colleges maintain same sound assessment and grading regulations. In addition, gender specific adjustments and educational programs should be tailored to assist students to cope with the nature of the academic study in the university.

The positive relationship between performance on the foundation placement tests and university GPA found in the present study testifies the value of having a foundation program prior to the undergraduate study. The current foundation program at SQU prepares and equips students with the academic requirements of the undergraduate study in terms of English language, mathematical proficiency, and computing skills. However, as revealed in this study, student goal orientation, university readiness, and critical thinking have a predictive role in university GPA. As such, the foundation program might need to be expanded to include soft skills in terms of time management, communication skills, and study skills.

Although the findings of the current study provide the basis for designing support programs to identify and help students who are at risk for poor academic performance in their first year of the university after the completion of the foundation program, there two limitations to be considered when interpreting the findings. First, the general education diploma averages and university GPAs have different measurement scales. Second, the findings do not imply causal relationships despite the longitudinal nature of the data. Replicating the study using data drawn from different cohorts and universities might maximize the generalizability of the findings. Finally, future research might consider examining the extent to which students maintain their academic performance between the general education diploma and the first year of the university.

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