Summary of Thesis Submitted for (PhD) Degree.

BY

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On

FACTORS INFLUENCING THE ACADEMIC PERFORMANCE OF UNDERGRADUATE STUDENTS OF SULTAN QABOOS UNIVERSITY (OMAN) LEARNING IN ENGLISH, WITH SPECIAL REFERENCE TO ATTITUDE, MOTIVATION AND ACADEMIC SELF CONCEPT

Many official papers and research studies suggest that the low academic performance of science students in Sultan Qaboos University (SQU) in Oman may be due to their being taught in a foreign language, namely English. This belief has prompted the researcher to embark on the present endeavour. Since it would be impractical to investigate within a study of this scale all possible factors relating to the problem, three factors highlighted by previous studies, namely, attitudes, motivation and academic self-concept, were chosen as the focus for this work.

This study is a modest attempt to explore the intricacies of the multidimensional nature of attitudes, self-concept and motivation and their relationship to academic performance. Sex, level of education (first and fourth year stages), and also the main subject differences, were also investigated in relation to the above variables.

Thus, this study attempts to fulfil the following objectives:

1- ascertaining what relationships, if any, exist between attitude, academic self-concept and motivation of students learning science in English.

2- finding out to what extent the above variables are mutually influential.

3- proposing recommendations.

The study is limited to the SQU science students, with the sample taken from the five relevant colleges in the university. Three questionnaires were developed and administered to 565 students of both sexes, drawn from the first and fourth years. 39 lecturers were also interviewed.

The study is divided into seven chapters, ending with the appendices to the study, and an introductory chapter which deals with relevant contemporary issues.

The principal conclusions reached are:

1- A significant correlation was found between students' academic performance and their attitude, self-concept and motivation towards learning science in English.

2- A significant difference was found between male and female students in their academic self-concept towards learning science in English, but no significant differences regarding their attitude and motivation in learning science through English.

3-Significant differences were found among students of different colleges in their attitudes and academic self-concept towards learning science in English, but not in their motivation towards learning science in English.

4- A significant difference exists in attitude academic self-concept and motivation of first and fourth year students. Fourth year students had more positive attitudes and higher academic self-concept than those of the first year, but lower motivation.

Recommendations proposed include:

1- Building a good relationship between the teaching staff and the students; establishing a counselling body and friendly ecology in the colleges; and providing more positive feedback, which might all help to improve students' academic performance.

2- The university administration and lecturers must begin to create an atmosphere more encouraging of female students' attitudes, motivation and academic self-concept.

3- Closer ties should be forged with the female students, and more attention paid to them and their problems, as well as developing extra-curricula activities.

THE UNIVERSITY OF HULL

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ABSTRACT

Many official papers and research studies suggest that the low academic performance of science students in Sultan Qaboos University (SQU) in Oman may be due to their being taught in a foreign language, namely English. This belief has prompted the researcher to embark on the present endeavour. Since it would be impractical to investigate within a study of this scale all possible factors relating to the problem, three factors highlighted by previous studies, namely, attitudes, motivation and academic self-concept, were chosen as the focus for this work.

This study is a modest attempt to explore the intricacies of the multidimensional nature of attitudes, self-concept and motivation and their relationship to academic performance. Sex, level of education (first and fourth year stages), and also the main subject differences, were also investigated in relation to the above variables.

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The study is limited to the SQU science students, with the sample taken from the five relevant colleges in the university. Three questionnaires were developed and administered to 565 students of both sexes, drawn from the first and fourth years. 39 lecturers were also interviewed.

The study is divided into seven chapters, ending with the appendices to the study, and an introductory chapter which deals with relevant contemporary issues:

Chapter 1: looks at the development of the Omani education system in relation to the country's cultural development, to set the issues in context.

Chapter 2: surveys previous literature concerned with the various issues and variables of interest. The aim of this chapter is to provide a general account of the views, opinions, theories and findings of previous researchers who have dealt from differing angles with the same issues.

Chapter 3: is devoted to identifying and stating the problem which this study seeks to probe, and presenting the significance and objectives of the study.

Chapter 4: explains the approaches adopted in collecting the data and the methods used to analyse and interpret the findings of the study.

Chapter 5: provides a detailed analysis of data. This chapter is divided into two parts. In the first part the study hypotheses are tested. The second part comprises of two sections. Section one presents the views of lecturers, while the second reports the findings from an open question addressed to students.

Chapter 6: presents further analysis and interpretation of the findings and compares them with those of previous studies relating to academic performance, attitudes, self-concept and motivation. The model proposed for this study is also tested.

Chapter 7: recapitulates the main findings of the study and puts forward suggestions to help both the SQU, and Oman as a country, to solve the problems which appear to arise from teaching science in a foreign language.

The principal conclusions reached are:

1- A significant correlation was found between students' academic performance and their attitude, self-concept and motivation towards learning science in English.

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LIST OF ABBREVIATION

SQU = Sultan Qaboos University.

EFL = English as a Foreign Language.

TOEFL = Test of English as a Foreign Language.

GPA = Grade Point Average.

SA = Strongly Agree

A = Agree

U = Undecided.

D = Disagree.

SD = Strongly Disagree.

MSQ = Missing Questions.

F = Frequency.

P = Positive.

N = Negative

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INTRODUCTION

In recent years, strong interest has developed internationally concerning learning through a second language. A growing number of related studies published in the United States and United Kingdom, assessing the role of English as a second language, bear witness to this concern. These studies have set out to determine why people study through a second language, and what problems influence the students' progress. Thus, this is an issue which is of concern not only to the focus of this study i.e. Oman and Sultan Qaboos university, but also to other universities and countries which hope to benefit from this approach.

Eng and Manthei's (1984) studies show that, for the majority of international students, adjusting to the host culture and learning to communicate effectively in the host culture's language, is a stressful experience, one which may have a negative effect on the students' academic performances.[1] Ng's (1962) New Zealand study reported that 57 percent of the overseas study sample had learning difficulties relating to language.[2] Noor (1968), in another New Zealand study, found that 48 percent of the sample had great difficulty in understanding lectures upon their arrival in that country.[3]

Wardlow (1989), reporting his findings regarding the relationship between learning through a second language and academic performance in American institutions, claimed that, for international students, performance on a measure of English proficiency was highly correlated with success in graduate course work. However, Wardlow indicated that little evidence exists to indicate that abilities in learning through a second language accurately predict the likelihood of success in graduate course work and that

distinguished undergraduate performance in the home country was not a good indicator of probable success in graduate programmes in American institutions.[4]

Holthe's (1985) study reported that inappropriate immersion in a second language may have detrimental effects on academic performance.[5] However, Cummins (1979) suggested that learning through a second language can positively influence the academic and cognitive growth of individuals.[6]

In a study linking foreign language learning and motivation, Laine (1987) analysed the short term motivation of school pupils learning a foreign language, concluding that the "short term motivation" which appears in the foreign language situation is equally significant as " long term motivation", as a determinant of achievement. Laine stated that motivation leads to over or under- achievement and showed that in optimal achievement grade situations in the foreign language classes, high self-evaluation influences the chance of success. Under- achievement was clearly associated with low motivation. Laine also found that a supportive home background has a positive effect on attitude toward classroom activities, whereas underachieving students have negative attitudes associated with background toward foreign language learning.[7]

Laine (1986) proposed that all affective factors can contribute to the "filter" attitude and motivation, personality traits and self-ratings, and all have their affective elements which lead to a negative attitude toward foreign language learning or associated activities. Thus, the learner turns away from the subject and develops a negative attitude toward the non-native language of learning.[8]

As the cited studies show, motivation and attitude in foreign language learning have usually been lumped together into a cluster of factors which are held jointly responsible for success or failure in foreign language learning. Studies have also been conducted showing correlations between learning through a second language and student self-concept. Scovel (1978) suggested that the intrinsic variable of self-concept can largely influence learning in a second language.[9]

Cox et al. (1981) reported in a study of overseas students at Edinburgh University that language difficulties in studying in a second language caused personal stress and a related self-feeling of inferiority, resulting in the possibility of a relationship between stress and examination failure.[10] Kapur (1970) reported a higher failure rate in male overseas students than among British students, which he related to the stress of being an international student in a non-native language of study.[11] Forsythe (1987) found that native English-speaking students in a French immersion class had a lower self-concept than native French-speaking students.[12] Marion (1986) concluded that foreign students learning through second language find themselves in a communication and cultural maze, causing academic problems and a lowered self-concept.[13]

A study by Lee stated that "self-concept is considered to be formed upon the self-perception of significant others' evaluation". In relating this statement to past studies showing a consistent association between a positive self-concept of a student and his/ her high academic achievement and learning through a second language. Lee asserted that feelings of inferiority caused by being in a non-native language of study most assuredly affect academic performance and have future ramifications for education experiences.

In 1984, Lee's research showed that a relationship exists between a complex idea of learning through a second language, academic achievement and self-concept.[14] Previous studies have also shown that there is no simple causal link between the three; the relationship is complex and learning through a second language is seen to influence academic achievement and self-concept; and motivation, language attitude and academic achievement influence self-concept.

The issues considered above are linked to the personal interest of this researcher, in his need for research into the factors influencing the academic performance of students learning science through a second language (i.e English), with an emphasis on attitudes, motivation and academic self-concept, and an attempt to discover to what extent these variables are mutually influential. This interest has emerged and been strengthened as a result of many years of experience in teaching in both public schools and at Sultan Qaboos University in Oman, and has developed strongly through class lecturing and close work with students at the university, and continued study and reading in the field of educational psychology.

The present topic of research was prompted by the apparent scarcity of empirical studies which investigate the relationship between academic performance of undergraduate students and their academic self-concept, attitudes and motivation in learning science through a second language. Few studies in this area have been conducted in Arabic countries. Omani society, like the neighbouring countries, is influenced by the Islamic religion, which has also had major effects on the individual's behaviour and education. Great importance is attached to academic success for students in Oman. As Zaidan (1985), writing of Saudi Arabia (a country with a very similar culture) asserted, to the successful student is greatly appreciated and

rewarded by the university and family while the low achieving student experiences demoralisation with few alternative ways being available to regain his self- respect and maintain his self-concept.[15] These comments are equally true in the Omani context.

The subject of the present research became an urgent matter for the researcher when he realised that Omani students earned lower grades when tested in the English language, while the same students did better when tested in their native language. Thus, this research is focused on certain factors influencing students' academic performance.

At an early stage, it became very clear that if this study could establish a link between learning science through English language and academic achievement (performance), as well as attitudes, academic self-concept and motivation, it might provide a basis for action to improve the relation between these above variables and enhance students' academic performance. Additionally an improvement in students' attitudes towards learning science through English may be achieved.

However, in this introductory preface, it must be admitted that, like any other project, the enterprise of teaching through a second language- which is the field of this study, has its negative and positive aspects. Therefore, this study has as one of its objectives the analysis of the positive and negative influences upon the students whose performance is the subject of this study.

Hence, the present study may be important and worthwhile to both Sultan Qaboos University and the University of Hull. If the present study succeeds in verifying the relationship between academic performance and academic self-concept, attitudes and motivation in learning science through

a second language (English) it will have achieved its aim and paved the way for more research in the field of educational psychology.

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CHAPTER ONE

OMAN

CULTURE AND EDUCATION SYSTEM.

1.1 Geographical Background:

Oman is located at the extreme south-east of the Arabian Peninsula. Oman is the second largest state of the peninsula following Saudi Arabia, with 300,000 square kilometres.

To the west, Oman borders Saudi Arabia and the United Arab Emirates; to the south, Yemen; to the north, the Strait of Hormuz and the Gulf of Oman; and to the east, the Arabian Sea. Topographically, Oman falls into a number of distinct areas: The Muscat region(the capital region); The Interior, Batinah plain, Dhahira Area, Sarqiya Area, Southern Region (Dhofar); and Musandam Region (see Appendix 1.1).

The country covers a vast expanse of rugged mountainous terrain with green valleys and oases that have been transformed into arable land. The mountains ranging up to 12,000 feet, the rainless harsh expanses of the desert and the tropical monsoon climate on the coastal plain have made it difficult for Oman to adopt similar systems on development projects for the whole country.[1] Oman is influenced by geographical location, as the crossroads of both the land and the sea. Oman has also been the meeting place of many cultures: the Sumerian, the Babylonian, Greek, Persian, Indian, and Arab, as for centuries it dominated the vital trade routes along the Arabian sea and the Gulf of Oman. All these forces have helped in forming the customs of Omani society.

The country falls into two main divisions, the Coast and the Interior. This distinction, historically has. been one of main formative influences on

the country's economic organisation and development. The sea has contributed much to the character of the coastal Omani communities. Seaborne trade, on a relatively important scale, and shipping that accompanied it, enriched the coastal ports, creating a powerful and well-organised state. This formed a trading empire reaching as far as coastal India, eastern Africa and much of present day Iran. During Oman's commercial golden age, the shipping industry was the keystone of the coastal economy, for thousands of years.

The contrast between the inward directed agricultural subsistence economy of the Interior, and the more complex and open coast economy geared to commercial activity, has left a cultural and communication gap between the coast and the Interior in the respective attitudes displayed toward economic enterprise.

1.2 Oman: Society and Culture

Omani society, like society elsewhere in the Middle East, is dominated by two major social features: religion and family. An exceptionally strong aspect of the sociocultural system is religion. Oman, as an Islamic state, has played an important role in the propagation of Islam in east Africa. The religion of Islam is not only a system of beliefs but also an entire way of life, with no distinction between sacred and secular. For example, the Qur'an (holy book) reveals certain customs, traditions, and rituals for guiding everyday life, from the first rituals of birth to the principal events of life and death, including education, discipline, and marriage. It is worth mentioning here that in spite of the dominant hegemony of concepts of Islam, there still remain numerous other overlapping customs and traditions, which have met on Omani soil. These customs, relating to the family and tribe, still affect decision making today.

Birks and Sinclair (1987) stated that "In Oman society, the family, and not the individual, is the social unit, as elsewhere in the middle East. The Omanis are oriented closely to extended families and tribal groupings. Obligations to one's kin must always come first. The family retains, in varying degrees, the traditional characteristic of being extended through patriarchal, partrilineal, endogamous, and occasionally polygamous forms of organization."[2]

The integrity of the family is highly valued because the individual derives from his or her family, support and security. In return, individuals give their services and loyalty to the family. Consequently, family ties are strong and trust, mutual help, and feelings of responsibility for one's extended family are the established order. Within the family, the relationship of offspring to the parents is basically submissive, obedient and pious.

As in other patriarchal societies which are involved in the modernisation process, the Omani family has undergone some changes in the family patterns and role of women, that have led to new modes of living. The large family is losing ground as being the ideal family, replaced by a more moderately-sized family of about four to five children. Beliefs about the status of women are changing; employment for women in certain occupations is increasing and girls are marrying at a later age.

The extent of this development, however, is more apparent usually in the urban areas, while in the villages, the extended family system remains the dominant feature of local society. From this perspective, the extended family is the basic sociocultural unit underwritten by specific Arab-Islamic ideology.[3]

1.3 Education in Oman

In the writer's view the people of Oman are looking towards new horizons in the future of their country, proud of their religious and cultural heritage, aware of the challenges of the present age and strongly determined to face and overcome them. The Omani people remain committed to their fundamental principles, while being obliged to meet their international and human commitments, and aware of the changing world around them affecting the lives of the people of Oman. The task before them is one of creating a generation capable of applying itself to ever changing circumstances, building up a new society. It is believed that education will play a major role in the reformation of Oman. Bearing all these points in mind the basic aims of Omani education are as follows:

1- to give every Omani child at least a primary education;

2- to ensure a sufficiently trained contingent of Omanis are produced to meet the manpower needs;

3- to afford women equal opportunities in society;

4- to instil Omani values and national pride through the Omanization programme.[4]

The above aims were the basis for universal education for all Omanis, which was introduced in 1970. Before this date, only three public primary schools existed in Muscat, Matrach and Salalah, in addition to an American Mission school, which together provided education for 900 male students. Since 1970, and the accession of His Majesty Sultan Qaboos, education has made great strides, growing from three public primary schools to 823 in general education in 1992. The number of students has increased from 900 (male only) to 387,288 both male and female, (see Table 1.1).

Table 1.1

Number of students and teachers at Public and Private schools in Oman for 1993

STAGE	SEX	STUDENTS		TOTAL	TEACHERS	
		public	private		Omani	foreigners
Pre-Primary	M	-	2453	**2453**	-	-
Education	F	-	1982	**1982**	-	-
	Total	-	**4435**	**4435**	-	-
Primary	M	148769	3574	**152343**	3166	2399
(Elementary)	F	135065	2503	**137568**	2755	2074
Education	Total	**283834**	**6077**	**289911**	**5921**	**4473**
	M	52023	333	**52356**	247	2720
Intermediate	F	44340	263	**44603**	405	1921
Education	Total	**96360**	**596**	**96959**	**652**	**4641**
	M	19499	200	**19699**	73	1199
Secondary	F	20360	82	**20442**	159	1187
Education	Total	**39859**	**282**	**40141**	**232**	**2386**

Source = Ministry of Education (1993).

There are more than 380 primary schools with 272,068 students, 359 intermediate schools with 84,128 students and 83 secondary schools with 31,092 students. In addition to general education, there are seven Islamic intermediate schools in the mosques with 566 students and one secondary Islamic institute with 264 male students. Moreover, currently ten intermediate teacher training colleges exist (equivalent to Further Education colleges in Britain). Six of these are for males, with over 2,000 students and four for females, with a total of 1700 students.

The present aims are to have teacher training colleges for both male and female students, to overcome the shortage of teachers, and also to replace the present foreign teachers with nationals, while at the same time expanding the educational network.

1.4 Structure of the Education System:

The educational system is a centralised one. The structure of primary, intermediate (preparatory) and secondary education is as follows:

1.4.1 Primary Stage:

The entry age for primary school in Oman is between 6-8 years old. The children attend for six years (from grade one to grade six). In this respect, Oman is like most Arab countries. This stage of education is compulsory.

1.4.2 Intermediate Stage:

This stage is a continuation of the elementary stage. It lasts for three years, for students who have passed the primary stage. It prepares the students to enter the secondary level. The age of the students at entry ranges from 13-15 years old.

1.4.3 Secondary Stage:

This stage has been organised as a complete stage which leads to university or different colleges; it extends for three years. The first year is general, for all students, and the last two years are divided into two streams. literary(arts) and science. The science section concentrates on science subjects, while the arts section emphasises in social studies. There are no strict criteria for selecting students for either section. Students who obtain the arts certificate can study at the university, in the College of Arts or Islamic Studies, or at the College of Education. while the holders of

scientific certificates can attend the university in the College of Science. the College of Education or the College of Commerce.

1.5 Private Education:

Private education is widespread in Oman. Children are provided with education in all four stages of general education (pre-primary, primary, intermediate, and secondary education.). All schools are coeducational. According to the Directorate of Private Education in the Ministry of Education (1993), there are 68 private schools in different parts of the country with a total of 8,531 students. The Ministry of Education supervises private schools to ensure that the students enjoy appropriate educational facilities and that the standards are equivalent to those in corresponding state schools.[5]

1.6 Curriculum

The basic philosophy and the basic objectives of education have been set out and various curricula have been designed to reinforce and achieve these objectives. The responsibility for curriculum development rests with the Ministry of Education, qualified teachers and inspectors.

The Omani school curriculum emphasises knowledge in terms of disciplines and focuses on school subjects. In other words, it is a very traditional curriculum which controls the educational system in the Arab countries in general (Akrawi and EL-Kousy 1971)[6] . Curricula are identical for public and private schools, and they are assigned by government authority. Identical textbooks are used in all schools. It is very uncommon for teachers to give assignments from sources outside the textbooks.

Curricula are usually devised by committees. A central committee established by Ministry of Education formulates the basic directives, the subjects to be taught and the time to be allocated to them; specialised

committees decide on the content of each subject. The curriculum for the primary school aims to provide basic knowledge and skills. School subjects at this level encompass religion, nationality, society, economics, science, health, and leisure. The curriculum for intermediate and secondary stages emphasises Islamic religion, Arabic language, mathematics, social science, physics, chemistry. English as a foreign language and physical education.

Al-Farisy (1988) stated that "the subjects of Arabic language, Islamic Religion and Mathematics are given more attention in comparison to other subjects, even though other subjects are essential for student development. Almost half the school's weekly timetable is allocated to Islamic religion, Arabic language and science studies, hence leaving very little time for other subjects, such as social activities."[7] (see Table 1.2).

TABLE 1.2

The Weekly Study Plan for Secondary Education

	GRADE 1		GRADE 2				GRADE 3			
SUBJECT	**General**		**ART**		**SCIENCE**		**ART**		**SCIENCE**	
	B	**G**	**B**	**G**	**B**	**G**	**B**	**G**	**B**	**G**
Religion	4	4	4	4	4	4	4	4	4	4
Arabic	7	7	9	9	5	5	9	9	5	5
English	6	6	8	8	6	6	8	8	6	6
Math	6	6	2	2	8	8	2	2	8	8
Science	-	-	2	2	-	-	2	2	-	-
Physics	2	2	-	-	4	4	-	-	4	4
Chemistry	2	2	-	-	3	3	-	-	3	3
Biology	2	2	-	-	3	3	-	-	3	3
Social studies	6	6	9	9	1	1	9	9	1	1
Art education	-	-	1	1	1	1	1	1	1	1
Physical ed	1	1	1	1	1	1	1	1	1	1
Total	**36**	**36**	**36**	**36**	**36**	**36**	**36**	**36**	**36**	**36**

Source: Ministry of Education, Oman 1993. (Boys = B. ; Girls = G.)

It can be observed from Table 1.2 that the important role which English Language should play as vital element in the learning process for students in all subject areas has not been adequately addressed by the

planners of the school time-table. This can be seen from the fact that English language teaching enjoys no special extra time allocation on the time-table. This situation highlights the significance of this study as students whose mother tongue is not English are bound to experience some difficulties in a learning process that relies on English as the medium of communication.

1.7 The Examination System:

There are two types of examinations in general education. One is given at the end of the first semester and the other is given at the end of the year(second semester); the former carries fifty percent of the marks and the latter, fifty percent. Marks each semester are distributed between three class exams (every month; fifteen marks) and one end of semester exam(35 marks).

In the last year(third year) of secondary school the first semester has fifty percent of the marks and the second semester the other fifty percent. The exam for the last year of secondary school is set by the Central Examination Board of the Ministry of Education while the exam for the first and second years of secondary education are set by a board in each individual region in the country

Pass marks of forty percent or more will ensure the student can progress into the next grade in the case of general subjects, but the pass mark for Arabic language and Islamic education is fifty percent. Students who fail to achieve the pass mark must sit a national exam again at the end of the summer holiday, before school starts; students who fail in this second exam must repeat the same grade. Students who fail in more than two subjects must repeat the whole year.

1.8 English as a Second Language in the Education System:

In general education, English as a foreign language (EFL) instruction begins in the fourth year of primary education, when students are approximately nine years old, and continues through the intermediate and secondary stages. Students will have completed nine years of English as a foreign language during their general education.

Research into English as a second language in the Omani education system has identified issues of concern, particularly that of the number of study units (hours per week) and the most effective age to begin study of English in the Omani system.

Surur and Al-Twaijri (1982) suggested that EFL instruction should begin in the first year of the primary stage.[8] They added that many Omani teachers complain that students begin studying a foreign language too late, and that all public schools should start teaching English as a foreign language at the pre-primary stage, as do the private schools.

The reason for this early start in learning a new language is because when students begin their study of English as a foreign language, they are forced to grapple with an entirely new phonological and morphological system which is unrelated to that of their native language. In addition, these students are unfamiliar with Roman script and the concept of reading from left to right(Arabic is read from right to left). Progress is obviously slow for students at the primary and intermediate stages, since students spend most of their time learning to read, write and memorise words.

Problems of overcrowded classrooms, lack of materials and facilities are all endemic in Oman. For the most part, the instructors are from Jordan, Sudan, Pakistan, Egypt and India, and cause the students confusion because of their different pronunciation and their differing accents. At present, only

10% of these teachers who teach English are Omani. Moreover, the structure of EFL courses, in general, is based on translation, along with memorisation and exercises in grammar.

Poor preparation in learning English as a second language is usually felt by students when they reach the University and Technical college where students find English language knowledge is essential in their chosen field of study. In university programmes, students continue with twelve hours of English language instruction per week during the first semester in the first year of entrance to the university, to help improve their academic and communicative skills in English and to bring them to a level where they are able to pursue higher studies.

1.9 Higher Education:

Higher education in Oman aims to prepare graduates for executive levels and key posts; in other words, to achieve the objective of fulfilling manpower requirements. Diversification of education is deemed necessary, and courses are established based on the results of careful study of manpower needs in all fields.[9] Now, there are two types of higher education in Oman, to fulfil the country's requirements:

1.9.1 University Education:

Sultan Qaboos University was opened in 1986 and accepted both male and female students for higher education (undergraduate and postgraduate). Table No.2.3 shows the growing number of university students since 1986/1987 (the start year) to 1993/94, according to colleges and year.

TABLE 1.3

Number of New Students at SQU According to Colleges and Academic Year.

COLLEGES	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94
College of Education	284	235	253	270	375	340	390	502
College of Science.	82	80	86	87	75	76	71	67
college of Medicine.	41	36	57	66	75	80	87	85
College of Engineering.	103	72	105	101	90	110	119	100
College of Agriculture.	81	80	85	75	75	61	70	75
College of Arts.	-	122	138	132	160	157	124	137
College of Commerce & Economics	-	-	-	-	-			122
Total	**591**	**625**	**724**	**731**	**850**	**824**	**861**	**1088**

Note: this table has been compiled by the researcher based on information taken from the Department of Students' Affairs: SQU 1993.

The university follows the system of credit hours and academic years.

1.9.1.1 Credit Hour System:

The credit hour system is a basic measure used in calculating and recording the work completed by students in the university. Usually, one credit- hour represents one hour's instruction per week in a given subject. for a designated number of weeks in the semester. Students have to take 12-18 credit hours. Those of good academic standing can take 16-18 credit hours, but students who are on academic probation are not allowed to take more than 12 credit hours for two semesters, until the academic performance is satisfactory (grade point average of 2 on a 4- point scale). If students do not achieve the required standard in those two semesters, then they are dismissed from the university.

1.9.1.2 Academic Year System:

The university also follows the academic year. The year is divided into two semesters, Autumn and Spring. The two main semesters are each 16 weeks long, including two weeks for examinations and registration. It is

also possible to run an intensive summer semester for ten weeks. The university comprises the following seven colleges:

1- College of Education and Islamic sciences

The duration of study is four years or completion of 136 credit hours, after which the successful graduates will be awarded the degree of B.Ed in their subject specialisation or BA in Islamic sciences.

2- College of Sciences

The duration of study is five years; graduates are awarded the BSc in their subjects of specialisation after completing the prescribed courses successfully.

3- College of Medicine

The duration of study is divided into two parts; the first part is four years and ends with the degree of Bachelor of Medical Science; the second part is three years and is concluded with the award of B.M.B.S, after which the student must spend one year in a compulsory internship before practising medicine independently.

4- College of Engineering

The duration of study is five years and graduates are awarded the degree of B.Sc. in Engineering, according to their specialisation.

5- College of Agriculture

The duration of study is four years and the degree awarded is B.Sc. in different specialisations.

6- College of Arts

The duration of study is four years and the degree awarded is BA in different specialisations.

7- College of Commerce and Economics

The duration of study is four years and the degree awarded is BE in economics or BC in commerce.

2.9.2 Sultan Qaboos Institute of Islamic Studies:

The Institute of Islamic Studies is supervised by the office of the Diwan of the Royal Court; the duration of study is four years. The courses cover different branches of Islamic studies, such as the Shari'a (Islamic Law), the Holy Quran and the Sunna(Prophet's Sayings), Islamic education and Arabic language.

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CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction:

Because of the broad scope of this research, a difficulty is faced in this chapter in presenting a concise yet reasonably comprehensive survey of previous literature concerned with the various issues and variables of interest to this study. It is the aim of this chapter to provide a general account of the views, opinions, theories and findings of previous researchers who have dealt from differing angles with the same issues which this research aspires to tackle. This chapter will be divided into three sections as follows:

1- second language acquisition;

2- attitude and motivation;

3- self-concept.

In each of these sections, particular attention will be paid in a separate sub-section, to learning through the medium of a second language.

2.2 Second Language Acquisition:

Firstly it is necessary to highlight some of the most important definitions of language, by way of introduction to this section. Freedman and Grand (1977) stated:

> " *language is ordinarily considered to be a complex system of interpersonal communications, of numerous sub-systems and intimately connected in various ways with culture. Language is also an intra-psychic system that acts as a mechanism of self-control, self-direction and transforming such intra-psychic phenomena as images (visual,*

auditory, olfactory), fantasies, dreams, and ideas into conscious and communicable form."[1]

Fishman (1972) regarded language not merely as a vehicle that carries meaning, but as an entity in its own right. He said:

> *" language is not merely a carrier of content, whether latent or manifest, language itself is a content, a reference for loyalties and animosities, an indicator of social status and personal relationship, a marker of situations and topics as well as the social goals, and large-scale value-laden arenas of interaction that typify every speech community"*[2].

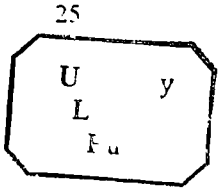
Towards a universal theory of second language acquisition, Brown (1973) contributed this suggestion:

> *" a widespread inter-disciplinary research in the affective domain of psychology of language acquisition could lead to the construction of comprehensive theory of second language acquisition as well as more approaches to language teaching".*[3]

Freedman and others drew attention to the role of body in language transmission, particularly hand movement, which helps in the transmission of vocalised ideas and thought.

Ellie (1988) emphasised the active participation in communication interactions in which learners engage as part of the process of second language acquisition, not merely absorbing but actively developing competence by negotiated understanding of meaning while transferring the gaps in knowledge.[4]

Gass and Ard (1984) suggested a possible relationship between second language acquisition and language universals in which they attempted to predict the influence of universals on the form of learning language, and they predicted that those universals that have a basis of cognition or



perception are most likely to be reflected in the performance of second language learners.[5]

Litte (1989) tried to establish a form of comparison between first and second language acquisition in relation to the development of the capacity to communicate and deal with meaning in a variety of contexts.

> *" The behaviour capacity that is enlarged by language learning is the capacity to communicate of the language learner. This signifies the capacity to convey meanings intelligibly in given circumstances using a particular linguistic code, and to understand meanings so conveyed. With regard to second language learning, the situation is somewhat different, insofar as some second language learners are interested only in understanding the target language. However, in all cases second language learning entails learning more ways of dealing with meaning in more contexts and in communication with more people".*[6]

Cognitive theorists see second language learning as a mental process, leading through structured practice of various component subskills to automatization. automatic or routinized analytical processes.[7] Gardner and Lembert (1972) argued that those learners who have a tendency to act with a strong ethnocentric or authoritarian feeling toward other groups are not likely to have an integrated orientation toward the learning of a new language. Moreover, other variables such as feelings of societal satisfaction or social uncertainty have to be taken into account when studying the processes of language learning.[8]

2.2.1. Age in Second Language Acquisition

A number of foreign language learning researchers have observed some important similarities between first language acquisition and foreign language learning. Dulay and Burt (1982) argued that:

> *" the errors made by children learning their language typically involve syntactic simplification, rule over-generalisation, and the reduction of syntactic redundancies".*[9]

Such mistakes are typical also of second language learners, of whatever age. However, research has also pointed to differences in acquisition of a language which are age-related. Oyama (1976) investigated the relationship between age of arrival in a new region and pronunciation of its language. He concluded that the degree of native-like pronunciation ultimately attained, whether in a second language or a second language dialect, depends largely on the age of arrival of the learner in the country. The younger the learner upon arrival, the more likely that native-like pronunciation will be attained .[10]

In a study by Neufeld (1977-1979) twenty Canadian students (aged 19-22) were trained in the production of a number of Japanese, Chinese and Eskimo sound patterns via eighteen hours of individual instruction programmes for each language. He concluded that younger students learn a second language more easily and more proficiently than older ones. After settling in another language community, younger children seem to be very efficient in picking up the new language, whereas their parents often seem to experience great difficulty in acquiring the same level of proficiency as their children. In addition, he strongly supported the notion that children are superior in the area of pronunciation within a second language environment.[11]

Yamad and Kotake (1980) also reported that younger children are more successful at memorising vocabulary and pronouncing new words in a second language. This phenomenon is sometimes ascribed to the role of the co-ordination of "speech muscles".[12] For example Brown (1980) argued that:

> ***Starting a physical skill at a young age is advantageous. The same should be true of language in respect to pronunciation of language. It is no wonder that children acquire authentic pronunciation while adults generally do not, since pronunciation involves the control of so many muscles".***[13]

Another theory put forward to explain age-related difference in the speed and efficiency of language acquisition is that of lateralization. For example Scovel (1969) commented in favour of a lateralization hypothesis, whereby adults' inability to master a foreign language is directly related to cerebral lateralization.[14] Krashen (1973) reported that the capacity for language is not a finely specialised ability, but part of a general cognitive capacity. Krashen gave evidence that lateralization may be completed as early as five years of age, and presented data providing some evidence of a phase similar to that of adults.[15] Abler (1981) reported the results of a study involving Hebrew-speaking school children at different levels of proficiency in English. He suggested that non-dominant hemisphere may be more involved during the initial stages of foreign language learning than during later stages.[16]

The widely observed phenomenon that children learn a second language more easily and proficiently than older people, has led to a hypothesis that there is such a thing as an optimal age, or critical period of language acquisition.[17] Lenneberg (1967) argued that the critical period for

natural language learning "by more exposure" is roughly between age two and puberty. Before two, language learning is impossible due to lack of maturation of the brain, while by the time of puberty, lateralization of the language function to the dominant hemisphere is complete. He maintained that this biologically-determined period is responsible for the fact that after puberty, languages have to be taught and learnt by conscious effort and hard work; also, foreign language accents are difficult to conquer.[18]

However, the evidence regarding the role of age in language acquisition is inconsistent .Little (1989) pointed out that :

> ***"There is a body of evidence suggesting that learners whose exposure to the second language begins in childhood achieve higher levels of proficiency in the language than learners whose experience of the language begins later in life. On the other hand, there is also a great deal of evidence indicating that in the beginning stages of second language acquisition older children learn more rapidly than younger children and post-puberty learners progress more quickly than prepubertal learners".***[19]

Moreover, the results of comparisons are inconclusive because often, like is not compared with like; as comparisons are often made between children acquiring their native language and adults learning a foreign language.

Many studies have made a comparison between the child learning from "natural exposure" with the help of parents, and adults learning in the classroom situation, which depends greatly on textbooks based on particular teaching methods or technique. Kennedy(1973) commented on this difference. Whereas the first language is usually acquired in a rich linguistic environment, in the second language "we the teachers, select phonological,

syntactic, lexical and thematic items, we decide and arrange the sequence of their presentation to the student, we force him to practise the rules we think are being learned".[20]

Ingram (1980) maintained that a typical second language learner is exposed to the target language from four to six hours a week during the school term. This cannot begin to approximate to the amount of exposure experienced in all his waking hours, by a child learning his first language.[21] Catford (1971)[22] and Kennedy (1973)[23] pointed out the wide difference between the amount of time spent by a child learning his first language and that spent learning a second.

Ingram (1980) claimed that the intelligent interest which a student brings to the task of learning a second language is slight by comparison with that of the first language learner. The same writer pointed out that there is only one way in which an adult can experience something approaching the intensity of drive which he brought to his first language, and that is by being in a comparable situation. An individual may find himself in a place where people speak a language he does not know, and where there is nobody to interpret. Learning in such situations can be very fast.[24]

2.2.2. Context in Second Language Acquisition:

The context within which second language acquisition occurs is an important factor. As noted previously (2.2.1) the child acquires his first language in a direct and immediate situational context, while many second language learners learn in a formal classroom situation. Seggliger (1975) distinguished between informal and formal learning situations in two respects: organisation of language exposure and feedback. In formal situations, the

rules of the language (whether phonological, syntactic, or socio-linguistic) are presented to the learner in a more or less orderly fashion, in extreme cases, one by one. In informal situations, any encounter may potentially involve any combination of the rules of the language.[25] Ingram (1980) believes that:

> *" second language teachers do their best to provide context for language work for much of the time, but nobody in a formal setting can arrange appropriate contextual support for every utterance".*[26]

Ingram claimed it is rarely possible in a classroom situation to relate utterances to communication purposes, to a direct and practical need to be understood. Dulay and Burt (1982) stated:

> *" Children receive much more concrete "here and now" input, which facilitates language acquisition. In contrast, adults typically are exposed to conversations about topics whose referents are not obvious from the non-linguistic context".*[27]

2.2.3. Cognitive and Affective Domain

A number of researchers have argued that the adult's cognitive level should make adults better than children at language acquisition.

Piaget (1958) debated and argued that the growth of the intellect takes place in four stages: the sensorimotor stage from age nought to two, the pre-operational stage from two to seven; and the operational stages from seven to sixteen, with a crucial change from the concrete operational stage to the formal operational stage around the age of eleven.[28]

At each stage, certain concepts are acquired and certain language structures appear. However, adults acquiring a second language are already at stage four in their cognitive development. Dulay and Burt (1982) stated:

> *" The ability to think abstractly about language, to conceptualise linguistic generalisation, to mentally manipulate abstract linguistic*

categories, in short, to construct or even understand a theory of language, a grammar, may depend on those abilities that develop with formal operation".[29]

Another construct to be considered in examining the cognitive domain is the notion of equilibrium. The latter has been defined by Sullivan (1967) as: *"progressive interior organisation of knowledge in a stepwise fashion".*[30]

That is, cognitive development is seen as a process of moving from states of doubt and uncertainty (disequilibium) to the state of resolution and certainty (equilibrium) and then back to further doubt which is, in time, also resolved and so the cycle continues.

Brown (1980) pointed out that disequilibrium may provide the key motivation for language acquisition: " Language interacts with cognition to achieve equilibrium. Perhaps until that state of final equilibrium is reached, the child is cognitively ready and eager to acquire the language necessary for achieving the cognitive equilibrium of adulthood".[31]

It appears that cognitive differences between children and adults suggest that adults are better and faster conscious learners than children. However, the cognitive domain is not the only area which must be considered in an attempt to understand language acquisition. Brown (1973) stated :

" The cognitive approach to human learning has important implications for both a theory of second language acquisition and more effective approaches to language teaching. But an equally important psychological domain to explore in trying to understand the process of second language acquisition is the affective domain. We must acknowledge that, while all the optimal cognitive factors may be operating in the attempted solution of a given task, the learner can fail because of an affective block".[32]

Toulor (1974)[33] and Schuman (1976)[34] also focused on the affective domain, linking the notion of a critical period with the affective change that occurs in the learner at the onset of puberty. It is argued that children have a greater empathic capacity than adults, that children have not yet developed inhibition about their self-identity, and are, therefore, not afraid to sound ridiculous and are prepared to take risks when experimenting with their language. Moreover, they are not impeded by negative attitudes towards speakers of that language. This means that children approach the task of learning with a low "socio-affective filter".[35]

It is clear that a number of problems arise in attempting a fruitful comparison between first and second language acquisition. These barriers are due to inadequate knowledge of human language behaviour, which includes not only linguistic but also psychological, and environmental factors.

2.2.4. Acculturation

Successful foreign language learning involves not only the mastery of new verbal characteristics of language, but also the teaching of a second culture. Schuman (1976) believed that: "language learning is not a matter of method, but is a matter of acculturation and where acculturation cannot take place, we cannot expect to achieve much more than we are achieving in our foreign language programs".[36]

In order to understand what the second language culture is, one needs to understand the nature of acculturation, culture shock and social distance. Sociological research has identified four stages of acculturation which an individual passes through adapting himself to new culture. The first stage is the period of excitement and euphoria over the newness of the surroundings.

The second stage, culture shock, emerges as the individual feels the intrusion of more and more cultural differences into his own image of self. The third stage of acculturation is one of gradual and at first tentative and vacillating recovery. This stage is similar to what Larson and Smaley (1972) called culture stress.[37]

The fourth stage represents near or full recovery, either assimilation or adaptation, acceptance of the new culture, and self-confidence in the person who developed in this culture.[38] Larson and Smaley (1972) discussed the relationship between second language acquisition and adjustment to the new surroundings for those going to live abroad. They viewed the learner entering a new culture as 'alien' and people belonging to the new culture as 'domestics'. To acquire a new language, the learner must undergo 'delineation' or 're domestication' and join the target language group as 'neo-domestic'.[39]

A further difficulty is that identified by Larson and Smaley (1972) :

> " ***New problems mean making new demands on one's supply of energy. The new climate, the new people, all mean that the alien must muster up every bit of available energy and put it to use in new ways***". [40]

As the learner acquires ways of coping with the new culture, the extreme symptoms of culture shock may pass relatively quickly, though subtle problems may persist and produce stress that might last for months or years. This culture often involves a threat to the learner's identity. For example, the alien may be an engineer or professor but be unable to function in the new culture because of the difference of the host culture's definition of what an engineer or professor should do. The alien should learn the target language in

order to have the ability to articulate problems and to adjust himself and finally to overcome culture stress.

Delineation can be frustrating in many ways. A learner experiencing delineation usually faces three types of disorientation: language shock, cultural shock and cultural stress. Culture stress can produce a whole syndrome of rejection which diverts attention and energy away from the learning of the second language: rejection of members of the host country, rejection of the organisation for which the learner is working, rejection of the learner himself, rejection of his own culture without the acceptance of the target culture. Moreover, an extreme degree of home-sickness or excessive worry about germs, sickness, and education for his children, are likely to prevent the learner from acquiring the target language and culture. All of these syndromes are likely to inhibit identification with people of the target culture and can exhaust the energy required for successful second language learning.

Schuman(1974) pointed out that if language shock and culture shock are not overcome, the second language learner will maintain a psychological distance from the speakers of the target language, so limiting contacts with speakers of the target language to those occasions when contact is extremely necessary and unavoidable. On such occasions, his communication with the target language speakers is likely to be restricted to referential, denotative intercourse.[41]

Acton (1979) found that successful language learners see themselves as maintaining some distance between themselves and both cultures. Furthermore, if the learner perceives himself \ herself as either too close to or

too distant from either the target culture or native culture, he/she falls into the category of 'bad' language learners, as measured by English proficiency tests.[42]

Gardner and Lambert (1972) dealt with other individual psychological factors that might also have some effect on one's perception of social and psychological distance, such as ethno-centrism, culture allegiance, etc.[43] Generally, those who were less ethnocentric and less authoritarian had more positive attitudes, motivation, and self-concept towards language learning and tended to be more successful. These latter factors will be discussed further in the following sections.

2.2.5. Learning Through Second Language Related to Students' Performance

Many studies have shown that, for the majority of international students, adjusting to the host culture's language is a stressful experience; one which may have negative effects on these students' academic performances.[44]

Pearson (1990) studied the English language performance of native speakers of Mandarin Chinese and English, and speakers of English as a second language. The subjects were six native American English speakers and twelve Chinese speakers, six using Chinese and six using English. Each language group was asked to discuss and to come to an agreement on aspects of a survival task. The findings were that the native English speakers used much greater variety and complexity of language than the other groups whose native language was not English.[45]

According to Hall and Lindsey (1977) "the experience of being a foreign student and a non-native English speaker in the United States is

'frequently a difficult and unsettling one, involving periods of isolation and loneliness'. and ' if entry into US. collegiate institutions is a major developmental transition for well-prepared American high school graduates, the transition will be more difficult for young people arriving from distinctly different cultures with different educational systems".[46]

Goldman (1983) studied for two years, the transfer of two literacy skills for elementary school children in California US, from their first language, Spanish, to their second language, English. She concluded that comparisons with monolingual speaking students indicated no negative effect of dealing with Spanish and English in school. In addition, by the fourth grade, the English performance of the students of English as a second language equalled that of their monolingual counterparts, and their own first language performance.[47] Cummins (1979) suggested that learning with a second language can positively influence the academic and cognitive growth of individuals.[48] This opinion appears controversial but can be seen from the point of view that information derived from sources exclusively available in a second language, which otherwise would not have been accessible to a learner in his or her mother-tongue, are very likely to enrich the knowledge of the learner.

Noor (1962), in a New Zealand study, reported that 48 percent of the sample had great difficulty in understanding lectures upon their arrival in that country.[49] In another New Zealand study, Ng (1962) found that 57 percent of the overseas students sampled had learning difficulties relating to language.[50]

Mornion and Pawley (1987) studied the French language proficiency of 9th, 10th, and 12th grade high school students in Eastern Ontario in

Canada. The results indicated that the cumulative amount of French instructional time influenced proficiency, particularly in grade nine, while grade nine students did not generally score as high on listening tests as late immersion groups with similar amounts of instructional time.[51]

Marion (1986) indicated that foreign students' adjustment is affected by a variety of factors and that academic achievement of foreign students is affected by their attitudes and adjustment.[52] Genesee (1986) examined the research basis for school achievement and learning in a second language. The findings indicated that the language of study as in the case of learning in a non-native language, is an important causal factor negatively affecting the academic performance of students.[53]

Cuevas and others (1986) studied the effects of the language process approach on mathematics achievement of first, third, and fifth grade students in California, US. The results of their study indicated that it is possible to integrate language and content teaching with favourable results in terms of mathematics achievement in second language learners.[54]

Wardlow (1989) studied learning in a second language and academic performance. Wardlow's findings indicated that international students' performance on measures of English proficiency was highly correlated with success in graduate course work in American institutions. However, Wardlow also noted that little evidence exists to indicate that abilities in learning in a second language accurately predict the likelihood of success in graduate coursework, and that undergraduate performance in the home country was not a sound indicator of probable success in graduate programmes in American institutions.[55]

Finally, Light and Mossop (1987) studied international students and noted that mastery of appropriate communications skills for international students is a complex and formidable task inherent to academic success.[56]

2.3. Definitions of Attitude and Motivation

It is useful to give some important definitions of attitude and motivation.

Attitude:

Allport (1967) defined attitude as:

> *" a mental and neural state of readiness, organised through experience,exerting a directive or dynamic influence upon the individual's response to all objects and situations which it is related".*[57]

Mager (1968) recognised this view of attitude and stressed the directive influence of attitudes upon the individual's responses to his environment. He defined attitude as:

" A "feeling for' or ' moving towards or away from" response".[58]

In definition of attitudes, Lambert (1963) emphasised that they are organised and consistent ways of thinking, feeling and reacting with regard to events and persons in one's environment.[59] Brown (1980) stated that:

> *" Attitudes, like all aspects of development of cognition affect in human beings, develop early in childhood and are the result of parents' and peers' attitudes, contact with people who are' different' in any number of ways, and interacting affective factors in the human experience. These attitudes form a part of one's perception of self, of others and of the culture in which one is living".*[60]

Lambert (1963) offered three principles to account for how attitudes are learned: association, transfer, and need satisfaction. He thought that

association and need satisfaction accounted for the development of feeling and reaction tendencies.[61]

According to recent research, attitudes can be classified into two categories: **external** and **internal**. External attitudes refer to those evaluations which the learner directs towards factors outside himself, for example, the value of the target language, of the target culture, of his mother tongue, of his native culture, etc. On the other hand, internal attitudes refer to those evaluations which the learner directs toward factors inside himself. Hiyde (1979) refers to internal attitudes as self-concept or self-esteem. The self-concept is the sum of one's attitudes toward oneself; the overall evaluation of what a person feels he is.[62]

Both internal and external attitudes affect a person's behaviour. As early as 1949, Jones indicated that attained proficiency in Welsh as a second language was related to attitude towards the study of Welsh.[63] Research by Gardner and Lambert (1972) showed the relationship among external attitudes, motivation and second language behaviour.

As for internal attitudes and their relationship to motivation and behaviour,[64] Barksdale (1972) suggested that self-concept is a precursor to motivation, since a person must feel confident about his ability to survive a change in his life in order to risk changing his behaviour, personality, language behaviour, achievement, etc.[65] In other words, if a person views himself as undesirable, worthless, or bad, he tends to act accordingly. If a student feels that he does not have the ability to learn in a second language, his language behaviour will reflect his feeling.[66] Jakobovits (1972) pointed out that the learners have definite ideas about what constitutes knowing a

language and who is or is not bilingual. They judge their use of the second language on the basis of what they feel it means to know a language. We develop feelings of fear of people and things associated with unhappy experiences.[67]

Attitudes are also learned according to the principle of "'need satisfaction". It is widely accepted that one develops an interest and positive attitude toward things and people that satisfy one's psychological or physical need.[68] Foreign language learning supports this viewpoint. Burstall (1973) found that her subjects developed negative attitudes towards learning French because it did not satisfy their practical needs. She pointed out that the majority of the students in her sample were strongly oriented towards "realism" in their studies. They were dissatisfied with instructional materials which were often unrealistic in content and which did not provide them with the necessary communicative skills in French.[69]

Motivation:

Theo et al. (1984) defined motivation thus:

> " ***Intrinsic motivation is usually defined as motivation which is guided by an interest in the task itself in which one is engaged, whereas extrinsic motivation is said to be guided by external stimuli, such as parental approval, offer of a reward, threat of punishment, a good grade, etc.".***[70]

With regard to definition of Motivation, White (1959) understood intrinsic motivation in terms of the individual's need to be competent through effective interaction with his environment. The power of his theory of competence lies in its simplicity, in that it provides a general explanation for the primary source of energy in the individual. Instead of having a list of needs and motives for the wide range of human activity, one need can be used

as foundation for higher level motivation theory, which explains how the desire for competence is manifested in humans.[71]

Ausubel (1968) identified six desires or needs of human organisms which underpin the construct of motivation: the need for exploration, for seeing the other side of the "mountain", for probing the unknown; the need for manipulation, for operating on the environment and causing change; the need for activity, for movement and exercise, both physical and mental; the need for stimulation, the need to be stimulated by the environment, by other people, or by ideas, thoughts, and feelings; the need for knowledge, the need to process and internalise the result of exploration, manipulation, activity, and stimulation, to resolve contradiction, to quest for solutions to problems and for self-consistent systems of knowledge; and finally, the need for ego enhancement, for the self to be known and to be accepted and approved by others.[72] Maslow (1970) also assumed a hierarchy of needs, ascending from the basic physical needs which are present at birth (air, water, food) to higher needs of security, identity, self-esteem, achievement, knowledge and exploration; the fulfilment of which leads to self-actualisation.[73]

According to Hilgard (1979), motives which are based on need for air, water, food are called biological motives and are largely innate, and motives which are based on the higher needs are called psychological motives and are primarily influenced by learning and environmental factors.[74] Brown (1980) defined motivation as:

" Inner drive, impulse, emotion, or desire that moves to a particular action."[75]

Brown (1973) also identified three types of motivations: global motivation, which consists of general orientation to the goal of learning; situational motivation, which varies according to the situation in which

learning takes place (classroom, or in a natural environment); and task motivation, which is the motivation for performing particular learning tasks.[76] Hunt (1965) defined intrinsic motivation as:

> ***" Motivation inherent in the organism's informational interaction with its environment".***[77]

Deci (1975) defined intrinsic motivation as an integral part of his general cognitive model of motivation. According to him, motives are defined as a cognitive representation of future states of awareness of potential satisfaction. People engage in intrinsically motivating activities in order to derive internally rewarding consequences, namely feelings of competence and self -determination. Therefore, the desired objective of the individual's behaviour is an affective state. The need for feelings of competence and self-determination leads to two classes of intrinsically motivated behaviours: **first** to seek out optimally challenging situations; **Second,** to attempt to conquer these challenges.[78] Atkinson (1964) suggested that people with a high need for achievement tend to prefer tasks with a moderate level of risk, that is tasks where their probability of succeeding is about fifty percent.[79]

Gardner and Lambert (1972) examined motivation as a factor in a number of different types of external attitudes and defined motivation as a construct made of certain attitudes. They were of the opinion that attitudes' resultant motivation functions are contributing variables of students' learning situations.[80]

Finally in the context of language learning Gardner (1985) stated that motivation refers to:

> ***"The combination of effort plus desire to achieve the goal of learning plus favourable attitudes toward learning the language. That is, motivation to learn is seen as referring to the extent to which the individual works or strives to learn, because of the desire to do so and the satisfaction experienced in this activity".***[81]

He claimed that effort alone does not signify motivation. The motivated individual expends effort towards the goal, but the individual expending effort is not necessarily motivated. Finally, he reached the conclusion:

> ***"when the desire to achieve the goal and favourable attitudes towards the goal are linked with effort or the drive, than we have a motivated organism".***[82]

Moreover, the roles of attitude and motivation in the learning situation have usually been lumped together into a cluster of relative factors of success or failure.

Recently, however, the distinctive roles of attitudes and motivation have been redefined. Theo (1984) stated that:

> ***" it is now argued that attitudes are directly related to motivation which in turn, is directly related to language".***[83]

Theo maintained that motivation to learn language is determined not only by attitudes, but also by other "motivation props" such as the desire to please teachers and parents, promise of reward or experience of success, etc. In addition the relation of attitude to motivation is dependent on the type of motivation. An integrative motivation for example, presupposes a positive attitude of the learner toward the target language and culture, but a learner

who is instrumentally motivated does not necessarily have a positive attitude toward the target language.[84]

2.3.1 Attitude and Motivation Related to Students' Performance:

Kremer and Walberg (1981) studied self-concept, academic self-concept and achievement motivation. The studies typically produced small positive correlations for the relationship between motivation and science learning with a mean correlation of .37 being found. However, Kremer and Walberg suggested that " the productive relation of students' motivation in learning and achievement is independent of subject area or content".[85] They concluded that science educators should give greater attention to motivational factors, as they seem to have been largely neglected.

Hurd (1978) reported that science courses commonly taught to adolescent students in most school systems do not produce individuals with positive attitudes toward science courses in high school and colleges.[86] Bandura and Dwee (1985) found that low confidence children tended to have somewhat higher achievement test scores than their high confidence group. The low confidence children did not have poorer opinions of the past attainment or abilities but faced the oncoming task with low expectancies of absolute and relative performance.[87]

Haledyna and Shaughinessy (1982) showed that students who possess confidence in their own abilities, a sense of control of their own fate, and a feeling for science as being important, also possess positive attitudes toward science.[88] Simpson (1986) stated that feelings of self-confidence have a strong relationship with attitudes toward the subject, and by increasing

positive feeling toward a specific discipline, the discipline-related self-concept will improve.[89]

Simpson and Oliver (1985) investigated students' attitude toward science and achievement motivation in grades six to ten in central North Carolina, US. The sample included all sixth grades from four elementary schools, all seventh, eight and ninth grades enrolled in science in four junior high schools, and all tenth grade biology students in four senior high schools. The results revealed that:[90]

a) male students showed significantly more positive attitudes toward science than female students;
b) attitude toward science of all students declined sharply from the beginning to the middle of the year within each grade;
c) female students were significantly more highly motivated to achieve in science than their male counterparts;
d) both black and white students had a positive attitude toward science .

Khan (1969) reported that female students in junior high school tended to be more predictable than male students in scholastic achievement.[91] Husen, Fagerlind and Liljefors (1974) studied the relationship between affective determinants and science achievement, and found that all students felt that it was important to do well in school. However, the higher the grade level, the less students liked school, males being more dissatisfied than females. Also, they reported that females enjoying school were more highly motivated than male students, yet, in all science subjects, males scored higher than females.[92]

Licht (1984) studied sex differences in achievement cognitions and responses to failure. On the basis of their grades, Licht divided the subjects into A,B,C, and D students and, among other measures, administered a novel concept formation task. A significant sex difference was found among the A students in their response to failure, with the A girls showing the greatest weakness of the eight groups and the A boys being the only group to show any facilitation. In addition, Licht found strong sex differences in task performance between A girls and A boys: The A girls much preferred tasks they knew they were good at, whereas A boys preferred ones they would have to work harder to master.[93]

Leggett (1985) found in a study of bright junior high school students, that there was a greater tendency for girls than boys to subscribe to an "entity" theory of intelligence (smartness as a fixed trait, a static entity) and for those who did to choose a performance goal that avoided challenge.[94]

Gliksman (1967) investigated the role of the integrative motive on behaviour in a French classroom. He hypothesised that the integrative motive influenced individual differences in the amount of active participation in the second language classroom. Two studies were conducted. In each study, measures of attitudes and motivation were obtained at the beginning of the term. During the term, observers studied several specified behaviour dimensions, including amount of volunteering, number of correct responses, and the number of questions asked. The data were analysed by means of analysis of variance. In both studies, integratively motivated students volunteered more frequently. The two groups did not differ in number of questions asked of the teacher.[95]

Knight and Waxman (1990) investigated the relationship between social studies classroom environment and student motivation (academic motivation, academic self-concept and social self-concept) among 157 sixth grade, predominantly Hispanic students. Results showed that students' satisfaction significantly affected the three dimensions of motivation.[96] A similar study by Payne (1992) examined the effects of motivation variables (achievement motivation, academic self-concept, social self and emotional self-concept) and the classroom learning environment, on verbal tests and mathematics tests. The results showed that the motivation variable, academic self-concept had positive effects on verbal tests and mathematics tests, but motivation had no significant effect on the variables.[97] Moreover, Kremer and Wallerg (1981) reported that the relationship between motivation and achievement is independent of subject area or content. However, analyses to predict language and achievement from the achievement motivation subscale, did not produce significant results. Mathematics achievement did relate strongly to science self-concept.[98]

Many attitude studies in Science education have focused on the relationship between attitudes and achievement. Schibeci (1985) for instance, reported that most studies examining this relationship have produced a small positive correlation between attitudes toward science and achievement.[99] Schibeci noted that an exception to this trend can be found in a study by Simpson and Wasik (1978), who found a correlation of 0.84 between attitudes and achievement.[100] Haledyna and Shaughinessy's (1982) results were more in line with the general trend. They summarised this relationship by saying " the relation of attitudes to achievement has been consistently of a

low order of relationship, with an occasional finding that exceeds 10%".[101] Howe and Durr (1982) reported that attitude interactions in chemistry laboratories increased students' understanding of abstract concepts.[102] However, Keeves (1975) found no direct relationship between students' attitudes and students' achievement in mathematics or science. He found that attitudes toward science were strongly influenced by friends who participated in mathematics and science activities. He concluded that the attitudes of the group with which a student spends his or her leisure time would be expected to influence personal attitudes toward science and mathematics.[103]

Handley and Morse (1984) examined the relationship of achievement in science to attitudes toward science, within self and gender role perceptions of seventh and eight grade students over a two year period. They summarised their findings by saying that " both attitudes and achievement in science were related to the variables of self-concept and gender role perception of male and female adolescents. These relationships, however, are more evident in association with attitudes than achievement in science ".[104]

Yager and Yager (1985) used data from the 1977 to 1982 collections of the National Assessment of Educational Progress (NAEP), as well as additional data collected using the same instruments, to study how students of different ages perceived school science. They found that school science became less fun, less interesting, and more boring as students' age increased.[105] Another study, by Tallon and Simpson (1985), studied attitudes and achievement of adolescent science students from grades six to ten. Looking at individual attitudes toward science achievement, results showed a strong positive relationship between the two variables, and a lower significant

correlation in grade six than the other grades (7,8,9 and 10) but the ninth grade scores produced a significantly higher correlation coefficient than the other grades.[106]

The inconsistencies in the findings have also been related to the failure of most studies to include an examination of the cognitive abilities of children. Aitden (1970) in a review of attitude studies, suggested that it may be discovered that the correlation between attitudes and achievement varies with the level of ability and that in the middle range of ability, scores will be more accurate predictors or determiners of achievement.[107]

Finally, Marjoribanks (1976) on the basis of complex multiple regression analysis, concluded that at each level of ability, increases in attitude score, in general, are related to increases in achievement. However, for each academic subject, the nature and strength of the relation between achievement ability and attitude differ for boys and girls and depend on the cognitive ability being investigated. For each academic subject and within each sex group, ability measures were more powerful predictors of achievement than were the attitude scores.[108]

2.3.2 Learning Through a Second Language Related to Attitude and Motivation.

An extensive body of literature in second language acquisition has noted the importance of aptitude, intelligence, age and methodology in the second language learning process. More recently, sporadic allusions to the influence of attitudes and motivation on the second language learning have occurred.

McGroarty (1989) studied two adult groups' attitudes towards learning English as a second language. The first study compared two groups of high / intermediate students taking English as a second language in two settings, a traditional university and a community extension class. The second study examined intermediate and advanced groups (Chinese, Japanese and Spanish). The results of the first study showed that the first group had positive attitudes toward second language learning in general and had positive attitudes toward experiences in English as a second language, significantly related to achievement. In the second study, attitudinal factors were associated with achievement and represented an instrumental motivation for the study of English for occupational or professional purposes.[109]

Ange (1984) studied the relationship between time, motivation and students' achievement in introductory second language courses in French, German and Spanish, for tenth and eleventh grade English speakers. The results of this study showed a positive correlation between study time and achievement for the students of French and German, but negative correlation between motivation and students' achievement, and positive significant correlation between motivation and study time for all the groups. For the Spanish group, the correlation was much lower than for the other groups.[110]

Lee (1980) examined the relationship between students' attitudes and motivational orientation towards learning English and proficiency in English as a foreign language, among Korean senior high school students in two geographical regions (Seoul and Jeon Ju). In addition, the interaction effect of the students' motivation toward learning English, parental motivation for having their children study English, and students' proficiency in English were

also investigated. The results revealed that the integratively motivated students of Seoul scored significantly higher in English proficiency tests than instrumentally motivated pupils. In Jeon Ju, on the other hand, there were no significant differences between the integratively and instrumentally motivated students, and no significant relationship between student-parent motivational orientation and attitudes in either region.[111]

A study by Kremer and Zisenwine (1989) investigated a large sample (1,253) of childrens' attitudes toward the Hebrew language in South Africa. The results showed that students' attitudes decreased in positive value over the nine grade levels.[112] However, when Ravid (1986) investigated students' attitudes toward the Hebrew schools, his findings showed non-significant, low correlation with parents' attitudes, and significant but low correlation between students' attitudes and achievement in Hebrew language. There was no difference between boys' and girls' attitudes scores.[113]

Hurshberger (1989) investigated the bipolar tension relaxation factors that affect a second language learner's oral proficiency in Mostar, Yugoslavia. The result indicated that an interactive relationship exists between attitudes toward the language and proficiency. Low proficiency learners were not uniformly negative toward communicative interaction, although positive attitudes became more prevalent with higher levels of English proficiency.[114]

Strong (1984) examined the relationship between integrative motivation and acquired second language proficiency among Spanish speaking kindergarten pupils in an American classroom. The result showed that advanced children had significantly more integrative orientation to the

target language group than the beginners, and he suggested that integrative attitudes follow second language acquisition skills.[115]

Laine (1978) analysed school foreign language learners' "short term motivation" which appears in the foreign language situation, and found it equally significant with "long term motivation" as a determinant of achievement.[116] In addition, motivation leading to over or under-achievement was a problem. It was shown that an optimal achievement geared situation in a foreign language class 'high in general achievement level, high self-evaluation regarding chance of doing even better' promoted over-achievement. The students achieved even higher scores than were predicted from their aptitude measurement. Also, under-achievement was clearly accentuated in the school learning situation; there were even signs that in good foreign language classes, the eventual group of " slow learners" tended to sink deeper and deeper, while in a poor class, an eventual group of good learners received extra promotion. Furthermore, overachievers displayed positive affective attitudes toward classroom activities, whereas underachievers displayed negative attitudes toward language learning.[117]

Pierson (1980) tested more than 400 grade ten students from eleven schools in Hong Kong. Eight of the schools were English medium, while the other three taught all subjects other than English, in Chinese. Twenty-three direct attitude items were involved. A factor analysis of the twenty-three direct attitude items revealed that six of these contributed to the overall prediction of English achievement. The six factors were defined as freedom of language choice, desire to learn English, lack of self-confidence in using

English, approbation for using English, and discomfort about Chinese speakers using English as a mark of education.[118]

Chiara and Oller (1978) investigated the relationship between the attitudes of Japanese students of English as a foreign language toward themselves, towards other Japanese, toward English speakers, and toward learning English and proficiency in English as a foreign language. The results showed weak correlations between factors distilled from attitude measures and attained English as a foreign language proficiency.[119]

Burstall and Hargred (1974) analysed the data from 15 samples of Canadian students from grades (7-11) studying French for two consecutive years. They found that motivation and attitudes toward learning situation and integrativeness decreased from year one to year two. The decrease in positive affect characterised both high and low achievement groups.[120] Gardner (1985) suggested several possible causes for these findings, including a more critical approach to the learning situation.[121]

Jordan (1941) used the Thurstone attitude scale to assess the attitudes of British students toward learning French. He found positive, but modest, correlation between these attitudes and achievement in French. Moreover, he reported that the more able students generally expressed the more positive attitudes.[122]

Gardner and Lambert (1972) suggested that students with motivation to learn and with positive attitudes toward the target language and its speakers were more successful than were students with less positive attitudes and lower level of motivation.[123]

Clement, Gardner and Smythe (1977) investigated a sample of (130)

grade seven and eight Franco-Ontarian students. A factor analysis of relations among twenty-nine variables resulted in three factors, identified as integrative motivation, self-confidence with English, and English achievement. Another aspect of the study assessed the relation between major second language acquisition contexts and various student characteristics. The language acquisition context did not have any significant effect on attitudes or motivation.[124]

A separate study by Oller (1977) found that students who were proficient in English rated lower on tests such as cleverness and happiness than students who scored lower on proficiency in English as a second language.[125] Similar results were found by Svanes (1987) in a study of the acquisition of Norwegian by foreign students at the university of Bergen, Norway. The findings showed a negative relationship between proficiency in Norwegian and integrative orientation toward studying Norwegian.[126]

Another study by Oller, Budson and Lei (1977) investigated forty-four native speakers of Chinese who were students at two American universities.[127] The students completed a closed test of English, four indirect measures of attitude derived from Spolsky (1969), and sixteen attitude items. The results indicated that negative attitudes toward Americans were associated with a high level of English proficiency, while positive attitudes toward self, and native group were related to English proficiency.[128]

2.4. Self-concept

James (1890) is identified as the earliest "self" psychologist. He stated (1890) that:

> ***" The altogether unique kind of interest which the human mind feels in those parts of creation which it can call me or mine may be a moral riddle but it is a fundamental psychological fact."***[129]

His theory was based on personal insight and the observations of others. He is most readily identified with the familiar I-ME dichotomy, in which the total self (or person) is differentiated into the self as the knower and the self as that which is known. In describing the self, James (1890 P291) further stated that: "***A man's self is the sum total of all that he can call his.***"[130] James' writings are significant because they are among first detailed descriptions by a psychologist of what was later called the self-concept. At this stage, the notion of self-concept was subjected to wide criticism, similar to that being levied today. The theory was attacked as lacking experimental and empirical verification as it did not conform to the behaviour models of scientific psychology. Sociologists, not being constrained by this apparent lack of scientific rigour, became involved with the idea of self. Cooley (1902) confined himself to the aspect of self that James had labelled the social ME. He used the notion of the "looking glass self" as a means of describing the self-concept. The theory postulates that an individual's conception of self is determined by the perception of other people's reactions.[131] He stated that:

> ***"A self-idea of this sort seems to have three principal elements: the imagination of our appearance to the other person; the imagination of his judgement of that appearance; and some sort of self-feeling, such as pride or mortification."***[132]

Cooley's work supplied the beginnings for a developmental theory of self-concept. His writing stressed that our self-perceptions are largely the result of feedback we receive from other people who influence our lives. Hall and Lindsey (1976) stated that " self is a socially formed self. It can arise only in social settings where there is social communication." Initially the person is believed to be not innately self-conscious, there being no self. The individual develops attitudes and feelings about himself as a result of experiences in which people react to him. He also decribed the self as being a collection of reflective attitudes which emerge in given social situations.[133]

In attempting to account for self-conscious behaviour, Mead (1943) stated that "He becomes a self in so far as he can take the attitude of another and act towards himself as others act." [134] Mead (1943), like Cooley, saw the self as a product of interactions, a social phenomenon. The person is said to experience himself as reflected in the behaviour of others.

2.4.1. Psychoanalytic and Modern Theories:

Sigmund Freud (1900-1938) has been described by Child (1973) as the father of in-depth psychology or psychodynamics. In his early teaching, Freud emphasised the Id; the Ego being considered a weaker and less influential factor in understanding behaviour. In later writings more emphasis was placed on the Ego as a component of the total personality. The personality was stated to be made up of the three major systems- the Id, the Ego, and the Super Ego. These were described as possessing their own functions, properties, dynamic and mechanisms, but interacting to produce behaviour.[135]

Freudian theory suggested a dynamic, purposive conception of the person. Like many descriptions of the self, Freud's work was directed toward realistic adaptations to the world. It would appear to correspond at times to the self as knower or as actor, as described by William James.

Although Freud did not deal explicitly with self-image, the *function of Ego* instincts clearly represented the psychological and social components of personality. Freud did not deal with reflected evaluations such as self-concept but with strong emotions such as self-hate. He decribed the process of self-evaluation, not as a result of repeated reinforcement or the experience of success or failure, but as a result of the identification with Ego Ideal.

During the period 1900-1940, self theories were not developed further, probably because the psychological scene was dominated by the behaviourists. Wylie (1979) quotes psychologists who stated that Freud's tenets and models lacked rigour, were not susceptible to empirical tests and were incompatible with other theoretical models of psychology.[136] This was obviously the view of behaviourists who believed that experimentation should be controlled in laboratory situations where variables could be carefully manipulated, producing replicable results.

Later theories which were influenced by Freud's psychoanalytic writing have dealt more directly with self-concept and self-esteem. Erikson described eight points of identity growth, and he paid considerable attention to the crisis and diffusion of identity at the adolescent stage.[137] Erikson (1956) criticised terms such as self-conceptualisation, self image and self-esteem, which provide a static view of identity.[138]

Symonds (1951) also attempted to develop the distinction between the self and ego, with the self generally represented as the reflexive aspect of behaviour. He believed that there was considerable interaction between the self and the ego, and he further made a distinction between the core and the periphery of the self.[139]

Rogers (1959) brought self-concept to the centre of all psychological dimensions and thinking, greatly affecting self theory. The self, according to Rogers, was a phenomenological concept which was the major determining factor in all human behaviour. The self was described as that portion of the phenomenological field which gradually becomes differentiated. Rogers introduced the notion of the ideal self: what the person would like to be. He also proposed a notion of congruence and incongruence between self as perceived and actual experience of the organism. In this, the terms self-concept and self-structure were seen as synonymous.[140]

The self was described as "the organised, consistent, conceptual gestalt composed of perceptions of the characteristics of the "I or ME" to others and to various aspects of life, together with the values attached to these perceptions".[141] The organism and self, although they possess the innate tendency to actualise themselves, are strongly influenced by the social environment. Rogers, in his consideration of the processes of socialisation, focused upon the evaluation of individuals by others. He maintained that during childhood, the evaluation of individuals by others was subsequent to differentiation between approved worthy actions and feelings and the disapproved. The child was described as trying to be what others want him to be, with unworthy feelings becoming excluded from the self-concept.[142]

With regard to modern theorists, prior to the 1980s, reviewers of self-concept research, Burns (1982)[143] and Wylie (1979)[144] noted the lack of theoretical models and appropriate measurement instruments. In attempting to address this situation, Shavelson, Hubner, and Stanton (1976) reviewed existing theory, research and instruments and developed a multifaceted, hierarchical model of self-concept.

Shavelson and others further posited a general self-concept defined by academic and non-academic self-concept in particular content areas, e.g. English and Mathematics, and the non-academic self-concept was divided into social, and emotional self-concept.[145] Marsh and Shavelson(1985) tested the first and the second order structure of self-concept and elaborated a new structure of self-concept that included a wider variety of specific academic self-concept. They called it " a multifaceted Academic Self-concept".[146] The hierarchical structure of the SDQ III was divided into general academic self-concept(part A) in particular content areas, English, history, mathematics, and science; and variable academic self-concept(part B)

Earlier factor analytical studies of self-concept Coopersmith (1967);[147] Rotter (1975)[148] failed to identify domain-specific factors. Coopersmith and Feldman, (1974) stated that "the self-concept consists of the beliefs, hypotheses and assumptions that the individual has about himself".[149] Their discussion of the central concept has been described by Wells and Marwell (1976) as "something of different theories".[150] Coopersmith focused on the processual relevant to the self-evaluation process, and attempted to establish the divergent validity of domain specific measures but his constructs (1974) were also unsuccessful.[151] In a study by Max and Winne (1978) of

three self-concept inventories, using a multitrait multimethod, little support was found for divergent validity.[152]

Purkey (1970),[153] in an elaboration of the various concepts of self proposed by Lecky (1945),[154] Rogers (1951),[155] Combs and Snygg(1959)[156] arrived at a composite definition of the self as "a complex and dynamic system of beliefs which an individual holds true about himself, each belief with a corresponding value". This belief system was depicted as spiral in form. The smaller spirals represent beliefs which the individual holds about himself. Beliefs close to the essence of self are near the centre of the spiral and other, less important, beliefs are pictured towards the outside of the self.

Lecky (1945) described the self as "organisation of experience into an integrated whole". He attempted to construct three models to illustrate his theories, and he compared the structure of the personality to that of an atom, with the nucleus or centre of the atom consisting of ideas of the self.[157]

Many other researchers have viewed the self-concept as multifaceted. Brookover, Thomasand and Patterson (1964) conducted a study to establish whether the self-concept was differentiated into specific self-concepts. They concluded that the self-concept is a "complex of several segments including the self-concept of ability".[158]

This research however was only concerned with one aspect of the self-concept: the person's conception of his own ability to learn the accepted types of academic behaviour.

In an extensive consideration of the nature of self-concept, Rosenberg (1979) unusually clarified the self-concept. Rosenberg stated that the self-concept is not Freud's "ego" and also not the "real self",[159] (Horney, 1950)[160].

the "self-actualizal person" (Maslow, 1954[161]; Moustakas, 1959)[162], the "productive personality" (Fromm,1947)[163], the "impulsive self (Turner,1976)[164] or "I" (Mead,1943)[165]. The self-concept was further distinguished from "ego-involvement "(Sherife, 1947)[166], and the existential self. Rosenberg (1979) finally described the self as "the totality of the individual's thought and feelings with reference to himself as an object", a concept to which he ascribed breadth and depth, one with profound consequences and ramifications both for the individual and society.[167]

Hurlock (1974) also viewed the self-concept as multi-dimensional, comprising the organisation of qualities that the individual attributes to himself. The elements present in the self-concept were listed as the physical self-image, psychological self-image, the real self-image of what the individual believes or thinks of himself and ideal self-image (what the person would like to be, physically and psychologically)[168].

Harter (1983) also addressed many of the issues of multi-dimensional self-concept in a review of self-concept theory and research. Harter argued for the need to consider both domain-specific components and a general, superordinate component of self.[169] In 1987, Harter focused on an evaluation of self in which individuals are required to make judgements about their competence or adequacy across a variety of content areas. Her work proceeded on two fronts, empirical and theoretical. She conceptualised the self-concept as a collection of domain-specific judgements about competence or adequacy and a goal.[170]

Several studies of the self-concept have been carried out over the years, and those involving school indicate that there is a persistent relationship

between self-concept and a variety of school-related variables.[171] Among these variables are academic achievement, language situation, students' attitudes, and students' achievement motivation.

2.4.2 Self-concept and Academic Performance:

A number of studies have shown a positive correlation between self-concept and school achievement. (Bloom, 1976[172]; Hattie and Hansford 1982).[173] It is generally accepted that a more positive self-concept is associated with higher levels of performance in school and those who hold negative opinions about themselves and their abilities are more likely to obtain lower grades in school work.

From a review of the research addressing the relationship between the self-concept and academic achievement, it can be seen that many studies have investigated the self-concept of underachieving students, others have reviewed predictions of academic achievement by college students, while still others have looked at disadvantaged elementary school children and locus of control.

A study by Bauer (1981) of self-concept of groups of gifted students showed a significant relationship between reading and self-concept. She postulated that" gifted third and fourth grade achievers scored higher on self-concept measures than gifted underachievers in reading ". This hypothesis was confirmed. Gifted underachievers were found to have significant lower score in self-concept measures.[174]

Skaalvike (1983) reported a significant relationship showing a marked tendency toward lower self-esteem for lower achievement in fourth grade boys, but no measurable relationship was found between academic

achievement and self-esteem in the second and third grades[175]; while, Lay and Wakstein (1985) found a correlation between the measure of achievement and self-esteem, and also found that lower achieving students tended to have a lower self -esteem.[176] Bross (1979) found that self-concept and creative thinking abilities are significantly related to academic achievement.[177] Similarly, Oliver and Simpson (1988) found a significant relationship between achievement and science self-concept, and students who scored higher in science and mathematics had a more positive attitude toward science and higher self-concept.[178]

The research of Brookover and associates at Michigan state university was not directed to general self-concept but to "self-concept of academic ability". It was stated that this was limited to "behaviour in which one indicates to himself, his ability to achieve in academic tasks as compared with others engaged in the same task".[179] Later, scales were devised to provide scores in four subject areas, including English, mathematics, science and social studies.

In a major study by Brookover and Thomas (1962) of the relationship between academic self-concept and achievement, a correlation of .57 between grade point average and general self-concept of ability for both males and females was recorded. Brookover's study was based on the assumption that specific academic self-concept conceptions would be superior to general self-perception items when attempting to predict academic achievement. The study and the analysis of data supported the following hypotheses, which are very relevant to the present research:[180]

A- Self-concept of academic ability is associated with academic achievement at the grade level.

B- Change in self-concept of academic ability is associated with parallel change in academic achievement.

C- Students' perceptions of the evaluation of their academic ability by others (teachers and friends) are associated with self-concept of ability at each level.

D- Change in students' perceptions of the evaluations of their academic ability by others (teachers and friends) is associated with parallel change in self-concept of ability.

The findings of Brookover provide strong support for the hypothesis that a positive relationship exists between academic self-concepts and achievement. This is of interest to the present discussion, because the research separates the academic self-concept from general self-concept.

A large number of studies have been presented by Marsh, Relich and Smith (1983) indicating that grades in English, mathematics and science were each highly correlated with the corresponding self-concept.[181] In a further study, Marsh, Smith, Barnes, and Butler (1983) supported the argument that academic ability was highly correlated with self-concept in the same areas.[182] Marsh and O'neill (1984) noted that verbal and quantitative self-concept were not correlated with each other, even though achievement in the corresponding areas was substantially correlated.[183]

A study by Nails (1970) investigated the self-concept and academic grades of black pupils in an inner city elementary junior high school in Michigan. He found both self-concept and academic test scores increased

after the students were involved in a school programme designed to improve their self-concept. He concluded that the development of positive self-concept was responsible for improved academic performance.[184]

Another study by Kemp (1982) involved a two-year survey of 204 students in four Wisconsin elementary schools. He examined the relationship of student self-concept and student use of time and academic achievement in reading and mathematics. The data, involving third and fourth grade students, included self-concept score, and observation of student time "off task". The findings showed that:[185]

a) The regression analysis of students' change in self-concept scores against change in their reading achievement scores revealed a statistically significant positive relationship.

B) A statistically significant positive relationship was found between change in student self-concept and change in student mathematics achievement test scores.

C) No significant change was found in student " task" time .

Another major study by Bledsoe (1984) used a random sample of 271 fourth and sixth grade boys and girls. He found a significant difference between the respective self-concepts. The girls in both grades scored significantly higher than boys in the corresponding grades. However, the relationship between self-concept and achievement in the girls was low to moderately positive, while the correlation for the boys was significant and positive.[186]

Coopersmith (1967) found a significant relationship between self-concept and grade point average in children aged between 10-12. He stated

that 'a child's concept of his ability is largely built up on the basis of successes he experiences in the various tasks he undertakes'. He further advocated that certain procedures be adopted in school to promote the development of positive self-concept.[187]

Hattie and Hansford (1982) found a significant correlation between academic self-concept and academic achievement in a study of junior high school students.[188] Shavelson and Bolus (1982) found a significant causal relationship between students' academic self-concept and academic achievement.[189] Similarly, Lyon and MacDonald (1990) found academic self-concept a significant predictor of the achievement of sixth grade students.[190] Gerade(1990) found that the academic self-concept of minority engineering students was the best predictor of subsequent grade point average after three semesters in college.[191] Bachman and O'Mally (1986), however, measured the academic self-concept of high school junior students and found no significant relationship with educational attainment.[192]

Hagtvet (1990) found a relationship between self-concept and academic achievement, i.e. self-concept affects achievement and is affected by it at the same time.[193] Burns (1982) supported the existence of a positive relationship between self-concept and academic performance.[194] Rubin (1978) found a negative correlation between self-concept and academic achievement.[195] Trippi (1989) found that black students' expected grade performance was significantly related to persistence; in this study, persistence was defined as students returning to college for the fall semester of their second year.[196] Ethington (1990), however, failed to find a significant relationship between achievement-related expectancies and subsequent degree

completion.[197] With respect to academic self-concept, Arbona (1990) found that for minority students, expectancies were not significantly related to enrolment status for the second year of college, whereas expectancies were significantly related to the persistence of white students.[198]

A number of studies have investigated self-concept change in relation to the school setting, for example Coopersmith and Feldman (1974) suggested that the self-concept can be significantly influenced by teachers and friends beliefs and also that academic achievement will influence self-concept through the evaluations of significant others.[199]

Rosenberg (1979)[200] and Harter (1987)[201] found that self-concept-ratings of academic ability consisted of quite accurate descriptions of actual academic performance. Marsh and Parker (1984) found a positive correlation between academic ability and teacher ratings of ability as compared to negative correlation between self-concept and students' ratings of their scholastic performance.[202] Similar results were reported by Bachman and O'Malley (1986), who emphasised that the most important determinant of academic self-concept is actual ability.[203] Also, Harter (1986) found that children who rate themselves higher than their teacher rates them, show higher self-concept than more accurate peers and he believes that higher self-concept in any specific domain reflects greater success in a facet which is deemed important.[204]

Eshel and Kuman (1990) compared teachers' ratings of academic ability and school performance of 287 elementary school students in Israel. They found a positive relationship between academic self-concept and teacher ratings, and that students who assessed themselves as performing at a higher

academic level had higher academic self-concepts.[205]

Rogers, Smith and Cleman (1978) suggested that students may develop relatively low aspirations if they compare themselves with schoolmates.[206] Kraut (1979) argued that self-concept change is likely to be an outcome of increased achievement rather than a necessary variable for achievement to occur.[207] Other studies predict that students with low academic self-concept will avoid situations that could alter their self-concept, and hence make less effort to do well in school, and students with low expectations of success may develop failure -avoiding tactics.[208]

In studies of younger students, sex differences in the relationship between academic self-concept and achievement have been noted. Rubin (1978) found that self-concept measures were consistently related to achievement for female students, but not for male students.[209] Similarly, Skaalvike (1983) found that for elementary and junior high school students, low academic achievement was associated with low self-esteem for male students but not for female students, and he concluded that the relationship between self-concept and academic achievement differs for male and for female students.[210] Fleming and Courtney (1981) found significant sex effects in the self-concept of university students, and they concluded that only the difference in physical ability favouring male subjects was large enough to be practically significant.[211]

Marsh, Smith and Barnes (1985) found that fifth grade girls had lower mathematics self-concept than boys, even though their mathematics performance was better on standardised tests and according to teachers' ratings.[212] Also, Goff and Futterman (1982) reported that sex differences in

achievement and self-concept were not large in the elementary school, but girls had lower levels of achievement and self-concept in junior and senior high school.[213] These findings are consistent with self-description Questionnaire research which found no sex differences in mathematics self-concept for pre-adolescents in grades two and five, but significant differences favouring boys in high school seventh and eighth grade.[214]

With regard to Arab states, there are two traceable Arabic studies, carried out in Saudi Arabia, and Egypt, investigating the relationship between self-concept and academic achievement. The first was by Adul Raheim (1980) covering a sample of 957 boys and girls drawn from primary, intermediate, secondary, and university and postgraduate stages in Egypt. The Tennessee scale was used together with other self-concept and personality scales. A significant relationship was found with academic achievement as measured by end of year examination marks, at the primary, intermediate and secondary stages, for both boys and girls. At the secondary stage, a significant relationship was found between the total score of the boys' self-concept (self-esteem) and academic achievement.[215] (see Table 2.1). Moreover, boys' personal self, social self, satisfaction and behaviour at the secondary stage were found to be significantly related to academic achievement.

Table: 2.1

The relationship between self-concept and total score and academic achievement

	Sex	Physical Self	Moral Self	presonal Self	Family Self	Social Self	Identity Self	Self-stusfsc-ation	Behaviour	Total
Primary	B 110 G 117		.34**	.28**	.39**					
Interm-editate	B 87 G 90	.37**	.36**	28**	.37**	.38**	.34**	.40**	.48**	.47**
Secon-dary	B 102 G 104			.21*		.22*				.21*
univers-ity	B 178 G 78	-.16*		.30**	-.14*					
Post-graduate	B 48 G 43		-.29*		-.31*					
Total	957									

Source : Adul Raheim, A. (1980)

The second study, carried out in Saudi Arabia by Bamashmous and Mansy (1986), investigated the relationship between self-concept and academic achievement, covering a small sample (198) of male university students drawn from four faculties: Science, Arts, Economic, and Education at King Abdulaziz University, Saudi Arabia.

The Tennessee self-concept scale was used and academic achievement was measured by the first term marks achieved by each student. There were significant relationships between the total score for self-concept (self-esteem) and academic achievement in all the groups studied in the four faculties[216] (see Table 2.2).

Table 2.2

The relationship between self-concept (as total score) and academic achievement

Faculty	Number	correlation	Level of significance
1- Science	24	.76	.01
2- Arts	37	.68	.01
3- Economic Administration	47	.77	.01
4- Education	90	.71	.01

Source : Baashmaus and Mansy (1986)

The Egyptian and Saudi studies both used the Tennessee scale by W.Fitts (1964), administered to both samples after being translated into Arabic. Some variations could be found between the Arabic text of the two translations. Different results were obtained at the university level by the two studies, and while the Egyptian study found no significant relationship between self-concept and academic achievement, the Saudi study found a high significant relationship, although the Egyptian sample was larger. Moreover, the Egyptian study carried out the analysis of results with the specific dimensions of self-concept as well as the total score (self-esteem) , whereas the Saudi study reported only the total score. It is not clear why the correlations among the Saudi sample were so much higher than among the Egyptians. Some difference may be due to the differences in the Arabic text. However, cross-cultural variation might be suggested by these results and part of the difference may have resulted from sampling different values N.

This review of literature on self-concept and academic performance has highlighted a great deal of data and information on junior and senior school-children because fewer studies based on university students were

available, nonetheless, the issues raised are relevant to the academic self-concept problems of the university students. For instance, the way a students assesses his or her ability would affect learnability no matter what age. Again, students can carry forward from school to the university, their self-concepts which are likely to affect their academic performance. Consequently, it could be argued that the results of situations concerning school pupils self-concept in relationship to academic performance, may be helpful to our understanding of Omani students' academic self-concept in relation to their academic performance in learning science in English.

2.4.3 Learning Through Second Language Related to Students' self-concept:

Little research has been published exploring learning through a second language and students' self-concept, especially in the Middle-East and Eastern countries. Brown (1973) stated that "self-concept is related to successful second language learning.[217] He also stated in 1977 " presumably, the person with high self-esteem is able to reach beyond himself more freely to be less inhibited, and because of his ego strength, to make the necessary mistakes involved in language learning with less threat to ego".[218] Brown (1982) quoted the research done by Adelaide(1979) who studied the effects of self-esteem on learning French as foreign language and concluded that students with high self-esteem actually performed better in the foreign language.[219] Krashen (1981) emphasised that self-confident people are good second language learners because they have the advantage of not fearing rejection and are therefore more likely to put themselves repeatedly in

learning situations and they feel less threatened if they make mistakes than learners who are more self-conscious.[220]

Studies have been conducted showing a correlation between learning through a second language (English as a second language) and self-concept and academic achievement. Lambert and Gardner (1972) noted that positive self-concept of foreign students and positive feelings toward speakers of a language were among the variables most highly correlated with successful learning in a second language.[221] Forsythe (1987) found that native English speaking students in a French immersion class had a lower self-concept than native English-speaking students in a regular English speaking class.[222]

Marion (1986) contended that foreign students learning in a second language find themselves in a communication and cultural daze, causing academic problems and lowered self-concept.[223]

Cox, Babiker, and Miller (1981) documented language stress related to feelings of inferiority, resulting in the possibility of a relationship between stress and examination failure, among overseas students at Edinburgh University in the UK.[224] Scovel (1978) suggested that the intrinsic variable of self-concept can have a considerable influence on learning in a second language.[225]

In addition, Kapur (1970) reported a higher failure rate in male overseas students than among British students, related to the stress of being international students studying in a non-native language.[226]

Lee (1984) stated that "self-concept is considered to be formed upon the self-perception of significant other evaluations". Discussing this statement in relation to past studies showing a consistent association between a positive

self-concept of students' higher academic achievement and learning with a second language, Lee asserted that feelings of inferiority arising from being in a non-native language programme of study most assuredly affect academic performance and have ramifications for future educational experiences. This relationship between self-perception and perception of significant others' valuations is demonstrated in the tendency of foreign students to seek fellow countrymen as friends in foreign countries of study.[227]

2.5 Possible Effects of Learning in English as a Second Language on Omani Students' Attitudes, Motivation, Self-concept and Academic Performance:

It is important to point out that most of the studies conducted on English as a second language and how it affects learnability are based on the experiences of primary and secondary education students and pupils. In any classroom learning situation where students have to learn the second language alongside unfamiliar concepts, difficulties are bound to arise and these could hamper the students' proficiency in either the language or in the acquisition of knowledge. Very often, students' problems revolve around solving verbal constraints imposed on them by the complex linguistic obstacles they have to overcome. This is true of Omani students learning in English as a second language.

It has already been suggested in the literature review that younger learners tend to cope more effectively with English than older learners for a variety of reasons. It must be observed that the linguistic problems adults encounter in learning sessions are usually carried over from their primary and secondary education levels. In other words, English as a language of

instruction for university students would be effective if the verbal problems associated with learning in a language that is not the mother tongue have been properly addressed at the primary and secondary stages of the Omani education systems. There is therefore a link between the problems encountered by younger and older students at the different levels of education in Oman, in learning in English as a second language. But older students such as university students would naturally encounter greater problems because of the greater academic burden they carry by virtue of the wide scope and high intensity of university education. In addition, the social role they have to combine with academic learning would create more problems for them. It is also important to observe that as people get older, their physiological state may show some decline which can affect language-based learning.

There are two issues in learning through a foreign language: the degree of complexity of the language in relation to mother tongue; and the degree to which the second language interferes with Arabic language of the Omani learners. If these two factors are considered along side the complex nature of scientific language, the magnitude of the problems Omani students encounter in learning in English as a second language become more obvious. Since the structure of English and Arabic are in no way compatible, it means that Omani students have the difficulties of reasoning first in Arabic, and then trying to relate their thoughts to the language of communication in English without loss of information. This is a difficult and frustrating process.

In the situation these students find themselves, and give also the problems associated with learning in English, it is reasonable to assume that there must be a feeling of frustration and doubt during the learning process

which could affect their level of motivation to learn. Also, lack of motivation could result in doubts in a person's academic self-concept and ability to learn, which in turn could affect negatively the individual's attitude to learning science or any other subject in English. The cumulative effect of all the decline in attitude, motivation and academic self-concept would be poor performance in the affected subjects and courses. This could mean low GPA. In the end, the difficulties encountered by Omani students in learning in English as a second language might result in low attitude, academic self-concept and motivation, as well as low academic performance. There is, therefore, a need to address these possibilities, which are the focus of this study.

2.6. Summary:

In this literature review, a number of interesting issues have been raised right across the studies conducted on attitude, motivation, academic self-concept and academic performance in relation to learning in English as second language. An attempt has been made in this subsection to summarise the important points raised.

Jakobovist (1972) has argued that " if a student feels that he or she does not have the ability to learn in the second language, the language behaviour would change to reflect this feeling". It is therefore clear that a number of problems arise in attempting a fruitful comparison between first and second language acquisition. Barriers to proper human language behaviour include not only linguistic factors but also environmental factors. It is now obvious that an analysis of selected factors and their interrelation with each other must consider other surrounding factors. Some of these factors are:

the difference in the level of acquisition of the second language in relation to age, sex, etc: the stage of cognitive development: the standard of textual material and teaching methodology; the movement into a new climate, place and institution of study; cognitive ability, ethnic outlook and cultural loyalty, as well as the feelings of social satisfaction and uncertainty. Other factors include: strong enthocentric or authoritarian feeling toward integrated orientation in the students' loyalty to their native language and culture. Notably, all these factors can be classified into four main groups: pathological, biological, physiological and economic. Gardner and Lambert (1972) found some relationships between attitude, motivation and second language behaviour which have been supported by the views expressed by Schibeci (1985) that most investigations of relationship have produced small positive correlations between students' attitude and science achievement.

Other studies such as Simpson and Wasik (1978) found a positive higher correlation (0.84) between attitude and academic achievement. Howe and Durr (1982) reported that attitude interactions in Chemistry laboratories increased students' understanding of abstract concepts. Keeves (1975) found a non direct relationship between students' attitude and their achievement in mathematics or science. Attitude towards science was strongly influenced by friends who participated in mathematics and science activities. Keeves concluded that the attitude of the group with which a student spends his or her leisure time would be expected to influence personal attitude towards science and mathematics.

Moreover, Oliver and Simpson (1988) also found that students who scored higher in science and mathematics had more positive attitude towards

science and mathematics than those who scored lower. Majoribanks (1976) found that for each level of ability, increase in attitude score, in general, is related to increase in achievement. However, for each academic subject, the nature and strength of the relation between academic ability and attitude differs. Attitude also differs between boy and girls, and depends on cognitive ability. Simpson and Oliver (1985) investigated students' attitudes toward science and achievement. They found that male students have significantly more positive attitude toward science than female students.

Kremer and Wallerg (1981) found a significant positive correlation between academic performance and motivation. They suggested that the predictive relation of students' motivation in learning and achievement is independent of subject area or content. Payne (1992) found that motivation had a positive effect on verbal and mathematics tests. Simpson and Oliver (1985) found that female students were significantly more highly motivated to achieve in science than their male counterparts. Finally, Fagerlind and Liljefors (1974) reported that female students were more highly motivated than male students. To sum up, there is ample evidence in the literature to suggest that there is a significant relationship between attitude and achievement, and between motivation and achievement, though the direction of causality is not clear. The relationship may be reciprocal. It also appears that there are differences between the sexes, in both attitude and motivation towards science.

Marsh, Smith, Barnes and Butler (1983) and Shavelson and Bolus (1982) argued that self-concept has a multiple structure and that consequently, one should expect a stronger relationship between academic performance and

academic self-concept than between academic performance and other types of self-concept, such as general self-concept and social, and physical self-concept. Bookover (1964) found a higher correlation between academic self-concept and students' grade than between general self-concept and students' grade. Hattie and Hansford (1982) reported that performance achievement measures correlated with general self-concept, but had a higher correlation with academic self-concept. Lyon and MacDonald (1990) found academic self-concept to be a significant predictor of the achievement, of sixth grade students. Hagtvet (1990) found a mutual relationship between self-concept and academic achievement i.e; self-concept affects achievement and is in itself affected by it, at the same time. In addition, Burns (1982) supported the existence of a positive relationship between self-concept and academic performance. Wakstain (1985) found a correlation between measures of achievement and self-esteem. Wakstain also found that lower-achieving students tended to have lower self-esteem. Oliver and Simpson (1988) found a significant relationship between academic achievement and science self-concept, with students who scored higher in science and mathematics having higher self-concept.

Another study by Marsh, Relich and Smith (1983) found that grades in English, Mathematics and Science each were highly correlated with the corresponding self-concept. Also, Marsh, Smith, Barnes and Butler (1983) supported the argument that academic performance (academic ability) is highly correlated with self-concept.

However, the relationship appears to be different for boys and girls. Simon and Primavera (1972) noted a significant relationship between self-

concept and academic performance for female, but not for male students. In 1984 Marsh found gender produced no difference in pre-adolescents grade two and five in mathematics and self-concept, but in high school grades seven and eight, a significant difference appeared in favour of boys. Bledson (1964) found a significant difference in self-concept between male and female fourth and sixth grade students. The girls scored significantly higher than boys in the corresponding grade. Skaalvike (1983) found that elementary and junior high school students' low academic achievement was associated with low self-concept for male students, but not for female students and concluded that the relationship between self-concept and achievement differs for males and for females. Futterman (1982) reported that sex differences in achievement and self-concept were not large in elementary school, but girls had a lower level of achievement and self-concept in Junior and Senior high school. Similar studies by Marsh (1984, 1983), Stevenson and Newann (1986) and Meece et al. (1982) reported that male students had a significantly higher self-concept in mathematics, for instance, than female students, irrespective of female students' performance.

2.7 Rationale of the Hypotheses:

The foregoing review of literature provides a rationale for a number of hypotheses (see Chapter 4) to be tested in this study. The salient points are these: Lesser (1965) indicated that intelligence is not the only factor affecting students' academic performance, attitudes, academic self-concept and motivation; other factors also play an important part in influencing those variables. These factors include environment, social surrounding, ability of students, etc. An additional factor is the language in which the students learn,

for example learning through a second language (in the case of the present study, English).[228] If it is the case that learning science through a second language has a great impact on students' academic performance and may be correlated with academic self-concept, attitudes and motivation, this would suggest that educators should look carefully at the teaching of science in a second language, and handle it accordingly, in order that desirable academic self-concept, attitudes, motivation, and academic performance are to be achieved by students.

A number of studies have suggested that learning through a second language may influence self-concept and academic achievement. Forsythe (1987) found that native English speaking students taught in French had lower self-concepts than native English speaking students in a regular English speaking class.[229] Kapur (1970) reported a higher failure rate in male overseas students than among British students, related to the stress of being students studying in a non-native language.[230] Lee (1984) showed a consistent association between a positive self-concept and higher academic achievement when learning through a second language. Lee asserted that feelings of inferiority induced by being in a non-native language programme of study most assuredly affect academic performance.[231] Lambert and Gardner (1959) noted that positive self-concepts of foreign students and positive feelings toward speakers of the language in question are among the variables most highly correlated with successful learning in a second language.[232] Cummins (1979) suggested that learning with a second language can positively influence the academic performance and cognitive growth of individuals.[233]

McGroarty (1989) found positive attitudes toward second language in general and positive attitudes toward experience in English as a second language significantly related to achievement.[234] Gardner (1985) found a correlation between a measure of attitudes toward learning a second language and achievement. Gardner concluded that this is because those with a positive attitude will be more attentive in the learning process, and will take assessments more seriously, hence achieving more than individuals with negative attitudes.[235] Gardner and Lambert (1972) suggested that students with motivation to learn and with positive attitudes toward the target language are more successful than are students with less positive attitudes and lower motivation and they showed a relationship between attitude, motivation and second language.[236]

Other studies have investigated whether there are differences between male students and female students in achievement, attitudes, motivation and self-concept. For example Simpson and Oliver (1985) found that male students showed significantly more positive attitudes toward science learning than female students, though female students were more highly motivated to achieve in science than male students.[237] Skaalvike (1983) found that for elementary and junior high school students, low academic achievement was associated with low self-esteem for male students, but not for female students, and he concluded that the relationship between self-concept and academic achievement differs for male and for female students.[238] Marsh, Smith and Barnes (1985) found fifth grade female students had lower mathematics self-concept than male students.[239]

Goff and Futterman (1982) found that sex differences in achievement and self-concept were not large in the elementary school, but that female students had lower levels of achievement and self-concept in junior and senior high school than male students.[240] Ravid (1986) found a significant low correlation between students' attitudes and achievement in Hebrew language and no difference between male and female students in attitudes scores.[241]

It is evident that there is a need to determine whether and to what extent learning through English affects academic performance, academic self-concept, attitudes and motivation. The studies previously mentioned indicate the possible existence of positive correlations between learning through second language, academic self-concept, motivation, attitudes and academic performance.

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CHAPTER THREE

THE NATURE AND AIMS OF STUDY

3.1 Introduction:

The university in Oman is totally integrated into the educational system and as part of that system, plays an important role in the development of the country by developing its students' abilities, attitudes and perceptions. The need for more highly trained and educated specialists is greater now than it has ever been. The world today is characterised by rapid change and an increasingly wide and fast dissemination of new knowledge and recently developed skills.

As a consequence of an increasingly complex environment, educational and social needs have arisen, which educators and planners at the university level are naturally expected to meet and cope with efficiently.

Therefore the study and discussion of problems facing university students in Oman is of extreme importance, and their resolution can improve efficiency, both internally and externally. Learning science in English is one of many problems which face the Omani students in their educational environment. The researcher believes this issue has both negative and positive implications in that learning is affected, and thus influences the external and internal efficiency of the university, and it is of the utmost importance to investigate this matter thoroughly.

Since learning in English can affect the students' academic performance, especially when English is not the mother-tongue, and therefore the students have the difficulties of overcoming language barriers as well as

understanding the meaning of the scientific information conveyed through a foreign language, the students' attitude, academic self-concept and motivation are all likely to be adversely affected.

Although, for policy reasons, the researcher was unable to obtain official data on the academic performance (GPA) for all students in the university, it was possible to obtain the GPA of the sampled students. This information revealed that the academic performance of nearly 27.6% of students was lower than 2.0 GPA (see Table 3.1). The position was far worse with students of the college of Agriculture, 51.%. of whom had a GPA lower than 2.0, while college of Medicine students fared better; only 13.6% of them scored less than 2.0. It is worth mentioning here that all these are classified as under-achievers and would not be able to graduate from the university according to the university regulations (i.e. they are on academic probation). The number of students withdrawing from the colleges in 1994 is shown in Table 3.2.

Table 3.1

Number of low performing students in science colleges at SQU.(91 &94)

Colleges	Total Students	No of students with Low performance	%
Education	259	58	22.4
Medicine	177	24	13.6
Engineering	218	55	25.2
Agriculture	147	75	51.0
Science	158	53	33.5
Total	959	265	27.6

* the above table has been compiled by the researcher according to information given by the Admission and Registration Office(1995) at SQU.

Table 3.2

Number of students required to withdraw from SQU by college in 1994

Colleges	Withdraw officially	Withdraw unofficially	Total
Education	31	13	44
Medicine	13	3	16
Engineering	27	25	52
Agriculture	27	12	39
Science	18	8	26
Total	116	61	177

* the above table has been compiled by the researcher according to information given by the Admission and Registration Office(1995) at SQU.

There is also a relatively large number of students who transfer to the Education college (see Table 3.3) from science colleges such as Medicine, Engineering, Agriculture and Science, in order to study Arabic, Islamic Studies, History, which are taught in Arabic. This suggest that some students are forced to change course because of their difficulties with English.

Table 3.3

Number of students transferring to College of Education, by College.

Colleges	92-93	93-94	94-95	Total
Medicine	22	12	25	59
Engineering	12	15	19	46
Science	19	11	22	52
Agriculture	25	18	19	62
Commerce	-	8	21	29
Total	78	64	106	248

* the above table has been compiled by the researcher according to information given by the Admission and Registration Office (1995) at SQU.

The researcher has noticed that his students in the university produced lower grades when tested in various subjects through the medium of English,

than when tested in their own language (Arabic language). It is therefore suggested that correct diagnosis of the most important factors which influence the students' academic performance, when they are taught science in English language, and in particular, clarification of the role played by factors that many studies have highlighted, would be of benefit to the university and hence to Omani society. Of course, the researcher is aware of the difficulties in studying or investigating all the factors which may possibly affect or influence the students' academic performance. Thus, out of necessity, the focus of this study is on a limited selection of important variables, namely the Attitudes, Academic Self-concept and Motivation of the target group.

3.2 Statement of the Problem:

Students in the Science Colleges at Sultan Qaboos University (SQU) in Oman seem to be experiencing great difficulty. All the students who joined the university have previously been taught in their native language (Arabic). On entering the university, they face a change, with science courses taught in English. It may be that the high proportion of students who change to another college (see Table 3.3) do so in order to avoid learning in English.[1] Another high percentage drop-out from university (see Table 3.2) every academic year, while still others achieve below their true potential (see Table 3.1) and are therefore disappointed and dissatisfied.

It is worth mentioning here that there are many and varied reasons for teaching in a foreign language (in this case, English). However, the major reason is the lack of university staff of Omani nationality and a plethora of foreign lecturers from many different parts of the world. Omanis constitute

only some 5% of the teaching staff, or less. Also, to translate existing books into Arabic, and/ or write new ones is a very difficult matter for the Omani University, which has only existed since 1986.

It may also be that this university utilises English because it aspires to adopt contemporary technology and knowledge in the international and scientific language of the modern world, which is English.

The above justifications for teaching in English would be all very well, were it not for the inadequacies of English language teaching at secondary school level. Many reasons may be identified for this. There is a lack of properly qualified English teachers, especially those of Omani nationality, so that many teachers are in fact teaching outside their specialism. Traditional methods of learning place emphasis on memory, rather than of comprehension. Thus, language teaching, focuses on memorisation of vocabulary lists and grammatical material, in order to ensure a satisfactory pass rate. Since this is a matter for which the teachers and school administrators are held responsible, the pressure of examinations leads teachers to narrow the scope of their teaching. As a result, students develop the feeling that the foreign language is of no practical value to their lives, which affects their attitudes, motivation and performance.

This state of affairs has created an unhealthy environment and a huge chasm exists between the curriculum adopted in the secondary stage and the needs of the university stage.

There is a major problem for students whose mother-tongue is Arabic in learning science in a foreign language (English) which has vast linguistic differences with Arabic. Owing to the inadequate teaching programme in the

schools and differences in the competencies in the teaching of English between these schools, Omani students arrive at the various colleges of the SQU with a generally inadequate English background, which therefore means that there are certainly going to be differences between the students in their abilities to learn effectively through English as a foreign language.

As a result of this situation in which students learning in English find themselves, and the different levels of frustration they experience, their level of academic performances at the university is likely to be affected. Therefore, it is not only the process of having to learn in English which is a foreign language that affects academic performance, but also, students' negative attitudes towards studying science and other subjects in English and the frustration it brings, which affect motivation and academic self-concept of the learner. It can therefore be seen that the influence of learning in foreign language affects all these variables in connected and interrelated ways, rather than in separate ways.

Regarding the variable of self-concept, it is important that the problems students are likely to face in this respect are clearly explained. The self-esteem or self-regard of any student can be affected by success or failure in his or her studies. Therefore, academic achievement can influence the direction of a students' self-concept. In this study, the Omani students studying science in a foreign language, and experiencing difficulties as a result of this, can be going through self-doubts or personal feelings of inadequacy. There are, therefore, two issues to consider in respect of students' self-concept and academic performance. First, difficulties in learning in English; and second, difficulties encountered in learning science and other

subjects. It is very difficult to say when academic achievement has been affected by one of these factors alone. However, this study is concerned with success attributed to students' levels of competence in learning in English.

The Academic self-concept of students before they enter the university could be low or high in respect of their English language competence, which could influence the attitudes, motivation and academic performance of the students as they begin to learn in a foreign language. This is the reason why the researcher sampled first year students in this study as well as the fourth year students, whose academic self-concept has been influenced by the process of learning in a foreign language over a period of time. This in turn affects their attitudes, motivation and academic performance.

Finally, the academic self-concept of students in learning in English, their attitudes and motivation, all of which are dependent on each other as they influence the academic performance of the students, can be linked to how relevant the students' need for English language is to their career after graduation. In a way, therefore, the problems this study has set out to investigate are not simply variables acting as single and separate issues, but rather, they are interrelated, and their link to academic performance, and learning in English, as opposed to learning science or other subjects, is at the centre of this study.

All of the above place the students in a very difficult situation when learning science in English. This has prompted the university and the researcher, who can testify to his own experience in this field, as a member of the teaching staff, to raise the question as to the possible relationship between

academic self-concept, attitudes and motivation of Sultan Qaboos University students learning science subjects in English and their academic performance.

There is an urgent need to answer this question now. Sadly no research has been carried out in this field. Therefore this study is the first to be done in this field in Oman.

The researcher aims to examine and analyse these particular issues from various angles in the hope that an easing of the present problems will be achieved. An attempt has been made to shed light upon all the above mentioned aspects, drawing upon information supplied by students, teaching staff and experts with regard to their points of view and perceptions, with a view to offering recommendations to alleviate the situation in future.

It is important that efforts should be made through research to find ways of removing the constraints students experience by learning in English. To be able to address this problem, this study is a small attempt towards a proper understanding of the ways attitudes, academic self-concept and motivation of Omani students, are affected in learning science through the medium of English as a second language.

3.3 Aims and Objectives of the Study:

As indicated in the Introduction, there are many factors which influence, directly or indirectly, the academic performance of students who are learning science through a second language. However, the researcher has confined this study within certain limits, concentrating on the examination of factors which have also been highlighted as important by other studies. The focus of this study, therefore, is on academic self-concept, attitudes and motivation. This study will therefore address the following questions:

1- What relationships, if any, exist between the academic performance and the academic self-concept, attitudes and motivation of Sultan Qaboos University students, who are learning science through the medium of English Language?

2- To what extent are these research variables, academic performance, attitudes, academic self-concept and motivation, mutually influential?

In addition, this study is intended to draw from the vast literature sources on the influence of these variables on performance as they relate to several western countries in Europe and America, which would form a base for the present investigation in a different cultural setting.

3.4 The Limitations of the Study:

The scope of this study is confined to students who are studying science through the medium of English language at the five colleges of Sultan Qaboos University (SQU) in Oman. These colleges are: Education, Medicine, Engineering, Agriculture and Science. It is important to stress that Sultan Qaboos University is the only University in the country, with a student population in the science colleges of about 5000. These students include those in all the four levels (years 1-4) of the colleges.

The research sample was drawn from students in years 1 and 4 only, excluding students in years 2 and 3. This measure was taken because if any significant difference in students' attitude, academic self-concept, motivation and academic performance were to be observed, common sense would dictate that students who have stayed longest in the colleges (year 4) and those who have just joined the colleges (year 1), would be most suitable for the study. Therefore, all the year 1 and year 4 students were included in the study.

Several psychological studies on students' academic achievement tend to investigate wide range of variables such as intelligence, aptitude and several others in addition to the specific variables- attitude, academic self-concept and motivation- with which this study is concerned . The decision as to which variables to select for a given study is a matter of the researcher's interest. One of the limitations of this study is the fact that only the three independent variables of attitude, academic self-concept and motivation have been selected for study. This is because the researcher believes they are most relevant variables to Omani students' problems in learning science through a foreign language (English). Other researchers may wish to investigate other variables.

It is mentioned in Chapter Four- (methodology) that the questionnaires were translated into Arabic, to ensure that the students understood properly the research issues raised. This was necessary because of the linguistic differences in explaining some scientific concepts in English and Arabic. The translation to Arabic was carefully carried out and validated by experts. In addition, the Test-retest exercise carried out on the instruments has removed any difficulties that might have existed. The language difference between English and Arabic was a slight problem, but this was overcome.

The researcher had to make a decision to include both male and female students in the study, once the decision was made to use all first year and fourth year students.

3.5 Significance of the Study:

This study and the formulation of its aim transcend the restricted population of students at the Sultan Qaboos University, and this has implications for the whole society. This is the first time any study has investigated the factors influencing academic performance, attitude, academic self-concept and motivation of science students in Oman who are learning through English as a second language. Therefore, the findings of this study are likely to generate useful discussion on ways of improving the methods of teaching science in English. Lecturers in the different colleges will find the recommendations of this study useful in seeking ways to enhance the academic performance of students as well as improving their attitude toward learning science in English by increasing students' motivation and academic self-concept. The Sultan Qaboos University is interested in finding ways to maximise its external and internal efficiency, since its graduates must be regarded as the future specialists who will one day occupy the top positions on the pyramid of workers. This study aims to contribute to feeding this pyramid with competent and well-educated science teachers who have a positive attitude and are well motivated, for the benefit of the country as a whole.

Reference:

1- Sultan Qaboos University/ Department of Admissions and Registration Office 1995.

CHAPTER FOUR
METHODOLOGY OF THE STUDY

4.1 Introduction:

The methodology of this study is explained in this chapter, along with the procedures used in carrying out the investigation and achieving its aims. There follows a description of methods used to collect data, presenting the hypotheses of the study, development of the instrument, pilot study, sample size, administration of the questionnaires and the statistical analysis of data obtained.

Because of the scope of this study, a variety of research tools have been used by the researcher to gather the information needed. **Firstly,** a questionnaire which was distributed to the different groups and colleges. **Secondly,** interviews, which were used selectively with a carefully selected group which had an interest in developing the efficiency of the graduates of the target university; **Thirdly,** a review of relevant existing literature, official and non-official reports.

Van Dalen (1979) stated that:

> ***"One method is not suitable for all circumstances, each situation demands an appropriate method, or the use of several methods in the solving of problems. Therefore, it is imperative that a researcher be familiar with several methods and instruments of data collection."***[1]

The construction of the instrument is very important, for the statements must be organised in such a way as to obtain the necessary material, and in order to frame and organise his statements, according to three

type of scales, the researcher should first identify the specific and clear objectives of his research. Both Evans (1965)[2] and Oppenheim (1966)[3] emphasised that a questionnaire is a scientific aid, and so it should be constructed with great care, in line with the specific objectives of the research. Oppenheim added: "data collected must be of practical use to the researcher, so it must be kept in mind that the questionnaire is not merely a list of statements or questions but is a scientific aid issued for a specific intention."[4]

The level of learning in English of students in Omani schools before they enter the university has a direct relationship with the problems they encounter in learning science in English at the different colleges of the university. Therefore, learning English as opposed to learning science or any other subject, can influence the students' attitudes, academic self-concept and motivation, as well as their academic achievement in the different subject areas.

4.2 Statement of the Hypotheses:

A combination of the aims and objectives of this study, and the literature review on the rationale behind the main assumptions of this research, has given rise to the following null hypotheses which will be tested in chapter five:

H 1: There is no significant correlation between the academic performance of SQU students when learning science in English and their attitude.

H 2: There is no significant correlation between the academic performance of SQU students when learning science in English and their academic self-concept.

H 3: There is no significant correlation between the academic performance of SQU students when learning science in English and their motivation.

H 4: There is no significant difference between male and female students in their attitude when learning science in English.

H 5: There is no significant difference between male and female students in their academic self-concept when learning science in English.

H 6: There is no significant difference between male and female students in their motivation when learning science in English.

H 7: There is no significant difference among students of different colleges, in attitude when learning science in English.

H 8: There is no significant difference among students of different colleges, in academic self-concept when learning science in English.

H 9: There is no significant difference among students of different colleges, in motivation when learning science in English.

H 10: There is no significant difference between first year students and fourth year students in attitude when learning science in English.

H 11: There is no significant difference between first year students and fourth year students in academic self-concept when learning science in English.

H 12: There is no significant difference between first year students and fourth year students in motivation when learning science in English.

4.3 Operational Definitions of the Variables:

The researcher classified the variables selected for this study into two main categories: Independent and Dependent variables.

4.3.1 Independent Variables:

1- Students' academic self-concept:

The total collection of judgements and perceptions of their academic abilities which individuals hold with respect to their worth as a person - in short, how the students evaluate themselves in subject matter.

2- Students' attitude:

The way a person views something or tends to behave towards it, often in an evaluative way (Collins English Dictionary).[5]

3- Students' motivation:

The combination of effort and desire to achieve a goal desired by an individual.

In additional to these three above independent variables, there are also some important independent variables such as sex of students, level of students and colleges (see Table 4.1).

4.3.2 Dependent variable:

Academic performance: The students' scholastic performance as measured by their grade point average:

A- Low academic performance:

Students whose grade is below 2.0 on a scale of 4.0.

B- High academic performance:

Students whose grade is above average, 3.0 on a scale of 4.0.

Table 4.1

(Illustrative Table) Hypotheses variables and Techniques suggested.

Group	Hypothesis	variables (dependent & independent	Technique used
One	1 ⟶	with — Students' academic performance Students' attitude	Pearson's correlation
	2 ⟶	with — Students' academic performance Students' academic self-concept	
	3 ⟶	with — Students' academic performance Students' motivation	
Two	4 ⟶	with — Male students' attitudes Female students attitudes	t. Test
	5 ⟶	with — Male academic self-concept Female academic self-concept	
	6 ⟶	with — Male students' motivation Female students' motivation	
Three	7 ⟶	with — Students' attitudes in colleges Students' attitudes in colleges	One- way Analysis of Variance
	8 ⟶	with — S.a. self-concept in college S. a. s. concept in other college	
	9 ⟶	with — Students' motivation in college Students' motivation in college	
Four	10 ⟶	with — Attitudes of first year. Attitudes of fourth year.	t. Test
	11 ⟶	with — A. self-concept of first year. A. self-concept of fourth year.	
	12 ⟶	with — Motivation of first year s. Motivation of fourth year.	

4. 4 Research Instruments:

The purpose of this section is to describe the instruments used in this study and indicate their reliability and validity. Because of the type of data required for this study, the researcher has used a variety of research methods to collect data. This use of multiple methods is in keeping with the opinion of

Van Dalen (1979) who argued that:

> "*One does not master a single method of obtaining data, such as the questionnaire, and apply it to every problem that arises. Each tool is appropriate for acquiring particular data, and sometimes several instruments must be employed to obtain the information required to solve a problem. Researchers, therefore, must possess considerable knowledge about a wide variety of techniques and instruments.*"[6]

4.4.1 The Questionnaires:

Three different sets of questionnaires were used to collect data from the students on the variables of attitude, academic self-concept and motivation. An interview schedule was used to collect data from the lecturers. These instruments have been described in greater detail in this chapter. The objective of the questionnaires was to assess students' opinions about their attitudes, motivation and academic self-concept in learning science through English. The construction of the questionnaires was very important in that the questions must be framed in such a way as to obtain the necessary material without unduly influencing the respondents. In this regard, Evans (1965) argued that " statements on questionnaires collected through investigation must be relevant to the specific objectives of the investigation."[7] Also, Oppenheim (1966) has stated that " a questionnaire is a scientific tool and therefore must be constructed with great care in line with specific aims and objectives of investigation."[8] These arguments suggest that the questionnaire is not merely a list of questions, but is a scientific tool constructed for a specific purpose.

Since much of the information required for this aspect of investigation was in the form of opinions and views, the researcher conducted a search of

current literature related to questionnaire design such as Shavelson and Bolus (1982),[9] Shavelson et al. (1976),[10] Marsh and O'Neill (1984),[11] Allen et al. (1980),[12] Gilkson (1988),[13] Simpson and Troost (1982),[14] Gardner and Lambert (1972),[15] Mullas (1979)[16] and Simpson and Oliver (1988).[17] This search helped to identify the various key issues in the area. The procedures followed in the construction of the questionnaires were essentially those recommended by Oppenheim. The first step which is the design stage involves listing the specific objectives and relating each question to these objectives. Also, Oppenheim stated that " a questionnaire has a task to do, its function is measurement, therefore, the specification should clearly state in the aim the variables to be measured"[18] . In addition, Cohen (1989) pointed out that " a good questionnaire should be easily understood, short, uncomplicated, reliable and valid."[19]

To meet the aims and objectives of this research as stated in Chapter Three, three questionnaires (scales) were devised to measure students' attitudes, academic self-concept and motivation, as follows:

1- Students' Attitude Scale consisting of 17 items

2- Students' Motivation Scale- 20 items

3- Academic Self-concept Scale- 53 items

1- Students' Questionnaires (Scale) on Attitude.

This instrument was developed by Gardner and Smythe (1979)[20] to measure students' attitudes in different subjects in Canada. In the first stage of development of the attitude/ motivation scales, Gardner and Smythe selected 81 items (44 items to measure students' attitude and 37 items to measure students' motivation) from an original pool of several hundred items.

Gardner and Smythe piloted the scales on a group of 1512 studentsfrom 7th grade to 11th grade in different schools in Canada. Item- total correlations were computed separately for each scale and were examined. An item was considered a potentially good one if item-total correlation was in the top-half (not less than three out of five). As a result of this refinement, the final attitude scale contained 17 items of which 10 were positively worded and 7 negatively worded to measure students' attitude in science (see Appendix 4.4).

Despite the cultural differences between Canada, where the instrument was developed and tested, and Oman where it is being applied in this research, the researcher decided that the scale was appropriate because the science learning situation is similar, although language difficulties would be a more significant problem in the case of Omani students. To compensate for cultural differences in this study, the researcher added six more items (10, 11, 20, 21, 22, and 23) to the scale to make the instrument more culturally-fair to the research environment (see Appendix 4.5).

Of the six items added to the original scale, 4 items measured the students attitude toward science examination; 1 item measured students' attitude toward other students who study science in English-speaking countries; and 1 item measured students' attitude toward science taught in English. The researcher modified some statements in the scale by adding the word "English" so as to reflect the objectives of the study, and also to make the meaning of the content of the items clearer.

The response to each item is on a 5- point Likert scale graded from Strongly Agree (SA) to Strongly Disagree (SD) as shown in Appendix 4.6.

2- Students' Questionnaires (Scale) on Motivation.

This instrument was originally developed by Gardner and Smythe (1979)[21] to measure students' motivation in different subjects in Canada. They originally selected 37 items which were piloted to the same group as their attitude scale. As the result of item selection based on item-total correlation, the final scale contained 11 positive items and 9 negative items, to give a total of 20 items (see Appendix 4.4). The researcher found the items relevant to this study as the instruments are found suitable in measuring motivation related to science learning among Omani students.

In order to adapt the scale to the present study, some modifications were made. First four items (9, 10, 17, and 24) were added to the original scale so the scale contained 13 items positively worded and 11 items negatively worded to give a total of 24 items (see Appendix 4.5). Items 9 and 10 measured students' motivation when they are in the university; item 17 measured students' motivation to continue their study after graduation; and item 24 measured students' motivation in science examinations. In addition, the researcher modified some statements in the questionnaire (2, 3, 11, and 22) by adding the word " English" to statement 2 and changing the words "work", and "job" to "study" in statements 3, 11 and 22 and the word "teacher" to "lecturer" in statement 22 (see Appendix 4.5).

The response to each item was made on a 5-Likert scale in the form of Strongly Agree (SA), Agree(A), Undecided (U), Disagree (D), and Strongly Disagree (SD) as shown in Appendix 4.6.

3-The Students' Questionnaire (Scale) On Academic Self-concept.

The Students' Academic Self-concept Scale, developed by Drummond. (1984)[22] and used by Gilkson (1988)[23] to measure academic self-concept. was incorporated in the students' questionnaire for this research. This scale contains 53 items (see Appendix 4.4) and was based on the development of academic self-concept based on the studies of such distinguished researchers as Rogers (1959),[24] Brookover et al. (1962)[25] and Shavelson et al. (1976);[26] and together with narratives from adult learners of situations which they experienced positive and negative self-concept and observations and interviews with adult learners. The researcher contacted Dr. Drummond to get more information about the development of the scale, but only a limited amount of information was available (see Appendix 4.4A, page 280)

Drummond piloted the scale with a group of 213 adult university students including both sexes in North Florida. Items were worded to conform to a Likert-type scale using five points. Strongly Disagree to Strongly Agree. (see Appendix 4.6).

The researcher is satisfied that this instrument is suitable and appropriate for this study in measuring the academic self-concept of Omani students in SQU. However, to reflect the cultural elements of Oman, the researcher modified some of the statements by adding "I" and "MY" to a number of items, as shown in Appendix 4.5.

4.4.2- The Interviews:

The researcher also conducted interviews with lecturers who participated in the course to find out their views on what causes students'

low academic performance in learning science through English (for more details, see Appendix 4.7).

The purpose of using the interview as a method for collecting data from lecturers derived from Van Dalen (1979) who stated that "the interview as a research method in survey research is unique in that it involves the collection of data through direct verbal interaction between individuals."[27] Also, Hoinville et al (1987) reported that " in a small scale survey, a researcher may decide to carry out his own interviews. He knows better than any one else the purpose of his questions, and may be better than anyone else to resolve queries that arise during the interview."[28] According to Jaber and Kadhim (1973) the interview is necessary in order to ensure the validity and correctness of the information collected from independent sources."[29] Dunnham and Smith (1979) indicated that " the unique strength and weaknesses of both interviews and questionnaires suggest that a combination of the techniques provides the most effective organisational survey programme."[30]

39 lecturers from different colleges teaching science in SQU were interviewed. The interview schedules included initial questions followed by probes (see Appendix 4.7 for questions) which investigated lecturers' opinions about:

1) how they rate students in learning science in English;
2) students' understanding of lectures in English;
3) students' performance;
4) science lecturers' awareness of students' problems.

To conduct the interviews, the researcher used the following steps:

1- At the beginning of each interview the researcher explained to the interviewees the objective of the interview and assured them that their answers would be confidential and used for research purposes only.

2- The interview was then conducted by asking the probe questions. For example in question 2: How do you rate the students' understanding of the science lectures which are taught in English? Good.., Satisfactory, Poor.. Please give a reason for your answer.

3- At the end of the interview, the researcher asked each lecturer if he\ she had any comment or suggestion.

4.5- Pilot Study:

An initial reading of existing literature made clear the importance of a pilot study, based on the argument of Hoinville et al. (1987): " the creation of good questionnaires does not have to rely solely on the researcher's perspective. At some stage in the design process the questionnaire should be subjected to a field test."[31]

The importance of pilot testing has been emphasised by many writers such as Borg and Gall (1983),[32] Hayman (1968),[33] Cohen and Manion (1985),[34] Lin (1976),[35] Johnson (1977),[36] Ary et al (1972).[37] Although all the foregoing writers proclaim the importance of the pilot test, it might be valuable to indicate the reason for this importance. Borg and Gall (1989) reported, "Every questionnaire must be tested and refined under real world conditions. Even after years of experience, no expert can write a perfect questionnaire".[38]

The pilot test is very important in research investigation because it helps the researcher to see how the questionnaires will be conducted at the

time of the main study and how long respondents take to complete them, and to locate any ambiguities. On this basis, researchers can remove any items which do not yield usable data, add items to fill any data gaps and reword unclear questions, in preparation for the main study.

Before the questionnaires were piloted the researcher took the following steps:

1- Six items were added to the original Attitude subscale because the researcher felt it necessary to include some items specifically concerned with students' attitude in science toward the exam when learning science in English. Two items were positive and four items were negative.

The Attitude Scale contained 23 items after the researcher had added these six items, which were Nos. 10, 11, 20, 21, 22, and 23, so the scale became 12 items worded positively and 11 items worded negatively.

2- The researcher also adopted or modified the statements in the Attitude scale by adding the word (**English**) to some statements, so the student could understand the statements clearly. (see Appendix 4.5)

3- The researcher also modified the statements in the Academic self-concept scale by adding words to the statements (**I**, and **MY**). (see Appendix 4.5).

4- Four items were added to the motivation subscale to meet the present research objectives, these items were specifically concerned with students' motivation. Two items were positive and two were negative. The motivation scale contained 24 items after the researcher had added these four items, which were Nos. 9,10, 17 and 24, so the scale became 13 items positively worded and 11 items worded negatively (see Appendix 4.5).

5- The researcher also modified the statements in the Motivation scale by adding the word (English) to some statements, and changing words (work) and (job) to study, so the student could understand the statements clearly. (see Appendix 4.5).

6- The researcher added at the end of the motivation scale, an open question (***What problem do you think students face in studying science in English Language***? See Appendix 4.6). This open question was to give students freedom to explain the problems they faced in learning science in English, from their own view point, which might not be covered in the questionnaire.

7-Translation of the Questionnaires:

The questionnaires (attitude scale, scale motivation scale, and academic self-concept scale) were translated into Arabic by the researcher and then translated back to English by a specialist who is fluent in both languages. This procedure was repeated several times until a satisfactory similarity between the two versions was achieved.

4.5.1 The Pilot Sample:

The pilot study sample was 30 students (16 male and 14 female), in their second year at SQU. They were randomly drawn from various science colleges and were studying science in English. See Table (4.2). The age of the pilot sample ranged from 20-22 years. The pilot sample was similar to that from which the main sample was planned to be drawn, and was not included in the main study.

Table 4.2

Pilot Sample by Sex and Colleges

Colleges	Male	Female
College of Education	3	5
College of Medicine	4	3
College of Engineering	3	-
College of Agriculture	2	-
College of Science	4	6
Total	16	14

The researcher administered the questionnaires to the pilot sample twice. The first pilot test was in the first week of December 1994. The researcher directed the distribution to the pilot sample. Students were given full written directions (in Arabic) as how to answer the statements in each scale. Three weeks later, the researcher retested the same group.

All the selected respondents answered indicating support for and interest in the study and provided valuable feedback relative to redundancy, and the clarity and the length of the instruments and the validity of items. Both results (Test-retest) were recorded on the researcher's personal computer for statistical analysis to determine the reliability of the Attitude, Academic self-concept and Motivation scales.

4.6- Sample Size and Characteristics:

The sample of this study was selected from five colleges in the Sultan Qaboos University in Oman: (Education, Medicine, Engineering, Agriculture and Science), all of which teach science and science education in English language. The total number of first and fourth year students studying science in the mentioned colleges was 959 (see Table (4.3). The researcher sampled 59% of the total number of science students.

Bearing in mind the total number of science students in each college, the selected sample represented from 6.77 to 11.92 percent of the relevant populations, with the Education college most strongly represented (see Table 4.3)

Table 4.3

The total students (First and Fourth year) in science colleges

Colleges	Total in Science	First year	percent (1)	Fourth year	Percent (4)	Total 1&4	Total % 1&4
Education	513	160	7.37	99	4.56	259	11.92
Medicine	532	90	4.14	87	4.01	177	8.15
Engineering	508	127	5.85	91	4.19	218	10.04
Agriculture	254	83	3.82	64	2.95	147	6.77
Science	365	94	4.33	64	2.95	158	7.27
Total	**2172**	**554**		**405**		**959**	

The researcher prepared 959 questionnaires (in Arabic) to be distributed to the whole number of first and fourth year science students, but at the time of distribution, 154 students were unavailable for various reasons (e.g. teaching practice, field study). Therefore 805 copies of the questionnaires were distributed (see Table 4.4).

Table 4.4

Questionnaire response rate, by year and college.

College	Year	No of Students	No of students absent	QU distributed Randomly (1)	Total QU returned	Total QU-Un completed	Total QU completed (2)	Tota l % 1&2
Education	first	160	15	145	89	2	87	
	fourth	99	35	64	58	4	54	
	Total	259	50	206	147	6	141	67.5
Medicine	first	90	2	88	70	4	66	
	fourth	87	14	73	58	6	52	
	Total	177	16	161	128	10	118	73.3
Engineering	first	127	15	112	86	1	85	
	fourth	91	9	82	50	2	48	
	Total	218	24	194	136	3	133	68.6
Agriculture	first	83	19	64	45	0	45	
	fourth	64	21	43	27	3	24	
	Total	147	40	107	72	3	69	64.5
Science	first	94	4	90	62	2	60	
	fourth	64	20	44	44	0	44	
	Total	158	24	134	106	2	104	77.6
Total		**959**	**154**	**805**	**589**	**24**	**565**	**70.2**

The sample consisted of 333 male students and 232 female students, drawn from among first and fourth year students of pure science and science education colleges indicated above. A breakdown of the whole sample by gender and college is presented in the Table 4.5 and Tables 4.6 and 4.7 indicate the composition of first and fourth years samples respectively. The age range for participating students was between 19 and 25 years.

Table 4.5

Distribution of sampled students by colleges.

Colleges	Male	Female	Total	Total %
Education	23	118	141	25.0
Medicine	63	55	118	20.9
Engineering	133	none*	133	23.5
Agriculture	59	10	69	12.2
Science	55	49	104	18.4
Total	**333**	**232**	**565**	**100.0**

* Admission to Engineering college is only for male students, females being restrained from enrolling due to lack of jobs after graduation.

Table 4.6

Number of first year students from five colleges

Colleges	Male	Female	Total	Total %
Education	15	72	87	25.4
Medicine	31	35	66	19.2
Engineering	85	none	85	24.8
Agriculture	37	8	45	13.1
Science	35	25	60	17.5
Total	**203**	**140**	**343**	**100.0**

Table 4.7

Number of fourth year students from five colleges

Colleges	Male	Female	Total	Total %
Education	8	46	54	24.3
Medicine	32	20	52.	23.4
Engineering	48	**none**	48	21.7
Agriculture	22	2	24	10.8
Science	20	24	44	19.8
Total	**130**	**92**	**222**	**100.0**

4.7 Administration of the Instrument and Data Collection:

Before administering the questionnaires and collecting data, the researcher had to follow certain routine procedures:

Step One: Making Contacts.

A letter was sent by the researcher's supervisor to the Chancellor of Sultan Qaboos University to ask permission to distribute the questionnaires in the selected colleges in the university (see Appendix 4.1). After receiving permission, the researcher contacted the deans in each college individually to determine a convenient time for the students to answer the questionnaires. Letters were sent by the Dean of the College of Education and Islamic Science to other deans in the selected colleges, requesting co-operation with the researcher (see Appendix 4.2).

Step Two: Administration of the Questionnaires:

The researcher himself began to administer the three questionnaires to the students, since postal distribution of the questionnaires was impracticable, particularly in the university and for this kind of group. Oppenhiem (1966) recommended that the personal administration of questionnaires ensures a high response rate and accurate sampling.[39] For this reason, the researcher thought it wise to conduct the field study by himself rather than entrust it to the vicissitudes of an unreliable postal service.

The researcher began to administer the three questionnaires to the students on January 25-1995 in the first week of the second semester. Administration of all three instruments took six weeks of continuous work. The researcher administered the questionnaires to the students in their

classrooms and asked them to pay attention and to read all the instructions in the questionnaires before responding to the items. Students were requested to remain in the classroom until everyone had finished. All responses were completed in one hour or less. Copies of the questionnaires in Arabic are shown in Appendix 4.8.

Step Three: GPA Data Collection.

The researcher contacted the Director for Students' Affairs to obtain the students' Grade Point Average (GPA). In the case of science courses, GPA was requested only for courses taught in English (see Appendix 4.3).

4.8- Validity of the Instruments:

Good and Brophy (1990) stated that "at the most basic level a test is said to be valid if it measures what it is supposed to measure".[40] In other words, an item is said to be valid if it can measure the phenomenon for which it was designed. The validity of a measure, as Hopkins and Stanley (1981) pointed out, is how well it fulfils the function for which it is being used.[41]

They added that regardless of the other merits of a test, if it lacks validity, the information it provides is useless. The validity of a test can be viewed as the accuracy of specified inferences made from its scores. These inferences will pertain to:

1- Performance on a " universe" of items (content validity).

2- Performance on some criterion (criterion- related validity) or

3- The degree to which certain psychological traits or constructs are actually represented by test performance (construct validity). During the process of test validation one examines the relationships between test scores and other empirical data and logical considerations."[42]

The students' questionnaires have all been shown to have high validity ratings based on standardised tests carried out on them by the experts who developed them. Gardner and Smythe (1979) established the validity of the Attitude and Motivation Scales by having the items reviewed and evaluated by a five-member expert panel of sociologists and science educators, to maximise item content validity.[43] Also they used correlation with the aptitude scale. The correlation of attitude with aptitude was 0.43, and for motivation with aptitude, was .34.

Drummond (1984)[44] established the validity of the Academic Self-concept Scale (ASCS) in terms of correlation analysis, by correlating the scale with Coopersmith's (1967)[45]. Adult Self-Esteem Inventory (ASEI). The ASCS showed a substantial correlation with the ASEI (r = 0.55) Also, Drummond (1984)[46] used the scale in other studies comparing with adult learners across the age range and compared the scale with other Academic Self-concept Scales.

Some precautions were taken, to ensure that the questionnaires were valid internally and externally in Oman. To ensure that the contents were accurately interpreted, that the items were phrased clearly and that colloquial terms and meanings were appropriate and equivalent in the English and Arabic versions, the researcher took the following steps to ensure validity of the questionnaires:

2- The researcher gave the Arabic and English versions to be checked by bilingual members of staff in the Department of Education and Psychology in

the College of Education and Islamic Sciences in Sultan Qaboos University in Oman, to ensure that the Arabic version generated meanings as similar as possible to the English version.

3- The researcher gave a copy of the questionnaires with a letter indicating the nature and purpose of the study and description of the questionnaires to (20) lecturers specialising in education. educational psychology, and English language in the College of Education and Islamic Science in SQU. The lecturers were not asked to respond to the items (whether they agreed or disagreed), but to respond to whether the items were suitable for each scale or not. The researcher asked the specialists to assess the questionnaires in the following respects: The lecturers were asked:

A- to make an assessment on a scale of 5 for each item: (extremely important, important, moderate, fairly important, and not at all important).

B- to suggest any additions or corrections for the items, which could be considered important to the present study.

C- to make any other suggestions that might be helpful for the present study.

The specialists' responses were classified into five levels, according to their importance and then weighted as follows:

1- Extremely important =5

2- Important = 4

3- Moderately important = 3

4-Fairly unimportant = 2

5- Not at all important = 1

The data were analysed by using the Mean and any items below the mean (5.) were removed from the scales. All items in the scale scored approximately (5.0) or above the mean and all were retained in the scale according to the specialists' response (see Appendix 4.9). The researcher analysed the comments and notes of the referees and rearranged and corrected the items according to their recommendations. The specialists recommended that the researcher change the word (Job) to (Study) on statement no 11 and the word (teacher) to (lecturer) in statement no 22 on the motivation scale. The specialists also recommended that the researcher should add (I) and (My) to the statements on the Academic Self-concept Scale. The researcher made the corrections to the statements in line with the specialists' recommendations before the pilot study took place.

4- After these changes the researcher discussed and checked all the statements with colleagues who were competent in both languages.

5- The internal and external validity of the questionnaires were checked within the Department of Educational Research in the Education College in SQU. All these measures taken have ensured all the students' scales have high validity rating.

4.9- Reliability of the Instruments:

Much has been written on the measurement of the reliability of research instruments. In an empirical study, one will encounter such terms as reliability of research and reliability of measurement. Van Dalen (1979) stated that the "results obtained from a sample of subjects is only as good as the instruments used to collect the data. Therefore, it is of the utmost importance that instruments are reliable, objective, and valid, as well as suitable for the

job they have to do, so the information and reports from the investigation are both correct and clear".[47] Wiersma (1986) stated. " reliability of research concerns the replicability and consistency of the methods, condition and results".[48] In considering the reliability of measurement, a distinction is made between internal and external reliability. Internal reliability refers to the extent to which the data collection, analysis, and interpretation are consistent given the same conditions. External reliability deals with the issues of whether or not independent researchers can replicate studies in the same or similar settings. According to Wiersma (1986) "the term reliability of the measurement refers to the consistency of the instrument in meaning whatever it measures". "This type of reliability refers to the consistency of scores obtained by the same person when retested with the same test on different occasions or with a different set of equivalent items".[49]

Several procedures can be used to estimate measurement reliability. All of them have computational formulae that produce reliability coefficients. Among the commonly used procedures are:

1- Parallel forms or alternate forms of the same test to give two presumably equivalent forms are given and then the correlation between the resulting two sets of scores is studied;

2- Test- restest, where the same test form is given on two separate occasions and then, the correlation between the results from the two testing is studied;

3- Internal consistency in which a single form is given consisting of several sections or numbers of items and then, the consistency of performance of sections or items is studied.

For the pilot study, the researcher used the Test-retest procedure to measure the reliability of the Students' Attitude Scale, Academic Self-concept Scale, and Motivation Scale. Pearson's product Moment Correlation was used to measure the correlation between the two tests on different occasions. The Pearson's Product Moment Correlation was (r 0.88) for the Students' Attitude Scale, for the Academic Self-concept Scale it was (r 0.77) and for the Motivation Scale it was (r 0.90). This highly significant correlation between Test-retest for all three scales (Students' Attitude, Academic self-concept and Motivation) means that the scales were highly reliable to measure the attitude, academic self-concept and motivation of Omani students in SQU in Oman.

It is important to state that all the three scales used in this study had been tested for standard reliability value by their developers. For instance, Gardner and Smythe used test-retest reliability: the result for attitude was 0.78 and for motivation, 0.79. Also they used Cronbach's (1951).[50] alpha reliability coefficient, which for the Attitude and Motivation scales was calculated to be greater than 0.80. The internal correlations for the items on the Attitude Scale ranged from 0.3 to 0.5, and for those on the Motivation Scale, from 0.2 to 0.3. For the Academic self-concept Scale, Drummond (1984) [51] based the reliability on Split-half and Cronbach's alpha correlation, which were 0.89 and 0.90 respectively with the sample of 200 adult learners.

It can be seen that all the three scales had high reliability for the pilot study and for the previous developers, before being used for the main study.

4.10 Reliability of the Questionnaires for the Main Study

Originally, Factor Analysis was conducted to measure the reliability of the students' questionnaires (attitude, academic self-concept and motivation) after the main study. However, this has been omitted on two grounds: **Firstly,** the reliability testing which was carried out on the three scales, based on Cronbach's Alpha correlation analysis of each items as presented in Tables 4.8 to 4.13, was sufficient, and the results clearly show that the scales have substantial reliability ratings. **Secondly,** the purpose of this study is to investigate the possible differences between groups of students according to the subject of study; and not to develop new or adapted scales for the measurement of attitude, academic self-concept and motivation. Therefore, only a reliable instrument is required for the purpose of this study, and it is believed that the scale developers will need to use the second technique involving factor analysis, to probe the internal structure (undimensionality) of the scales.

The researcher tested the reliability of each scale, using **Cronbach's Alpha.** Lee (1951) said Cronbach's Coefficient Alpha (α):

> ***" It is a general form of the K- R20 formula that can be used when items are not scored dichotomously, for example, some multiple-choice tests and easy tests include items that have several possible answers, each of which is given a different weight. In this case, Alpha is the appropriate method for computing reliability".***[52]

1- Students' Attitude Scale:

The researcher tested the reliability of the students' attitude by using Cronbach's Alpha procedure. As seen in Table (4.8) three items (10, 21 and 22) in the students' attitude scale were found have lower inter-item correlation

than other items in the scale. Alpha for the 23 items was 0.90 and the inter-item correlation was ranged between 0.19 and 0.75. (see Table 4.8).

Table 4. 8

Reliability Analysis of Students' Attitude Scale (N= 565).

No	The items	Item total Correlation	Alpha if Item deleted
1	I like studying science in English.	.72	.90
2	I would like to take all courses in English.	.65	.90
3	Most of my classmates enjoy studying science in English.	.75	.90
4	I would prefer to study science in Arabic.	.66	.90
5	Every student should study science in English.	.68	.90
6	Anyone who can study science in Arabic can study it in English.	.35	.90
7	Studying science in English is more interesting.	.67	.90
8	Studying science in English makes the subject too difficult to understand.	.51	.90
9	Studying science in English will be useful to me in the future.	.55	.90
10	Students who study science in English speaking countries are better than me.	.19	.91
11	I'm glad that science is taught in English.	.74	.90
12	I have confidence in my ability to study science in English.	.62	.90
13	I feel that thinking about science in English is too difficult for me.	.62	.90
14	Studying science in English takes longer to understand than studying it in Arabic.	.48	.90

Table (4.8) Continued:

No	The items	Item total Correlation	Alpha if Item deleted
15	I'm wasting my time studying science in English.	.61	.90
16	I enjoy thinking of different ways to say the same thing.	.43	.90
17	If I had the opportunity to change my major I would change it to social science.	.38	.90
18	I work hard studying science in English.	.47	.90
19	Studying science is more difficult for me in English.	.72	.90
20	Examinations in English are too difficult.	.63	.90
21	I need more time to do well in the science exam in English language.	.30	.91
22	I would do better if I took the exam in the Arabic language.	.26	.91
23	It is to easy to do the exam in science in English.	69	.90

According to Borg (1981) " correlations within this range (0.20 to 0.35) show only very slight relationship between variables, although they may be statistically significant. Whereas correlations at this level may have limited meaning in exploratory relationship". "With this range (0.35 to 0.65) correlations are useful and statistically significant beyond the 1 percent level".[53] The researcher took these points into consideration and omitted from the scale any items which had less correlation than 0.35. Consequently, items 10, 21 and 22 were deleted. Item 6 and 17, however, were retained, despite their low correlation, as it was considered important to reflect another aspect of attitude which was not covered by other items.

After omitting items 10, 21 and 22 from the students' attitude scale, Alpha was increased for the 20 item scale from 0.90 to 0.93 and inter-

correlation also increased for nine items, decreased for five items, and for six other items it remained the same. The *20-item scale was, therefore, more* homogenous and sufficiently reliable to measure the attitude towards learning science in English of students in SQU in Oman (see Table 4.9).

Table 4.9

Reliability Analysis of Students' Attitude Scale. (N=565).

No	The items	Item total Correlation	Alpha if Item deleted
1	I like studying science in English.	.75	.92
2	I would like to take all courses in English.	.67	.92
3	Most of my classmates enjoy studying science in English.	.78	.92
4	I would prefer to study science in Arabic.	.69	.92
5	Every student should study science in English.	.70	.92
6	Anyone who can study science in Arabic can study it in English.	.32	.93
7	Studying science in English is more interesting.	.70	.92
8	Studying science in English makes the subject too difficult to understand.	.51	.92
9	Studying science in English will be useful to me in the future.	.58	.92
10	I'm glad that science is taught in English.	.77	.92
11	I have confidence in my ability to study science in English.	.63	.92
12	I feel that thinking about science in English is too difficult for me.	.62	.92
13	Studying science in English takes longer to understand than studying it in Arabic.	.45	.93
14	I'm wasting my time studying science in English.	.63	.92
15	I enjoy thinking of different ways to say the same thing.	.43	.93

Table (4.9) Continued:

No	The items	Item total Correlation	Alpha if Item deleted
16	If I had the opportunity to change my major I would change it to social science.	.38	.93
17	I work hard studying science in English.	.44	93
18	Studying science is more difficult for me in English.	.72	.92
19	Examinations in English are too difficult.	.61	.92
20	It is easy to do the exam in science in English.	.65	.92

2- Students' Academic Self-concept Scale:

Alpha coefficient for the 53 items in the Academic Self-concept Scale was 0.84 and inter-item correlation ranged from 0.05 to 0.45. There were 27 items (3 ,6 , 11 , 12 . 13 , 14 , 16 , 20 , 21 , 23 , 25 , 26 , 29 , 31 , 35 , 38 ,39, 43, 44, 45, 46, 47, 49, 50, 51, 52, and 53) for which inter-correlations were lower than 0.4. (see Table 4.10).

Table 4.10

Reliability Analysis of Academic Self-concept Scale (N=565).

NO	The items	Item total Correlation	Alpha if Item Deleted
1	I feel I am as competent as my classmates.	.44	.84
2	I participate in class discussion.	.43	.83
3	I have difficulty with class assignments.	.13	.84
4	I have good study skills.	.35	.84
5	I can fulfil academic goals.	.40	.84
6	I feel some disadvantage in being out of school	.19	.84
7	I feel comfortable speaking in front of the class	.33	84
8	My research skills are adequate.	.42	.83
9	I make efficient use of time.	.33	.84
10	I express beliefs and opinions in class.	.50	.83
11	I feel intimidated by lecturers.	.25	.84
12	I feel comfortable seeking academic advice.	.29	.84

Table (4.10) Continued

NO	The items	Item total Correlation	Alpha if Item Deleted
13	My academic contribution is respected by my peers.	.23	.84
14	I feel comfortable in small group situations in class.	-.06	.84
15	I enjoy my classes.	.43	.84
16	My family supports my academic goals.	.24	.83
17	My writing skills in English are adequate.	.44	.83
18	I feel prepared for academic challenges.	.47	.83
19	My verbal skills in English are adequate.	.44	.83
20	I feel comfortable in a large class group.	.05	.84
21	I feel comfortable about raising an issue in class.	.21	.84
22	Students in class listen to what I say.	.41	.84
23	I enjoy expressing ideas to others.	.20	.84
24	I have the skill to write a good research paper in English.	.42	.83
25	I feel pressured by time constraints in class.	.31	.84
26	My classmates are smarter than I am.	.24	.84
27	I enjoy being called on to answer in class.	.40	.83
28	I understand what I read for class study.	.45	.83
29	My lecturers are fair.	.24	.84
30	I feel uneasy in class.	.40	.84
31	Most students know more than I do.	.31	.84
32	I enjoy learning new ideas.	.35	.84
33	I feel I am an important member of class.	.49	.83
34	I enjoy interacting with classmates.	.38	.84
35	I am able to set realistic goals.	.20	.83
36	I am confident I can master skills-competency.	.42	.84
37	I am not afraid to be evaluated.	.41	.84
38	I feel threatened by new ideas in class.	.29	.84
39	I get upset when criticised by lecturers.	.24	.84
40	I am afraid I might fail.	.36	.84
41	I can process required information quickly.	.43	.83
42	I can understand what I have to read.	.39	.84

Table (4.10) Continued

NO	The items	Item total Correlation	Alpha if Item Deleted
43	I can budget time efficiently.	.26	.84
44	I have a difficult time concentrating in class.	.31	.84
45	I am not afraid to ask where to find things.	.19	.83
46	I enjoy doing homework and assignments.	.32	.84
47	I like to be a discussion leader.	.23	.84
48	I learn new concepts easily.	.40	.84
49	I believe lecturers expect too much of me.	-.20	.83
50	I wish compulsory courses in the specialisation were more varied.	.20	.84
51	I only take classes because I have to.	.32	.84
52	I attend the lectures because I have to.	.31	.84
53	I wish the elective courses in the specialisation were more varied.	.14	.84

When the researcher removed these 27 items from the Students' Academic self-concept scale, Alpha coefficient for the remaining 26 items increased from 0.84 to 0.87, with inter-item correlations ranging between 0.30 to 0.51. The correlation for most items was increased and the scale appeared more homogenous and adequately reliable to measure students' academic self-concept in learning science in English in SQU in Oman (see Table 4.11).

Table 4.11

Reliability Analysis of Academic Self-concept Scale (N=565).

NO	The items	Item total Correlation	Alpha if Item Deleted
1	I feel I am as competent as my classmates.	.51	.86
2	I participate in class discussion.	.48	.87
3	I have good study skills.	.37	.87
4	I can fulfil academic goals.	.41	.87

Table (4.11) Continued:

NO	The items	Item total Correlation	Alpha if Item Deleted
5	I feel comfortable speaking in front of the class	.36	.87
6	My research skills are adequate.	.43	.87
7	I make efficient use of time.	.30	.87
8	I express beliefs and opinions in class.	.53	.86
9	I enjoy my classes.	.41	.87
10	My writing skills in English are adequate.	.51	.86
11	I feel prepared for academic challenges.	.50	.86
12	My verbal skills in English are adequate.	.50	.86
13	Students in class listen to what I say.	.39	.87
14	I have the skill to write a good research paper in English.	48	.87
15	I enjoy being called on to answer in class.	.38	.87
16	I understand what I read for class study.	.48	.87
17	I feel uneasy in class.	.33	.87
18	I enjoy learning new ideas.	.35	.87
19	I feel I am an important member of class.	.48	.87
20	I'm afraid I might fail.	.38	.87
21	I enjoy interacting with classmates.	.47	.87
22	I am confident I can master skills-competency.	.40	.87
23	I am not afraid to be evaluated.	.32	.87
24	I can process required information quickly.	.48	.87
25	I can understand what I have to read.	.45	.87
26	I learn new concepts easily.	.45	.87

Three items (7, 17 and 23) which had inter-item correlation lower than 0.35 were retained in the students' academic self-concept scale for the research purpose, as they measured different aspects of students' academic self-concept.

3- Students' Motivation Scale:

Alpha coefficient for the 24 items in the students' motivation scale was 0.70 and inter-item correlations ranged between 0.01 and 0.50. 13 items had inter-item correlations lower than 0.35 (1, 12, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23 and 24). (see Table 4. 12).

Table 4.12

Reliability Analysis of Motivation Scale (N= 565).

No	The items	Item total Correlation	Alpha if Item Deleted
1	I do more studying in science than most of my classmates.	.10	.70
2	I try to study science in English.	.38	.70
3	In science I just do enough study to get along.	.40	.68
4	When I do something in science I usually plan carefully.	.49	.68
5	When I start a new project in science, I usually do not finish it.	.44	.68
6	When I do well in science, it is because I study for it.	.37	.69
7	When I do well in science, it is because I'm lucky .	.48	.67
8	When I have a hard problem in science, I usually keep trying to solve it.	.50	.68
9	When I'm in university I can't wait until the day ends.	.36	.68
10	After I graduate, I will continue to study science in the same specialisation.	.38	.69
11	I am very careful that achieving success is the basic objective in any study I do.	.37	.69

Table (4.12) Continued:

No	The items	Item total Correlation	Alpha if Item Deleted
12	I feel getting "excellent" in the courses which I take is too easy for me.	.16	70
13	I am very careful to have realistic objectives.	.42	.68
14	I think I'm more successful than my classmates in what I'm assigned to do.	.11	.72
15	I prefer to be like my classmates more than being successful in my study.	.14	.70
16	I am afraid of failure more than I like to pass.	.30	.69
17	I participate effectively in the activities held in the university out of the study curricula	.10	.70
18	I am very interested in the classes that have students of varied levels of intelligence.	.19	.70
19	I think social acceptance is more important for me than personal success.	.12	.70
20	I like being among a group of students with a similar level of abilities to my own.	.03	.70
21	Fear of failure is the reason for my low performance in some courses.	.24	.69
22	I do not do any extra study beyond what the lecturer requires or determines.	.32	.69
23	I always volunteer to answer questions raised in the class.	.23	.69
24	I find myself reading the questions of the exam repeatedly before I begin to answer.	0.01	.71

The researcher removed 13 items which had correlations lower than (0.35). Alpha coefficient increased from 0.70 to 0.80 and inter-item correlations ranged from 0.29 to 0.61. Correlations for most items in the scale were increased, but for items 8 and 9 decreased. However, items 8, 9, and 10 were retained in the scale for research purposes, because the researcher felt that these items would measure different aspects of students' motivation.

After these changes, it is believed that the scale became more homogenous and reliable to measure students' motivation in learning science in English in SQU in Oman (see Table 4.13).

Table 4.13
Reliability Analysis of Students' Motivation Scale.(N=565).

No	The items	Item total Correlation	Alpha if Item Deleted
1	I try to study science in English.	.44	.78
2	In science I just do enough work to get along.	.51	.77
3	When I do something in science I usually plan carefully.	.61	.76
4	When I start a new project in science, I usually do not finish it.	.51	.77
5	When I do well in science, it is because I work for it.	.51	.77
6	When I do well in science, it is because I'm lucky .	.57	.76
7	When I have a hard problem in science, I usually keep trying to solve it.	.60	.77
8	When I'm in university I can't wait until the day ends.	.31	.80
9	After I graduate, I will continue to study science in the same specialisation.	.30	.80
10	I am very careful that achieving success is the basic objective in any job I do.	.29	.79
11	I am very careful to have realistic objectives.	.39	.79

As a result of the Cronbach's Alpha procedure for the reliability test, students' responses for 3 items from students' attitude, 27 items from students' academic self-concept and 13 items from students' motivation, were omitted from the scales when using the data to test the research hypotheses.

4.11 Statistical Analysis of Data:

All students' responses for each question were processed for data analysis using SPSS for Windows into the researcher's personal computer. The researcher tried as far as possible to avoid the use of unduly complex and sophisticated statistical methods in analysing the data, but because of the type of instruments used i.e, different kinds of questionnaires, the nature of instrument and nature of the hypotheses and main aims of study, the researcher used various statistical procedures and tools, as follows:

1- Pearson's Product-Moment Correlation:

This was used to test hypotheses 1, 2 and 3, regarding the relationship between the students' academic performance, on the one hand, and their academic self-concept, attitudes and motivation on the other.

Greene and Oliveira (1982) pointed out that "the Pearson test is designed to test whether high scores on one variable tend to be found with high scores on the other variable, low scores with low scores and so on. The test does not take into account the actual values of scores when calculating the amount of correlation between variables."[54]

The statistical value of ***r*** reflects the amount of correlation as a number between -1 (perfect negative correlation) through 0 (no correlation) to +1 (perfect positive correlation).

2- **The T. Test:**

This was used to test hypotheses 4-9 and 13-15, regarding the differences in means between male and female students, level of study (first and fourth year), and different colleges.

It is important to calculate the degree of freedom (df) i.e. number of subjects (N-1). If the observed value of t is larger than or equal to a critical value (in the statistical related Table) at the significance level of $p<0.05$. or $p<0.01$, the researcher can reject the null hypothesis at that particular level of significance and the value of t is subject to the degree of freedom (df).

3- One-way Analysis of Variance:

This statistical technique was used to test the null hypotheses 10, 11. and 12. Norusis (1993) stated that One Way Analysis of Variance "examines the variability of the observations within each group as well as the variability between the group mean."[55]

4- Regression Analysis:

Regression Analysis (Stepwise) was used to test the Model for the present study. The "Stepwise selection of independent variables is probably the most commonly used procedure in regression. It is really a combination of backward and forward section. If the variable fails to meet entry requirements, the procedure terminates with no independent variables in the equation. If it passes the criteria, the second variable is selected based on the highest partial correlation. If it passes the entry criteria, it also enters the equation."[56]

5- Partial Correlation:

The researcher also used Partial Correlation to test the Model of the present study. Borg and Gall (1989) stated that Partial correlation " is the technique used to describe the strength of relationship between two variables after the influence of one or more other variables on one or both of the variables has been removed."[57]

4.12 Summary of the Chapter:

In this chapter, the procedures adopted in the implementation of this empirical investigation have been described. A number of null hypotheses were proposed, regarding the possibility of relationships among these variables, and of differences in the relationships, to gender, colleges or year of study. The three questionnaires addressed to students, through which the proposed relationships were tested, were discussed in some detail, and evidence put forward as to their validity and reliability. Also explained, was the interview procedure by which additional information was obtained from lecturers. The outcome of this empirical work is presented in the next chapter.

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Chapter Five

Test of Hypotheses and Presentation of Data

5.1 Testing the Hypotheses:

The purpose of this study is to find out what relationships, if any, exist between factors such as the students' attitudes, academic self-concept and motivation (independent variables) and students' academic performance in learning science in English (dependent variable). The second objective is to see how these factors are mutually influential.

The research findings obtained in this study have been presented in two parts: the first part tests the hypotheses using data obtained from the students' questionnaires and achievement results. The second part describes all the information obtained from interviews with lecturers, and also, the open question directed to students.

This section of the chapter deals with those hypotheses testing possible relationships between the dependent and independent variables of this study, in order to build a base for the analysis and interpretation of data in chapter six.

It is important to explain at this stage that all testings of hypotheses in this study was conducted at 0.05 level of significance. The students t-distribution test (T- Test) has been interpreted on the Two-tailed test.

The results of the Pearson's Correlation testing of hypotheses 1, 2 and 3 are collectively presented in Table 5.1, as shown below.

Table 5.1

Pearson's Correlation Between Students' Attitudes, Academic self-concept and Motivation with Academic Performance

N = 565

Variable Combinations	Correlation Coefficient (r)
1- Attitude	0.22; $p < 0.05$
2- Academic self-concept	0.11; $p < 0.05$
3- Motivation	0.16; $p < 0.05$

Hypothesis 1 stated that:

There is no significant correlation between the academic performance of SQU students when learning science in English and their attitudes.

There is a low positive correlation (r = 0.22) between academic performance and attitude of the students and this correlation is statistically significant. The null hypothesis is therefore rejected. This means that among SQU students learning science in English language, there is an increase in academic performance as their attitude increases, although this increase is only slight.

Similarly, Hypothesis 2 stated that :

There is no significant correlation between the academic performance of SQU students when learning science in English language and their academic self-concept.

The results in Table 5.1 indicate that the correlation between the two variables of academic performance and academic self-concept is low

(r = 0.11), positive and statistically significant. These students do show an increase in academic self-concept as performance improves.

Finally, Hypothesis 3 makes the following assumption:

There is no significant correlation between the academic performance of SQU students when learning science in English and their motivation.

Again the correlation (r = 0.16) is positive and low and also statistically significant, showing that an increase in the students' motivation would possibly result in better academic performance.

The general results on the correlation between academic performance and the independent variables of students' attitude, academic self-concept and motivation show that SQU students learning science in English language are very likely to show better performances and higher GPAs if their attitudes, academic self-concept and motivation are increased or improved by their lecturers. Learning science in English will be more successful if attempts are made to increase these variables.

Hypothesis four:

This hypothesis states that:

There is no significant difference between male and female students in their attitudes when learning science in English.

The result of the testing of this hypothesis is presented in Table 5.2.

Table 5.2

Statistical Difference in the Attitudes of Male and Female Students

Group	Number	Mean	SD	df	T.value
Male	333	62.93	14.98	563	**1.72; p > 0.05**
Female	232	60.58	17.20		

With a t-value of 1.72 calculated for the difference between the mean scores of male and female SQU students' attitude on learning science through the medium of English language, the result shows that no statistical difference exists between their attitudes and therefore the null hypothesis is accepted. This result demonstrates that while the attitude of students generally does correlate positively with academic performance, there is no remarkable difference in this variable between male and female students.

Hypothesis five stated:

There is no significant difference between male and female students in their academic self-concept when learning science in English.

The result of this hypothesis testing is presented on Table 5.3

Table 5.3

Statistical Difference in the Academic self-concept of Male and Female Students

Group	Number	Mean	SD	df	T.value
Male	333	95.10	11.82	563	**5.75, p < 0.05**
Female	232	89.95	12.98		

Regarding the test on students' academic self-concept. Table 5.3 shows that the difference between the mean scores of the male and female students on academic self-concept in learning science in English is statistically significant. Therefore, the null hypothesis is rejected. The lower mean score recorded for female students indicates that female students tend to show lower academic self-concept in learning science in English than male students. There may be a reason for this result. It is possible that because female students regard science as more suitable for male students' careers, they, therefore see themselves as better off in the social sciences and humanities. In that case, it is the feeling that students have about the way science learning can help them achieve their future career plans, rather than the fact that English is being used as the medium of teaching science, that influences their academic self-concept.

Hypothesis Six:

There is no significant difference between male and female students in their motivation when learning science in English.

Table 5.4 contains the result of the testing of this hypothesis.

Table 5.4

Statistical Difference in the Motivation of Male and Female Students

Group	N.	Mean	SD	df	T.value
Male	333	44.17	6.49	563	**1.15; p > 0.05**
Female	232	43.54	6.23		

The result shows that there is no significant difference in the motivation of male and female SQU students in learning science in English

This result shows that students of both sexes are almost evenly motivated when learning science through a foreign language -(English). Therefore the null hypothesis is accepted.

Earlier in Chapter four, it was stated that Hypotheses 7, 8 and 9 have been tested using One-way Analysis of Variance.

Hypothesis Seven:

There is no significant difference among students of different colleges in attitudes, when learning science in English.

The result of this hypothesis testing is explained in Table 5.5

Table 5.5

Statistical Difference in the Attitude of Students of Different Colleges.

	df	sum of squares	mean squares	F. ratio
Between Groups	4	15918.29	3979.56	**17.45; p < 0.05**
Within Groups	560	1277717.3	228.07	
Total	564	1436635.3		

From the data presented on Table 5.5, it is clear that the difference in the attitudes of SQU students from the different colleges towards the learning of science, is statistically significant given the high calculated F-value of 17.45. Consequently the null hypothesis has been rejected.

It is naturally useful to say which colleges are responsible for these differences in attitudes. To be able to do this, Scheffe's test has been carried out to shed light on these differences among colleges in students' attitudes towards learning science in English. The results of this test are presented in Table 5.6.

Table 5.6

Scheffe's Test for Difference in the Attitudes of Male and Female Students by Colleges

colleges	N	Mean	college 1	college 2	college 3	college 4	college 5
1- Education	141	53.64					
2- Medicine	118	67.05	*				
3- Engineering	133	64.29	*				
4- Agriculture	69	59.35					
5- Science	104	66.19	*			*	

* Indicates significant difference.

Scheffe's test showed significant differences among colleges, in students' attitudes towards learning science in English (see Table 5.6). It can be seen that students of the College of Education had the lowest mean (53.64), and students of the College of Medicine had the highest mean (67.05) in their attitudes. This significant difference between the means indicates that the students of education have less positive attitudes in learning science in English, while students of the College of Medicine have more positive attitudes, than students of other colleges, in learning science in English.

Table 5.6 also indicates that a significant difference exists between the College of Education and Colleges of Medicine, Engineering and Science in students' attitudes towards learning science in English, and that students of the College of Education show a less positive attitude compared with those of other colleges based on their mean scores. A significant difference was also found between the College of Agriculture and College of Science in that students of the College of Agriculture had a less positive attitude towards learning science in English, compared with science students.

The researcher investigated whether any difference existed among male students of different colleges. The results indicate significant differences among male students of different colleges, in their attitude in learning science through English. Therefore the null hypothesis has been rejected (see Table 5.7).

Table 5.7

Statistical Difference in the Attitudes of **Male** students by Colleges.

	df	sum of squares	mean squares	F. ratio
Between Groups	4	4850.20	1212.55	**5.71; p < 0.05**
Within Groups	328	69690.06	212.47	
Total	332	74540.27		

Scheffe's test was used to clarify the significant difference for male students' attitude among colleges. and revealed a significant difference between students of the College of Education and those of the Colleges of Medicine, Engineering and Science. This significant difference shows that male students at the College of Education tend to show less positive attitudes towards learning science in English than students of the colleges mentioned. However, there is no significant difference between male students of the College of Education and those of the College of Agriculture in their attitude towards learning Science in English (see Table 5.8).

Table 5.8

Scheffe' Test for Differences in **Male** Students' Attitudes by Colleges.

colleges	N	Mean	college e 1	college e 2	college 3	college 4	college 5
1- Education	23	51.43					
2- Medicine	63	67.03	*				
3- Engineering	133	64.29	*				
4- Agriculture	59	60.10					
5- Science	55	62.67	*				

* Indicates significant difference

One way Analysis of Variance F-ratio (16.39) indicates a statistically significant difference among female students of different colleges in their attitude towards learning science in English language. The statistical result would lead to rejecting the null hypothesis (see Table 5.9).

Table 5.9

Statistical Difference in the Attitudes of **Female** Students by Colleges.

	df	sum of squares	mean squares	F. ratio
Between Groups	3	121226.38	4042.13	**16.39; p< 0.05**
Within Groups	228	56216.07	246.56	
Total	231	68342.44		

Scheffe's test was used to clarify the significant difference among colleges in female attitudes towards learning science through English. Table 5.10 shows there is a significant difference between female students of the College of Education and those of the Colleges of Science and Medicine. Also, there is no significant difference between female students of the College of Education and those of the College of Agriculture in their attitude towards learning science in English (see Table 5.10).

Table 5.10

Scheffe' Test for Differences in **Female** Students' Attitudes by Colleges.

colleges	N	Mean	college 1	college 2	college 3	college 4	college 5
1- Education	118	54.06					
2- Medicine	55	67.07	*				
3- Engineering	----	------					
4- Agriculture	10	54.90					
5- Science	49	70.14	*				

* Indicates significant difference

Hypothesis Eight:

There is no significant difference among students of different colleges in academic self-concept when learning science in English.

The result of the testing of this hypothesis, shown in Table 5.11, indicates that the difference in academic self-concept is statistically significant. This means that students of different colleges have different levels of academic self-concept with regard to learning science in English.

Table 5.11

Statistical Difference in the Academic Self-concept of Students of Difference Colleges.

	df	sum of squares	mean squares	F- atio
Between Groups	4	5845.85	1461.46	**9.69; p< 0.05**
Within Groups	560	84439.30	150.78	
Total	564	90285.15		

Scheffe's test was used to clarify the extent of this significant difference in students' academic self-concept among colleges. There is a

significant difference between the College of Education and those of Engineering and Science in students' academic self-concept. The results indicate that the students of the College of Education had the lowest mean (88.78) in their academic self-concept, while the highest mean was found among students of the science college (97.96). This result shows that students of the Education college have a lower academic self-concept towards learning science in English, compared with students of the Science college. (see Table 5.12).

Table 5.12

Scheffe' Test for the Differences in Students' Academic Self-concept by Colleges.

colleges	N	Mean	college 1	college 2	college 3	college 4	college 5
1- Education	141	88.78					
2- Medicine	118	92.68					
3- Engineering	133	94.14	*				
4- Agriculture	69	95.50					
5- Science	104	97.96	*				

(*) Indicates significant differences.

When data were treated separately, the value of F.ratio for academic self-concept of male students was 3.35. The results reveal a significant difference in academic self-concept for male students among the colleges (see Table 5.13).

Table 5.13

Statistical Difference in the Academic self-concept of Male Students by Colleges.

	df	sum of squares	mean squares	F. ratio
Between Groups	4	1818.22	454.55	**3.35; p < 0.05**
Within Groups	328	44564.78	135.87	
Total	332	46382.10		

Table 5.14 shows there is a significant difference in male students' academic self-concept between the College of Education and College of Science. This indication means that male students of the Science college tend to show higher academic self-concept, than male students of the College of Education. The same table shows no significant difference between other colleges regarding male students' academic self-concept.

Table 5.14

Scheffe's Test for Differences in Male students' Academic Self-concept by Colleges.

colleges	N	Mean	college 1	college 2	college 3	college 4	college 5
1- Education	23	89.26					
2- Medicine	63	95.97					
3- Engineering	133	95.50					
4- Agriculture	59	96.34					
5- Science	55	99.65	*				

* Indicates significant difference.

The result of ***F.*** ratio (6.02) for female students' academic self-concept among colleges indicated a significant difference (see Table 5.15).

Table 5.15

Statistical Difference in the Academic Self-concept of Female Students by Colleges.

	df	sum of squares	mean squares	F- ratio
Between Groups	3	2856.74	952.25	**6.02; p <0.05**
Within Groups	228	36042.61	158.08	
Total	231	38899.38		

Scheffe's test was used to clarify the significant differences among female students of different colleges. As seen in Table 5.16, the results indicate a significant difference between College of Science students and students of College of Agriculture in academic self-concept. Also, there is a significant difference between the students of the College of Education and College of Science. Moreover, there is a significant difference between College of Medicine and College of Science students.

Table 5.16

Scheffe's Test for Differences in Female Students' Academic Self-concept by Colleges.

colleges	N	Mean	college 1	college 2	college 3	college 4	college 5
1- Education	118	88.69					
2- Medicine	55	88.80					
3- Engineering	-----	- ----					
4- Agriculture	10	81.20					
5- Science	49	96.06	*	*		*	

* Indicates significant difference

Hypothesis Nine:

There is no significant difference among students of different colleges in motivation, when learning science in English.

The test of hypothesis nine revealed no significant difference in motivation among students of different colleges towards learning science in English. One-way Analysis of Variance shows that the ***F.*** value (.53) is not statistically significant (see Table 5.17).

Table 5.17

Statistical Difference in the Motivation of Students by Colleges.

	df	sum of squares	mean squares	F- ratio
Between Groups	4	86.84	21.71	**0.53; p > 0.05**
Within Groups	560	22914.38	40.92	
Total	564	23001.21		

So, the null hypothesis is accepted. There is no significant difference among colleges in students' motivation towards learning science in English.

The researcher investigated whether any difference existed among education students and science students in their motivation.

Table 5.18

Statistical Difference in the Motivation of Education and Science students

Group	Number	Mean	SD	df	T-value
Education	141	43.57	6.26	563	**0.73; p >0.05**
Science	424	44.02	6.43		

Table 5.18 indicates that the t-test value (0.73; p>0.05) shows that the difference in the mean between education students and science students is not statistically significant. This means that the two groups have the same degree of motivation in learning science in English.

Hypothesis Ten:

There is no significant difference between first year students and fourth year students in attitudes when learning science in English.

It is useful to examine the difference in attitude, academic self-concept and motivation of first year students and fourth year students. This is because fourth year students have passed through the long process of science learning in English at these colleges as against the first year students who are newly enrolled at the colleges. With the fourth year students focused on career after college life, the result should be interesting.

T. test technique was again used to test the last group of hypotheses, 10, 11 and 12. The ***T.*** value of students' attitudes (5.00) is statistically significant, and there is a significant difference between students' attitudes according to their different stages, i.e. first and fourth year. So the null hypothesis has been rejected (see Table 5.19).

Table 5.19
Statistical Difference in the Attitudes of First Year and Fourth Year Students.

Group	N	Mean	SD	df	T-value
First year	343	59.32	14.71	563	**5.00; p <0.05**
Fourth year	222	66.05	16.96		

From Table 5.19 it can be seen that the fourth year students had a higher attitude mean (66.05) than that of first year students (59.32). The significant difference between the mean scores of the first and fourth year students indicates that the fourth year students had more positive attitudes towards learning science in English than first year students.

Hypothesis Eleven:

There is no significant difference between first year students and fourth year students in academic self-concept when learning science in English.

The results of testing hypothesis eleven indicated that the ***T.*** value (3.00) of the students' academic self-concept statistically indicates existence of a significant difference in academic self-concept between the first year and fourth year students towards learning science in English language. Therefore the Null hypothesis has been rejected (see Table 5.20).

Table 5.20

Statistical Difference in the Academic Self-concept of First Year and Fourth Year Students

Group	N	Mean	SD	df	T-value
First year	343	92.24	12.62	565	**3.00; p < 0.05**
Fourth year	222	95.48	12.47		

Table 5.20 also shows that the fourth year students had a higher mean (95.48) in their academic self-concept than the first year students, with mean

(92.24). This difference in the level of the mean indicates that the fourth year students had a slightly higher academic self-concept than the first year students, towards learning science in English.

Hypothesis Twelve:

There is no significant difference between first year students and fourth year students in motivation when learning science in English.

In testing this last hypothesis, the *T*-value of students' motivation (3.07) was statistically significant, indicating that a difference existed between first and fourth year students (see Table 5.21).

Table 5.21

Statistical Difference in the Motivation of First Year and Fourth year Students.

Group	N	Mean	SD	df	T-value
First year	343	44.57	6.21	563	**3.07; p < 0.05**
Fourth year	222	42.89	6.54		

The results in Table (5.21) also show that the null hypothesis has to be rejected. In general, fourth year students had a slightly lower motivation than those in the first year, according to level of mean, which was 44.57 for the first year and 42.89 for the fourth year students.

From the above presentation of the results of the testing of the hypotheses of this study, it is now clear that only three of twelve hypotheses between the targeted dependent and independent variables were statistically not significant. All of the rest were significant. The relationships which were

found not to be significant in the testing of the hypotheses were four, six and nine (see Table 5.22).

Table 5.22

Summary of Results of Tests of Hypotheses.

Hypothesis	Technique used	The results	
		r value	sig or no sig
1	Pearson's correlation	r.0.22	s
2	Pearson's correlation	r. 0.11	s
3	Pearson's correlation	r. 0.16	s
4	T. Test.	t. 1.72	n
5	T. Test.	t. 5.75	s
6	T. Test.	t. 1.15	n
7	One way analysis	f. 17.45	s
8	One way analysis.	f. 9.69	s
9	One way analysis.	f. .53	n
10	T.Test.	t. .5.00	s
11	T. Test.	t. 3.00	s
12	T.Test.	t. 3.07	s

S= significant at level 0.05.

N = not significant at level 0.05.

Part Two:

The Interview and the Open Question

5.2. The Interview:

The second part of this research project involved the interviewing of a special group of 39 experienced lecturers who were encouraged by the researcher to be frank with him, as it was believed that ultimately, they would benefit from this study. The interview schedules were standardized to cover defined areas such as second language acquisition, students' performance,

understanding of English, and students' problems in learning through second language. In addition to these above areas which were covered by the interview schedule, open questions inviting comment were also posed to the interviewees.

1- Students' command of English:

20 lecturers (51%) in their answers to question one, on students' performance, (students' command of English) rated it "Poor" (see Table 5.23). They gave several reasons for this, such as insufficient teaching of English in the early stages of education, poor standard of English teaching in high school, insufficient teaching of English at the secondary stage, and poor command of teaching English among first year students; none of the lecturers took the blame for this, nor did they blame the teaching methods used.

20 (51%) of the interviewees among the teaching staff sample pointed out the students' shyness and reluctance to ask questions during the lecture could be blamed. It was reported that students could not express themselves well in English and found reading and writing English difficult. This extended even to final year students, who seem to understood simplified English only. This limited understanding was said to inhibit note-taking, and also leads to time-consuming repetition of certain points that students did not understand. Sometimes, a whole lecture had to be repeated. Most English words had to be explained, using the limited vocabulary understood by students (see Table 5.23).

Table 5.23

Interviewed lecturers' opinions

No of Q	The question	Good	Poor	Satisfactory	No idea	No answer
1	How do you rate the students' command of English as a learning medium?.....	1= 2.7% 6	20= 51% 51.3	17=43.5%	non	1= 2.7% 6
2	How do you rate the students' understanding of the science lectures which are taught in English.?....	5= 12.8%	7= 17.9%	27=69.2%	non	non
3	How do you rate the students' performance in science examinations?....	7= 17.9%	8= 20.5%	18= 46.2%	5= 12.8%	non
No of Q	**The question**	**Yes**	**No**	**to some extent**	**No idea**	**No answer**
5	In your opinion, would performance improve if students took science course in their own language (Arabic rather than English)?.....	14= 35.9%	12= 30.8%	8= 20.5%	5= 12.8%	
6	As a lecturer, are you aware of problems faced by the students due to the use of English rather Arabic in their science lectures?.....	26= 66.6%	10= 26.3%	non	non	3= 7.6%
7	Would the students' performance be improved if extensive training in English was provided before starting courses in English?	33= 84.6%	4= 10.2%	2= 5.1%	non	non
9	Do you think most of the science lecturers in your college are aware of students'problems relating to difficulties in English as a medium of teaching?.....	29= 74.4%	6= 15.4%	non	4= 10.2%	non

However, 17 (43.5%) of the group said they thought the standard of the students' English was "satisfactory", though it differed from college to college and from year to year. Most of the lecturers agreed that the standard of English in the College of Science was higher than in non-science colleges, especially Education. Only one (2.7%) of the group interviewed said the students' standard of English was "good". Finally one (2.7%) gave no answer at all.

2- Students' understanding:

With regard to students' understanding of science in English, seven (17.9%) of the sample classified the students' understanding as poor. These respondents made many statements in support of their claims. They said "students do not need a high level of competence in English to understand the language of the lecturers". Some pointed out that inadequate command of English led to problems in understanding the books and references used at the university, and sometimes students failed to understand the meaning of the examination questions, which prevented them from doing justice to their scientific understanding.

At the other extreme, five (12.8%) of the sample rated students' understanding as good. They argued that the students, especially those in their final years (i.e. the third and fourth) in medical and science colleges were not as bad as the respondents in the first group suggested. They said, for example, that in general, the students understood the lectures, but some do have problems with scientific and technological terminology; however they soon overcome this and get used to the teaching in English language. Some said they didn't believe poor performance was due to the medium of instruction,

though there were those who suggested that inaccurate communication could be attributed to thinking in two languages at the same time.

However, the majority of respondents 27 (69.2%) fell between these two extremes, claiming that students had a "satisfactory" level of understanding of English lectures on science. However, 50% of the last group explained that they rated the students' understanding as satisfactory, simply because they could not determine what constituted good or bad levels, due to the differences between groups of students, from year to year, and college to college. In general, it was suggested that students from some (not all) science colleges had a better standard of English than those from the educational and agricultural colleges.

3- Students' performance:

18 (46.2%) of the respondents rated the students' academic performances as "satisfactory", though in answering the second part of the question, asking for the criteria on which they judged students' performance, nearly 50% of the above group said they had no clear reason with which to defend their decision. The rest said it was very difficult for them to give logical answers, as it was dependent on the subject matter, course level, and method of teaching; moreover, as in any university, there are some good results, some satisfactory, and some poor.

Respondents suggested that students' performance would improve when they moved up to higher classes. Four (10.2%) said they believed most students can write understandable answers in short sentences. Others observed that students can pick up the techniques for solving mathematical problems, even though their command of English is weak. Three (7.6%)

respondents argued that when satisfactory motivation is present in a subject, students' performance improves.

However, eight (20.5%) of the respondents rated students' performance no better than "poor", and made a strong case for their decision. Some reported that "students often misinterpret questions" and complained that they rely on memorizing lecture notes. According to this group, the low standard of performance of the students can be attributed to their poor background in science subjects and logic, poor comprehension of exam questions, and inability to express themselves well in written English.

Most of the respondents rated students' performance as " good", "poor" or "satisfactory" on the basis of their performance in exams. Others used other criteria such as essay writing and project work. However, some respondents argued that it is difficult to measure students' performance this way, because of the many influencing factors. It would seem that those lecturers who gave a clear decision concerning performance in answering questions one and two, seven (17.9%) also did the same for this question.

It is worth mentioning here that most of the lecturers were non - Omani, and were keen to appear thoughtful and alert in their responses, as they fear their jobs may be threatened if the education system changes.

4- Reasons for lower performances:

In order that a list could be compiled of the reasons why the performance of the students was lower than expected, the researcher asked his colleagues on the teaching staff what they believed to be the reasons for this. The main reasons given were a poor understanding of English, and the

problem of the change in the language of the institution when translated from Arabic into English.

A further reading of their comments enabled the researcher to infer some other reasons that reduced the students' academic performance. Many of the respondents argued that the fault was not in the English itself, but in the tendency to rely on memorizing rather than understanding. Overloaded timetables, lack of motivation, lack of responsibility or dedication, inhibition about asking questions, not asking for help, defective background in science, students' own interests in a specific area, lack of discipline (especially among male students), and poor study habits were also to blame. Some students were doing more work than they were capable of tackling. Some were not studying their preferred specialization. Some observations noted too much emphasis on class-room work and not enough utilization of libraries in the whole learning process. It was also asserted that free education and low entry requirements in science colleges, combine to allow too many students of limited ability to enrol in the university.

5- Improvement of students' performance:

The fifth question put to the teaching staff was whether the students could improve if they were taught in their own language. 35.9% of respondents gave a firm "yes" to this while 30.8% thought it would make no difference at all. Eight (20.5%) said yes, to some extent and five (12.8%) did not answer the question at all. The 14 (35.9%) who said "yes" defended their answer by saying that the students would learn and digest the information more quickly, and understand the subject more precisely. Also it would remove the barrier of working in a foreign language. Students would

understand and communicate far better. The 12 respondents (30.8%) who strongly rejected this idea argued that it all centred around what is meant by "performance". In the short term, the students would improve because of being taught in their native language. But since English is the international language of science - most publications of new work are written in this language -a scientist with poor English is at a very great disadvantage.

This same group also pointed out how important a background in science was; and often, students were less able to express themselves scientifically in their own language than in English. Other problems, such as students "burning the midnight oil" before exams and trying to memorise as much as they can, have nothing to do with language, but are common student problems generally.

It was also pointed out that many students at the university do degrees in a language other than their own. Some respondents said that at present, science is taught mainly in English and it would take decades to perfect Arabic teaching of science. Even Arabic professors of science , it would appear, teach better in English than in Arabic. This underscores the importance of English as the language of science.

However, this group did seem to recognise that the language issue is a problem, as they recommended that a preliminary orientation year, dedicated to developing English ability, could be very useful as a sound foundation for future study. Midway between the above two groups, were some eight (20.5%) respondents who commented that students' performance would improve "to some extent" if the students were taught in their native language rather than English. In general, it could be said that the feeling of this last

group was that students did not face excessive difficulty in understanding their lectures in English language (particularly in the post foundation years), and that there are advantages in studying in English, as the students are thus motivated. Unfortunately, five (12.8%) of the sample said they had no idea what answer could be given to the question.

6- Problems and Difficulties:

The researcher asked his colleagues: ***Are you aware of any problems faced by the students due to the use of English rather than Arabic in their science lectures?*** 26 (66.6%) of respondents agreed there were problems. As in responses to earlier questions, real and tangible problems facing students and influencing their performance were highlighted. Respondents in this group pointed out problems related to:

1- learning in a second language (English);

2- teaching methods used by lecturers;

3- teaching staff;

4- teaching aids and materials.

More specifically, they reiterated the comments about reluctance of students to ask questions, difficulty in expressing themselves, difficulties in reading and interpretation of text books; extra time needed to become accustomed to the accent of lecturers and unsuitable teaching methods. Ten (26.3%) said they were not aware of any particular problems faced by students due to the use of English. The majority (90%) of this last group did not give any reason for this ignorance which may be due to the broad and general nature of the question itself. Three (7.6%) respondents did not answer this question at all.

7- More Training in English:

Thirty-three (84.6%) of the sampled lecturers agreed with the proposal of the researcher that intensive English training courses could be provided prior to starting science courses in English. They thought that these courses could be very useful. The high percentage of respondents holding this view seems to suggest that even those who had previously rated understanding as satisfactory did, in fact, recognise problems exist in the use of English. However, few comments were made by respondents to justify their opinions and even those who welcomed the project differed in their points of view. Some favoured linkage and co-ordination with lecturers who teach English at the university in order to achieve intensive and comprehensive language. Others said schooling at the secondary stage needed to be improved as part of the preparation for university education.

Four (10.2%) disagreed with the proposal altogether. Some of them stated that, "our impression is that science students already have the basic skills in English which we believe are quite adequate". Nevertheless, some also said, "better understanding of English would be an additional advantage".

The two (5.1%) who were not sure about this question or said "to some extent" reported that "good" training in English could also be given, along with some elementary science courses and in that way, students would have a chance to relate their knowledge in both areas (English and science). It would be less monotonous also.

8- The Form Of Training:

Regarding the form of the English training needed for science learning, the most important suggestions of the respondents were as follows:

1- One year English course, preferably with exams.

2- Intensive training in the first semester of the first year of the university course.

3- Improving the level of the English programme at the secondary school stage.

With regard to the first two of the above suggestions, it was suggested that those who failed in the final exam should be required to take an additional course, possibly during the summer session. Many respondents added: "Only students passing the intensive course should be allowed to commence the science course". Some said: "the minimum level to commence science courses should be TOEFL, particularly for the Medicine and Engineering colleges".

Regarding the required approach to implementation of these different proposals, responses varied, but the majority appeared to be most concerned about the skills of reading and writing, especially writing reports. Many others said "the course should be more academic than simply to learn language". However, others took a completely opposite view, saying English should be taught as a language, not as a parent scientific English. 10 (26.3%) of respondents recommended emphasis on reading and communications skills, and accurate pronunciation. Qualified teachers to teach English, more lab work, more equipment, text-books, dictionaries and other important materials and teaching aids were recommended for these suggested courses. It follows

that the other four lecturers (10.2%) who had rejected the proposal of any kind of specific English course, in answer to question 7, did not give any comments on this question.

9- Awareness Of The Lecturers:

Another question regarding the problems arising from the use of English as a medium of learning was, "***Are most lecturers aware of students' problems in this specific area?***"

29 respondents (74.4%) of the sample, said yes, again confirming that students of SQU face difficulties in English. Some of them stated "Lecturers are aware but have probably got complacent over the years". They added "but awareness does not solve the problem". Some Arab lecturers themselves would have preferred to use Arabic to communicate with students.

Six (15.4%) of respondents said lecturers are not aware of problems and four (10.2%) said "No idea". However many of them were new to the teaching staff and might not yet have had the opportunity and experience to recognise language-related difficulties which students might be facing.

10- Further Comments:

With regard to this issue, the researcher requested his colleagues in the teaching staff to give further comments, if necessary, in order to enrich this study. The outcome of such comments is reported below.

An intensive English programme would certainly help, especially in the first and second year of university courses. The performance of students could be improved if they were given enough encouragement and motivation, in terms of real life applications of the subject. Students should be encouraged to study independently, to complement class-room instruction, and should be advised

on study techniques. Students should be made aware that, although Arabic is important in their training, English is the number one medium of exchange of technical information and most widely used; therefore, a certain minimum standard of English should be determined as one of the criteria for admission. Students cannot be expected to do well when learning science in a second language for which they have not received adequate training.

Eight (20%) admitted lecturers should be encouraged to set exams in which the major components are essay questions, rather than multiple choice questions, short answers, and true or false. Students should be encouraged to write term papers on the courses that they are taking. They should be required to reach a higher level in TOEFL- type exams, before being allowed to proceed. Students not reaching a satisfactory level should be channelled into Arabic medium subjects or asked to repeat the English instruction until they attain the required level.

Regarding secondary school as a preparatory stage, it was suggested that there is a need for teachers with qualifications to teach English. It would help the students if they used English more in school and if they learned scientific words in English as well. That would help them greatly when coming to university and studying in English. Intensive efforts should be made from primary school to get students to appreciate the virtues of regular study, and more emphasis should be placed on understanding, rather than mere rote learning. Otherwise, it will make little difference whether science is taught in Arabic or in a second language. For corrective measures to be effective, they should be applied earlier on, in school.

Regarding the pre-university stage, many respondents argued that the main reason for the low standard of English and low achievement in science colleges could be that all students, more or less, are passed. More rigorous standards and a complete reorganisation of English teaching are necessary.

Other respondents suggested that research is needed to ascertain **Why** standards are declining; **How** serious is the effect of not allocating students to their preferred field of study; and **Why** students can fail the English course but receive "good" grades in the science course during the same year.

5.3 Section Two: The Open Question (Students):

It was mentioned in Chapter Four that the researcher gave the opportunity to the students sampled to comment further by answering the open question, which was allocated at the end of the third scale of the main questionnaires. This question was ***"What problems do you think students face in studying science in English language?".***

The students gave their opinions and comments on the question asked which exposed some of the difficulties they encounter in studying science in English language.

The researcher classified their complaints and comments into three main topic areas: problems, criticism and suggestions as shown in Table 5.24. However, many students said to the researcher, "We want to solve the problems quickly". Others said "We are too shy to request the teaching staff to repeat the lecture". With regard to most of the non-science colleges, the belief was that "no advantage exists in teaching in English". It was argued that students "will not need English, either in their daily life or work.

1- Problems and difficulties:

The most important problem, according to 221 (39.1%) of students sampled was the difficulty in understanding technical expressions and terms. Also some 114 (20.1%) of them found difficulties in understanding examination questions in English, which affected their achievement. Half of this last group felt that the time allowed for examinations was too short. They said, "We need more time to translate most of the words and terms before we start answering the questions".

The third most frequent problem, as expressed by 99 (17.5%) of respondents, was difficulty in the pronunciation of English in general. 61 (10.8%) students reported an inability to explain and discuss matters with lecturers in the second language and 24 (4.2%) students felt shy. It is worth mentioning here that 76 (13.4%) admitted that they wished to learn science in their native language because of their loyalty to their own language.

It was suggested that most lecturers 53 (9.3%) failed to convince students of the value of English language as a teaching medium. This could be because of the teachers' diverse accents, or because of the teaching methods which they used.

Added to the above problems were a very heavy work load in the time-table, and difficulties in the examination system. According to 92 (16.3%) of the students, learning science in English is a waste of time (see Table 5.24).

2- Criticisms:

The open question gave a good opportunity for students to expand on the reasons for problems. Nearly 40% of students complained of the secondary education stage, claiming that the poor standard of students in English language is due to the low standard at this stage. However, 68 (12.0%) respondents said that "the policy of the university still depends on the average marks achieved in the final exam of the secondary school stage". This criterion is still the only one for the admission of new students into university. 45 (7.9%) stated that the administration of the university did not give any help to its students to solve the problems that face them, such as that of the second language. 15 (2.6) respondents claimed that difficulty is created by the existence of students of different abilities, which results in an unsuitable learning environment for both levels.

Regarding the traditional teaching methods, 53 students (9.4%) confirmed that the curriculum encouraged students to memorise rather than understand, in order to pass exams (see Table 5.24).

3- Suggestions:

In this open question, students were very generous with their answers, and tried their best to help. They gave many suggestions which may help the researcher in understanding thoroughly the students' attitudes and the more critical problems they face. 83 (14.6%) of the students expressed the belief that the students' performance would be improved by learning in their native language, while 76 (13.4%) preferred the use of English to teach science, but only in the College of Medicine, not in the College of Education.

68 (12.0%) suggested the use of the English language to teach science at the secondary stage, in order to alleviate the problem at the university stage. Furthermore, a group of 53 (9.4%) suggested English should be taught from the first year of primary school. So, "It is necessary to requalify teachers who teach English in all stages of Education", 38 (6.7%) said. However, in opposition, 28 (9.4%) respondents reported there is no need at all to use English in their daily life. It seems there is a degree of similarity between the lecturers' suggestions and those of students, particularly those relating to the procedure which should be used for students' admission in to the university. 22 (4.0%) students said: an examination and interview for students who finished their first year in university (orientation year) should be set up in order to test their ability in using English. Then, it would be decided whether they could continue in the university or choose a more suitable channel for themselves.

Another 22 (4.0%) students suggested that the best place to take an English language course is at the language centre, rather than those that are held by the university. 22 (4.0%) students suggested the necessity of doing a comparative study to find out if there are any differences in the standard of English between students from different backgrounds, i.e. from the public and private education sectors in the country. Another suggestion was for more comparative studies between the performance of the groups of students, one learning science in Arabic language and one learning in English (see Table 5.24).

Table 5.24

Students' Responses to the Open Question

No	Students' comments and suggestions	Num	%
	First: problems facing students:		
1	Difficulty in understanding technical terms	221	39.1
2	Difficulty in understanding exam questions	114	20.1
3	Difficulty in pronunciation.	99	17.5
4	Lecturers' accents	113	20.0
5	More time needed to understand.	92	16.3
6	Loyalty to first language.	76	13.4
7	Inability to explain and comment.	61	10.8
8	The lecturers fail to attract students (make English easy).	53	9.3
9	Over loaded time-table in science.	53	9.3
10	Limited time for exams.	52	9.2
11	The lecturers are teaching outside their specialisation.	30	5.3
12	New ecology environment.	25	4.4
13	Shy to ask and discuss matter with teaching staff (in English)	24	4.2
14	Lack of qualified lecturers to teach science.	23	4.1
15	Scarcity in references and resources.	23	4.1
	Second: Criticism:		
1	Poor background of students.	221	39.1
2	Learning in English is a waste of time.	145	25.6
3	The criteria for accepting students in the university.	68	12.0
4	A programme of memorising rather than understanding.	53	9.4
5	Not enough concern given to solving students' problems	45	7.9
6	Students with different standards in the same group.	15	2.6

Table 5.24 Continued:

	Third: Suggestions:		
1	Teaching in native language would improve the students' performance.....	83	14.6
2	Teaching science in English is suitable only for specific colleges.....	76	13.4
3	Science should be taught in English in the secondary school stage.....	68	12.0
4	No need for in English in daily life.....	53	9.4
5	Necessity of requalifying teachers in all stages of education to teach English.....	38	6.7
6	More comparative studies on the differences in academic performance between students who learn science in different languages	38	6.7
7	Orientation year to learn English.....	30	5.4
8	English is the science language, also the language of the future.....	29	5.1
9	Start to teach English in the first year of primary school.....	28	4.9
10	More comparative studies on the relationship between those who come from private and public schools, relating to their performance.	22	4.0
11	Exam and interview should be held at the end of first year of university	22	4.0
12	The English course should be under the supervision of the Language Centre.....	22	4.0

Summary of the Chapter:

In this chapter the findings of the empirical study have been presented and subjected to a variety of statistical analysis techniques, in order to test the hypotheses presented earlier.

The correlations examined proved to be significant, with only three exceptions. In other words, attitudes, academic self-concept and motivation were all found to be significantly related to academic performance. Significant differences in attitude, self-concept and motivation were found between first and fourth year students; there was a significant difference in academic self-concept between male and female students, in favour of the former; and there were significant differences in attitude and academic self-concept between students of different colleges.

The chapter also presented the outcomes of interviews with college lecturers, and the open question addressed to students. These confirmed students' difficulties in understanding and using English. Various reasons were suggested to account for the level, and the perception by some students that English is a waste of time, as it is not relevant to their anticipated future needs. A variety of suggestions were put forward by both staff and students, as to how to improve the situation.

The implications of these findings, for the proposed model will be explained in more detail in chapter seven, where the findings will also be viewed in the context of previous findings in the field.

Part Three

Model for the Study

5.4 Introduction:

In past decades, a wide body of research has investigated the relationship between learning through a second language and students' attitudes, motivation and academic self-concept as part of the general trend to ascertain the effect of language learning and psychological factors on students' achievement in school.

Research findings have shown a persistent and positive relationship between academic self-concept, attitudes, and motivation of students learning science through a non- native language (English) and their academic performance. Positive attitudes, motivation and academic self-concept are related to success in learning through a second language, while negative self-concept, attitude and motivation are related to failure. Mayer and Greenwood (1986) indicated that language of study, as in the case of learning in a non-native language, is an important causal factor affecting the academic performance of students.[1]

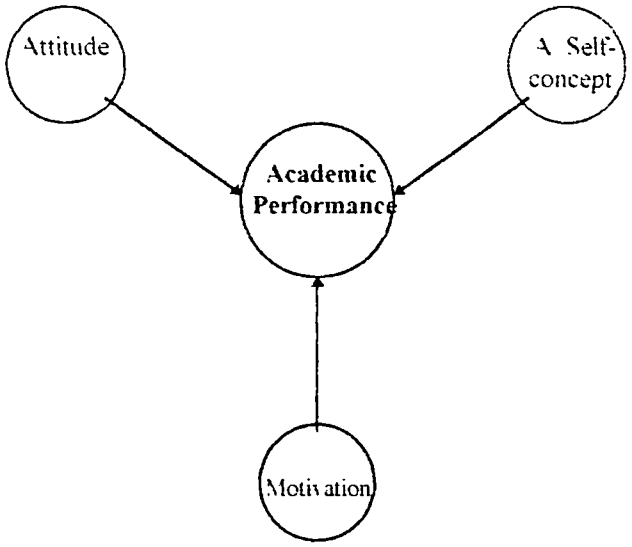
Laine (1978) reported that achievers are more motivated and have more positive attitudes toward language learning, while under-achievers lack motivation and have negative attitudes to language and themselves.[2] Burns (1982) has related language to achievement. This is not a one-way relationship, it is more of a reciprocal nature. There is continuous interaction between academic performance and academic self-concept, attitudes and motivation in learning science through a second language, where each of these variables directly influences the other. The basic argument is that

opinion of self plays a major role in how students succeed in their performance in school, and that their scholastic performance has a great impact on their conception of the self, attitudes and motivation towards the target language.[3]

To satisfy the general aim of this study, which set out to investigate the relationship between academic self-concept, attitudes, motivation of Omani students learning science through English and their academic performance, a model is needed to clarify the predicted nature of the relationship, between the different variables covered by the study, to guide selection of variables for testing and to check their relevance, to verify the empirical results achieved, and to answer the questions raised. More specifically, the proposed model, within the framework of the empirical results, will try to seek an answer to the basic question raised by the researcher: What is the relationship between academic performance and other variables such as attitudes and motivation, and academic self-concept?

This study is based on a number of assumptions which have been outlined in the statement of hypotheses. The framework of the proposed model of this study as shown in Fig. 5.1 is derived from these assumptions, that there are interactions between the attitudes, academic self-concepts and motivation of SQU students who are learning science in English, and that these variables can be influenced positively or negatively in relation to their effects on academic performance. Therefore, learning science through a second language can either increase or decrease students' attitudes, academic self-concept and motivation, which in turn affects academic performance.

FIG 5.1 Model Proposed for the Study:



The degree to which each of these variables influences each other, and academic achievement, can provide some useful information if available data can be analysed using partial correlation and regression analysis. Therefore, the relationship between the variables of attitude, academic self-concept and motivation has been shown in Fig 5.1 to revolve around, and contribute to, academic performance. This framework will be used to verify the results of the analyses of the different hypotheses. Furthermore, the empirical results themselves will be used to test the structure of the model and the relationship between the variables in this study. The process of comparison, verification and testing will lead to the support or modification of the proposed model.

References:

1- Mayer, W. Greenwood, P. (1986), Foreign Language Learning differences: Affective Language Aptitude Defferences. The Modern Language Journal, 75 (I): 3-16.

2- Laine, E. (1978), Foreign Language Learning Motivation. Finland: Tudk University Press.

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CHAPTER SIX

Discussion of Results and Testing of the Model

6.1 Introduction:

Having tested the hypotheses of the study and presented the data obtained from interviews with lecturers and the open question to students in the preceding chapter, this chapter further analyses and discusses the findings and compares them with those of previous studies relating to academic performance, attitudes, self-concept and motivation. The second purpose of this chapter is to test the model which was proposed for this study. Accordingly, this chapter is divided into two main parts: Part one discusses the interpretation of the data, and the second part is devoted to a final test of the model of this study.

Part: One.

6.2 Discussion of Results on Students' Attitude:

A number of interesting results have been obtained from the testing of four different hypotheses on matters relating to SQU students' attitudes towards learning science in English. Each result has been stated clearly and possible interpretations given in the discussions that follow in this chapter.

1- This study has found that there is a low positive correlation between the academic performance of students measured in GPA, and their attitude towards learning science in English, and that this correlation is statistically significant. A positive correlation between these two variables indicates that as students' attitudes towards science learning in English increase, there is a greater possibility that their academic performance will improve. What this means is that for the academic performance of the different groups of students in SQU in science courses learned through English to show

considerable improvement, their attitude must be positively enhanced. This finding has attracted a lot of previous reports in the literature.

Schibeci (1985) reports that most investigations of relationship have produced small positive correlations between students' attitudes and science achievement.[1] The range of correlation reported was from 0.07 to 0.45 which reflects appropriately the correlation value of o.22 calculated in this study for attitudes of students at SQU (page 167). Similarly, Simpson and Wasik (1978) found a positive high correlation (r = 0.84) between attitudes and academic achievement of United States students.[2]

In another study, Howe and Durr (1982) showed that attitude interactions in chemistry laboratories increased students' understanding of abstract concepts.[3] This finding is quite useful as it explains the role of classroom laboratory communication in relation to students' attitudes and science learning. In the case of SQU students' attitudes, interactions in the classroom or laboratory will be dependent on how the language (English) has been properly applied to bring about academic performance.

One study which found no direct relationship between students' attitudes and their academic performance in science and mathematics is that carried out by Keeves (1975), which claims that attitudes towards science were strongly influenced by friends who participated in mathematics and science activities. Keeves concluded that the attitudes of the group with which a student spends his or her leisure time would be expected to influence personal attitudes towards science and mathematics.[4] This finding means that one way of approaching the issue of creating positive attitudes among Omani students learning science through English would be to explore ways of introducing attitude group promotion activities in a relaxed and informal or outside the classroom environment. Thus group attitudes created

would help individual students develop a better attitude towards English-based science learning, and ensure improved academic performance.

2- The second result on students' attitudes made in this study indicates that there is no significant difference between the attitudes of male SQU students and their female counterparts on attitudes in learning science through English language (page 169). One would expect that female students and their way of thinking in relation to science learning through English would have shown a remarkable difference. But this study has proved the opposite. If the opinion expressed by Keeves (1975)[5] on the influence of peer group on attitudes were to apply, male and female students would show different attitudes, especially as female students generally tend to prefer courses in social sciences and the humanities. The reality is that female students who enrol in science colleges tend to share common behaviour, thinking and feelings with their male counterparts.

The result on attitudes of male and female Omani students on science learning in English means that any measures taken to improve the attitude of students must be the same for both male and female students. It also means that attitude problems of students do not depend on the sex of the learner. There are, therefore, common attitude problems affecting both male and female students in SQU, and their lecturers should address them as a common matter, rather than a sex- related issue. Finally, male as well as female students will do better in their academic performance if attitudes are positively improved. This finding differs from the one made by Marjoribanks (1976) that academic ability and attitudes differ between boys and girls and would depend on cognitive ability. His study dealt with college students who were younger and more likely to go through rapid attitude changes.[6]

Another study by Simpson and Oliver, (1985) who investigated the students' attitudes towards science learning and achievement found that male students showed more significant positive attitudes than female students.[7] This is contrary to the findings made in this study. It might be that culture of people could influence attitudinal patterns. In Western societies, due to the influence of the environment both within and outside the school, students' attitudes towards science learning are affected. The situation is different in an Islamic Arabic society. While influence in Western societies may affect boys and girls, male and female students differently because of strong peer group influences, the situation has been shown in this study to be different in Oman possibly because of adult independent behaviour, and less peer- group effects on male and female students.

On the difference between the attitudes of male and female students, this study has found that no statistical difference exists between them and their attitudes in learning science in English. One would have expected that female students, who traditionally tend to go for courses in the humanities and social sciences, would show an attitude decline in learning science, especially through a foreign language. However, the female student population at the college level reflects individuals of outstanding science ability. Therefore, they are not expected to be inferior or less capable than male students.

The issue of learning science in the English language is therefore not a matter of sex. Students' attitudes cannot be seen from the point of view of gender. Rather, it is a common issue for both male and female students. But the results in this study have also shown that female and male students in some colleges have more positive attitudes than others in other colleges.

These possible factors have been identified: the fact that students in the science colleges, whether male or female, more pressing need of English knowledge, not only in learning science, but also in their work after completion of their courses; the university admission policy on English language requirement for students; and the manner in which science teaching is conducted for the different groups of students. These issues are been discussed more fully in the next section of data analysis.

3- The next finding made on students' attitudes concerns the differences among colleges as they relate to students' attitudes towards learning science in English. The result shows that the attitude differences among colleges was statistically significant (page 171-172). Further, analysis of this hypothesis shows that students of the college of Medicine tend to show more positive attitude than students of the other colleges, and that students of the college of Education had least positive attitude indications when compared with students of the other colleges. There are a number of possible reasons for this result.

First, students of colleges whose main course programmes focus on science learning through English such as medicine, have a greater tendency to show a relatively positive attitude. The positive attitude found in the College of Medicine can be explained from the point of view that students who are accepted into the college, are immediately acknowledged as people of outstanding academic ability. It is not likely that high intelligence often associated with medical students has much to do with this trend. Again, acceptance into the College of Medicine usually gives the students a guaranteed promising future in two respects: first the assurance of a good career, and second as a consequence of high social status.

On the other hand, the students of the College of Education, who showed relatively least positive attitude, believe that being taught science in English will not be very helpful to them when securing a teaching position after leaving university this is because they will be required to teach after graduation in Arabic and not in English, since all the textbooks and materials they will use in the public schools are written in Arabic. The fear that learning in English for four years may adversely affect their thinking in Arabic, especially with regard to specialised concepts and terms, is a main obstacle to developing a positive attitude.

Moreover, the students of the College of Education are made to take science courses in the College of Science, which has a different curriculum and teaching style, science lecturers show greater commitment to teaching purely science subject matter, which does not represent what education students want. It would appear to these students that the lecturers have not really taken their needs into account, but prefer to teach all the students in the same manner, instead of teaching education students the courses relevant to their career interests. Such as a course would be a special science programme for teachers. It can be argued that the feeling of resentment caused by lack of special attention to the science needs of education students may by responsible for their less positive attitude to learning science in English. Since the students of the College of Education have lower entry qualifications, and are less proficient in English, they are bound to have the least positive attitude in learning in English.

It can therefore be concluded that a major influence on students' attitude towards having to learn their subject in English, is the way they perceive its relevance to their future career in terms of job aspirations and satisfaction. For those who require English to function efficiently in their

post- qualification career, their attitude towards learning science in English tends to be positive. Burstall (1973) agrees that students develop negative attitudes towards learning in a foreign language (in this case English), if they feel it does not satisfy their practical needs.[8]

The feeling of inadequacy can also create attitude problems towards learning in a foreign language as Jakobovits (1972) pointed out that if a student feels that he or she does not have the ability to learn in a foreign language, the language behaviour could possibly affect his or her feelings.[9] So, the university admission policy relating to the English language requirement for education students, which contributes to the feeling of inadequacy in terms of the English language need of all university students, may have contributed to the less positive attitude of Education College students.

In the final analysis, the attitude of those students who will need to function in the world of work in the English language tends to be more positive than that of those students who will not be using English in their everyday work-life such as school teachers. They are having to complete their university studies in English as a matter of university arrangement, and not because it is necessary for their career.

4- Finally, this study investigated the difference in the attitudes of first year and fourth year students in learning science in English. The gap between the two groups in relation to the amount of science learning through the medium of English, is the main reason for their selection. It is assumed that having just been admitted into the colleges, the first year students, as opposed to the final year students, would show attitude differences. The difference in their attitudes have been found to be statistically significant, with the fourth year students having greater positive attitude than the first years (page 180). This

result is not a surprise as the feelings and behaviour of the fourth year students over the years they have been exposed to learning science in English, would contribute to their positive attitude.

First year students are still influenced by strong Arabic influences from society, and less concerned with the importance of English in science learning, and so are less positively affected in their attitude. It is therefore correct to assume that as students are exposed to learning science in English, whatever their discipline may be, they are likely to develop more positive attitudes to learning science in English. The fourth year students' attitudes and personalities are likely to have changed as the result of attending university academic programmes generally over the period of four years.

It must, however, be said that because it is quite difficult to say in clear terms which factors actually account for the changes in the attitudes, the interpretations given in some cases amount to suggestions rather than conclusive evidence or facts. As Handly and Morse (1984) noted when they studied the relationship between achievement in science, attitudes, self-concept and gender role perception, the relation between attitude and those factors could be attributed to a whole range of other factors not identified.[10]

In using descriptive statistics (percentages and frequencies) in order to understand more thoroughly the students' attitudes in answering the 20 items of the attitude scale, the researcher decided to place the students' answers "agree" and "strongly agree" together as one percentage score, and similarly with "disagree" and "strongly disagree". Thus, two broad categories of agreement and disagreement were created.

The researcher found that 60.9% of the sample reported their willingness to learn these science subjects in Arabic (see statement 4, page 320). On the other hand, 63.4% of the sample reported their willingness to

learn the subjects in English (statement 1, page 320). It would seem that those 63.4% do not mind learning in English, but if they were given a choice, many might prefer to learn in Arabic, because they would understand better. The overlapping between these two groups' responses, can be explained because to an Arabic reader, the meaning of statement No. 1 is completely different from that of statement No. 4. "I like" means "I wish and " I hope", but the statement " I would prefer" means "I give priority to". So 63.4 % of the sample like learning science through English, but 60.9 % would have preferred to learn science in their own language (Arabic), if given the chance to do so. This fact is still true despite the similarity in percentages between the two responses. (see Appendix 6.1, page 320)

Only 32.6% really wished to learn all their subjects in English, which supports the researcher's point of view (statement 2, page 320).
66.9% pointed out that studying science in English makes the subjects difficult to understand (statement 8, page 320). This also supports the researcher's point of view. It may be worth mentioning, that the accuracy of the students' answers depended on their understanding the question given to them, and in some cases the researcher could not see any plausible explanation for some answers, other than indifference, carelessness or inaccuracy due to lack of time!

6.3 Discussion of Results on Students' Academic Self-concepts:

It is very possible that a student success or failure in learning in English, which can be attributed to his or her fluency or adequacy in English as a foreign language through which science learning takes place, can affect the self-esteem or self-regard or self-perception, all of which add up to his or her self-concept. Several results have been obtained in this study of Omani students' academic self-concepts in learning science in English.

1- The result of the hypothesis on the relationship between the students' academic performance and academic self-concept in learning in English, reveals a significant positive correlation between the two variables. The interpretation is that success measured in terms of GPA among the students for learning science in English, would give rise to more positive self-concept (page 167).

This finding is consistent with the findings made by Marsh, Smith, Barnes and Butler (1983), which argue that self-concept has a multiple structure; consequently one should expect a stronger relationship between academic performance and academic self-concept, rather than between academic performance and any other forms of self-concept such as social, general, and physical self-concept.[11]

When a student shows a positive self-image in learning in a foreign language (English), that student's ability to achieve success in a particular subject area (science) is enhanced. A negative self-concept would result in failure or low academic performance. The implication for effective science learning in English is that lecturers would have to introduce measures in their teaching methods to raise the self-concept of the students, not in science learning, but in the use of English as a medium of learning science.

2- On the statistical testing of the difference between the academic self-concept of male and female students in relation to learning in English, this study has obtained the result of substantial differences between the two groups. From the mean scores of the two groups on this variable, it can be seen that male students tend to show greater academic self-concept than their female counterparts (page 169). Such a trend can be said to relate to the ways both groups of students see the need for them to learn in English in relation to its career implication after graduation. With more men likely to

end up in the industrial and medical professions than women: and most of the female students likely to be teachers using Arabic as their career language. self-concept. and in fact all the other variables of attitude and motivation, are almost certain to differ among the sexes.

A number of studies have come up with different interesting results on the ways self-concepts differ among male and female students. Simon and Primavera (1972) have observed that a significant relationship exists between academic performance and self-concept for female students. but not for male students.[12] In another study. Marsh (1984) found that gender produced no difference in pre-adolescents' grades two and five in mathematics and self-concept, but in school grades seven and eight. a significant difference appeared in favour of boys.[13] In reality. the self-concept of students at secondary education stage prior to entry to the university. can be a major contributory factor in their self-concept at the university. Depending on whether they attended gender segregated schools or mixed- sex schools; and whether the schools had a good English language learning programme or not. self-concept among male and female students will be affected by these factors.

A number of studies such as those conducted by Bledsoen (1964);[14] Hansford and Hattie (1982);[15] Skaalvik (1983);[16] Campbell(1966);[17] Wylie (1979);[18] Goff and Futterman (1982);[19] Chapman and Boersma (1988);[20] Brookover, Paterson and Thomas (1962);[21] Stevenson and Newman (1986),[22] and Meece et al. (1982)[23] , have reached different conclusions on the effect of self-concept on the achievement of students. While most of these studies represent secondary education students' circumstances in societies where English is not a foreign language. the findings made in this study are notable in the sense that the relationship between academic self-

concept and academic performance (GPA) for adult university students (male and female) learning science in English, as a foreign language has been found to be statistically significant.

How can this disparity in self-concept between male and female students be explained? It may be that the university environment which is new, different and sometimes strange, has more effect on female students than males, particularly since, in Oman, the colleges and university seem to favour male applications more than female. University life is still a relatively new area for females to enter.

Another reason for this gender difference in academic self-concept could be cultural modelling of gender role identities, produced by socialization. The cultural context of Oman gives more freedom to males, allowing them to pursue the activity of their choice, and building up their confidence. This freedom does not exist for women, for after the university day, they mainly stay indoors. This has a negative effect upon their self-concept; at the same time, it gives them more opportunity for study, which may explain the higher GPA of female students.

It is also possible that there is a closer bond between the teaching staff (i.e. the lecturers) and the male students, rather than with female students. This situation may be due to the conservative nature of the culture, customs and habits. This results in the male students receiving more positive feedback and encouragement from the teaching staff, and greater freedom to debate and argue, which can enhance their academic self-concept and also their academic performance.

Feedback from others is of the utmost importance and an essential element and source of data concerning self (Mead, 1934;[24] Cooley, 1902)[25].

Thus, the social environment of the individual is of great importance to the individual's self-concept

3- The statistical differences in the academic self-concepts of students across the different colleges were found to be significant, with students in some colleges showing more positive academic self-concept than others in other colleges (page 175-176). Closely related to this finding are the results made in related studies by Lay and Wakstain (1985),[26] Simpson and Oliver (1988),[27] and Brookover (1962).[28] on the relationship between academic self-concepts and achievement of students whose educational backgrounds are different.

The differences in the academic self-concepts of students in the College of Science and College of Education, were found to be particularly significant. One explanation for this result is the perceived importance of English language to future career, as well as the general impression held in the university that students who study science as their main discipline, are "superior" to education students.

Many students who are low achievers, entered university straight from secondary school, and were allocated places in the different colleges according to the marks they received in secondary school. Students with high secondary school performance gain places in the more prestigious science and medicine colleges, while lower -scoring students end up in the College of Education. Thus, Education College students may be of a lower academic standard compared with those in Medicine and Science Colleges, and this may be reflected in their self-concept.

Students of the education college complained more than students of other colleges about the use of English language in learning science. It seems

that learning in English is more of a problem to College of Education students, which increases their fear of failure and of losing face in society.

Another set of factors may be differences among colleges in the ability and experience of lecturers, teaching methods, lecturers' accents and the nature of lecturers' relationships with the students. Students in the College of Education were found to be more inclined to believe that they do not need English, either in their daily life or in the future, which may affect their self-concept. Some factors which are outside the scope of this research, and can therefore not be tested or discussed, such as socio- economic status and class-room environment, may have had an influence on the students' self-concept.

As has been explained previously, the students' English language competence level before joining their colleges, and their background fluency in English in general across the colleges, may be another reason for their differences in academic self-concepts in English.

4- Finally the result of the hypothesis testing on the difference in the academic self-concepts of first year students and fourth year students shows that this is significant (page 181). Again, this can be explained by the fact that the first year students have just been exposed to learning science in a foreign language, and they are largely influenced by whatever competence levels in English they have brought with them to the university from their former schools. For the fourth years, long exposure to learning in English at university level, would have contributed to better understanding of learning science in English. Therefore, the fourth year students may have adapted to learning science in English, and they perceive English language problems and obstacles to learning in English with greater optimism than the first years.

It was found through the frequency and percentage of the students' responses related to the level of importance of each statement- which were computed, and recorded for all subjects - that the fourth year students had more confidence in themselves, and gave more positive answers. 26 statements forming the whole scale of Academic Self-concept were answered "undecided" by the sample students. On average 22.1% of fourth year students answered with "undecided" for the 26 items, compared with 31.6% of the first year students (see Appendix 6.1, page 323-326). This would seem to suggest that fourth year students were less hesitant in giving their opinions, due to an increase of confidence in themselves, and possibly increase in the level of academic self-concept. Also, the difference in response could be explained in terms of the uncertainty of the first year students, who had not yet adapted to their new environment at the university.

The decline of the GPA from level 2.45 among first year students to level of 2.38 among fourth year students, could be explained by the nature of the subject of specialization which gets progressively harder, along with the higher grades. It may be because no change occurs in the teaching through the medium of a foreign language. The weekly load may also have been a contributory factor.

In general, the researcher has found a lower correlation between self-concept and academic performance than that found in other studies carried out in Arab countries. The discrepancy between the findings of the present study and others in the Arab countries may be due to certain factors. The two studies previously carried out in Arab societies were undertaken in different countries and were also different in other respects. The study by Abdul Raheim, (1980)[29] was carried out in Egypt and dealt with the many dimensions of general self-concept, looking at physical self, moral self, self-

satisfaction and so on, whereas this study dealt with academic self-concept exclusively. The above-mentioned study dealt with the relationship between general self-concept and academic performance in the field of Arabic language and Islamic studies. This study has investigated the relationship between attitude, motivation and academic self-concept and academic performance in learning science through English, which presents more difficulty than Arabic language and Islamic studies, which are taught in the native language.

However, Abdul Raheim's study yielded results according to two levels of probability 0.01 and 0.05. The study came close to this study in its finding of 0.05 probability. It is worth mentioning here that the correlation of Abdul Raheim's study results from his university sample come closer to those of this study, than do his correlations from the secondary and primary school samples.

Similar reasons can be used to explain the difference between the present study's findings and that of the second study, that by Baashmaus and Manesey (1986)[30] which was also carried out in an Arab country (Saudi Arabia) which was closer to the society of the present study. Both studies dealt with academic subjects other than learning science in English which is the focus of this study, which may go some way to account for the different findings.

6.4 Discussion of Results on Students' Motivation:

Some of the hypotheses tested in this study centred on the relationships between students' motivation and academic performance in learning science in English. The results have been presented in chapter five. In this section, those results are be discussed.

1- The correlation between students' academic performance and their motivation in learning science through English, was found to be low, positive and statistically significant (page 167). In effect, an improvement in the motivation of students in learning in a foreign language (English) would result in a correspondingly better academic performance (GPA). This finding is supported by the study conducted by Kremer and Wallerg (1981) who found a significant positive correlation between academic performance and motivation.[31] They suggested that the predictive relation of students' motivation in learning and achievement is independent of subject area or content. Their finding differs from the finding made in this study in the sense that " learning in English" as opposed to " learning", is the object of this study.

The correlation in Kremer and Wallerg's study (r = 0.37) is higher than the degree of correlation found in this study (r = 0.16). The difference in correctional values between the two studies can be attributed to the difference in the language of instruction between the two groups of subjects: native language in a Western society as against foreign language (English) in an Arabic setting. Age difference between the two groups could also have affected the results, as well as the perceived need for English in the future career of the Omani students. Similar findings made by Payne (1992) support the result that motivation positively affects achievement in verbal and mathematical tests.[32] The difference in the language of instruction and learning (in this case English) makes to the motivation of students cannot be seen in isolation from the influence of other variables such as attitude and Academic self-concept previously discussed.

2- Another result obtained in this study on students' motivation and learning in English demonstrates that between male and female students, levels of

motivation does not differ significantly (page 170). It is interesting to note that whereas the attitudes and academic self-concept of the male and female students differed substantially, motivation did not differ significantly.

It is difficult to say why the result on motivation does not reflect the pattern of results between the male and female students in the two other variables- attitudes and academic self-concept. A possible explanation could be that the learning of science in English involves a situation where the interests of the two groups would have to be stimulated differently to create major differences in their motivation. In practice, lecturers use the same teaching styles for both sexes during the learning of science in English, and so little difference in motivation is likely to occur.

Again, the way gender groups support and encourage each other in learning science in English may be so similar in the case of Omani students, that neither the male nor the female students appear to have outstanding level of motivation in learning through English. If the level of difficulties they encounter in the classroom in terms of their English language competence, and their inclinations to Arabic language, does not sufficiently affect their interest to learn in English, then it is unlikely that their levels of motivation would show any significant difference.

It is useful to state that Simpson and Oliver (1985) found in their studies that female students were significantly more highly motivated to achieve in science (not necessarily by learning science in a foreign language- English) than their male counterparts.[33] In a related study, Husen and Liljefors (1974) reported that female students were more highly motivated than male students.[34] These studies have findings which do not support the findings made in this study, and the reasons may lie with the age differences between the sample groups used in the studies. Likewise, the fact

that learning in English is the main focus of this study but was not the object of the other studies. In addition, the style of science teaching in different circumstances, can influence students' levels of motivation.

3- As in the case of male and female students, the statistical difference between the motivation of students from the different colleges learning science in English, was found not be significant (page 179). This means that one could not say that students in a particular college were better motivated than the other groups of students in the other colleges. Again, the reasons may be related to the arguments presented in the case of motivation between male and female students.

If students' motivation can be influenced, one factor that can do that is their perceived need of English in their postgraduation career. One would have expected that students in the Science Colleges who would need English at work, would be more motivated significantly than education students who would be teaching in Arabic. Further analysis carried out between the Science groups and the Education group between these colleges showed there was not a significant difference again (0.73; $p > 0.05$) as indicated on Table (5.18, page 179).

In the final analysis, when the motivation of students is high in learning in English, their attitudes and academic self-concepts ought to be high as well, as Gardner and Lambert (1972) reported that a relationship among external attitude, motivation and second language behaviour exists.[35]

This view is shared by Deci (1975).[36] But in this study, the evidence available shows that positive attitudes and favourable academic perceptions of one's self-image (self-concept) in learning science in English, which are likely to influence academic performance positively, do not necessarily

appear to be so across the various disciplines in science to which the students are attached.

4- The difference in motivation of first year students and fourth year students learning science in English was found to be statistically significant. This means, the first year are slightly more motivated than the fourth year, as demonstrated by the differences in their mean scores (see Table 5.21, page 182). This result shows a slightly different pattern within the differences in the attitudes and academic self-concept of two groups. Here, they show greater motivation, as against less attitudes, and less positive academic self-concept in previous analysis (see Table 5.19, page 180 and Table 5.20, page 181).

The excitement of becoming part of the university elite community might encourage first year students to show greater interest in their studies, not necessarily in science classes particularly, and this in turn would result in greater motivation. Again, exposure to the compulsory requirement of having to learn science in English, which until they joined the university was not required may account for this unusual show of motivation. Whatever the reason may be, the fact that first year students are unlikely to be relating science learning in English to their post- graduation need for English (because they still have a long way to go compared to the career- focused fourth years), would mean that the excitement, interests or motivation they show in learning through English may be unusual or untypical.

Part Two

6.5 Testing the Research Model:

The model proposed for this study was tested by "partial correlation analysis", which was used to investigate the relationship between students' academic self-concept, attitudes and motivation, and to determine to what extent these independent variables affected students' academic performance (dependent variable) when one or more of the independent variables was controlled.

For example; the first order of partial correlation controlled "motivation" as an independent variable. Then, the researcher tested the effect of the other two variables together (students' academic self-concept and attitude towards learning science in English) on their academic performance. The result was then compared with the effect of all three independent variables on students' performance. From this, it was possible to determine the effect of the controlled variable i.e. the effect of motivation.

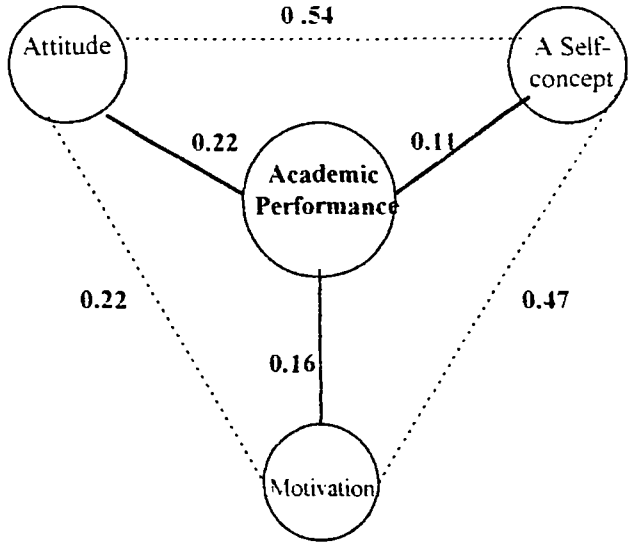
To obtain an accurate view of the relationships between the effect of the independent variables, the following partial correlations have been discussed:

1- A comparison of the extent of the effect of students' academic self-concept and attitude on their academic performance **before** and **after** controlling the motivation variable. This comparison will represent the "independent effect" of motivation.

2- A comparison of the extent of the effect of students' academic self-concept and motivation on their academic performance **before** and **after** controlling the attitude variable. This comparison will indicate the "independent effect" of attitude.

3- A comparison of the extent of the effect of students' attitudes and motivation on their academic performance **before** and **after** controlling the academic self-concept variable. This comparison will confirm the "independent effect" of self-concept. (see Figure 6.1).

FIG 6.1 below shows the correlation between dependent and independent variables (before controlling).



So, if academic self-concept, attitudes and motivation are "relatively" independent in their effect on academic performance. then this will be demonstrated by the result of multiple regression analysis. The method adopted here is controlling the mediating variables, attitudes academic self-concept, and motivation. If the correlation is not significantly reduced after controlling one variable, it is held to show a direct effect of the uncontrolled variables. A correlation in which substantial reduction occurs will indicate a relation with another variable; in this case, academic performance.

The results indicated that the correlation between academic performance and academic self-concept before motivation was controlled was $r = 0.11$. After controlling motivation. the correlation fell from 0.11 to 0.04, showing it is non-significant, since the value of 0.04 is just above zero.

Regarding the correlation between academic performance and attitude before controlling motivation, the value of *r.* was 0.22, which is a significant correlation; but after controlling the motivation variable, the correlation went down to 0.19, but this is still statistically significant as shown in Table 6.1.

Table 6.1

Correlations after controlling motivation

Variables	A. Self-Concept	Attitude
Academic Performance	.04	0.19*
Attitude	0.51*	

* level of significance = 0.05

Concerning the correlation between academic performance and attitudes, before controlling academic self-concept, the value of *r* was 0.22 (a significant correlation), but after academic self-concept was controlled, the value of correlation dropped slightly to 0.19. The correlation between academic performance and motivation before controlling academic self-concept was $r = 0.16$, and after controlling self-concept, the correlation again dropped, this time to 0.13 as demonstrated in Table 6.2.

Table 6.2

Correlations after controlling self-concept

Variables	Attitude	Motivation
Academic Performance	0.19*	0.13
Motivation	-0.05	

* level of significance = 0.05.

The correlation between academic performance and academic self-concept before controlling attitude was $r = 0.11$, thus indicating a significant correlation. However, on controlling attitude, the correlation dropped to -

0.01, which is just about zero correlation. Finally, the correlation between academic performance and motivation before controlling attitude was 0.16, but after, the value of *r* dropped to only 0.12 as shown in Table 6.3.

Table 6.3

Correlations after controlling attitude

Variables	A. Self-Concept	Motivation
Academic Performance	-0.01	0.12
Motivation	0.43	

* level of significance = 0.05.

The accumulative Table 6.4 shows the correlations between academic performance and the independent variables (attitude, academic self-concept and motivation) before and after controlling each of these independent variables.

Table 6.4

A Cumulative table of the correlations before & after controlling the independent and dependent variables

Variables	Correlation before controlling	Controlled variables	Correlation after controlled	Final Results (r)
A. performance A. self-concept	r = 0. 11	Motivation	r = 0.04	reduction 0.07
A. performance Attitude	r = 0. 22	Motivation	r = 0.19	reduction 0.03
A. performance Attitude	r = 0.22	Self-concept	r = 0.19	reduction 0.03
A. performance Motivation	r = 0.16	Self-concept	r = 0.13	reduction 0.03
A. performance A. self-concept	r = 0.11	Attitude	r = -0.01	reduction 0.10
A.performance Motivation	r = 0.16	Attitude	r = 0.12	reduction 0.04

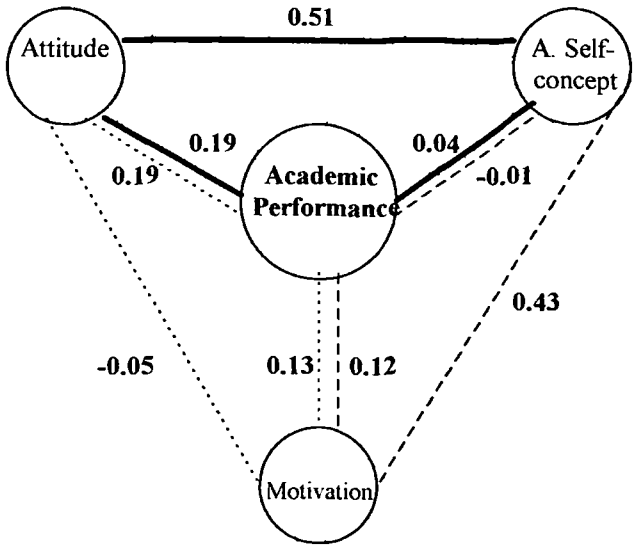
Regarding the results in the above cumulative table. 6.4. the following points can be made:

1- The degree of the effect of controlling the variable of motivation was strong, causing a substantial reduction in the correlation between students' academic performance and their academic self-concept. This reduction was higher than that which accrued for the correlation between students' academic performance and their attitudes. In the first case, the value of *r* went down from 0.11 to 0.04 (a difference of 0.07). Again, the value of *r* in the second case did go down, but only by 0.03.

2- Controlling the self-concept variable had a significant impact on the correlation between students' performance and their attitudes. The controlling of self-concept caused a reduction of the correlation between these two variables. It seems the regression in the correlation between students' performance and motivation was the same, i.e. a difference of 0.03 (see Table 6.4).

3- The correlation between students' performance and self-concept after controlling the attitude variable was significant. This control caused the reduction of this correlation from $r = 0.11$ to $r = -0.01$, a difference of 0.10. This last result indicates the highest level of regression among all correlations tested in this study. The regression in the correlation between academic performance and motivation was reduced after controlling attitudes, from 0.16 to 0.12, a difference of 0.04. (see Figure 6.2).

FIG 6.2: below shows the correlation between dependent and independent variables (after controlling).



Controlling Motivation
Controlling A.Self-concept
Controlling Attitude

The results of this study indicate that controlling any one of the selected independent variables, generally caused reduction, of varying degrees, in the relationships between the students' academic performance and the other independent variables. However, the difference in the value of r was 0.10 after controlling the attitude variable, which is the highest regression compared with others. This indicates the impact of attitude as an independent variable. It plays an important role in influencing the correlations between the other variables, having the greatest effect of all independent variables. In this respect, the result of this study is inconsistent with that of Pullenbaum et al. (1986) who found: "There is no causal relationship between self-concept and academic achievement; but that one or more "third variable" are causally predominant over both self-concept and academic achievement".[37]

Also, regression analysis was used to examine the possible contributions of the independent variables (attitudes, academic self-concept and motivation) to the academic performance of students (dependent variable).

Norusis (1985) stated:

> ***"Regression analysis (stepwise) selection of independent variables is probably the most common technique used in testing regression. It is really a combination of backward and forward selection. If the variable fails to meet entry requirements, the procedure terminates with no independent variables in the equation. If it passes the criteria, the second variable is selected based on the highest partial correlation. If it passes the entry criteria, it also enters the equation".***[38]

The multiple regression analysis demonstrates that the correlations between all these independent variables (academic self-concept, motivation and attitudes) and academic performance are significant, as shown on Table 6.5.

Table 6.5

Multiple Regression (stepwise) N=565

Predictors	Step	Beta	Multiple R	R Square	F	T
Academic self-concept	1	**0.11**	**0.11**	0.01	**6.71**; $p < 0.05$	**2.59**; $p < 0.05$
Attitude	2	**0.22**	**0.22**	0.05	**27.43**; $p < 0.05$	**5.24**; $p < 0.05$
Motivation	3	**0.16**	**0.16**	0.03	**15.11**; $p < 0.05$	**3.89**; $p < 0.05$

* level of significance = 0.05.

From further study of the results of the above table, it appears that attitude is the prime predictor of academic performance, with motivation in the second position and academic self-concept third. However, it must be

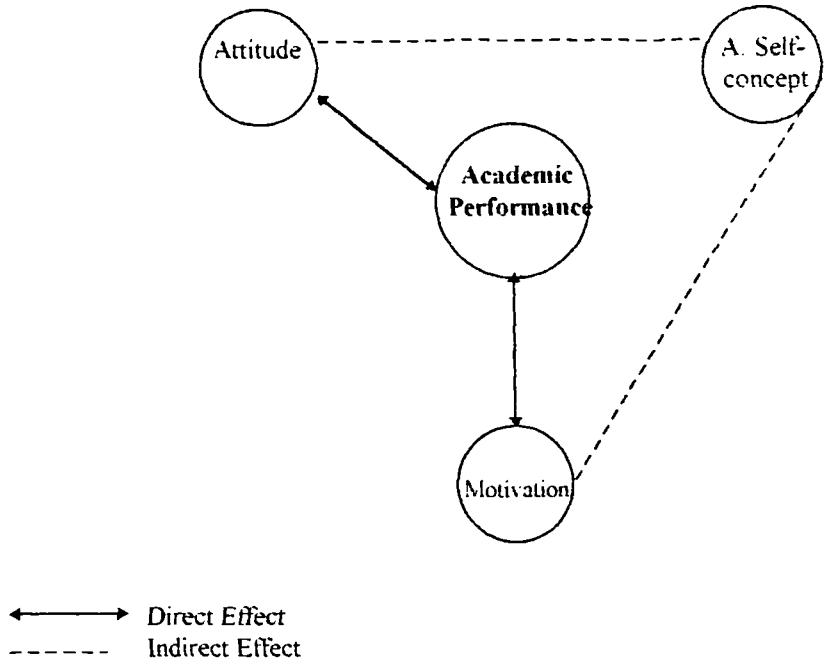
recognised that there is a significant correlation between the variables-attitudes, academic self-concept and motivation, and that this could reduce the power of the multiple regression to predict accurately the variable of academic performance. As Youngman (1979) indicated " if two predictors are highly correlated with each other, one will necessarily attract a low beta weight simply because its effect has already been included in the other".[39]

The results obtained in this study appear not to support the findings of Pullenbaum et al (1986), who reported that motivation is the best predictor when compared with the other variables.[40] However, the results are supported by the finding of Schibeci (1985) who reported a high correlation between attitude and science achievement,[41] and also, by the study of Simpson and Wasik (1978), who found a high correlation between attitude and achievement.[42]

The above results of the present study in general appear not to support the model which was created for testing in this study. However, it is worth stressing, that the researcher proposed this model with the assumption that the effect of all these variables would be equal (i.e. the same in influencing power) upon the students' academic performance. This is not the case.

These overall results are very important in re-assessing the relationship between students' academic performance and the other independent variables which were selected to be tested in this study and also the extent (scope) of interior and alternate interaction. It remains now to refine the model. The new model is shown in figure 6.3.

Fig 6.3: The New Model



The findings of the present study are consistent with the direction of effect in Figure 6.3. The relationship between attitude and academic performance appears to be direct and so, also, is the relationship between motivation and academic performance. But the relationship between academic self-concept and academic performance, is not direct, and tends to depend on the mediating effect of attitude and motivation.

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CHAPTER SEVEN

Conclusions and Recommendations

7.1 Summary of Main Findings:

This study has made a number of interesting findings on the attitudes, academic self-concept and motivation of SQU students learning science in English, in relation to the ways these variables influence their academic performance. It is useful to state clearly all these findings.

1- A significant positive correlation was found between the students' academic performance and their attitude, academic self-concept and motivation towards learning science in English. This finding demonstrates that higher attitudes, academic self-concept and motivation among the students would result in better academic performance, and also lower attitudes, self-concepts and motivation would diminish their academic performance.

2- A significant difference exists between the academic self-concepts of male and female students in learning science through English. Remarkably, no such difference was recorded between their attitude and motivation. In other words, sex differences do influence the pattern of self-concept of Omani students learning science in English, but their attitude and motivation are unlikely to be sex-linked. In general, male students tend to show greater academic self-concept than females.

3- Significant differences were found among the students of the different colleges in their attitudes and academic self-concept towards learning science in English, but not their motivation. Generally, students of the College of

Education tend to show the least positive attitudes and academic self-concepts than the other students in the mainly science colleges. In particular, students in the colleges of Medicine and Science tend to show more positive attitudes and greater academic self-concept than students in the other colleges. It would appear that the attitudes and academic self-concepts of the students are considerably affected by the ways they perceive their need for English in their future career.

4- A significant difference exists in the attitude and academic self-concept, and motivation of first and fourth year students learning science in English across the different colleges. In general, fourth year students tend to have more positive attitudes and academic self-concepts, but not for motivation. First year students tend to be more motivated than fourth year students.

7.2 Conclusions:

Learning science in English, as distinct from just learning science, has at its centre the issue of how the language of communicating science is being handled in the different colleges that make up the SQU. For science learning to be effective, the language of science should be carefully and properly used in order that students will learn easily and with interest, which in turn will enhance their performance. When the language of science is foreign to the learners, difficulties are bound to arise.

It is against this background, that the role of the English language, which is the mandatory language of science learning, for a group of students whose mother- tongue is Arabic, and who previously have not learned science in English, can be appreciated. Since the English language fluency of the students cannot be taken for granted, the lecturer or teacher passing on

information in English to these students in a science class, has the responsibility to find the best ways of carrying out his task successfully. Such measures should include ways and means of enhancing the self-concepts of the students, and encouraging them to develop positive attitudes, as well as generating greater motivation among the students in learning science in English. In turn this would help to boost their academic performance.

In reality, the three variables of attitudes, academic self-concept and motivation are interrelated, and therefore cannot be seen as separate entities influencing students' academic performance differently. So, the lecturer teaching science through English would have to adopt an integrated approach in generating interest among the students. This study does show that if the attitude and academic self-concept of students are sufficiently developed in the positive sense, their motivation is likely to be enhanced. The lecturer therefore, can vary his or her teaching strategies with the intention of creating more positive attitudes, greater academic self-concept and higher motivation, among the students.

An important issue in the proper development of students' attitudes, academic self-concept and motivation towards learning science in English, is the need to identify their level of English language competencies or fluency as soon as they join the university colleges. This measure is necessary to understand the degrees of English language deficiency among the students, so as to reflect these differences during classroom science learning in English.

Again, it may be possible that the differences in the students' attitudes, academic self-concept and motivation are related to their English language need after they have completed their studies, and taken up jobs in

the society. It would be advisable to give closer attention to ways of improving the level of English of these students such as education students, who would not be required to work in English. The effect of the difference in their language of science learning (English) at college, and work language (Arabic) must be properly understood, so as to remove the obstacles they present to attitudes, academic self-concept, motivation and better academic performance in learning science through English.

7.3 Recommendations:

The present research revealed different levels of significant correlation (relationships) between students' attitude, and academic self-concept and motivation and their academic performance. This means that it is likely that improving students' attitude, motivation and academic self-concept could bring about better students' academic performance, one way or another.

*** Therefore, building a good relationship between the teaching staff and the students, establishing a counselling body and a friendly ecology (atmosphere in classroom and workshops) in the colleges, and providing more positive feedback, might all help to improve students' academic performance to some extent.**

The present research has yielded results indicating that male students' attitudes, are more positive than those of female students. A number of reasons have been put forward, earlier, in an attempt to explain this trend.

*** Therefore, the second recommendation of this study is that the university administration and lecturers must begin to create an atmosphere more encouraging of female students' attitudes, academic self-concept and motivation towards learning science in English.**

*** Closer ties should be forged with the female students, more attention paid to them and their problems, and additional-curricula activities developed (e.g. more laboratory activities, computer awareness courses).**

Significant differences exist, as this study has shown, in the variables, between students of different colleges. Those of the Colleges of Medicine and Engineering tend to show greater academic self-concept, and attitude, whereas the students in the College of Education showed lesser tendencies in these areas. It is imperative that steps be taken to raise the attitudes, motivation and academic self-concept of these students.

*** An extra programme of English should be initiated so that the students' English ability will be brought up to standard and their confidence in the English language will be increased.**

*** More effort and thought should be put into choosing qualified and experienced staff for teaching in the English language.**

*** Lecturers must do more than just teach, they must encourage a positive and friendly atmosphere in their classrooms.**

*** Negative and aggressive language must be eliminated in teaching, and more positive feed-back provided to encourage the students.**

The open question to both students and lecturers yielded the suggestion that the low standard of students entering university is due to the very poor standard of pre-university (secondary school stage).

*** It is of the utmost importance that the secondary school science curriculum should be revised by introducing scientific terms in English at this stage.**

The results indicated that a large gap exists between the university and the secondary school. The university stage is a very strange world to new entrants.

*** A special induction programme would be helpful, to familiarize new students with the university and university life, and the curricula could be made more suitable.**

It does not appear that learning science in English is an extremely critical problem facing all students in the targeted university. This may be the case with the College of Education students, but is definitely not the case with medical students. The surrounding countries have for decades used Arabic to teach science in their Colleges of Education, though they teach science in English at the Medicine and Engineering Colleges. It is, as yet, impossible to provide indigenous qualified teaching staff for all the colleges to teach in the Arabic language. Therefore,

*** For the college of Education, especially in first intake year, indigenous qualified staff should be recruited from neighbouring Arab states.**

There is a conviction among most of the students of the scientific and science colleges and even among the lecturers that, in spite of the difficulties and problems caused by teaching in English, the positive aspects of this policy will overcome the negative aspects.

*** Hence, this study recommends that as an experimental plan, the university should commence immediately to teach the first year students, in only the College of Education, in Arabic.**

This would enable a comparison to be made between the levels of students' performance in learning science in Arabic, and that of students taught in English.

Accordingly, although there exists more than one justifiable reason to recommend teaching science in Arabic in the College of Education, there do not appear to be sufficient reasons to require that all the colleges do the same.

It is anticipated that the employment of these recommendations will at the least alleviate the concerns that led to the above study being carried out, and hopefully improve the academic performance of students learning science through the medium of English.

7.4 Suggestions for Further Studies:

Evidence of the different results in the literature regarding the relationships between academic performance and students' attitudes, academic self-concept and motivation in learning in English, together with the findings made in this study, have brought to the attention of the researcher, a number issues which could be addressed in the advancement of knowledge in the area of academic performance in relation to the variables investigated in this study. The researcher therefore suggests the following issues for further studies:

1- This study is limited in its objective and scope by concentrating on a few selected independent variables- attitudes, academic self-concept and motivation of university students who are learning science in English. There is need to extend the search to include other factors which other studies have highlighted such as: students' intelligence, aptitude, socio- economic students, family background etc., which are considered relevant to the improvement of teaching styles for Omani students learning science in a foreign language.

2- Again, the language problems of Omani university students could be better understood if their level of English language competence prior to entry into

the university is examined to see the extent to which it account for students' level of attitude, academic self-concept and motivation in learning through English.

3- The influence of job aspirations among students learning science in English can be a major area for further studies of the ways students' perceived need of English language in their jobs after graduation from the university, affects their levels of attitude, academic self-concept and motivation in learning in English while at the university.

4- Learning science through English, as opposed to the problems associated with students' understanding of scientific knowledge, concept and language, has been the main focus of this study. In practice it is hard to draw a line between these two situations. Further research into the place of language in learning science, between the use of English as a foreign language. and the use of Arabic as a mother- tongue, can make an interesting study.

5- Finally, a more detailed study of male and female students, drawn from different colleges, but learning science through English, could consider pre-university English language fluency, career expectations, and ultimate academic performance.

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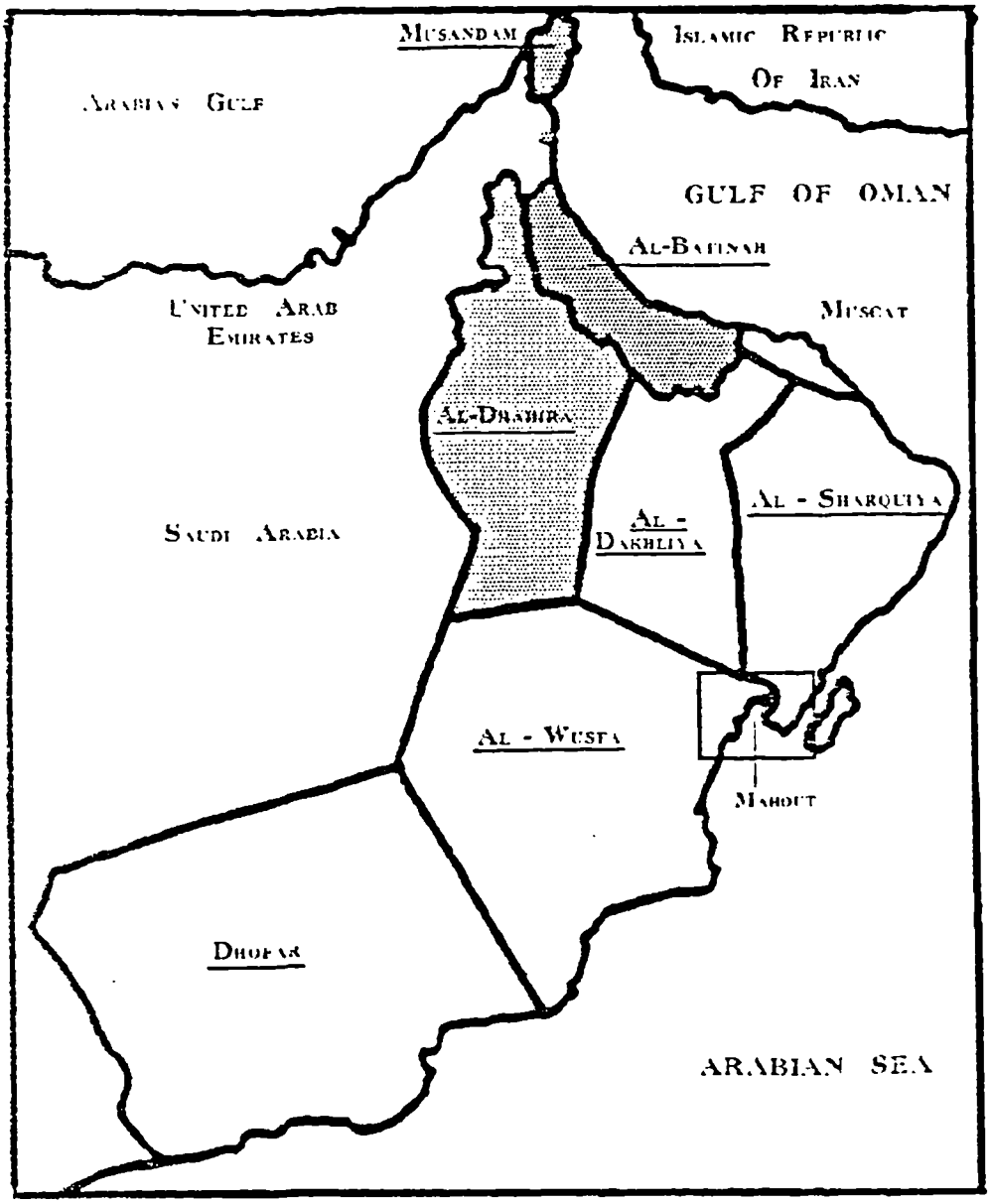
Appendix 1.1

Map of Oman

The Sultanate Of Oman



Appendix 4.1

Letter from Supervisor to SQU Chancellor

THE UNIVERSITY OF HULL
INSTITUTE OF EDUCATION

HULL HU6 7RX • UNITED KINGDOM
TELEPHONE 01482 465406 • SWITCHBOARD 01482 46311 • FACSIMILE 01482 465406

PROFESSOR V A McCLELLAND MA PhD
DIRECTOR OF THE INSTITUTE OF EDUCATION
DIRECT LINE 01482 465988

KPB/JL

19 October 1994

The President
Sultan Qaboos University
Oman

Dear President

Mr Al-Nabhani is currently a full-time student of this University, conducting research studies leading towards the award of the degree of PhD. His progress has been most satisfactory to date and has been reviewed in the report submitted in September 1994 to the Cultural Division of the Oman Embassy in London.

Having completed a review of previous research and formulated a methodological basis for the topics under consideration, he is returning to Oman with the intention of conducting surveys amongst students at Oman university.

Survey work is the natural stage of progression for his studies, and I fully support the work in progress.

Yours sincerely

Kenneth Brookes.

KENNETH BROOKES
Supervisor

MR I D MARRIOTT CBiol MIBiol (SECRETARY TO EDUCATION (01482 465402)
MRS M E CORDEAUX BA (ADMINISTRATIVE ASSISTANT) (01482 465031)

Appendix 4.2

Letters from Dean of College of Education to Chancellor and Other Deans

Sultan Qaboos University

COLLEGE OF EDUCATION
& ISLAMIC SCIENCES

جامعة السلطان قابوس

كلية التربية والعلوم الاسلامية

Ref: CEIS/95/2/1/2
Date: / /14 Hijra
Feb/13/1995

الرقم :
التاريخ : / / ١٤هـ
الموافق : / / ١٩ م

TO: ALL DEANS
Copy: H.E. The Vice Chancellor

FROM: DEAN, COLLEGE OF EDUCATION AND ISLAMIC SCIENCES

RE: THESIS QUESTIONNAIRE

This is to inform you that Mr. Hilal Al-Nabhani, Assistant Lecturer in our College, has been approved by H.E. Vice Chancellor to collect his Ph.D. research data in the University Colleges. Your colleges' assistance in distributing the questionnaire to the students would be highly appreciated. In this connection, I enclose a copy of H.E. The Vice Chancellor's approval for your information.

Thanking you for your assistance.

Sincerely,

Mohamed El Shibiny, Dean
C.E.I.S.

Enclosure

P.O. Box : 32 Al-Khod
Postal Code : 123
Muscat - Sultanate of Oman
Telex: 5602 SQU ON Cable: Jami'ah
Fax: 513255, Telephone: 513333

صندوق البريد : ٣٢ الخوض
الرمز البريدي ١٢٣
مسقط ـ سلطنة عمان
تلكس : ٥٦٠٢ إس كيو يو أوإن ـ برقيا : جامعة
فاكس : ٥١٣٢٥٥ ؛ هاتف : ٥١٣٣٣٣

بسم الله الرحمن الرحيم

شفع

جامعة السلطان قابوس

Sultan Qaboos University

كلية التربية والعلوم الاسلامية

COLLEGE OF EDUCATION
& ISLAMIC SCIENCES

الرقم : ع/٥/٨/١/٢٤٥

التاريخ : ٢٩/ ١٠ / ١٤١٣هـ

الموافق : ١٩/ ٠٦ /١٩٩٣م

Ref :

Date : / /14 Hijra

/ /19

معالي رئيس الجامعة

الموقر

السلام عليكم ورحمة الله وبركاته .. وبعد ،

فاتشرف بافادة معاليكم بان الفاضل/ هلال بن زاهر النبهاني المدرس المساعد بوحدة علم النفس بالكلية ، قد حصل على قبول من جامعة هل ببريطانيا لدراسة الدكتوراه للعام الجامعي ١٩٩٣/١٩٩٤ ، وموضوع رسالته للدكتوراه هو " العلاقة بين التحصيل الدراسي ومفهوم الذات لدى الطلاب الذين يدرسون بلغة اجنبية لدى جامعة السلطان قابوس " وبما ان المذكور بصدد جمع البيانات الاولية لكتابة خطة البحث ، فسوف يحتاج الى النتائج الدراسية لطلاب الجامعة .

راجين التكرم من معاليكم بالموافقة على الحصول على النتائج الدراسية لطلبة الجامعة .

وتفضلوا معاليكم بقبول فائق الاحترام ، ،

ا.د. محمد الشبيني
عميد الكلية

١٩٩٣/٦/١٩

278

صورة مع التحية الى :
سعادة الامين العام
سعادة مساعد الرئيس للشئون الاكاديمية

جامعة السلطان قابوس
مكتب معالي الرئيس
الرقم : ٢٤٧٧
التاريخ: ٩٣/٦/٢٠
وارد

P.O.Box : 32482 Al-Khod
Muscat, Sultanate of Oman
Telex : 5602 SQU ON Cable : Jami'an
Telephone : 513333

صندوق البريد : ٣٢٤٨٢ الخوض
مسقط - سلطنة عُمان
تلكس : ٥٦٠٢ إس كيو يو أوان - برقيا : جامعة
تلفون : ٥١٣٣٣٣

Appendix 4.3

Letter from Researcher to Dean of Admissions and Registration

بسم الله الرحمن الرحيم

Sultan Qaboos University

جامعة السلطان قابوس

COLLEGE OF EDUCATION
& ISLAMIC SCIENCES

كلية التربية والعلوم الاسلامية

Ref: CEIS/95/2/1/2

الرقم:

Date: / / 14 Hijra

التاريخ: / / ١٤ هـ

Feb 21 1995

الموافق: / / ١٩٩٥ م

TO: MS. FRANCES LACEY, REGISTRAR
DEPARTMENT OF ADMISSIONS AND REGISTRATION

FROM: HILAL AL NABHANI, ASSISTANT LECTURER
COLLEGE OF EDUCATION AND ISLAMIC SCIENCES

RE: STUDENTS GPAs - 1991 AND 1994

I would appreciate it if you could help me in getting the students GPAs of 1st and 4th year (1991 and 1994) to help me for my Ph.D. research. I need these results from the Colleges: **Medicine, Education - Science Education students only, Engineering, Science and Agriculture.** For your information, I enclose a copy of H.E. the Vice Chancellor's approval to collect this information. Your cooperation will be very helpful to me.

Thanking you for your assistance.

Sincerely,

Hilal Al Nabhani
DEPARTMENT OF EDUCATION AND PSYCHOLOGY
C.E.I.S.

P.O. Box : 32 Al-Khod
Postal Code : 123
Muscat - Sultanate of Oman
Telex: 5602 SQU ON Cable: Jami'ah
Fax: 513255, Telephone: 513333

صندوق البريد : ٣٢ الخوض
الرمز البريدي ١٢٣
مسقط ـ سلطنة عمان
تلكس : ٥٦٠٢ إس كيو يو أوإن ـ برقيا : جامعة
فاكس : ٥١٣٢٥٥ ؛ هاتف : ٥١٣٣٣٣

Appendix 4.4A

Letter from Dr. Drummond to the Researcher on the Development of Academic Self-concept Scale

To:
Hilal Al-Nabini
33 Wellington Street
West Hull
HU1 2DG

FAX: 044 1482 34 2717

My research assistants could not find the information you requested because we are moving and everything is packed in boxes. I can give you the basic information, however.

Scale Development.
The following types of information were used to develop the items.

Review of the literature on Academic Self-Concept
Narratives from adult learners of situations in which they experienced positive and negative self-concept.
Observations of adult learners followed by interviews with the learners.

Construct Validity

The scale was correlated with the Coopersmith Adult Self-Esteem Inventory.
The correlation between the instruments was in the moderate range, +.55 with a n=213.
I have used it in other studies comparing adult learners across the age span and comparing the instrument with some other academic self-concept scales; however, this information is not readily available at this time.

Reliability

Split-half and Cronbach's alpha were computed and were .89 and .90 respectively with the sample of 200+ adult learners.

Other studies
You probably saw my 1988 study in the Journal of Employment Counseling. There have been several doctoral students that have used the instrument in their dissertations. I do not have available the specific information on them; since there were completed at other universities.

Sincerely,

Robert J. Drummond

Factor analysis was done on the instrument using principle components method with varimax rotation but I did not work with the factors in my recent research.

I hope this information is helpful. With the office moves and changing of the computer system, I am not in the position to provide you any additional information.

Appendix 4.4

The Scales Before Modification

Attitude Scale:

NO	The items	P/N
1	I like studying science.	+
2	I would like to take all science courses.	+
3	Most of my classmates enjoy studying science.	+
4	I would prefer to study science.	+
5	Every student should study science.	+
6	Anyone can study science.	+
7	Studying science is very interesting.	+
8	Science subject is too difficult to understand.	_
9	Studying science will be useful to me in the future.	+
10	I have confidence in my ability to study science.	+
11	I feel that thinking about science is too difficult for me.	_
12	Studying science takes a long time to understand it.	_
13	I'm wasting my time studying science.	_
14	I enjoy thinking of different ways to say the same things.	_
15	If I had the opportunity to change my major I would change it to social science.	+
16	I work hard studying science.	_
17	Studying science is difficult for me.	_

Motivation Scale:

NO	The items	P/N
1	I do more studying in science than most of my classmates.	+
2	I try to study science.	+
3	In science I just do enough work to get along.	_
4	When I do something in science I usually plan carefully.	+
5	When I start a new project in science. I usually do not finish it .	_
6	When I do well in science, it is because I work for it.	+
7	When I do well in science, it is because I'm lucky.	_
8	When I have a hard problem in science, I usually keep trying to solve it.	+
9	I am very careful that achieving success is the basic objective in any job I do.	+
10	I feel getting "excellent" in the courses which I take is too easy for me.	+
11	I am very careful to have realistic objectives.	+
12	I think I'm more successful than my classmates in what I'm assigned to do.	+
13	I prefer to be like my classmates more than being successful in my study.	_
14	I am afraid of failure more than I like to pass.	_
15	I am very interested in the classes that have students of varied levels of intelligence.	+
16	I think social acceptance is more important for me than personal success.	_
17	I like being among a group of students with a similar level of abilities to my own.	_

Motivation Scale Continued:

NO	The items	P/N
18	Fear of failure is the reason for my low performance in some courses.	_
19	I do not do any extra work beyond what the teacher requires or determines.	_
20	I always volunteer to answer questions raised in the class.	+

Academic self-concept scale (ASCS):

No	The items	P/N
1	Feel I am as competent my as classmates.	+
2	Participate in class discussion.	+
3	Have difficulty with class assignments.	_
4	Have good study skills.	+
5	Can fulfil academic goals.	+
6	Feel some disadvantage in being out of school.	_
7	Feel comfortable speaking in the class.	+
8	Research skills are adequate.	+
9	Make efficient use of time.	+
10	Express beliefs and opinions in class.	+
11	Feel intimidated by lecturers.	_
12	Feel comfortable seeking academic advice.	+
13	Academic contribution is respected by my peers.	+
14	Feel comfortable in small group situations in class.	_
15	Enjoy my classes.	+
16	Family supports my academic goals.	+
17	Writing skills in English are adequate.	+
18	Feel prepared for academic challenges.	+
19	Verbal skills in English are adequate.	+
20	Feel comfortable in a large class group.	+
21	Feel comfortable about raising an issue in class.	+
22	People in class listen to what I say.	+
23	Enjoy expressing ideas to others.	+
24	Have the skill to write a good research paper	+
25	Feel pressured by time constraints in class.	_
26	Classmates are smarter than I am.	_
27	Enjoy being called on in class.	+
28	Understand what I read for class study.	+
29	Lecturers are fair.	+

Academic Self-concept Continued:

No	The items	P/N
30	Feel uneasy in class.	_
31	Most students know more than I do.	_
32	Enjoy learning new things.	+
33	Feel I am an important member of class.	+
34	Enjoy interacting with classmates.	+
35	Am able to set realistic goals.	+
36	Am confident I can master skills-competency.	+
37	Am not afraid to be evaluated.	+
38	Feel threatened by new ideas in class.	_
40	Am afraid I might fail.	_
41	Can process. required information quickly.	_
42	Can understand what I have to read.	+
43	Can budget time efficiently.	+
44	Have a difficult time concentrating in class.	_
45	Am not afraid to ask where to find things.	+
46	Enjoy doing homework and assignments.	+
47	Like to be a discussion leader.	+
48	Learn new concepts easily.	+
49	Believe lecturers expect too much of me.	_
50	Wish compulsory courses in the specialisation were more varied.	+
51	Only take classes because I have to.	_
52	Attend the lecturers because I have to.	_
53	Wish the elective courses in the specialisation were more varied.	+

Appendix 4.5

The Scales After Modification

Students' Attitude Scale:

NO	The items	P/N
1	I like studying science in English.	+
2	I would like to take all courses in English.	+
3	Most of my classmates enjoy studying science in English.	+
4	I would prefer to study science in Arabic.	+
5	Every student should study science in English.	+
6	Anyone who can study science in Arabic can study it in English.	+
7	Studying science in English is more interesting.	+
8	Studying science in English makes the subject too difficult to understand.	_
9	Studying science in English will be useful to me in the future.	+
10	Students who study science in English speaking countries are better than me	+
11	I'm glad that science is taught in English.	+
12	I have confidence in my ability to study science in English.	+
13	I feel that thinking about science in English is too difficult for me.	_
14	Studying science in English take longer to understand than studying it in Arabic.	_
15	I'm wasting my time studying science in English.	_
16	I enjoy thinking of different ways to say the same things.	_
17	If I had the opportunity to change my major I would change it to social science.	+
18	I work hard studying science in English.	_
19	Studying science is more difficult for me in English.	_

Students' Attitude Scale Continued:

NO	The items	P/N
20	Examinations in English are too difficult	_
21	I need more time to do well in the science exam in English language.	_
22	I would do better if I took the exam in the Arabic language.	_
23	It is to easy to do the exam in science in English.	+

Students' Academic Self-concept Scale:

No	The items	P/N
1	I feel am as competent as my classmates.	+
2	I participate in class discussion.	+
3	I have difficulty with class assignments.	_
4	I have good study skills.	+
5	I can fulfil academic goals.	+
6	I feel some disadvantage in being out of school.	_
7	I feel comfortable speaking in front of the class.	+
8	My research skills are adequate.	+
9	I make efficient use of time.	+
10	I express beliefs and opinions in class.	+
11	I feel intimidated by lecturers.	_
12	I feel comfortable seeking academic advice.	+
13	My academic contribution is respected by my peers.	+
14	I feel comfortable in small group situations in class.	_
15	I enjoy my classes.	+
16	My family supports my academic goals.	+
17	My writing skills in English are adequate.	+
18	I feel prepared for academic challenges.	+
19	My verbal skills in English are adequate.	+
20	I feel comfortable in a large class group.	+
21	I feel comfortable about raising an issue in class.	+
22	Students in class listen to what I say.	+
23	I enjoy expressing ideas to others.	+
24	I have the skill to write a good research paper in English.	+
25	I feel pressured by time constraints in class.	_
26	My classmates are smarter than I am.	_
27	I enjoy being called on to answer in class.	+
28	I understand what I read for class study.	+
29	My lecturers are fair.	+

Academic self-concept Scale Continued:

NO	The items	P/N
30	I feel uneasy in class.	_
31	Most students know more than I do.	_
32	I enjoy learning new ideas.	+
33	I feel I am an important member of class.	+
34	I enjoy interacting with classmates.	+
35	I am able to set realistic goals.	+
36	I am confident I can master skills-competency.	+
37	I am not afraid to be evaluated.	+
38	I feel threatened by new ideas in class.	_
39	I get upset when criticised by lecturers.	_
40	I am afraid I might fail.	_
41	I can process. required information quickly.	_
42	I can understand what I have to read.	+
43	I can budget time efficiently.	+
44	I have a difficult time concentrating in class.	_
45	I am not afraid to ask where to find things.	+
46	I enjoy doing homework and assignments.	+
47	I like to be a discussion leader.	+
48	I learn new concepts easily.	+
49	I believe lecturers expect too much of me.	_
50	I wish compulsory courses in the specialisation were more varied.	+
51	I only take classes because I have to.	_
52	I attend the lecturers because I have to.	_
53	I wish the elective courses in the specialisation were more varied.	+

Students' Motivation Scale:

NO	The items	P N
1	I do more studying in science than most of my classmates.	+
2	I try to study science in English.	+
3	In science I just do enough study to get along.	_
4	When I do something in science I usually plan carefully.	+
5	When I start a new project in science, I usually do not finish it .	_
6	When I do well in science, it is because I study for it.	+
7	When I do well in science, it is because I'm lucky.	_
8	When I have a hard problem in science, I usually keep trying to solve it.	+
9	When I'm in university I can't wait until the day ends.	_
10	After I graduate, I will continue to study science in the same specialisation.	+
11	I am very careful that achieving success is the basic objective in any study I do.	+
12	I feel getting "excellent" in the courses which I take is too easy for me.	+
13	I am very careful to have realistic objectives.	+
14	I think I'm more successful than my classmates in what I'm assigned to do.	+
15	I prefer to be like my classmates more than being successful in my study.	_
16	I am afraid of failure more than I like to pass.	_
17	I participate effectively in the activities held in the school out of the study curricula.	+
18	I am very interested in the classes that have students of varied levels of intelligence.	+
19	I think social acceptance is more important for me than personal success.	_

NO	The items	P/N
20	I like being among a group of students with a similar level of abilities to my own.	_
21	Fear of failure is the reason for my low performance in some courses.	_
22	I do not do any extra study beyond what the lecturer requires or determines.	_
23	I always volunteer to answer questions raised in the class.	+
24	I find myself reading the questions of the exam repeatedly before I begin to answer.	_

Open question:

What problem do you think students face in studying science in English language?

Appendix 4.6

The Scales With Likert Responses

Dear Student,

Before you start please read the direction below carefully:

1- Please write all the following information clearly.

Your Name [ ]

Male[ ] Female [ ]

Age [ ] Major of Study [ ]

College of Study [ ]

2- Read each statement carefully then tick (X) one box for each statement that best shows your feeling about the statement as below:

Tick under **strongly agree** if you strongly agree with the statement.

agree if you agree with the statement.

undecided if you are not sure about your feeling about the statement

disagree if you are disagree with the statement.

strongly disagree if you are strongly disagree with the statement.

3- Answer all statements.

4- Your answers will be used for research purposes only and all information gathered is strictly confidential.

5- Remember this is not a test. Give your own honest opinion.

Students' Attitude Scale:

NO	The items	Strongly Agree	Agree	Undecided	Disagree	Strongly disagree
1	I like studying science in English.					
2	I would like to take all courses in English.					
3	Most of my classmates enjoy studying science in English.					
4	I would prefer to study science in Arabic.					
5	Every student should study science in English.					
6	Anyone who can study science in Arabic can study it in English					
7	Studying science in English is more interesting.					
8	Studying science in English makes the subject too difficult to understand.					
9	Studying science in English will be useful to me in the future.					

Continue of:Students' Attitude Scale

NO	The items	strongly Agree	Agree	Undecided	Disagree	strongly disagree
10	Students who study science in English speaking countries are better than me.					
11	I'm glad that science is taught in English.					
12	I have confidence in my ability to study science in English.					
13	I feel that thinking about science in English is too difficult for me.					
14	Studying science in English take longer to understand than studying it in Arabic.					
15	I'm wasting my time studying science in English.					
16	I enjoy thinking of different ways to say the same thing.					
17	If I had the opportunity to change my major I would change it to social science.					
18	I work hard studying science in English.					

Continue of:Students' Attitude Scale

NO	The items	Strongly Agree	Agree	Undecided	Disagree	Strongly disagree
19	Studying science is more difficult for me in English.					
20	Science examinations in English are too difficult.					
21	I need more time to do well in the science exam in English language.					
22	I would do better if I took the exam in the Arabic language.					
23	It is to easy to do the exam in science in English.					

Students' Academic Self-concept Scale:

NO	The items	Strongly Agree	Agree	Undecided	Disagree	Strongly disagree
1	I feel am as competent as my classmates.					
2	I participate in class discussion.					
3	I have difficulty with class assignments.					
4	I have good study skills.					
5	I can fulfil academic goals.					
6	I feel some disdvantage in being out of school.					
7	I feel comfortable speaking in front of the class.					
8	My research skills are adequate.					
9	I make efficient use of time.					
10	I express beliefs and opinions in class.					
11	I feel intimidated by lectures.					
12	I feel comfortable seeking academic advice.					
13	My academic contribution is repected by my peers.					

Students' Academic Self-concept Scale:

NO	The items	Strongly Agree	Agree	Undecided	Disagree	Strongly disagree
14	I feel comfortable in small group situations in class.					
15	I enjoy my classes.					
16	My family supports my academic goals					
17	My writing skills in English are adequate.					
18	I feel prepared for academic challenges.					
19	My verbal skills in English are adequate.					
20	I feel comfortable in a large class group.					
21	I feel comfortable about raising an issue in class.					
22	Students in class listen to what I say.					
23	I enjoy expressing ideas to others.					
24	I have the skill to write a good research paper in English.					

Students' Academic Self-concept Scale:

NO	The items	strongly Agree	Agree	Undecided	Disagree	strongly disagree
25	I feel presured by time constratints in class.					
26	My classmates are smarter than I am.					
27	I enjoy being called on to answer in class.					
28	I understand what I read for class study .					
29	My lecturers are fair.					
30	I feel uneasy in class.					
31	Most students know more than I do					
32	I enjoy learning new ideas.					
33	I feel I am an important member of class.					
34	I enjoy interacting with classmates					
35	I am able to set realistic goals.					
36	I am confident I can master skills-competency.					

Students' Academic Self-concept Scale:

NO	The items	Strongly Agree	Agree	Undecided	Disagree	Strongly disagree
37	I am not afraid to be evaluated.					
38	I feel threatened by new ideas in class.					
39	I get upset when criticised by lecturers.					
40	I am afraid I might fail.					
41	I can process required information quickly.					
42	I can understand what I have to read.					
43	I can budget time efficiently.					
44	I have a difficult time concentrating in class.					
45	I am not afraid to ask where to find things.					
46	I enjoy doing homework and assignments.					
47	I like to be a discussion leader.					
48	I learn new concepts easily.					

Students' Academic Self-concept Scale:

NO	The items	Strongly Agree	Agree	Undecided	Disagree	Strongly disagree
49	I believe lecturers expect too much of me.					
50	I wish compulsory courses in the specialisation were be more varied.					
51	I only take classes because I have to.					
52	I attend the lectures because I have to.					
53	I wish the elective courses in the specialistion were more varied.					

Students' Motivation Scale:

NO	The items	Strongly Agree	Agree	Undecided	Disagree	Strongly disagree
1	I do more studying in science than most of my classmates.					
2	I try to study science in English.					
3	In science I just do enough study to get along.					
4	When I do something in science I usually plan carefully.					
5	When I start a new project in science, I usually do not finish it					
6	When I do well in science, it is because I study for it.					
7	When I do well in science, it is because I'm lucky.					
8	When I have a hard problem in science, I usually keep trying to solve it.					
9	When I'm in university I can't wait until the day ends.					
10	After I graduate, I will continue to study science in the same specialisation.					
11	I am vary careful that achieving success is the basic objective in any study I do.					
12	I feel getting "excellent" in the courses which I take is too easy for me.					
13	I am very careful to have realistic objectives.					
14	I think I'm more successful than my classmates in what I'm assigned to do.					
15	I prefer to be like my classmates more than being succesful in my study.					
16	I am afriad of failure more than I like to pass.					

Continued of Students' Motivation Scale:

NO	The items	Strongly Agree	Agree	Undecided	Disagree	Strongly disagree
17	I participate effectively in the activities held in the university out of the study curricula.					
18	I am very interested in the classes that have students of varied levels of intelligence.					
19	I think social acceptance is more important for me than personal success.					
20	I like being among a group of students with a similar level of ability to my own.					
21	Fear of failure is the reaseon for my low performance in some courses.					
22	I do not do any extra study beyond what the lecturer requires or determines.					
23	I always volunteer to answer questions raised in the class.					
24	I find myself reading the questions of the exam repeatedly before I begin to answer.					

Open question:

What Problems do you think students face in studying science in English language?

Appendix 4.7

The Lecturers'Interview

Lecturers Interview

College:

Started teaching at SQU Since:

Nationality:

Speciality:

Course(s) you customarily Teach:

1- How do you rate the students command of English as a learning medium?.

Good....., Satisfactory....., Poor....

Please give a reason for your answer.

2- How do you rate the students' understanding of the science lectures which are taught in English?..... Good ....., Satisfactory....., Poor.....

please give a reason for your answer.

3- How do you rate the students' performance in science examination? Good..., Satisfactory..., Poor...

Please give a reason for your answer.

4- In your opinion, what are the reasons for the lower performance in science examinations?

5- In your opinion, would performance improve if students took science course in their own language (Arabic) rather than English? **and why**?

6- As a lecturer, are aware of any problems faced by the students due to the use of English rather than Arabic in their science lectures? **if yes. Please specify?**

7- Would the students performance be improved if an extensive training in English is provided prior to starting science courses in English?

8- What form should this training take?

9- Do you think most of the science lecturers in your college are aware of students' problems relating to difficulties as a medium of teaching?

10- With regard to this issue, do you have any other comments?

Think you for your co-operation

Appendix 4.8

The Scale in Arabic

بسم ا لله الرحمن الرحيم

* عزيزى الطالب من فضلك اقرأ التعليمات ادناه بعنايه:

١- اكتب البيانات التاليه بوضوح:

الاسم :

الجنس: ذكر( ) انثى( )

الرقم الجامعى:( )

الفصل الدراسى:

التخصص: الكليه:

٢- اقرأ كل بند بعنايه ثم ضع علامة ( ) أمام الخيار الذى ينطبق عليك أو تفضله علما بأن الاختيارات هى: (موافق بشده ، موافق ، لست متاكدا ، غير موافق ، غير موافق بشده).

٣- اجب على جميع الفقرات.

٤- تذكر ان هذا ليس اختبارا أعط انطباعاتك الصادقة.

٥- أن جميع البيانات ستستخدم لغرض علمى بحت وستكون فى سرية تامه

شكرا لتعاونكم

هلال النبهانى

كلية التربية والعلوم الاسلاميه

الرقم	البند	موافق بشده	موافق	لست متاكد	غير موافق	غير موافق بشده
١	أحب دراسة المواد العلمية باللغة الانجليزيه					
٢	أتمنى أن أدرس كل المقررات باللغة الانجليزيه.					
٣	أستمتع بدراسة المواد العلمية باللغة الانجليزيه.					
٤	أفضل أن أدرس المواد العلمية باللغة العربيه					
٥	يجب أن يدرس كل طلاب العلوم تخصصهم باللغة الانجليزيه.					
٦	من يستطيع دراسة المواد العلمية باللغة العربية يستطيع دراستها باللغة الانجليزية.					
٧	دراسة المواد العلمية باللغة الانجليزيه ممتعه.					
٨	دراسة المواد العلمية باللغة الانجليزيه تجعلها صعبة الفهم.					
٩	دراسة المواد العلمية باللغة الانجليزيه ستكون ذات فائده لى مستقبلا.					
١٠	الطلاب الذين يدرسون المواد العلمية فى بلاد ناطقة باللغة الانجليزيه أقدر منى فى التخصص.					
١١	أنا سعيد بأن المواد العلمية تدرس باللغة الانجليزيه.					

الرقم	البند	موافق بشده	موافق	لست متاكد	غير موافق	غير موافق بشده
١٢	لدى ثقة فى مقدرتى على دراسة المواد العلمية باللغة الانجليزيه.					
١٣	أشعر بأن التفكير باللغة الانجليزيه فى دراسة المواد العلمية باللغة الانجليزيه صعب جدا بالنسبة لي.					
١٤	مذاكرة المواد العلمية باللغة الانجليزيه تاخذ وقتا أطول من مذاكرتها باللغة العربية.					
١٥	أشعر بأننى أضيع وقتى بدراسة المواد العلمية باللغة الانجليزيه.					
١٦	دراستى للمواد العلمية باللغة الانجليزيه تمكننى من التفكير بطرق متعدده فى نفس الشى.					
١٧	أذا اتيحت لي الفرصة لتغير تخصصى الرئيسى سأغيره لادرس تخصصا آخر تكون فيه الدراسة باللغة العربية.					
١٨	أبذل جهدا وعملا كثيرا فى دراستى للمواد العلمية باللغة الانجليزيه.					
١٩	دراسة المواد العلمية صعبة بالنسبة لي لأنها تدرس باللغة الانجليزيه.					
٢٠	الامتحانات باللغة الانجليزيه صعبة جدا.					
٢١	أحتاج لوقت أطول كى اودى جيدا فى امتحانات المواد العلمية باللغة الانجليز.					

الرقم	البند	موافق بشده	موافق	لست متاكد	غير موافق	غير موافق بشده
٢٢	سأؤدي أفضل اذاكانت الامتحانات باللغة العربية.					
٢٣	أمتحانات المواد العلمية باللغة الانجليزية لاتشكل عائقا لي.					
٢٤	أشعر بأننى كفء وقادر مثل زملائى فى الاداء الاكاديمي.					
٢٥	أشارك فى النقاش والحوار فى المحاضرات.					
٢٦	أواجه صعوبات فيما يتعلق بالواجبات الدراسيه التى اكلف بها.					
٢٧	لدى مهارات دراسيه جيده.					
٢٨	أستطيع تحقيق أهدافى الدراسيه والاكاديمية.					
٢٩	سأشعر بالاحباط اذا تهدد استمرار دراستى الجامعية.					
٣٠	أكون مرتاحا حينما يطلب منى فى المحاضرة أن أعرض موضوعا كلفت به.					
٣١	قدراتى فى البحث كافية.					
٣٢	أستغل وقتى بكفاءة .					
٣٣	أستطيع أن اعبر عن آرائى وافكارى فى المحاضره.					
٣٤	كثيرا ما أشعر بأن المحاضرين يستفزوننى.					
٣٥	أشعر بالراحه فى طلب المساعده والنصح الاكاديمى.					
٣٦	مساهماتى الاكاديمية مقدرة من زملائى.					

الرقم	البند	موافق بشده	موافق	لست متاكد	غير موافق	غير موافق بشده
٣٧	أشعر بالراحة اكثر عندما أكون فى مجموعات طلابيه صغيره.					
٣٨	أستمتع بالمحاضرات التى اتلقاها.					
٣٩	تساندنى أسرتى فى تحقيق أهدافى الدراسية والاكاديمية.					
٤٠	مهاراتى الكتابيه باللغة الانجليزيه جيده وكافية.					
٤١	أشعر بأننى مستعد للتحديات الدراسية والاكاديمية.					
٤٢	قدراتى اللفظيه التعبيريه باللغة الانجليزيه جيده وكافية.					
٤٣	أشعر براحة عندما اكون فى مجموعات طلابيه كبيره.					
٤٤	أشعر بالسعادة عندما أثير النقاش حول نقطة ما فى موضوع الدرس.					
٤٥	زملائى بالمحاضرة يضعون أعتبارا لما أقول.					
٤٦	أستمتع بطرح أفكارى للأخرين.					
٤٧	لدى المهاره الكافية لكتابة ورقة بحث جيده باللغة الانجليزيه.					
٤٨	أشعر بضيق فى المحاضرات لعدم كفاءتى.					
٤٩	زملائى اكثر ذكاء ومهارة منى.					

الرقم	البند	موافق بشده	موافق	لست متاكد	غير موافق	غير موافق بشده
٥٠	أشعر بالراحة عندما أنادى للاجابة على سؤال ما فى المحاضره.					
٥١	أستطيع استيعاب ما أقرأه فى مذاكرة المقررات الدراسية.					
٥٢	أساتذتى عادلون.					
٥٣	أشعر بعدم الراحه فى المحاضرات.					
٥٤	يستوعب غالبية الطلاب الكثر منى.					
٥٥	أستمتع بتعلم أفكار جديده.					
٥٦	أشعر بأننى عضو مهم فى المحاضره.					
٥٧	أستمتع بالتفاعل مع زملائى من الطلاب.					
٥٨	أنا قادر على تحديد أهداف واقعيه لي.					
٥٩	أنا واثق من قدراتى على تحقيق المهاره والكفاءه اللازمة.					
٦٠	لا أخاف من تقويمى كطالب.					
٦١	أشعر بعدم الراحة والتهديد من الافكار الجديده التى تطرح فى المحاضرات.					
٦٢	أشعر بالضيق عندما أنتقد من قبل المحاضرين.					
٦٣	أخاف من اننى ربما أفشل.					
٦٤	أستطيع استيعاب المعلومات المطلوبه بسرعة					
٦٥	أستطيع فهم ما يجب على قراءته باللغة الانجليزيه.					
٦٦	أستطيع توزيع وقتى بكفاءة .					

الرقم	البند	موافق بشده	موافق	لست متاكد	غير موافق	غير موافق بشده
٦٧	أواجه صعوبات فى التركيز فى المحاضرات					
٦٨	لا أحرج من السؤال عما لاأفهمه.					
٦٩	أستمتع باداء الواجبات الدراسيه.					
٧٠	أحب أن اكون قائدا وموجها للنقاش.					
٧١	أتعلم المفاهيم الجديده بسهوله.					
٧٢	أعتقد أن الاساتذه يتوقعون منى اكثر من قدراتى.					
٧٣	أتمنى لو زادت وتنوعت المقررات الاجباريه فى التخصص.					
٧٤	أسجل فى المقررات الدراسيه فقط لان ذلك مفروض على.					
٧٥	أقوم بحضور المحاضرات فقط لان ذلك مفروض على.					
٧٦	أتمنى لوزادت وتنوعت المقررات الاختياريه فى التخصص.					
٧٧	أقوم بالمذاكره فى المواد العلمية اكثر من غالبية زملائى.					
٧٨	أحاول مذاكرة المواد العلمية باللغة الانجليزيه رغم صعوبتها.					
٧٩	فى دراستى للمواد العلمية ابذل من الجهد ما يكفى لنجاحى فقط.					
٨٠	عندما أود القيام بمشروع او عمل ما يرتبط بدراستى العلمية فأننى اخطط له بعنايه.					

الرقم	البند	موافق بشده	موافق	لست متاكد	غير موافق	غير موافق بشده
٨١	عندما أبدا مشروعا دراسيا فاننى عادة لا أتمكن من اكماله.					
٨٢	عندما أؤدى جيدا فى دراستى للمواد العلمية يكون ذلك لاننى بذلت مجهودا فيه.					
٨٣	عندما اؤدى جيدا فى دراستى للمواد العلمية يكون ذلك نتيجة للحظ فقط.					
٨٤	عندما تواجهنى مشكلة صعبة فى دراستى للمواد العلمية فأننى اثابر على محاولة حلها.					
٨٥	عادة ما انتظر بفارغ الصبر نهاية اليوم الدراسى.					
٨٦	عندما أتخرج سأواصل دراستى فى التخصص.					
٨٧	أحرص على أن يكون تحقيق النجاح هو الهدف الاساسى فى أى عمل أقوم به.					
٨٨	أشعر أن الحصول على تقدير ممتاز فى المقررات عملية سهلة بالنسبة لي.					
٨٩	أحرص على أن اضع لنفسى أهدافا ومطامح واقعية.					
٩٠	أشعر أننى أكثر قدرة من زملائى على النجاح فيما يسند الي من أعمال.					
٩١	أفضل أن أكون محبوبا بين زملائى اكثر من أن أكون ناجحا فى دراستى.					

لرقم	البند	موافق بشده	موافق	لست متاكد	غير موافق	غير موافق بشده
٩٢	يدفعنى الخوف من الفشل أكثر مما تدفعنى اليه الرغبة فى النجاح.					
٩٣	أشعر أننى أشترك بايجابيه فى الانشطه التى تقام بالجامعه خارج نطاق المقررات الدراسيه.					
٩٤	أستمتع بوجودى فى المحاضرات التى تضم طلابا ذوى مستويات متفاوته من حيث الذكاء.					
٩٥	أرى أن التقبل الاجتماعى اكثر أهمية من النجاح الشخصى.					
٩٦	أستمتع بوجودى ضمن مجموعة من الطلاب فى نفس مستوى قدراتى.					
٩٧	الخوف من الرسوب هو السبب فى أدانى الضعيف فى بعض المقررات.					
٩٨	لا اقوم بأى عمل دراسى يزيد على ما يحدده أو يطلبه المحاضر.					
٩٩	أتطوع دائما للاجابة عن الاسئله التى تثار فى المحاضره.					
١٠٠	أجد نفسى أعاود قراءة اسئلة الامتحان اكثر من مرة كى استطيع أن ابدأ الاجابه.					

***ما هى فى اعتقادك المشكلات التى يواجهها الطلاب الذين يدرسون العلوم باللغه الانجليزيه؟**

Appendix 4.9

Lecturers' Responses

Lecturers response Students' Attitude Scale

QN	Extremely important	Important	Moderately	Fairly important	Not at all important	Total	The Mean
	F	F	F	F	F		
1	4	9	5	2		75	5.0
2	6	11	3	-		83	5.5
3	9	11	-	-		89	5.9
4	7	12	-	1		85	5.7
5	2	14	4	-		78	5.2
6	5	13	1	1		82	5.5
7	4	10	5	1		77	5.1
8	11	9	-	-		91	6.1
9	8	11	1	-		87	5.8
10	4	9	5	2		75	5.0
11	8	9	3	-		85	5.7
12	12	7	1	-		91	6.1
13	14	4	2	-		92	6.1
14	10	9	1	-		89	5.9
15	8	10	1	1		85	5.7
16	6	13	1	-		85	5.7
17	3	16	-	1		81	5.4
18	5	11	4	-		81	5.4
19	7	13	-	-		87	5.8
20	9	9	1	1		86	5.7
21	11	7	2	-		89	5.9
22	3	12	3	2		74	4.9
23	4	12	3	1		79	5.3

Lecturers response to Academic self-concept Scale

QN	Extremely important	Important	Moderately	Fairly important	Not at all important	Total	The Mean
	F	F	F	F	F		
1	4	12	3	1		79	5.3
2	3	14	2	1		79	5.3
3	3	10	6	1		75	5.0
4	2	15	3	-		79	5.3
5	6	14	-	-		86	5.7
6	5	12	2	1		81	5.4
7	4	11	4	1		78	5.2
8	8	11	1	-		87	5.8
9	2	13	3	2		73	4.9
10	1	15	4	-		77	5.1
11	2	17	1	-		81	5.4
12	2	18	-	-		82	5.5
13	8	10	2	-		86	5.7
14	6	14	-	-		86	5.7
15	9	11	-	-		89	5.9
16	1	11	8	-		73	4.9
17	11	6	2	1		87	5.8
18	9	11	-	-		89	5.9
19	7	12	1	-		86	5.7
20	5	12	3	-		82	5.5
21	2	16	1	1		77	5.1
22	3	11	4	2		75	5.0
23	2	15	2	1		78	5.2
24	7	12	1	-		86	5.7
25	2	14	3	1		75	5.0
26	3	12	5	-		78	5.2
27	6	14	-	-		86	5.7
28	2	17	1	-		81	5.4
29	3	17	-	-		83	5.5
30	5	15	-	-		85	5.7
31	7	12	1	-		86	5.7
32	10	9	1	-		94	6.3

Academic Self-concept Continued:

QN	Extremely important	Important	Moderately	Fairly important	Not at all important	Total	The Mean
	F	F	F	F	F		
33	7	12	1	-		86	5.7
34	9	11	-	-		89	5.9
35	4	12	3	1		79	5.3
36	10	6	4	-		86	5.7
37	3	14	2	1		79	5.3
38	11	7	2	-		89	5.9
39	2	13	4	1		76	5.1
40	4	9	4	3		77	5.1
41	5	15	-	-		85	5.7
42	7	10	2	1		83	5.5
43	3	12	3	2		76	5.1
44	3	16	1	-		82	5.5
45	4	8	5	3		73	4.9
46	5	14	1	-		84	5.6
47	4	13	3	-		81	5.4
48	10	9	1	-		89	5.9
49	3	16	1	-		82	5.5
50	2	12	5	1		75	5.0
51	4	14	2	-		82	5.5
52	5	12	3	-		82	5.5
53	3	9	6	2		73	4.9

Lecturers response to Students' Motivation Scale

QN	Extremely important	Important	Moderately	Fairly important	Not at all important	Total	The Mean
	F	F	F	F	F		
1	4	14	2	-		82	5.5
2	6	12	1	1		82	5.5
3	7	13	-	-		87	5.8
4	10	9	1	-		94	6.3
5	4	15	1	-		83	5.5
6	3	17	-	-		83	5.5
7	2	14	3	1		77	5.1
8	11	9	-	-		91	6.1
9	4	12	3	1		79	5.3
10	1	16	3	-		78	5.2
11	6	14	-	-		86	5.7
12	9	10	1	-		88	5.9
13	8	8	4	-		84	5.6
14	3	16	1	-		82	5.5
15	2	10	6	2		74	4.9
16	6	14	-	-		86	5.7
17	4	8	5	3		73	4.9
18	9	10	-	1		87	5.8
19	2	14	3	1		77	5.1
20	7	10	3	-		84	5.6
21	7	11	2	-		85	5.7
22	2	11	4	3		72	4.8
23	4	13	3	-		81	5.4
24	7	11	2	-		85	5.7

Appendix 6.1

Students' Responses on the Scales

Students' response to Attitude Scale (N= 565).

QN	The items	SA & A		D & SD	
		Total	P	Total	P
1	I like studying science in English.	358	63.4	147	26.0
2	I would like to take all science courses in English.	184	32.6	266	47.1
3	most of my classmates enjoy studying science in English.	295	52.2	163	28.8
4	I would prefer to study science in Arabic.	344	60.9	163	28.8
5	Every student should study science in English.	256	45.3	174	30.8
6	Anyone who can study science in Arabic can study it in English.	153	27.1	225	39.8
7	Studying science in English is more interesting.	282	49.9	156	27.6
8	Studying science in English makes the subject is too difficult to understand.	378	66.9	58	10.3
9	Studying science in English will be useful to me in the future.	184	32.6	266	47.1
10	I'm glad that science is taught in Englsih.	277	49.0	159	28.1
11	I have confidence in my ability to study science in English.	349	61.8	70	12.4
12	I feel that thinking about science in English is too difficult for me.	225	39.8	222	39.3
13	Studying science in English take longer to understand it.	68	12.0	434	76.8
14	I'm wasting my time studying science in English.	340	60.2	117	20.7
15	I enjoy thinking of different ways to say the same things.	196	34.7	160	28.3

Students' Attitude Continued:

QN	The items	SA & A		D & SD	
		Total	P	Total	P
16	If I had the opportunity to change my major I would change it to social science.	243	43.0	59	10.4
17	I work hard studying science in English.	84	14.9	422	74.7
18	studying science is more difficult for me in English.	221	39.1	241	42.7
19	Science examinations in English are too difficult.	220	38.9	237	41.9
20	It is to easy to do the exam in English.	263	46.5	183	32.4

Students' Responses to Academic self-concept Scale (N= 565)

QN	The items	SA & A		D & SD	
		Total	P	Total	P
1	I feel I am as competent as my classmates.	415	73.5	32	5.7
2	I participate in class discussion.	341	60.4	127	22.5
3	I have good study skills.	369	65.3	28	5.0
4	I can fulfil academic goals.	402	71.2	29	5.1
5	I feel comfortable speaking in front of the class	292	51.7	109	19.3
6	My research skills are adequate.	226	40.0	105	18.6
7	I make efficient use of time.	222	39.3	137	24.2
8	I express beliefs and opinions in class.	245	43.4	175	31.5
9	I enjoy my classes.	348	61.6	72	12.7
10	My writing skills in English are adequate.	255	45.1	147	26.4
11	I feel prepared for academic challenges.	320	56.6	68	12.0
12	My verbal skills in English are adequate.	190	33.6	204	36.1
13	Students in class listen to what I say.	264	46.7	28	5.0
14	I have the skill to write a good research paper in English.	155	27.4	192	34.0
15	I enjoy being called on to answer in class.	312	55.2	116	20.5
16	I understand what I read for class study.	389	68.8	74	13.1
17	I feel uneasy in class.	300	53.1	56	9.9
18	I enjoy learning new ideas.	514	91.0	16	2.8
19	I feel I am an important member of class.	268	47.4	67	11.9
20	I enjoy interacting with classmates.	499	88.3	23	4.1
21	I am confident I can master skills-competency.	399	70.6	25	4.4
22	I am not afraid to be evaluated.	375	66.4	70	12.4
23	I am afraid I might fail.	156	27.6	317	55.6
24	I can process required information quickly.	243	43.0	127	22.5
25	I can understand what I have to read.	306	54.2	118	209
26	I learn new concepts easily.	224	39.6	141	25.0

Students' Responses to Academic self-concept Scale (Fourth Year. N= 222)

QN	The items	SA & A		Undecided		D & SD	
		Total	P	Total	P	Total	P
1	I feel I am as competent as my classmates.	190	85.6	1	0.4	31	14.0
2	I participate in class discussion.	139	62.6	30	13.5	53	23.9
3	I have good study skills.	163	73.4	1	0.4	58	26.1
4	I can fulfil academic goals.	174	78.4	35	15.8	13	6.9
5	I feel comfortable speaking in front of the class	103	46.4	64	28.8	55	24.8
6	My research skills are adequate.	98	44.1	84	37.8	40	18.0
7	I make efficient use of time.	87	39.2	71	32.0	64	28.8
8	I express beliefs and opinions in class.	114	51.4	49	22.1	59	26.6
9	I enjoy my classes.	132	59.5	58	26.1	32	14.4
10	My writing skills in English are adequate.	144	64.9	38	17.1	40	18.0
11	I feel prepared for academic challenges.	144	64.9	57	25.8	21	9.5
12	My verbal skills in English are adequate.	106	47.7	68	30.6	48	21.6
13	Students in class listen to what I say.	105	47.3	58	26.1	59	26.6
14	I have the skill to write a good research paper in English.	170	76.6	28	12.6	24	10.8
15	I enjoy being called on to answer in class.	116	52.3	99	44.6	7	3.2
16	I understand what I read for class study.	94	42.3	71	32.0	57	25.7
17	I feel uneasy in class.	114	51.4	60	27.0	48	21.6
18	I enjoy learning new ideas.	203	91.4	13	5.9	6	2.7
19	I feel I am an important member of class.	101	45.5	88	39.6	33	14.9
20	I enjoy interacting with classmates.	201	90.5	14	6.3	7	3.2
21	I am confident I can master skills-competency.	175	78.8	40	18.0	7	3.2

Academic Self-concept Continued:

QN	The items	SA & A		Undecided		D & SD	
		Total	P	Total	P	Total	P
22	I am not afraid to be evaluated.	160	72.0	56	25.2	6	2.7
23	I am afraid I might fail.	62	27.9	12	5.4	148	64.4
24	I can process required information quickly.	115	51.8	68	30.6	39	17.6
25	I can understand what I have to read.	157	70.7	40	18.0	25	11.3
26	I learn new concepts easily.	109	48.6	75	33.8	39	17.6
	Total	**3475**	**60.2**	**1278**	**22.1**	**1019**	**17.7**

Students' Responses to Academic self-concept Scale (FirstYear, N= 343)

QN	The items	SA & A		Undecided		D & SD	
		Total	P	Total	P	Total	P
1	I feel I am as competent as my classmates.	225	65.6	95	27.7	23	6.7
2	I participate in class discussion.	202	59.0	67	19.5	74	21.6
3	I have good study skills.	206	60.1	119	35.0	18	5.2
4	I can fulfil academic goals.	228	66.5	99	28.9	16	4.7
5	I feel comfortable speaking in front of the class	59	17.2	229	66.8	55	15.7
6	My research skills are adequate.	128	37.3	150	43.7	65	19.0
7	I make efficient use of time.	135	39.4	135	39.4	73	21.3
8	I express beliefs and opinions in class.	131	38.2	94	27.1	119	34.7
9	I enjoy my classes.	216	63.0	89	25.4	40	11.7
10	My writing skills in English are adequate.	111	32.4	123	35.9	109	31.8
11	I feel prepared for academic challenges.	176	51.3	120	35.0	47	13.7
12	My verbal skills in English are adequate.	84	24.5	103	30.0	156	45.5
13	Students in class listen to what I say	148	43.1	174	50.7	21	6.1
14	I have the skill to write a good research paper in English.	61	17.8	147	42.9	135	39.4
15	I enjoy being called on to answer in class.	207	60.3	79	28.3	57	16.6
16	I understand what I read for class study.	219	63.8	74	21.8	50	14.6
17	I feel uneasy in class.	186	54.2	99	28.9	58	16.9
18	I enjoy learning new ideas.	311	90.7	22	6.4	10	2.9
19	I feel I am an important member of class.	167	48.7	142	41.4	34	9.9
20	I enjoy interacting with classmates.	298	86.9	29	8.5	16	4.7
21	I am confident I can master skills-competency.	224	65.3	101	29.4	18	5.2

Academic Self-concept Continued:

QN	The items	SA & A		Undecided		D & SD	
		Total	P	Total	P	Total	P
22	I am not afraid to be evaluated.	215	62.7	83	24.2	45	13.1
23	I am afraid I might fail.	94	27.4	48	14.0	201	58.6
24	I can process required information quickly.	128	37.3	175	51.0	88	25.7
25	I can understand what I have to read.	149	43.4	101	29.4	93	27.1
26	I learn new concepts easily.	116	33.8	125	36.4	102	29.7
	Total	**4208**	**47.2**	**2819**	**31.6**	**1723**	**19.3**

Students' Response to Motivation Scale.

QN	The items	SA & A		D & SD	
		Total	P	Total	P
1	I try to study science in English.	472	83.5	43	7.6
2	In science I just do enough work to get along.	348	61.6	133	23.5
3	When I do something in science I usually plan carefully.	426	75.4	35	6.2
4	When I start a new project in science, I usually do not finish it.	307	54.3	88	15.6
5	When I do well in science, it is because I work for it.	477	84.4	42	7.4
6	When I do well in science, it is because I'm lucky .	434	76.8	55	9.7
7	When I have a hard problem in science, I usually keep trying to solve it.	485	85.8	28	5.0
8	When I'm in university I can't wait until the day ends.	133	23.5	282	49.9
9	After I graduate, I will continue to study science in the same specialisation.	289	51.2	62	11.0
10	I am very careful that achieving success is the basic objective in any job I do.	516	91.3	23	4.1
11	I am very careful to have realistic objectives.	475	84.1	25	4.4

Attitude scale:

QN	SA		A		U		D		SD		MSQ	
	F	P	F	P	F	P	F	P	F	P	F	P
Q1	138	24.4	220	38.9	59	10.4	76	13.5	71	12.6	1	.2
Q2	58	10.3	126	22.3	111	19.6	158	28.0	108	19.1	4	.7
Q3	96	17.0	199	35.2	106	18.8	102	18.1	61	10.8	1	.2
Q4	120	21.2	224	39.6	53	9.4	94	16.6	69	12.2	4	.3
Q5	123	21.8	133	23.5	135	23.9	106	18.8	68	12.0	0	0
Q6	37	6.5	116	20.5	187	33.1	145	25.7	80	14.2	0	0
Q7	77	13.6	205	36.3	125	22.1	111	19 6	45	8.0	2	.4
Q8	260	46.0	118	33.3	127	22.5	21	3.7	37	6.5	2	.4
Q9	58	10.3	126	22.3	111	19.6	158	28.0	108	19.1	4	.7
Q10	79	14.0	198	35.0	129	22.8	102	18.1	57	10.1	0	0
Q11	86	15.2	263	46.5	145	25.7	49	8.7	21	3.7	1	.2
Q12	41	7.3	184	32.6	113	20.0	152	26.9	70	12.4	5	.9
Q13	18	3.2	50	8.8	57	10.1	201	35.6	233	41.2	6	1.1
Q14	111	19.6	229	40.5	101	17.9	66	11.7	51	9.0	7	1.2
Q15	36	6.4	160	28.3	204	36.1	112	19.8	48	8.5	5	.9
Q16	188	33.3	85	15.0	233	41.2	51	9.0	8	1.4	0	0
Q17	13	2.3	71	12.6	52	9.2	242	42.8	180	31.9	7	1.2
Q18	41	7.3	180	31.9	97	17.2	165	29.2	76	13.5	6	1.1
Q19	42	7.4	178	31.5	100	17.7	140	24.8	97	17.2	8	1.4
Q20	43	7.6	220	38.9	114	20.2	115	20.4	68	12.0	5	.9

Motivation scale:

QN	SA		A		U		D		SD		MSQ	
	F	P	F	P	F	P	F	P	F	P	F	P
Q1	152	26.9	320	56.6	43	7.6	36	6.4	7	1.2	7	1.2
Q2	99	17.5	249	44.1	80	14.2	101	17.9	32	5.7	4	.7
Q3	123	21.8	303	53.6	100	17.7	26	4.6	9	1.6	4	.7
Q4	45	8.0	262	46.4	166	29.4	67	11.9	21	3.7	4	.7
Q5	195	34.5	282	49.9	38	6.7	31	5.5	11	1.9	8	1.4
Q6	202	35.8	232	41.1	70	12.4	42	7.4	13	2.3	6	1.1
Q7	164	29 0	321	56.8	46	8.1	21	3.7	7	1.2	6	1.1
Q8	24	4.2	109	19.3	144	25.5	169	29.9	113	20.0	6	1.1
Q9	157	27.8	132	23.4	208	36.8	43	7.6	19	3.4	6	1.1
Q10	313	55.4	203	35.9	24	4.2	17	3.0	6	1.1	2	.4
Q11	144	25.5	331	58.6	63	11.2	19	3.4	6	1.1	2	.4

Academic self-concept scale:

QN	SA		A		U		D		SD		MSQ	
	F	P	F	P	F	P	F	P	F	P	F	P
Q1	105	18.6	310	54.9	116	20.5	28	5.0	4	.7	2	.4
Q2	61	10.8	280	49.6	96	17.0	108	19.1	19	3.4	1	.2
Q3	39	6.9	330	58.4	164	29.0	25	4.4	3	.5	4	.7
Q4	80	14.2	322	57.0	128	22.7	23	4.1	6	1.1	6	1.1
Q5	75	13.3	217	38.4	163	28.8	73	12.9	36	6.4	1	.2
Q6	25	4.4	201	35.6	232	41.1	86	15.2	19	3.4	2	.4
Q7	28	5.0	194	34.3	206	36.5	114	20.2	23	4.1	0	0
Q8	25	4.4	220	38.9	141	25.0	136	24.1	42	7.4	1	.2
Q9	67	11.9	281	49.7	144	25.5	56	9.9	16	2.8	1	.2
Q10	33	5.8	222	39.3	158	28.0	112	19.8	37	6.5	3	.5
Q11	53	9.4	267	47.3	174	30.8	53	9.4	15	2.7	3	.5

Academic self-concept scale contune:

QN	SA		A		U		D		SD		MSQ	
Q12	19	3.4	171	30.3	167	29.6	151	26.7	53	9.4	4	.7
Q13	30	5.3	234	41.4	270	47.8	16	2.8	12	2.1	3	.51
Q14	18	3.2	137	24.2	214	37.9	129	22.8	63	11.2	4	.7
Q15	70	12.4	242	42.8	133	23.5	90	15.9	26	4.6	3	.5
Q16	47	8.3	342	60.5	99	17.5	54	9.6	20	3.5	3	.5
Q17	32	5.7	268	47.4	154	27.3	86	15.2	20	3.5	5	.9
Q18	239	42.3	275	48.7	34	6.0	10	1.8	6	1.1	1	.2
Q19	48	8.5	220	38 9	228	40.4	53	9.4	14	2.5	2	4
Q20	143	25.3	356	63.0	41	4.3	19	3.4	4	.7	2	.4
Q21	91	16.1	308	54.5	138	24.4	21	3.7	4	.7	3	.5
Q22	86	15.2	289	51.2	118	20.9	50	8.8	20	3.5	2	.4
Q23	33	5.8	123	21.8	93	16.5	212	37.5	102	18.1	2	.4
Q24	16	2.8	227	40.2	193	34.2	108	19.1	19	3.4	2	.4
Q25	35	6.2	271	48.0	139	24.6	88	15.6	30	5.3	2	.4
Q26	25	4.4	199	35.2	196	34.7	118	20.9	23	4.1	4	.7

Appendix 6.2

SPSS Output

S.N	sex	college	Year	GPA	Attitude	Motivation	A. self
1	1	2	2	2.64	49.00	33.00	88.00
2	1	2	2	1.77	38.00	45.00	79.00
3	1	2	2	1.59	34.00	43.00	92.00
4	1	2	2	2.94	69.00	38.00	93.00
5	1	2	1	2.21	59.00	42.00	87.00
6	1	2	1	2.31	38.00	33.00	92.00
7	1	2	1	3.84	65.00	34.00	76.00
8	1	2	1	3.25	58.00	36.00	83.00
9	1	2	1	2.89	50.00	41.00	85.00
10	1	2	1	2.49	68.00	43.00	89.00
11	1	2	1	2.86	68.00	44.00	92.00
12	1	2	1	2.79	54.00	42.00	69.00
13	1	2	1	3.04	48.00	36.00	74.00
14	1	2	1	3.32	55.00	41.00	85.00
15	1	2	1	2.14	62.00	42.00	83.00
16	1	2	1	2.04	86.00	36.00	77.00
17	1	3	1	1.60	53.00	44.00	75.00
18	1	3	1	1.91	57.00	39.00	85.00
19	1	3	1	2.19	87.00	34.00	96.00
20	1	3	1	2.04	61.00	45.00	88.00
21	1	3	1	1.45	61.00	38.00	84.00
22	1	3	1	2.99	84.00	52.00	90.00
23	1	3	1	2.14	60.00	53.00	77.00
24	1	3	1	1.76	67.00	40.00	84.00
25	1	3	1	2.30	63.00	34.00	79.00
26	1	3	1	3.00	47.00	42.00	79.00
27	1	3	1	2.30	52.00	46.00	76.00
28	1	3	1	2.50	48.00	34.00	73.00
29	1	3	1	1.49	76.00	42.00	83.00
30	1	3	1	3.41	55.00	36.00	72.00
31	1	3	1	2.50	35.00	49.00	87.00
32	1	3	1	2.67	38.00	47.00	84.00
33	1	3	1	2.66	55.00	44.00	82.00
34	1	3	1	2.40	34.00	40.00	77.00
35	1	3	1	1.79	43.00	30.00	58.00
36	1	3	1	2.41	56.00	39.00	79.00
37	1	3	1	2.82	66.00	29.00	74.00
38	1	3	1	2.30	34.00	45.00	92.00
39	1	3	1	2.09	48.00	43.00	91.00
40	1	3	2	1.78	70.00	35.00	82.00
41	1	3	2	1.68	74.00	44.00	89.00
42	1	3	2	3.14	63.00	44.00	85.00
43	1	3	2	1.22	36.00	46.00	84.00
44	1	3	2	2.34	74.00	43.00	90.00
45	1	3	2	1.56	47.00	44.00	79.00
46	1	3	2	2.13	28.00	11.00	63.00
47	1	3	2	1.77	41.00	37.00	92.00
48	1	3	2	1.84	55.00	40.00	84.00

S.N	sex	college	Year	GPA	Attitude	Motivation	A. self
49	1	4	1	.28	59.00	33.00	68.00
50	1	4	1	1.70	55.00	44.00	87.00
51	1	4	1	1.00	55.00	43.00	87.00
52	1	4	1	1.98	56.00	46.00	87.00
53	1	4	1	.51	38.00	44.00	77.00
54	1	4	1	2.54	36.00	41.00	78.00
55	1	4	2	1.69	31.00	38.00	83.00
56	1	4	2	1.46	41.00	13.00	79.00
57	1	4	2	2.82	27.00	39.00	54.00
58	1	4	2	1.86	73.00	47.00	68.00
59	1	2	1	2.35	54.00	40.00	85.00
60	1	3	1	2.61	52.00	40.00	82.00
61	1	3	1	2.86	52.00	41.00	79.00
62	1	3	2	2.84	93.00	36.00	85.00
63	1	1	1	.81	29.00	37.00	62.00
64	1	1	1	1.39	30.00	48.00	62.00
65	1	1	1	1.07	60.00	45.00	83.00
66	1	1	1	1.80	36.00	46.00	82.00
67	1	1	1	1.56	43.00	40.00	85.00
68	1	1	2	2.37	49.00	41.00	89.00
69	1	1	2	2.32	41.00	37.00	73.00
70	1	1	2	1.82	53.00	44.00	79.00
71	1	1	1	1.49	62.00	40.00	70.00
72	1	5	1	1.12	50.00	34.00	71.00
73	1	5	1	.42	48.00	38.00	93.00
74	1	5	1	.71	55.00	41.00	88.00
75	1	5	1	2.32	48.00	51.00	74.00
76	1	5	1	.29	59.00	40.00	85.00
77	1	5	1	1.05	52.00	52.00	83.00
78	1	5	1	2.54	39.00	35.00	82.00
79	1	5	1	2.70	66.00	46.00	91.00
80	1	5	1	1.80	54.00	41.00	80.00
81	1	5	1	2.52	54.00	34.00	90.00
82	1	4	1	1.89	48.00	44.00	80.00
83	1	4	1	2.14	46.00	46.00	81.00
84	1	2	2	2.97	78.00	42.00	102.00
85	1	2	2	2.49	69.00	35.00	93.00
86	1	2	2	2.24	78.00	47.00	97.00
87	1	2	2	2.70	74.00	51.00	93.00
88	1	2	2	2.66	76.00	31.00	101.00
89	1	2	2	1.79	40.00	41.00	91.00
90	1	2	2	3.05	67.00	42.00	92.00
91	1	3	2	3.51	75.00	49.00	97.00
92	1	2	2	2.25	91.00	42.00	100.00
93	1	2	2	1.98	62.00	30.00	91.00
94	1	2	2	2.58	68.00	44.00	98.00
95	1	2	2	2.98	72.00	41.00	95.00
96	1	2	2	2.19	65.00	47.00	98.00

S.N	sex	college	Year	GPA	Attitude	Motivation	A. self
97	1	2	2	3.05	77.00	45.00	102.00
98	1	2	2	2.61	80.00	42.00	98.00
99	1	2	1	2.94	62.00	48.00	101.00
100	1	2	1	2.94	57.00	39.00	90.00
101	1	2	1	3.05	64.00	49.00	93.00
102	1	2	1	2.47	65.00	50.00	98.00
103	1	2	1	3.21	74.00	55.00	98.00
104	1	2	1	2.72	56.00	41.00	97.00
105	1	2	1	2.68	60.00	47.00	92.00
106	1	2	1	2.86	62.00	37.00	94.00
107	1	3	1	2.06	66.00	44.00	91.00
108	1	3	1	3.46	83.00	51.00	91.00
109	1	3	1	2.43	58.00	47.00	89.00
110	1	3	1	3.11	55.00	45.00	103.00
111	1	3	1	2.14	57.00	44.00	90.00
112	1	3	1	3.16	57.00	47.00	90.00
113	1	3	1	.75	72.00	31.00	95.00
114	1	3	1	3.64	88.00	54.00	98.00
115	1	3	1	3.51	66.00	43.00	98.00
116	1	3	1	3.05	75.00	47.00	102.00
117	1	3	1	2.44	74.00	38.00	90.00
118	1	3	1	3.09	56.00	44.00	89.00
119	1	3	1	2.66	62.00	38.00	96.00
120	1	3	1	2.14	61.00	21.00	89.00
121	1	3	1	2.76	83.00	44.00	94.00
122	1	3	1	2.81	76.00	51.00	90.00
123	1	3	1	3.64	81.00	47.00	90.00
124	1	3	1	3.06	72.00	48.00	98.00
125	1	3	1	.00	69.00	46.00	89.00
126	1	3	1	3.06	46.00	47.00	98.00
127	1	3	1	3.46	38.00	27.00	85.00
128	1	3	1	2.69	38.00	50.00	106.00
129	1	3	1	2.74	68.00	53.00	101.00
130	1	3	1	2.89	54.00	51.00	100.00
131	1	3	1	2.79	47.00	46.00	90.00
132	1	3	2	2.98	88.00	45.00	97.00
133	1	3	2	2.58	83.00	40.00	94.00
134	1	3	2	2.15	27.00	37.00	87.00
135	1	3	2	1.90	75.00	44.00	97.00
136	1	3	2	2.00	62.00	41.00	92.00
137	1	3	2	2.66	61.00	44.00	104.00
138	1	3	2	2.43	52.00	46.00	88.00
139	1	3	2	2.29	90.00	29.00	98.00
140	1	3	2	2.44	48.00	41.00	101.00
141	1	3	2	2.16	77.00	40.00	96.00
142	1	3	2	3.18	69.00	48.00	87.00
143	1	3	2	2.59	52.00	44.00	95.00
144	1	3	2	2.89	58.00	46.00	97.00

S.N	sex	college	Year	GPA	Attitude	Motivation	A. self
145	1	3	2	2.58	89.00	44.00	105.00
146	1	3	2	2.48	73.00	43.00	91.00
147	1	3	2	3.17	78.00	34.00	96.00
148	1	4	1	2.12	54.00	44.00	94.00
149	1	4	1	.68	34.00	45.00	96.00
150	1	4	1	1.71	63.00	42.00	91.00
151	1	4	1	1.74	70.00	46.00	102.00
152	1	4	1	1.94	39.00	40.00	92.00
153	1	4	1	.78	51.00	41.00	97.00
154	1	4	1	.83	42.00	46.00	96.00
155	1	4	1	1.86	42.00	46.00	97.00
156	1	4	1	2.68	64 00	43.00	86.00
157	1	4	1	1.29	60.00	40.00	94.00
158	1	4	1	1.71	72.00	43.00	101.00
159	1	4	1	1.58	58.00	41.00	102.00
160	1	4	1	1.49	57.00	44.00	91.00
161	1	4	1	1.93	50.00	39.00	88.00
162	1	4	1	1.32	53.00	43.00	87.00
163	1	4	1	1.42	65.00	47.00	99.00
164	1	4	1	2.06	70.00	50.00	96.00
165	1	4	1	1.94	53.00	35.00	92.00
166	1	4	2	2.49	75.00	42.00	98.00
167	1	4	2	1.61	47.00	45.00	99.00
168	1	2	2	2.48	63.00	46.00	92.00
169	1	3	1	3.26	67.00	46.00	91.00
170	1	3	1	2.39	64.00	41.00	88.00
171	1	3	1	3.18	80.00	48.00	93.00
172	1	3	1	3.02	66.00	47.00	99.00
173	1	1	1	1.21	55.00	49.00	102.00
174	1	1	1	.29	56.00	47.00	94.00
175	1	1	2	2.32	48.00	35.00	94.00
176	1	1	2	2.67	69.00	50.00	94.00
177	1	1	2	2.36	38.00	46.00	94.00
178	1	1	2	2.40	70.00	44.00	88.00
179	1	1	2	3.76	68.00	49.00	92.00
180	1	1	1	1.34	51.00	41.00	96.00
181	1	1	1	2.74	49.00	42.00	92.00
182	1	5	2	2.31	56.00	35.00	91.00
183	1	5	2	2.00	67.00	39.00	101.00
184	1	5	2	1.40	34.00	48.00	78.00
185	1	5	2	2.06	52.00	39.00	98.00
186	1	5	2	2.06	65.00	42.00	101.00
187	1	5	2	1.95	66.00	43.00	104.00
188	1	5	2	1.82	60.00	44.00	95.00
189	1	5	1	1.70	46.00	41.00	96.00
190	1	5	1	.36	57.00	27.00	85.00
191	1	5	1	.89	46.00	43.00	96.00
192	1	5	1	1.07	67.00	47.00	89.00

S.N	sex	college	Year	GPA	Attitude	Motivation	A. self
193	1	5	1	3.02	78.00	45.00	107.00
194	1	5	1	1.88	35.00	43.00	92.00
195	1	5	1	1.88	61.00	50.00	93.00
196	1	5	1	2.92	48.00	44.00	94.00
197	1	5	1	1.88	47.00	52.00	97.00
198	1	2	2	2.47	82.00	43.00	106.00
199	1	2	2	2.59	78.00	41.00	104.00
200	1	2	2	2.34	84.00	53.00	110.00
201	1	2	2	2.04	60.00	33.00	93.00
202	1	2	2	3.02	77.00	46.00	108.00
203	1	2	2	2.50	88.00	48.00	113.00
204	1	3	2	3.09	86.00	40.00	100.00
205	1	2	2	2.61	75.00	48.00	105.00
206	1	2	2	2.05	61.00	44.00	101.00
207	1	2	2	2.66	87.00	45.00	87.00
208	1	2	2	2.57	87.00	45.00	103.00
209	1	2	2	2.63	87.00	44.00	103.00
210	1	2	2	2.91	70.00	46.00	100.00
211	1	2	1	3.72	70.00	49.00	97.00
212	1	2	1	2.82	63.00	55.00	106.00
213	1	2	1	3.88	50.00	56.00	111.00
214	1	2	1	2.58	56.00	41.00	100.00
215	1	2	1	2.08	61.00	49.00	113.00
216	1	2	1	3.28	69.00	53.00	108.00
217	1	2	1	3.04	90.00	49.00	105.00
218	1	2	1	2.91	60.00	54.00	110.00
219	1	2	1	2.85	62.00	52.00	100.00
220	1	2	1	1.88	81.00	50.00	114.00
221	1	3	1	1.47	43.00	55.00	119.00
222	1	3	1	2.72	83.00	39.00	107.00
223	1	3	1	3.83	76.00	51.00	110.00
224	1	3	1	2.85	72.00	50.00	98.00
225	1	3	1	2.06	73.00	50.00	104.00
226	1	3	1	2.62	75.00	50.00	116.00
227	1	3	1	2.13	74.00	53.00	104.00
228	1	3	1	2.83	59.00	28.00	98.00
229	1	3	1	3.05	65.00	45.00	100.00
230	1	3	1	3.20	72.00	47.00	108.00
231	1	3	1	2.01	26.00	49.00	107.00
232	1	3	1	2.11	83.00	47.00	108.00
233	1	3	1	1.70	61.00	46.00	107.00
234	1	3	1	2.10	71.00	54.00	110.00
235	1	3	1	2.70	44.00	38.00	98.00
236	1	3	1	1.68	42.00	45.00	100.00
237	1	3	1	2.09	73.00	45.00	98.00
238	1	3	1	3.68	70.00	46.00	97.00
239	1	3	1	3.79	76.00	47.00	101.00
240	1	3	1	2.21	81.00	50.00	113.00

S.N	sex	college	Year	GPA	Attitude	Motivation	A. self
241	1	3	1	2.70	60.00	54.00	117.00
242	1	3	1	3.06	54.00	48.00	96.00
243	1	3	1	2.00	71.00	39.00	109.00
244	1	3	1	1.49	67.00	51.00	109.00
245	1	3	1	2.69	72.00	47.00	105.00
246	1	3	1	3.30	69.00	48.00	104.00
247	1	3	1	3.53	75.00	50.00	112.00
248	1	3	1	3.47	80.00	55.00	113.00
249	1	3	1	2.94	72.00	44.00	103.00
250	1	3	2	2.35	76.00	45.00	104.00
251	1	3	2	1.78	26.00	48.00	106.00
252	1	3	2	1.80	59.00	49.00	103.00
253	1	3	2	2.14	57.00	49.00	100.00
254	1	3	2	2.41	63.00	53.00	113.00
255	1	3	2	2.33	82.00	48.00	103.00
256	1	3	2	3.08	79.00	40.00	105.00
257	1	3	2	2.10	84.00	50.00	112.00
258	1	3	2	2.26	76.00	54.00	118.00
259	1	3	2	2.47	70.00	47.00	102.00
260	1	3	2	3.17	77.00	51.00	109.00
261	1	3	2	3.18	74.00	46.00	104.00
262	1	3	2	3.37	75.00	45.00	103.00
263	1	3	2	3.35	80.00	45.00	101.00
264	1	3	2	3.17	78.00	49.00	107.00
265	1	3	2	2.78	69.00	46.00	103.00
266	1	3	2	2.49	84.00	43.00	99.00
267	1	3	2	2.98	86.00	53.00	119.00
268	1	3	2	1.70	77.00	40.00	109.00
269	1	3	2	3.18	69.00	48.00	104.00
270	1	4	1	1.98	59.00	53.00	104.00
271	1	4	1	2.09	87.00	47.00	103.00
272	1	4	1	1.98	56.00	50.00	104.00
273	1	4	1	2.12	74.00	38.00	108.00
274	1	4	1	2.34	47.00	51.00	106.00
275	1	4	1	1.69	53.00	50.00	98.00
276	1	4	1	1.70	65.00	50.00	104.00
277	1	4	1	2.13	71.00	44.00	111.00
278	1	4	1	1.28	48.00	49.00	98.00
279	1	4	1	.40	62.00	51.00	112.00
280	1	4	2	3.19	76.00	46.00	103.00
281	1	4	2	1.90	77.00	40.00	102.00
282	1	4	2	2.16	73.00	51.00	113.00
283	1	4	2	2.06	65.00	47.00	98.00
284	1	4	2	2.01	77.00	41.00	111.00
285	1	4	2	2.97	73.00	50.00	112.00
286	1	4	2	2.55	57.00	51.00	105.00
287	1	4	2	2.60	76.00	46.00	100.00
288	1	4	2	2.29	73.00	56.00	115.00

S.N	sex	college	Year	GPA	Attitude	Motivation	A. self
289	1	4	2	1.90	43.00	45.00	103.00
290	1	4	2	2.49	79.00	46.00	106.00
291	1	4	2	2.51	90.00	53.00	123.00
292	1	4	2	3.02	85.00	46.00	110.00
293	1	4	2	1.96	87.00	42.00	100.00
294	1	4	2	1.97	60.00	46.00	107.00
295	1	4	2	3.69	92.00	47.00	110.00
296	1	3	1	2.40	65.00	52.00	108.00
296	1	3	1	2.28	51.00	47.00	101.00
298	1	1	1	.56	55.00	47.00	105.00
299	1	1	1	1.67	53.00	50.00	107.00
300	1	1	1	3.38	47.00	41.00	101.00
301	1	1	1	1.16	45.00	29.00	102.00
302	1	1	1	3.00	76.00	47.00	107.00
303	1	5	2	2.62	89.00	49.00	130.00
304	1	5	2	1.93	71.00	48.00	101.00
305	1	5	2	1.86	72.00	48.00	104.00
306	1	5	2	2.20	89.00	49.00	102.00
307	1	5	2	2.83	74.00	48.00	110.00
308	1	5	2	2.85	82.00	46.00	104.00
309	1	5	2	2.81	62.00	49.00	105.00
310	1	5	2	2.59	84.00	52.00	126.00
311	1	5	2	1.96	75.00	49.00	104.00
312	1	5	2	2.06	65.00	44.00	109.00
313	1	5	2	2.43	77.00	53.00	108.00
314	1	5	2	2.59	64.00	42.00	115.00
315	1	5	2	2.81	64.00	44.00	104.00
316	1	5	1	1.74	48.00	48.00	107.00
317	1	5	1	2.02	65.00	56.00	109.00
318	1	5	1	1.61	35.00	47.00	106.00
319	1	5	1	.42	86.00	51.00	116.00
320	1	5	1	2.21	81.00	41.00	102.00
321	1	5	1	1.77	75.00	46.00	102.00
322	1	5	1	2.83	68.00	48.00	105.00
323	1	5	1	2.18	66.00	47.00	101.00
324	1	5	1	2.30	60.00	56.00	107.00
325	1	5	1	3.72	79.00	31.00	99.00
326	1	5	1	1.42	62.00	44.00	113.00
327	1	5	1	2.90	77.00	56.00	115.00
328	1	5	1	1.94	81.00	39.00	116.00
329	1	5	1	3.30	67.00	52.00	105.00
330	1	5	1	2.70	61.00	54.00	105.00
331	1	5	1	2.86	58.00	46.00	97.00
332	1	4	1	2.00	57.00	56.00	91.00
333	1	2	2	1.87	83.00	32.00	109.00
334	2	2	2	3.02	80.00	35.00	80.00
335	2	2	2	2.08	61.00	37.00	62.00
336	2	2	2	2.33	58.00	49.00	87.00

S.N	sex	college	Year	GPA	Attitude	Motivation	A. self
337	2	2	2	1.27	78.00	36.00	85.00
338	2	2	2	2.76	66.00	37.00	53.00
339	2	2	2	2.43	56.00	53.00	91.00
340	2	2	2	2.93	64.00	36.00	82.00
341	2	2	2	1.83	75.00	44.00	88.00
342	2	2	1	3.30	53.00	38.00	83.00
343	2	2	1	2.56	70.00	48.00	87.00
344	2	2	1	3.05	44.00	53.00	85.00
345	2	2	1	2.84	74.00	43.00	85.00
346	2	2	1	2.74	67.00	48.00	89.00
347	2	2	1	3.46	70.00	48.00	85.00
348	2	2	1	1.94	73.00	35.00	83.00
349	2	2	1	2.18	62.00	39.00	86.00
350	2	2	1	3.39	66.00	41.00	77.00
351	2	2	1	2.46	47.00	39.00	66.00
352	2	2	1	2.75	77.00	45.00	84.00
353	2	2	1	1.94	72.00	49.00	80.00
354	2	2	1	2.42	61.00	48.00	87.00
355	2	2	1	1.68	62.00	44.00	86.00
356	2	2	1	2.84	78.00	40.00	81.00
357	2	4	1	2.48	22.00	49.00	50.00
358	2	4	1	1.78	76.00	40.00	88.00
359	2	4	1	1.13	62.00	42.00	86.00
360	2	4	1	1.29	57.00	39.00	77.00
361	2	4	1	1.96	20.00	48.00	49.00
362	2	4	1	.46	42.00	42.00	71.00
363	2	1	1	3.41	67.00	49.00	84.00
364	2	1	1	2.42	44.00	40.00	60.00
365	2	1	1	2.66	70.00	41.00	96.00
366	2	1	1	2.40	42.00	40.00	79.00
367	2	1	1	2.28	56.00	38.00	76.00
368	2	1	1	2.36	59.00	50.00	84.00
369	2	1	1	3.58	69.00	38.00	76.00
370	2	1	1	3.71	70.00	48.00	82.00
371	2	1	1	1.90	40.00	45.00	84.00
372	2	1	1	3.00	31.00	46.00	75.00
373	2	1	1	2.94	52.00	44.00	83.00
374	2	1	1	3.88	35.00	48.00	65.00
375	2	1	1	3.30	25.00	42.00	81.00
376	2	1	1	2.40	37.00	43.00	72.00
377	2	1	1	3.12	24.00	46.00	88.00
378	2	1	1	2.52	30.00	38.00	79.00
379	2	1	1	3.60	22.00	47.00	71.00
380	2	1	1	3.18	36.00	46.00	90.00
381	2	1	1	3.00	54.00	49.00	82.00
382	2	1	2	2.21	65.00	40.00	80.00
383	2	1	2	1.44	48.00	38.00	83.00
384	2	1	2	1.67	35.00	43.00	77.00

S.N	sex	college	Year	GPA	Attitude	Motivation	A. self
385	2	1	2	2.06	35.00	43.00	73.00
386	2	1	2	1.47	26.00	39.00	76.00
386	2	1	2	2.51	22.00	38.00	95.00
388	2	1	2	2.19	26.00	26.00	57.00
389	2	1	2	2.13	32.00	29.00	87.00
390	2	1	2	1.34	68.00	37.00	83.00
391	2	1	2	3.15	41.00	37.00	84.00
392	2	1	2	2.46	57.00	41.00	89.00
393	2	1	2	2.13	56.00	38.00	92.00
394	2	1	2	1.38	22.00	10.00	55.00
395	2	1	2	2.25	53.00	38.00	80.00
396	2	1	2	2.19	56.00	38.00	87.00
397	2	1	2	2.73	37.00	42.00	78.00
398	2	1	2	2.63	42.00	37.00	72.00
399	2	1	2	2.78	37.00	40.00	66.00
400	2	1	2	1.86	35.00	38.00	73.00
401	2	1	1	2.95	73.00	46.00	90.00
402	2	1	1	2.23	35.00	45.00	80.00
403	2	1	1	2.23	32.00	39.00	66.00
404	2	1	1	2.98	53.00	41.00	73.00
405	2	1	1	2.29	54.00	43.00	81.00
406	2	1	1	1.80	57.00	44.00	88.00
407	2	1	1	2.10	24.00	44.00	67.00
408	2	1	1	2.86	64.00	32.00	84.00
409	2	1	1	3.40	55.00	44.00	58.00
410	2	1	1	2.29	52.00	45.00	85.00
411	2	1	1	2.51	42.00	47.00	81.00
412	2	5	2	2.18	74.00	37.00	84.00
413	2	5	2	1.55	49.00	40.00	91.00
414	2	5	2	2.10	59.00	42.00	79.00
415	2	5	2	2.55	69.00	29.00	73.00
416	2	5	2	1.60	78.00	45.00	79.00
417	2	5	1	1.89	57.00	48.00	85.00
418	2	5	1	2.52	45.00	46.00	77.00
419	2	5	1	2.19	54.00	40.00	81.00
420	2	5	1	2.68	75.00	43.00	77.00
421	2	5	1	3.00	67.00	47.00	86.00
422	2	1	1	2.03	53.00	44.00	82.00
423	2	1	1	2.99	27.00	46.00	77.00
424	2	1	1	2.68	20.00	18.00	38.00
425	2	1	1	2.29	55.00	46.00	80.00
426	2	2	2	2.32	75.00	44.00	87.00
427	2	2	2	1.81	38.00	42.00	91.00
428	2	2	2	2.11	65.00	52.00	93.00
429	2	2	2	2.57	73.00	49.00	96.00
430	2	2	2	2.48	76.00	40.00	97.00
431	2	2	2	1.86	55.00	40.00	89.00
432	2	2	2	2.04	66.00	36.00	90.00

S.N	sex	college	Year	GPA	Attitude	Motivation	A. self
433	2	2	1	3.46	53.00	47.00	87.00
434	2	2	1	3.70	39.00	43.00	91.00
435	2	2	1	3.46	56.00	42.00	84.00
436	2	2	1	3.11	68.00	43.00	87.00
437	2	2	1	2.75	72.00	44.00	96.00
438	2	2	1	3.49	84.00	52.00	97.00
439	2	2	1	3.38	63.00	41.00	90.00
440	2	2	1	2.77	63.00	41.00	76.00
441	2	2	1	2.81	67.00	43.00	92.00
442	2	2	1	3.02	64.00	46.00	97.00
443	2	2	1	2.86	72.00	33.00	92.00
444	2	2	1	1.86	75.00	44.00	98.00
445	2	4	2	4.42	79.00	45.00	99.00
446	2	4	2	1.67	72.00	44.00	91.00
447	2	2	1	3.70	73.00	42.00	102.00
448	2	2	2	1.79	81.00	38.00	96.00
449	2	1	1	2.82	63.00	49.00	100.00
450	2	1	1	1.59	40.00	46.00	94.00
451	2	1	1	2.63	74.00	40.00	94.00
452	2	1	1	2.00	70.00	44.00	90.00
453	2	1	1	3.60	64.00	43.00	88.00
454	2	1	1	3.46	48.00	45.00	91.00
455	2	1	1	2.50	68.00	51.00	101.00
456	2	1	1	1.76	58.00	44.00	89.00
457	2	1	1	3.72	75.00	48.00	95.00
458	2	1	1	3.42	55.00	44.00	91.00
459	2	1	2	2.65	74.00	44.00	98.00
460	2	1	2	2.29	79.00	34.00	94.00
461	2	1	2	3.01	56.00	50.00	97.00
462	2	1	2	2.37	49.00	42.00	94.00
643	2	1	2	3.69	87.00	45.00	95.00
464	2	1	2	2.69	68.00	43.00	92.00
465	2	1	2	2.22	70.00	49.00	99.00
466	2	1	2	1.99	35.00	39.00	89.00
467	2	1	2	2.45	73.00	50.00	97.00
468	2	1	2	2.87	68.00	42.00	90.00
469	2	1	2	1.84	65.00	34.00	92.00
470	2	1	2	2.23	70.00	49.00	97.00
471	2	1	2	2.81	69.00	49.00	101.00
472	2	1	2	1.67	40.00	42.00	94.00
473	2	1	2	2.76	72.00	43.00	90.00
474	2	1	2	2.22	47.00	45.00	88.00
475	2	1	2	2.75	52.00	45.00	89.00
476	2	1	2	2.59	58.00	38.00	90.00
477	2	1	1	2.31	49.00	44.00	91.00
478	2	1	1	2.29	53.00	46.00	89.00
479	2	1	1	3.36	42.00	50.00	93.00
480	2	1	1	2.10	40.00	40.00	89.00

S.N	sex	college	Year	GPA	Attitude	Motivation	A. self
481	2	1	1	3.11	50.00	48.00	91.00
482	2	1	1	3.13	55.00	42.00	101.00
483	2	1	1	2.40	72.00	49.00	95.00
484	2	1	1	3.21	43.00	50.00	93.00
485	2	1	1	2.44	55.00	41.00	83.00
486	2	1	1	2.18	59.00	48.00	85.00
487	2	1	1	2.37	59.00	44.00	90.00
488	2	5	2	3.26	72.00	46.00	95.00
489	2	5	2	2.55	53.00	46.00	94.00
490	2	5	2	1.77	68.00	43.00	96.00
491	2	5	2	2.25	79.00	40.00	98.00
492	2	5	2	3.05	98.00	39.00	100.00
493	2	5	2	1.77	67.00	41.00	95.00
494	2	5	2	2.88	67.00	45.00	92.00
495	2	5	2	2.27	83.00	38.00	96.00
496	2	5	2	2.15	67.00	39.00	92.00
497	2	5	2	2.21	74.00	47.00	98.00
498	2	5	2	2.14	44.00	43.00	86.00
499	2	5	1	3.19	71.00	25.00	94.00
500	2	5	1	2.24	38.00	29.00	98.00
501	2	5	1	3.33	80.00	49.00	93.00
502	2	5	1	3.15	40.00	31.00	86.00
503	2	5	1	1.96	76.00	40.00	95.00
504	2	5	1	3.02	79.00	45.00	88.00
505	2	5	1	3.04	58.00	45.00	91.00
506	2	5	1	3.64	67.00	46.00	99.00
507	2	1	1	1.91	46.00	44.00	87.00
508	2	2	2	1.59	83.00	44.00	101.00
509	2	2	2	3.29	66.00	53.00	103.00
510	2	2	2	3.56	91.00	34.00	104.00
511	2	2	2	2.79	75.00	45.00	102.00
512	2	2	1	3.51	76.00	46.00	99.00
513	2	2	1	2.89	68.00	58.00	102.00
514	2	2	1	2.72	76.00	50.00	99.00
515	2	2	1	3.51	73.00	49.00	100.00
516	2	2	1	2.25	53.00	32.00	88.00
517	2	2	1	2.35	70.00	53.00	99.00
518	2	2	1	3.16	66.00	35.00	87.00
519	2	4	1	1.74	51.00	46.00	103.00
520	2	4	1	2.00	68.00	43.00	98.00
521	2	1	1	2.79	81.00	48.00	119.00
522	2	1	1	3.66	81.00	53.00	116.00
523	2	1	1	2.66	51.00	46.00	98.00
524	2	1	1	3.72	50.00	51.00	102.00
525	2	1	1	3.88	40.00	48.00	95.00
526	2	1	1	3.72	45.00	49.00	110.00
527	2	1	1	3.72.	44.00	49.00	99.00
528	2	1	2	2.03.	77.00	53.00	115.00

S.N	sex	college	Year	GPA	Attitude	Motivation	A. self
529	2	1	2	2.40.	87.00	43.00	112.00
530	2	1	2	1.54.	46.00	40.00	96.00
531	2	1	2	2.13	89.00	43.00	108.00
532	2	1	2	2.81	90.00	50.00	110.00
533	2	1	2	1.41	64.00	45.00	93.00
534	2	1	2	2.14	41.00	46.00	98.00
535	2	1	2	2.88	72.00	45.00	97.00
536	2	1	2	2.16	91.00	50.00	117.00
537	2	1	1	3.21	50.00	45.00	102.00
538	2	1	1	1.42	72.00	52.00	109.00
539	2	1	1	2.89	95.00	52.00	102.00
540	2	1	1	2.85	89.00	55.00	103.00
541	2	1	1	2.08	80.00	56.00	115.00
542	2	1	1	2.98	43.00	51.00	104.00
543	2	1	1	3.18	41.00	47.00	96.00
544	2	1	1	3.31	88.00	48.00	112.00
545	2	5	2	1.87	61.00	49.00	102.00
546	2	5	2	2.95	80.00	43.00	103.00
546	2	5	2	2.87	83.00	47.00	105.00
548	2	5	2	2.14	73.00	41.00	100.00
549	2	5	2	2.39	70.00	48.00	102.00
550	2	5	2	2.32	83.00	41.00	107.00
551	2	5	2	2.44	94.00	44.00	117.00
552	2	5	2	1.97	88.00	55.00	119.00
553	2	5	1	3.44	77.00	48.00	107.00
554	2	5	1	2.68	84.00	39.00	103.00
555	2	5	1	2.76	82.00	31.00	108.00
556	2	5	1	2.79	73.00	49.00	112.00
557	2	5	1	2.14	76.00	54.00	104.00
558	2	5	1	2.90	70.00	56.00	100.00
559	2	5	1	3.11	74.00	47.00	101.00
560	2	5	1	2.23	69.00	47.00	105.00
561	2	5	1	2.90	78.00	50.00	108.00
562	2	5	1	2.25	65.00	50.00	103.00
563	2	5	1	3.10	73.00	50.00	98.00
564	2	5	1	3.29	76.00	46.00	105.00
565	2	1	1	2.62	51.00	46.00	107.00