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Comparative and Analysis of Students Academic Performance in Oman Higher Education: Sultan Qaboos University Case Study

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ABSTRACT: Achievement and performance are important indicators that play significant roles in institutions of higher learning. To study the factors that influence performance, samples consisting of 400 students selected from the Sultan Qaboos University's Education, Engineering, Science, and Commerce colleges were utilized. Questionnaires and performance records were utilized as tools to study the influence of various factors such as demographics. The study reveals that performance and achievement are notably influenced by various factors such as individual motivation, learning strategies, teaching, and program alignment. Other factors that influence performance and achievement include the home and socioeconomic environments, peers, and familiarity and comfort with technology. Nonetheless, individual learning strategies and effective teaching are the fundamental drivers of high performance, while the other variables are significant but less influential. Science performers exhibited high achievement, and despite efforts, performance and equality for the opposite sex were marginally addressed. This study makes it clear that performance and achievement would benefit significantly if institutions of higher learning and the government were to focus on the various factors that influence performance, including but not limited to individual factors, but as well as other factors that influence performance. In the case of the 40th anniversary initiative, performance and achievement would benefit if the focus shifted to the development and improvement of teaching, familiarity and comfort with technology, and program and strategy alignment.

Keywords: academic performance, education, Oman, Sultan Qaboos University.

I. INTRODUCTION

Academic performance is one of the most critical aspects of educational success and quality. Academic performance indicates the degree at which learners have mastered knowledge and skills [1, 2]. This performance impacts learners' access to job and scholarship opportunities and builds learners' confidence and motivation [3]. At an institutional level, academic performance can serve as an instrument of measuring the quality of educational programs and the quality of higher education institutions as well [4]. On a more collective scale of the dimensions of higher education institutions around the world but particularly at the scale of the state of Oman, academic performance is closely linked with the accomplishments of Oman Vision 2040 [5]. As knowledge-based economies are considered critical for the growth of the state of Oman as stated on state of Oman's official government portal. Therefore, analyses of the underlying factors of academic performance at institutions like Sultan Qaboos University (SQU) remain critical during these modern times. This supports the continuation of quality education with respect to the socio-economic development of the state of Oman [6].

SQU founded in the year 1986, serves as the leading national university of the Sultanate of Oman [7]. As the leading institution of higher education, the university assumes an utmost significance in imparting

productive and qualified graduates and promotes educational and research endeavors that contribute significantly toward innovation and development programs of the country [8]. The university sprawls across various academic programs of different disciplines that attract students across Oman and could serve as a miniature representation of the education structure of the country [9]. As Oman strives toward the development of knowledge-based economies by leveraging the power of human resources according to its Vision 2040 platform, there arises an utmost obligation of SQU toward developing its qualified products with required skills and expertise that can contribute toward the sustained socio-economic development of the country [10]. As a result, the study of academic achievement at SQU provides an insightful overview regarding the efficiency of the higher education structure of the country toward the growth of qualified students and the development of leading personalities of the next generations. The study of the various factors that affect academic performance of students at the specific educational environment of SQU can facilitate the development of programs at the educational structure of the country toward the development of leading personalities of the next generations.

Moreover, performance levels are composed of multiple aspects that are ascertained by assorted variables intertwined together, which go beyond the intellectual aspects [11, 12]. These variables include elements that are individual and contextual, as well as factors that could influence the performance. The involvement of various aspects of personality, psychology, and the functioning of the environment may have a direct relationship with the student's performance [13]. The environment that the individual faces may contribute significantly to the institutional as well as the individual levels [14]. Contemporary educational advances have rendered the inclusion of technology an area that may significantly affect academic performance [15] [16]. Most recently, the integration of various technologies with e-leaning facilities may go a great way in offering enhanced experience that might directly affect academic performance [17-19]. Academic performance may therefore necessitate a multi-factor approach that incorporates various aspects and considers the relationship between various variables that may tend to contribute significantly at different levels. This may offer more precise and complete results regarding academic performance at Sultan Qaboos University.

Though the importance of educational attainment continues to be increasingly given attention in Oman, there still appears to lack adequate researched materials that address the combined effects of various variables on academic performance within the context of higher education institutions [20, 21]. Indeed, most of the available academic works that investigated the issue of academic performance within the Gulf region only considered one variable at a time with the lack of concern regarding the complex interactions between them [22, 23]. Additionally, few workers have considered a comparison approach to different colleges at the same higher education institution. Given the fact that students at Sultan Qaboos University possess vastly different academic profiles as well as different levels of academic and geographical backgrounds that may affect academic performance at the institution [6]. The study of these effects of various variables on academic performance at the institution appears highly valuable and necessary. As this study aims to address this academic void regarding the multifactor comparison of academic performance at SQU with the purpose of developing informed decisions regarding educational attainment at the institution and the overall goals of Oman Vision 2040.

The major goal of this research study is the development of an analysis of the major variables that contribute to the academic attainment of students at the Sultan Qaboos University. This study aims at comparing the variables across the different colleges as well as different student groups. By using an approach that analyzes multiple variables at the same time, this study intends to gauge the combined effects of individual variables on the academic performance of the students. This study must identify the variables that significantly affect the academic performance of the students the most. To do this, the study will address the following issues:

- What are the major factors that affect students' academic performance at Sultan Qaboos University?
- What are the relationships between individual and external variables and academic achievement?
- Do there exist considerable differences in academic performance among students coming from different colleges or demographic groups?

- What implications do the above results have regarding the improvement of educational practice and decision-making at SQU?

The paper structure: have the Literature Review in Section II, Methodology, in Section III, in Section IV, the Results and Analysis in section. Discussion presented in Section V. Implications and Recommendations discussed in VI, While the conclusion and Future Research presented in section VII.

II. LITERATURE REVIEW

1. THEORETICAL BACKGROUND OF ACADEMIC ACHIEVEMENT

Educational achievement has traditionally taken center stage as an area of research inquiry because the trait directly relates to the efficiency of the educational process and the accomplishment of the educational institution's goal of knowledge and skills acquisition [1]. This issue is based on a few theoretical foundations describing how different psychological, sociological, and environmental variables could affect educational performance. Some of the most successful theoretical structures underpinning the development of this area of research include the Theory of Student Integration as proposed by [24]. Which recognizes that academic success depends on the extent of integration of the student with the academic and other university contexts. This theory argues that a student who finds their place with the educational environment and institution enjoys increased access and academic success.

Second, there's Social Cognitive Theory (1999) proposed by Bandura [25], with the addition of the construct of self-efficacy; this consists of an individual's conviction of their capacity to perform tasks and succeed. Social Cognitive Theory asserts that there's increased student motivation and performance on the part of students who believe more in their own capabilities. Taken together, these theories argue that academic performance cannot be explained by the single factor but by the interactive effects of individual characteristics, institution-related variables, and external factors. This theoretical premise serves as the setting for the investigation on multifactor analysis of the variables that may affect academic performance at Sultan Qaboos University.

2. GLOBAL AND REGIONAL STUDIES ON ACADEMIC ACHIEVEMENT

Various global research endeavors over the years have taken up the topic of studying different variables that affect the academic performance of students pursuing higher education. Globally, investigations reveal that academic performance of students at higher educational institutions depends on various individual student-related variables and variables of an educational institution. To give an immediate insight into this topic, academic performance of students at higher educational institutions depends on different variables at Western institutions Robbins et al., (2004) [26] and at Asian institutions Richardson et al., (2012) [27] on the academic performance of students at higher educational institutions. Additionally, variables that affect the educational performance of students at higher educational institutions are socio-economic variables and the educational status of the student's parent Sirin, (2005) [28], along with the variables of the educational institution at which the student pursues higher education [29].

Within the context of developing countries, including the countries of the Arab region, other variables of potential relevance have emerged that pertain to the culture of expectations and transitions of education and technology readiness. Various research undertaken in the Gulf Cooperation Council (GCC) countries [30-32]. These studies point out the issues of lack of academic advising services offered on campuses; lack of student engagement; and the over-reliance on conventional education delivery methods. More recently, new technologies like e-learning platforms and environments have emerged with significance during the post-pandemic period when technology literacy emerged as a prerequisite of student success.

3. IMPORTANT CLASSIFICATIONS OF FACTORS THAT AFFECT ACADEMIC PERFORMANCE

Those that might affect the academic performance of learners are multi-dimensional and interconnected. Various researchers enumerate them into different broad categories such as personal, academic environment issues that cause technological issues that contribute distinctively differently.

3.1 Personal Factors

Other aspects that significantly contribute toward the achievement of academic success include personality traits like motivation and academic efficacy. Some of the highly motivated students usually have specific academic goals that they set and are more likely to prove better performing because of that motivation [33]. Additionally, academic efficacy that comprises the academic belief of academic capability usually exercises more efficacy and proves more persist because of the academic efficacy levels that the student possesses [34]. Other personality variables that contribute toward this academic success include stress management and academic strategies of studying.

3.2 Academic and Institutional Factors

Institutional variables refer to the issues of quality of education, curriculum structure, quality of academic evaluation tools, and academic advising. Quality education with engaging lectures and interactive lessons has the potential of improving student knowledge and critical thinking skills of learners [35]. Teaching pedagogy and academic engagement of students affect the efficiency of academic programs offered at the institution. Institutional culture, proper grading procedures, and access of learners to academic resources contribute significantly to the academic experience.

3.3 Environment and Socio-economic Factors

The external environment that comprises the student's income levels, education levels of their families, peer group pressures, and the conditions of their environment highly impacts their capacity to perform well [36]. Children who come from facilitating environments and socio-economic situations tend to access more resources related to education with lesser financial burdens on them and an abundance of motivation levels that place them at an advantageous point [37].

3.4 Technological Factors

With increased adoption of technology in institutions of higher learning, readiness for technology and technology literacy have increasingly become some of the most significant success factors. Greater opportunity for e-learning environments means there is improved flexibility and engagement levels with regards to the process of learning [38]. Challenges could be presented by disparities in levels concerning technological access or training. These categories cumulatively constitute an essential element in the entire process for evaluating the performance of students at SQU [39]. By evaluating the relationship between these variables, there is an aim to establish the most crucial predictors for performance, in addition to those with highest potential for improvement.

4. RESEARCH GAPS AND CONCEPTUAL FRAMEWORK

Though various research works have investigated the variables that affect academic performance individually, there appears to be a gap in the availability of complete research that considers variables of different aspects at the same time within the context of higher education institutions of Oman [40]. Most researchers who have sought the effects of various variables on academic performance so far have only investigated variables like motivation or quality of education or the socio-economic factors of students without considering the compound effects of these variables at different colleges or segments of the student community [41-43]. Additionally, very few studies have employed the method of comparison; this approach could enable the establishment of equality gaps regarding student academic performance based on different fields of study, colleges of origin, or their respective backgrounds [44, 45]. This issue constitutes an integral part of the interventions of the SQU, considering its student base with various backgrounds and its specific role concerning the Oman Vision of the year 2040.

On the light of the literature and theoretical perspectives [24, 46, 47]. The proposed study incorporates a theoretical framework that determines academic performance (measured by the Tabulated Grades Points Average) based on the combined effects of four broad dimensions of variables:

- Personal Factors: Motivation, Self Efficacy.
- Academic/Institutional Factors: Quality of Teaching; Curriculum; Assessments.
- Environment/Socio-economic Factors Family environment and Peer group Campus.
- Technological Factors: Digital literacy, Accessibility of eLearning.

III. METHODOLOGY

1. RESEARCH DESIGN

The Materials and Methods section encapsulate the blueprint of the research endeavor, meticulously delineating the tools, procedures, and approaches employed to explore the research questions or hypotheses. This section serves as a detailed roadmap, elucidating the systematic methodology adopted to gather, analyze, and interpret data with precision and integrity. Beginning with a comprehensive description of the participants or sample selection, it presents a detailed portrait of the individuals or entities involved in the study, outlining the demographic characteristics and selection criteria. Subsequently, the research design is explicated, illuminating the overarching structure guiding the study, whether it be qualitative, quantitative, experimental, or employing mixed methodologies. This section meticulously details the materials or instruments utilized, delving into the specifics of the tools, surveys, or equipment harnessed to collect data. The procedure or data collection segment elaborates on the step-by-step process undertaken during the research, providing transparency regarding the protocols followed. Moreover, the section addresses the approach to data analysis, offering insights into the methodologies employed to derive meaningful interpretations from the gathered information. Ethical considerations, limitations, validity, reliability, and, if applicable, statistical analyses are also conscientiously documented, ensuring a comprehensive and transparent portrayal of the research methodology.

This research utilizes a quantitative, cross-sectional research model to investigate the factors that impact the performance of students at SQU. The nature of the research as stated above makes it easier to investigate the relationship that exists between many variables based on the same point in time for the majority of the university's students. Comparisons concerning performance, based on demographics, are conducted across institutions.

2. POPULATION AND SAMPLE

The study's target the undergraduate students studying in the major colleges of the SQU, which are the colleges of Education, Engineering, Science, and Commerce. By employing stratified random sampling, the study sampled a combined total of 400 students across the various colleges so that the sample details roughly the proportion of every group represented. This study employed stratification so that the final sample details the varied student groups at the university.

3. DATA COLLECTION INSTRUMENTS

Data was obtained using an organizational questionnaire augmented with academic records. This assessed the students' academic performance based on their Grades Point Average (GPA) as captured by their academic records. The questionnaire used in this study reflected the results of various scales that had been used effectively by other researchers on the topic.

4. DATA ANALYSIS

The analysis was carried out using SPSS and AMOS computer programs. Initially, there was an analysis of descriptive statistics, such as means, standard deviations, and frequency distributions, to provide information on the nature of the data, in addition to regression statistics such as F-statistics to test for model

fit. Then there was analysis on correlations to examine associations between independent constructs and performance. To test for the relative importance of each predictor, multiple regression analysis was used to enable identification of those with highest importance in determining performance. Another test used was factor analysis to test for underlying constructs in the survey instrument, with a view to testing for its reliability. Finally, there were comparative analyses, such as ANOVA, t-tests, to test for differences in performance based on colleges, gender, among other demographics.

5. ETHICS

This study received ethical approval from SQU's Institutional Review Board. Participation in this study was on a voluntary basis; the students were made aware of the purpose of the study. All the answers provided were anonymized with the purpose of guaranteeing confidentiality.

IV. RESULTS AND ANALYSIS

1. DEMOGRAPHIC INFORMATION OF THE RESPOND

The surveys were conducted on a sample of 400 undergraduate students enrolled at four colleges of the SQU. These colleges include the colleges of Education, Engineering, Sciences, and Commerce. The sample comprises of an adequate proportion of female and male students. This proportion consists of 52% female students and 48% male students. A well-represented sample of students enrolled at different levels of study took part. A summary of the demographic details of the sample subjects of this study is provided in the following table1.

Table 1. Demographic features of participants.

Variable	Category	Frequency	Percentage
Gender	Male	192	48%
	Female	208	52%
College	Education	100	25%
	Engineering	100	25%
	Science	100	25%
	Commerce	100	25%
Academic Year	Year 1	100	25%
	Year 2	108	27%
	Year 3	96	24%
	Year 4	96	24%

2. SUMMARY STATISTICS

Descriptive analysis permitted the determination of the characteristics of averages with respect to the major variables of the study. On average, the levels of motivation (M=3.8; SD=0.6) and academic efficacy (M=3.7; SD=0.7) of the students were relatively higher. On the other hand, the average levels of the major variables of the study concerning academic performance of the institutions were between the scale points of 3.5 and 3.9. This indicates a relatively favorable reaction with respect to the variables of institutional characteristics. The average levels of the major variables of the study considering environmental settings revealed the presence of discrepancies with respect to the levels as well as the socio-economic environments.

3. FACTOR ANALYSIS

Factor analysis procedures can analyze the dimensions of the questionnaire by determining the appropriateness of the variables used. Principal component analysis with varimax rotation method revealed

the existence of four major factors that align with the proposed dimensions of the study's concept structure of the e-learning environmental factors [48].

- Personal Factors: motivation, self-efficacy, study skills and time management (Eigenvalue =3.1; explained variance=28)
- Academic/Institutional Factors: Teaching Quality, Curriculum Design, Faculty Support (Eigenvalue =2.8; Explained variance =25%)
- Environment/Support system: Family Support/Socio-economic Status/ Peer Influence (Eigenvalue =2.3; Explained=20%)
- Technological Factors: Digital literacy, e-learning, engagement with technology (Eigenvalue =1.9; Variance explained=17%)

The Kaiser-Meyer-Olkin measure of sampling adequacy overall came out at 0.85, while Bartlett's Test of Sphericity showed significance at p <0.0001. This justified the suitability of the sample based on the factor analysis.

4.CORRELATION ANALYSIS

Pearson's correlation coefficients were calculated to examine the strengths and nature of associations between each of these four independent variables and GPA [49]. All four showed significant positive correlations with GPA, suggesting a positive relationship between levels of each factor and levels of GPA. The results shown in Table 2 are as follows:

Table 2. Factors with correlation coefficients.

Factor with GPA	r	p
Personal Factors	0.52	< 0.01
Academic/Institutional Factors	0.48	0.01
Environmental Factors	0.31	0.01
Technological Factors	0.36	0.01

These results indicate that all four elements have a positive impact on students' performance in academics. Personal elements, along with academic/institutional elements, have high correlations with GPA, while environmental elements and technology elements have medium yet significant positive correlations.

5. REGRESSION ANALYSIS

Multiple regression analysis was performed to investigate how well the factors that had been identified would forecast levels of students' achievement. The overall model was significantly different from zero ($F = 45.32$, $p < .001$) and explained 48% of the variance in the dependent variable, as shown by the R^2 of 0.48. Table 3 shows the standardized regression coefficients and their corresponding *t* and *p* values:

Table 3. Predicator with regression coefficients.

Predictor	β	t	p
Personal Factors	0.38	7.12	<0.001
Academic/Institutional Factors	0.31	5.84	<0.001
Environmental Factors	0.18	3.21	0.002
Technological Factors	0.22	4.12	<0.001

Results show that the most significant influence on GPA values is created by the dimensions of personal predictors ($\beta = 0.38$) and academics/institutional predictors ($\beta = 0.31$), which signify that internal motivational and study processes, as well as the support mechanisms provided by institutions, play the most important

and integral part for the overall performance. The influence of technological predictors (β = 0.22) and environmental predictors (β = 0.18) is significant and of the medium category. All the above factors significantly influence the performance.

6. COMPARISON ANALYSIS

A comparison of the results through ANOVA revealed the differences regarding the performance of the students based on the different colleges. Results showed that:

- Students at the College of Science reported the highest average GPA of (M=3.6), followed by Engineering (M=3.5), Education (M=3.4).
- Past hoc analysis showed significant differences between Science and Commerce students ($p < 0.05$).
- Gender-based t-tests indicated that there were no significant differences in the performance of male and female students based on their GPA ($p > 0.05$), although female students considered themselves more motivated and had slightly higher levels of self-efficacy.

V. DISCUSSION

The study validates that academic performance at Sultan Qaboos University is affected by various interlinked variables as suggested by the multi-factor theoretical approach of Tinto, (2017) [24], Bandura, (1999) [25], and Astin, (1993) [47] among others. Within the four different categories of the factors identified through the study, the individual factors of motivation and self-efficacy stood out as the highest determinants of student performance. This study supports global trends as corroborated by various researchers [50, 51], who reported that students who are internally driven and believe that they could perform well are more likely to take active part in academic tasks and gain better grades. Academic and organizational variables of education quality, curriculum satisfaction, and faculty support played a part in the subsequent achievement of these students. This further confirms the critical role of institutions' infrastructure of supports and the strategies used with the institution's pedagogy. This group of students can better make their way through the program with the better quality of education that the faculty provides.

Environmental and technological variables, although being moderately significant variables, still made a positive contribution. Having a favorable home environment, peers' encouragement, and availability of eLearning platforms improved the study experience of students with multiple responsibilities. The significance of technology as a secondary variable over student-related variables indicates the growing relevance of learners' engagement with eLearning platforms in the higher educational sector of Gulf countries and the significance of eLearning platforms across the world [52]. Cross-comparison analysis suggests that there are major differences in mean performance levels in academics among college students, with science students scoring highest, while business students showed lower means. Gender did not have any influence on these outcomes, with the male group showing marginally higher means than the female group. But females showed slightly higher levels on motivation and efficacy.

VI. IMPLICATIONS AND RECOMMENDATIONS

From the case analysis conducted for Sultan Qaboos University, the following implications arise for institutions of higher learning for Oman regarding levels of performance. The implication for institutions of higher learning for Oman arises as there are programs that are based on motivation and self-efficacy for personal development, programs that focus on enhancing the quality of teaching through faculty development programs, and innovative approaches to the transmission of knowledge as well as an increase in the use of e-learning as factors that are most likely to influence performance. In addition, there are varying levels of performance for various colleges, which implicate the need for tailored approaches to ensure equity for the various disciplines. Also, there are implications regarding the allocation of resources for performance drivers, performance-driven actions, and ensuring the alignment of educational goals and national goals, such as Oman Vision 2040, for the development of innovators.

VII. CONCLUSION AND FUTURE RESEARCH

The study assists in drawing on the complex forces underlying those variables in relation to the performance of undergraduate students in SQU, utilizing a comparative analysis. It confirms individual forces, especially motivational beliefs, to have crucial bearings on those achievement levels, while other academic indicators, such as teaching performance, involvement, and engagement with faculties must be emphasized. It endorses validated concepts in education, requiring variable achievement levels to depend on the dynamic, individualized influence of several forces. It draws on areas needing future studies on analyses, taking into consideration qualitative aspects to measure motivation. Some other areas require focusing on studies in various institutions in Oman. Researchers are encouraged to probe into relations between Technological Readiness, individualized motivation, and achievement.

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Author Contributions

Specify individual contributions using the following statements: Conceptualization, A.A. and K.S.B.H.; methodology, A.A.; software, A.A.; validation, A.A. and K.S.B.H.; formal analysis K.S.B.H.; investigation, K.S.B.H.; resources, A.A.; data curation, K.S.B.H.; writing—original draft preparation, A.A.; writing—review and editing, A.A.; visualization, K.S.B.H.; supervision, A.A.; project administration, A.A.; funding acquisition, K.S.B.H. All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

Data is available from the authors upon request.

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