

# THE FACTORS INFLUENCING MALE SECONDARY SCHOOL STUDENTS' CHOICE OF EDUCATIONAL TRACK IN SAUDI ARABIA: SCIENCE VERSUS THE ARTS By <br> Mansour Ahmed Ghawanni 

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By
Mansour Ahmed Ghawanni

This study was undertaken to understand the process by which Saudi male secondary students select either Science or the Arts as an educational track at the end of grade ten. This decision is critical because it can influence options open to students for university study and for carrers. To understand this process, it was necessary to identify and study factors that influence students' decisions.

The randomly selected sample consisted of 100 tenth grade males and 100 eleventh and twelfth grade males attending five secondary schools in Medina, Saudi Arabia.

Six factors which influence choice of educational track were identified and studied: (a) students' interest, (b) teachers' attitudes, (c) teaching methods, (d) restrictions of the system, (e) difficulty of the curriculum, and (f) family influence. Questionnaires were developed and
administered, and interviews conducted to identify students' attitudes and opinions about these six factors.

To validate the students' responses additional interviews were conducted of randomly selected students and their parents, teachers, and school principals. Descriptive statistics, such as means, standard deviations, frequencies, and percentages were used to analyze the data which were obtained from the questionnaires, interviews and government documents. Statistical techniques employed were the Multivariate Analysis of Variance (MANOVA) and univariate $F$ test.
"Students' interest" influenced the selection of educational track more than other factors studied. Also deemed important by all subject groups were "teachers' attitudes" and "teaching methods."
"Restrictions of the system" were perceived by students to be influential, but were considered less important by their parents, teachers, and principals. "Difficulty of the curriculum" was identified as an influencing factor by students of the Arts and by school personnel. The least important of the six factors was "family influence." Parents and school personnel stated that "family influence" should be more of a factor in the students' choice of educational track.

Most parents preferred that their sons choose the Science track. That track would also be the choice of most
students, including many now enrolled in the Arts, if other factors (e.g., "difficulty of the curriculum") were not considered.

Choice of educational track was also influenced by students' career preference and plans for future study.


In The fane Of Allah
The Mereiful, The Compassionate
"O my Lord! advance me In knowledge"

## Dedication

To my mother Nazeeha (May Allah forgive her and let her soul rest in peace) for her advice and encouragement.
To my father, Ahmed, for his encouragement, support and prayers.
To my wife, Fouziah for her patience and encouragement at all times.
To my son Mohammad and daughter Bian for reducing all the difficulties $I$ faced in my program with their smiles.

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reducing, with their cheerful smiles, the difficulties $I$ faced during my doctoral program.

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THE PROBLEM

Saudi Arabia, like many of the rapidly developing countries, has some problems with its educational system, an otherwise powerful tool in achieving modern industrial and social goals. Educational programs in Saudi Arabia vary according to educational policy that is developed considering human resource needs and demands.

The Ministry of Education has emphasized building schools throughout the Kingdom, from pre-elementary schools to secondary schools, community colleges ( 2 years of study) and science and mathematics centers (3 years of study). The Ministry has also emphasized, to a lesser extent, the provision of centers for adult education and literacy, special education, technical education and teacher training.

The country's leaders believe, that Saudi Arabia is in serious need of additional students trained in the Sciences. Presently, it depends heavily on non-Saudi workers to fill a variety of jobs in science-related fields, such as, science teaching, medicine, engineering, medical technology, and
computer science. The government encourages students to enroll in these high priority programs. As one official document states:
The government wants to ensure that general
educational programs reflect economic
concerns...and will be relevant to available work
opportunities. It is giving encouragement to
study in priority degree programs such as
science, medicine, engineering, and agriculture.
It is also working to strengthen technical and
vocational training. (Saudi Arabia, l982, p.2)

Also, there is a significant demand for people trained in the Sciences for which there are unlimited jobs and locations available. Arts track have more limited choices of places and jobs.
The government, in conformity with national
strategy, seeks to improve the responsiveness of
the education and training system to the needs of
economy by ensuring that in higher education
appropriate numbers of secondary school graduates
enter such priority degree programs as science,
medicine, engineering, agriculture, etc.
(Ministry of planning, 1980, p. 305).

In spite of government priorities, there continue to be serious disparities between the number of students who choose the Sciences and the number that are needed to meet the demands for Science graduates.
...there are regional disparities in the
percentage of the age group enrolled in the
general education, and a continuing bias in
secondary education toward arts as opposed to the
sciences.... There are further imbalances due to
excessive enrollments in low priority fields of
study (largely as continuation of the arts bias

```
in secondary schools). There are also imbalances
in the structure of enrollments due to the
excessive time required by students to complete
their studies. (Ministry of Planning, l980,
p.292).
```

The Saudi government, has put a very heavy emphasis on the economic dimensions of development. In addition, the rapid growth of industry and agriculture has put tremendous pressure on the Saudi social system which has had an important effect on the demand for human resources.

The development of Saudi human resources stands at the heart of the development process. The national development plan aims at the formulation of policies necessary for development of these human assets. (Ministry of Planning, 1980, p. 287)

Saudi Arabia is developing through the labor of nonSaudi workers because of constraints on the growth of the Saudi workforce.

Labor force development has greatly affected the rate of implementation of development projects during the First Plan period. As the requirement for skilled workers builds up, the continued large-scale expansion of the non-Saudi segment of the labor force becomes more and more evident. (Ministry of Planning, 1975, p. 215)

High school students are considered to be one of the major sources of supply to satisfy the demand for workers. Although the number of the Saudi students increases each year, the shortage of apropriately trained human resources in the country cannot be solved by simply increasing the
number of high school graduates. Those responsible for educating and training the future workforce may pay attention to the mix of skills needed to increase its productivity to sustain the nation's economic growth.

The Science curriculum has the potential for providing students with knowledge and skills relevant to Saudi Arabia's economic development. However, in the government's view, too few students elect Science, even though more than 50 percent of the students do select that educational track.

## Statement of the Problem

The proportion of students electing the Science track in Saudi high schools has not changed significantly over the past two decades. In fact, the proportion is going down, (see Table l.l). However, efforts have been made to increase the proportion of students entering the Science track, such as providing higher stipends for science and engineering studies. Government policy states:
...imbalances in enrollments exist which despite corrective measures (such as higher stipends for science and engineering studies) already implemented, will require adjustment in the Third Plan period. This will be accomplished by controlling the growth of certain branches of higher education, improving admission requirements and opening up vocational-oriented post-secondary education programs. (Ministry of Planning, 1980, p. 290)

SOURCE: Educational Statistics in the Kingdom of Saudi Arabia, 1974.

Although more high school students are enrolling in the science fields, their numbers are still not sufficient for the country's needs, partly because of a bias in the educational system's rules that favors enrollments in the Arts rather than the Sciences. For example, students in the Science track are able to change at any time to the Arts track, even after entering higher education, but students who are in the Arts curriculum cannot transfer to the Sciences unless they return to the eleventh grade (see Figure l.l). Other factors that may influence the choice of Science or Arts are discussed later in this report.

The country's monarch, King Fahad, has spoken about the need for additional Science majors. When King Fahad met with students who are studying outside the Kingdom, he was asked to recommend academic majors that the government perceives as needed, and in which it would encourage students to epecialize. King Fahad emphasized that any scientific majors will help the country, although both Science and Arts are helpful. In a speech given on August 20, 1984 at Jeddah, Saudi Arabia, King Fahah said:
...the science major in its several branches such as technology, the oil major and its production, engineering, road engineering, electrical engineering are all very helpful so we need to work as best as we can to produce as many graduates in these majors as we can. The benefits of these majors are great and it will be many years before your country has enough of such Saudi expertise...

FIGURE 1.l: Restricted directions of educational choice in Saudi Arabia.

That does not mean the students who do not major in science are not helpful for the country, both majors are helpful but they are not of the same benefit because the country's need is for more scientists. The Arts students may work as teachers or workers in the government or elsewhere. No doubt we need both fields but I prefer as many as can to major in science because of its benefits.

The need to increase the numbers majoring in the Sciences is not new. In l971, plans were proposed to help increase students majoring in the Sciences by increasing the science and math taught to prospective teachers in colleges of education.

> ...to increase the numbers of the high school graduates in the science major, the higher education institutes would provide a special program, for students of the Arts and Religion, of the most important foundation of Science and Mathematics and other subjects which are required in the Sciences and in technical colleges.... Erom lig7, when the proposed plan would start, the Colleges of Education should be focusing on the need for certain subjects which are needed most, such as Science, mathematics, and English. (Zafer, 1971, pp. 221,224$)$

In spite of the consideration given this problem and the various efforts to overcome it, the trend in favor of the Arts and away from Science has not changed. Table l.l shows that the actual number of students enrolling in science programs has increased. However, there has been a decrease in the percentage of students choosing Science as a field. Overall, this trend was downward from 1980 to 1982, with corresponding increases in the percentage
Percentage
(Science)
(şオシ)
FIGURE 1.2: Comparision of all Saudi Arabia students enrolling in Arts or Science,
of students who choose the Arts field (See Figure 1.2). In 1980, the percentage of students enrolling in Science programs was 54.8 percent, but by 1982 this had decreased to 52.3 percent, a drop of about 2.5 percent.

Table 1.2 and Figure 1.3 show Science and Arts enrollments and percentages, 1980-1983, for the city of Medina. In 1980, the percentage of students who chose Science was 64 percent, but by 1983 the percentage was 60.4 percent which means it was reduced by 3.6 percent.

It is apparent that there is a percentage difference between Medina and the rest of Saudi Arabia during the same years. The difference is partially explained by the fact that residents of the city of Medina have been exposed to more formal education than their rural counterparts. Higher educational levels and the resulting exposure to modern ideas may explain why there seems to be greater interest in Science. The smaller percentage of students choosing Science in the entire Kingdom may be due to including in that calculation the choices of all rural inhabitants whose educational levels are lower and exposure to modern civilization minimal.

So it appears that the choices of the students in secondary schools run counter to the stated need for Science majors.

SOURCE: Educational Statistics in the Kingdom of Saudi Arabia, 1974
fercentage

66
(Science)
YFAR
1982
FIGURE 1.3: Medina students' choices between Arts or Science

## Purpose of the Study

The purpose of this study was to understand the processes by which secondary students and their parents make decisions about the selection of an educational track and the forces that influence their choice.

The first task in understanding these processes was to identify those factors which influence the choice of an area of study among high school students in Saudi Arabia.

Programs or curricula at the high school level are divided into two educational tracks: Arts and Sciences. The government emphasizes choosing a scientific curriculum, but the number of students who choose Science is not yet sufficient to satisfy the country's needs. Moverover, the percentage of students enrolling in Science has decreased during the last six years. Therefore, one purpose of this study was to determine the chief factors that influence students' choice of a curriculum, and the relative strength of these factors in the students' decision. A second purpose was to discover how these factors influenced the decision-making process.

By knowing the most salient factors related to students' choice of educational track, the government might use mass media (e.g., T.V.. radio and newspaper) in an educational campaign to attract students to the educational track that government priorities supported. The government
could also change national policies to encourage students to choose an alternative consistent with those priorities. For instance, more attractive salaries could be provided to graduates who choose the Science track.

The factors were selected after a review of relevant literature and the investigator's pilot study in Medina. During the pilot study, the investigator visited each of five secondary schools in Medina and conducted an interview, lasting about 30 minutes, with each principal. Questions were asked about the factors that affect students' choice of educational track. The investigator selected the factors that most of the principals identified. These factors are listed below:

1. Students' Interests. Some students may not like to study mathematics, biology, chemistry, physics, or geology, because they find it boring, they dislike working in labs, or they are simply more interested in social studies, religion, etc.
2. Teaching Methods. A majority of the teachers in Science in most schools are foreigners, and they may lack teaching skills, may use unfamiliar examples from their own cultures, and this may cause difficulty for Saudi students in understanding the materials.
3. Teachers' Attitudes. Some of the teachers, including the foreign teachers, may feel their work is just a job they do to earn money, rather than taking pride in good teaching
and their students' achievements. Also, the syllabus is long and complex and they may feel they will not have time to be friendly with the students or give them individual attention and assistance. Students may prefer an Arts curriculum which is less demanding and teachers can deal with students in a more humane manner.
4. The Difficulty of The Curriculum. Many students find the Sciences more difficult than the Arts; the memorization of more specific, detailed materials demands much more time and (usually) the completion of daily homework. In addition, even those students who would like to study science, may find the math component prohibitive. On the other hand, the Arts curricula contains more general material and it is perceived, generally, to require less study time.
5. Family Influence. Some parents may need their older children to help them by working in a shop or establishment, so they encourage them to choose the Arts field because it is perceived to require less time than the Sciences.
6. Restrictions of the System. After the tenth grade, the students decide on whether they wish to continue in Arts or Science. Later on the students who are in Science can change to Arts by taking a pretest in Arts material, but students who are in Arts cannot change to Science, unless they start the eleventh grade again. So if an individual decides he is interested in Science during eleventh or
twelfth grade or after he has finished the high school Arts curriculum, he cannot elect to go into science unless he starts the eleventh grade over again.

## Research Questions

The following research questions were used to guide the researcher to ensure that the purposes of the study were fulfilled.

1. How are the decisions about the educational track made? That is, who discusses it with the students and when is the decision made?
2. What are the most significant factors influencing students' choice of educational track. That is, what is the degree of influence of: students' interests, teaching methods, teachers' attitudes, the difficulty of the curriculum, family influence, and restrictions of the system?
3. How do students from different grades and tracks, their families, teachers and principals differ in their perceptions of the factors influencing students' choice of educational track.

## Importance of The Study

In an effort to determine answers to the research questions, the investigator analyzed the effects of: (a) students' interests, (b) teachers' attitudes, (c) teaching methods, (d) family influence, (e) the difficulty of the curriculum and (f) restrictions of the system on students' choice of educational track.

If the research findings showed significant relationships or patterns between one or more of the above factors and students' choice of Arts or Science as a major field of study, then the importance and usefulness of the findings may be three-fold: (a) any significant relationships or patterns may provide a better understanding of factors shaping the tendencies of students in choosing or changing their areas of study; (b) examining any significant relationships or patterns may help educational planners to encourage programs that can assist in improving the technological capacity of the workforce; and (c) exploring patterns or relationships revealed by the study may help to provide insight into how students' choices of educational track which could allow changes in educational policy and the process of implementing that policy.

## Delimitations And Generalizability

The research was limited to tenth, eleventh and twelfth grade male students in five high school in Medina, Saudi Arabia. It was limited to students in these grades because students completing tenth grade and continuing in the academic programs (rather than commercial or vocational programs) must choose either Science or Arts as their educational track, a serious and important choice which definitely shapes their future lives.

The study was limited to male students because the primary data collection procedures, personal interviews, is permitted only with members of the same sex, which is in accordance with Islamic law and customs. The investigation involved male students, their fathers, and male school personnel.

Research was limited to five high schools in Medina because of the large number of persons to be surveyed or interviewed. The plan for the study required selecting subjects from five different categories (i.e., loth grades, regardless of major; 11 th graders in Arts and Science; l2th graders in Arts and Science)--and interviewing a minimum of three different persons associated with each student (father, teacher, school administrator).

Another delimitation was that the investigator originally selected nine factors that might affect the students' choice of field of study, but had to eliminate the three least important factors before the pilot study to keep the questionnaire from becoming too lengthy. It was considered better to ask a reasonable number of questions about fewer factors than to ask too few questions about many factors. Factors eliminated were (a) peer influence, (b) the reward system, and (c) intentions to leave school.

Although the population for this study was limited, it was anticipated that findings may well have implications for other high schools in Saudi Arabia. With proper
replication, similar results may be generated throughout the country. This claim can be made because Saudi schools are not like U.S. schools where state and local control leads to variation in curricula, graduation requirements, and teaching methods. Saudi schools are characterized by centralized authority. All of the above elements are controlled by the Ministry of Education which specifies identical programs for all schools. The sameness of every other Saudi high school to the five schools in the study may enhance the generalizability of research findings.

## Definitions Of Terms

Clear understanding of specifications which appear in the research is important. For the purposes of this study, the following terms are defined as indicated in this section.

Science Educational Track or Major.--A branch of Saudi secondary education that is one of the two academic choices which may be elected after the tenth grade. Emphasis in the Science track is on courses in math and various scientific subjects which prepare high school science graduates for higher (and professional) education and careers in engineering, medicine and other science-related fields. Students in the Science curriculum have the following weekly schedule: religion (3 classes), Arabic language (6 classes), math (8 classes), sciences (13 classes), physical training
(1 class), and English (6 classes). Science majors may transfer to the Arts curriculum at any time.

Arts Educational Track or major. -- An academic curriculum which, like the Science major, can be chosen only after the tenth grade. Students who choose the Arts track are enrolled in courses which emphasize the humanities and arts and prepare them for higher education and/or employment in teaching, government service, and other non-science related fields. The weekly schedule of Arts courses consists of religion (4 classes), Arabic language (ll classes) social studies (12 classes), physical training (l class) and English (8 classes). Arts majors may not transfer to the Science track without beginning at the llth grade entry--even if they are beyond the llth grade (Abdullah, 1982). This is generally considered to be the easier of the two academic choices open to Saudi high school students.

Five-Year Development Plans. Since 1970, Saudi Arabia's social and economic development has been guided by three five-year plans (1970-1975, 1975-1980, 1980-1985). These comprehensive plans identify the country's overall goals in various areas (e.g., education, industry, agriculture, health and welfare and labor). The development plans also project ways and means for meeting those goals in the short, intermediate and/or long term. All government ministries-and much of the private sector--contribute
expertise and data to the Ministry of Planning which publishes the final five-year plan after approval of the country's rulers. These plans are important to this study because Saudi students' choice of educational track has direct implications for economic, industrial and educational planning.

Field of Study. To facilitate translation of research forms into Arabic "field of study" was used instead of "educational track". However, for the purposes of this report they are synonymous and can be used interchangeably.

## Plan Of Presentation

Following a discussion of issues related to the research problem in Chapter I, a review of government documents and related literature is presented in Chapter II. The investigator specifies his methods of data collection and analysis in Chapter III. In Chapter IV the findings and results of the data analysis are presented. A summary of the study, conclusions drawn from the findings and recommendations for further research are included in Chapter V.

## CHAPTER II

## REVIEW OF RELATED LITERATURE

In this chapter literature related to the problem of low enrollment in Science and the six factors to be examined in this study (student interest, teaching methods, teacher's attitudes, difficulty of curriculum, family influence, and restrictions of the system) are reviewed. The literature reviewed was obtained mainly through an ERIC search and an extensive survey of books, journals, and other pertinent publications.

This chapter is presented in three parts. The first part concerns studies related to the Islamic culture and schools of Saudi Arabia to provide some background to the reader. The second part includes studies related to the decline in secondary school science enrollment. The third part is a review of selected studies concerning the six factors listed above.

## Saudi Arabia: Its Islamic Culture and Its Schools

In this section, it is the researcher's intent to provide some basic information about Saudi Arabia, the
educational imperatives of its Islamic heritage, and how these cultural imperatives are reflected in the country's commitment to education, educational goals, and educational facilities. The interrelationship between religion and education is prominent because Islam, the national religion, requires that certain educational activities and principles exist.

The theme of the following section is that a basically traditional society like Saudi Arabia is experiencing at the end of the Twentieth Century a collision between strongly traditional imperatives and simultaneously, at the governmental leadership levels, strong imperatives of modernism--to foster and accelerate Saudi Arabia's transition into the modern, international, industrial world.

## Arabia And The Arab People

The Arabian Peninsula is an irregular rectangle bordering the Red Sea, which is on the West. Iraq and Jordan are situated to the north; Qatar, Oman, the United Arab Emirates, Kuwait, and the Arabian Gulf are on the east; Yemen, South Yemen and the Gulf of Aden are on the south (Figure 2.1).

In ancient times, the Romans and the Persians treated the Arabs as their subjects, but never attacked or occupied Arab territory because of its hostile, desert climate. The Arabian Peninsula has never been effectively occupied or


Figure 2.1: Map of Saudi Arabia
colonized by outside forces. Before 1932 the Arabs had no central government and lived nomadic lives. Thus, in the political sense, they had pratically no international influence.

Even though Saudi Arabia became a sovereign state in 1932, some tribes continue to live a nomadic life style.

For many centuries, after the time of Mohammad, the Arabian Peninsula continued to be a land of roving tribes of camel, horse, goat and sheep herders as well as merchanttraders. On the coasts, in areas that are now small states, like Bahrain, Kuwait, Oman and Yemen, men fished for pearls and became known around the world as boat-builders and captains of trading ships.

Though small coastal states of the Peninsula eventually may have come under the protection and influence of larger world powers, the vast central portion of the Arabian peninsula was never conquered by, or made a protectorate or feudal state of a foreign power. That area, inhabited mostly by nomadic tribes, was eventually united as the Kingdom of Saudi Arabia in 1932. The King was Abdul Aziz Al-Saud.

The Kingdom of Saudi Arabia is an Islamic Arab nation that has moved rapidly toward becoming a modern, industrialized nation the pace of change accelerated after the discovery of oil in the 1930 s and its rapid exploitation in the 1970 s and 1980s. Nevertheless, Islam remains the
religion of Saudi Arabia and is a central characteristic of its culture today.

The Ministry of Education at Riyadh, the capital city, is responsible for the centralized educational system. The Ministry of Education determines educational policy and procedures that are subsequently diffused throughout the Kingdom. Current educational policy follows guidelines provided by islam as well as the educational needs and goals of the Kingdom. Policies are delineated in three five-year Development Plans (1970-1975, 1975-1980, 1980-1985). These policies aim at modernization. However, Islam also provides significant guidelines to developmental educational policy in Saudi Arabia.

## Islam and Education

Mohammad's teaching influenced Arabian human studies and culture in diverse ways. It stimulated learning, encouraged scholary research, and emphasized searching for truth with a free mind. The harmony between the search for truth (i.e., Science) and religion is perhaps Mohammad's greatest contribution as an educator. As man was created with an insatiable desire for knowledge, God made adequate arrangements for him to know the hidden secrets of the universe and taught him the nature and names of all things.

Islam's impact on educational policy. Islam is the religion of Saudi Arabia and Mohammad is the Prophet of
the Muslim people. Mohammad was not educated in any school or university, nor did he learn reading or writing in his youth. Nevertheless, he was able to teach psychology, philosophy, and the principles of education to his companions. In addition, he taught them the fundamental principles of morality, ethics, and religion and gave them eternal values and standards which formed the basis of their culture.

This Islamic culture, which arose within a century of Mohammad's death, influenced not only the human civilization and culture of the time, but left a permanent mark on Saudi Arabia's history and the course of cultural events. Mohammed's followers and interpreters believe that human civilization and culture received a tremendous boost from his teachings, especially regarding the development and process of the sciences. A rationale for perceiving Islam as a foundation for modern science might be explained as follows:

He is the only individual who can be truly called the moulder of the course of human history. He gave man knowledge in place of ignorance, reason in place of custom and tradition, and freedom of thought and research in place of blindly following in the footsteps of forefathers and religious and political leaders. (Afzalur Rahman 1981, p.203).

Mohammad's teachings are contained in the Quran, the Hadith, and the Sunnah (the Prophet's sayings)--which are the sources of all Islamic teachings. More specifically,
interpreters of Islam believe that the Quran presents the principles, though not the details, of all science. It is also believed that the Quran, the Hadith, and the Sunnah promote the cultivation of the sciences by emphasizing the virtue of pursuing all knowledge that may provide a confirmation of Divine Unity.

Therefore, the Quran, Hadith, and Sunnah form the basis for the metaphysics upon which all Islamic sciences are constructed. These works also encourage intellectual activity to be in conformity with the spirit of Islam.

The Islamic science and the intellectual perspectives cultivated in Islam have always been seen in a hierarchy which leads ultimately to the knowledge of the One, of the supreme "substance" this being itself from another point of view the substance of all knowledge. That is why, whenever confronted with sciences originally cultivated by other civilizations, Muslim intellectual authorities sought to integrate them into the Islamic scheme of the hierarchy of knowledge. (Nasr, 1976, p. 32)

Consequently, in Saudi Arabia, the overall objectives of education in general, and Science in particular are supported by the Islamic teachings of the Quran, the Hadith and the Sunnah. Provisions of the country's educational policy bear this out.

Saudi Arabia's educational policies. The following list of Saudi educational policies and objectives are contained in a current publication of the Ministry of Higher Education (1978).

1. The purpose of education is to have the student understand Islam in a correct comprehensive manner; to plant and spread the Islamic creed; to furnish the student with the values, teachings, and ideals of Islam; to equip him or her with the various skills and knowledge; to develop his conduct in a constructive direction; to develop the society conomically, socially, and culturally; and to prepare the individual to become a useful member in the building of his community.
2. Promoting the spirit of loyalty to Islamic law by denouncing any system or theory that conflicts with this law and by honest action and behavior in conformity with the general provisions of this law.
3. Supplying the individual with the necessary ideas, ideas, feelings, and powers that will enable him to carry the message of Islam.
4. Preaching the Book of God (Quran) and the law of his Prophet by safeguarding them, abiding by their teachings, and acting in accordance with their commands.
5. Enforcing Quaranic morality in the Muslim and emphasizing moral restraints for the use of knowledge.
6. Training students in sound sanitary customs and spreading sanitary consciousness.
7. Keeping pace with the characteristics of each phase of the psychological growth of young people; helping the individual to growth spiritually, mentally, emotionally, and
socially in a well-rounded way; and emphasizing the spiritual Islamic aspect so that it will be the main guideline of private and public behavior for the individual and the society.

These directives demand application and practice which is difficult to achieve in school alone, because children spend a limited amount of time in classes and teachers have little opportunity to observe the application of the practices taught. However, teachers do influence the students strongly, resulting in positive or negative attitudes toward school and school subjects.

Parents (especially fathers, regarding their sons) also cooperate in the educational process. Islam is sensitive to the crucial dependence of the child on his or her parents. Their decisive role in forming the child's personality is recognized.

According to the Sunnah, if a Muslim died and left a well-developed and well-educated offspring, whenever the offspring did a good deed, the parent would share the spiritual benefit of that deed. Thus, the process of earning ajr (benefit) does not cease when parent dies, but continues because of the education of one's children. These are the aspects of parental responsibility for raising and educating children as well as the consequences for both the parents and the children in the present and future life, according to Islam.

Education is one of the major goals of Islam because it enables Muslims to read and write, which in turn enables them to read the Quran, the Haddith, and the Sunnah; to interpret them; and thus to practice their teachings. The Quran recommends cooperation between schools schools and parents to accomplish the desired Islamic objectives through education.

The role of Islam in the history of modern science. Science continued to be important to the religion of Islam. In ancient times many great muslim scientists existed, such as: Abu Musa Jabir Ibn Hayan (Geber), Muhammad ibn Musa (Al-Khwarizmi), Thabit Ibn Qurra, and Abu-Bakr Muhammad Ibn Zakariyya Ar-Razi (Rhazes). They were chemists, mathematicians, inventors, explorers, physicists, astronomers, biologists, and physicians. "The foundations of modern science were laid in the days of ancient Greece (at which time the above mentioned muslim scientists were contributing to the development of scientific thought) during the five centuries from 600 B.C. to 100 B.C. and in early modern times from A.D. 1600 to 1800. Since foundations are extremely important, these centuries are stressed in most histories of Science..." (Asimov, 1982, p. xv) .

It is in the period 100 B.C. - 1600 A.D. that scientific knowledge was kept alive in middle eastern culture, with the majority of that time influenced by muslim
teaching. Islamic Science is regarded by scholars as the repository of scientific knowledge during the Dark Ages (476 A.D. - 1000 A.D.). Moreover, it was the discovery of this treasure of scientific knowledge which contributed to the rise of modern science in Europe beginning with the Renaissance (1300-1500 A.D.). But Islam did more than provide a safe haven for ancient scientific knowledge of the Greeks. During the period from 100 B.C. - 1600 A.D., islamic scientists added to the fund of knowledge through their observations and recording of new data, for example, Abu Musa Jabir Ibn Hayan contributed to the development of chemistry; Muhammad ibn Musa worked on the discovery of mathematical principales; and Abu-Bakr Muhammad Ibn Zakiriyya Ar-Razi began to perfect important medical techniques.

This demonstrates the historical importance of islamic science. It also emphasizes the fact that Islam and Science are compatible in helping humankind understand the nature of the world.

In the modern era, Science is more important than ever in the development plans of Saudi Arabia. It is essential that Saudi youth are exposed to scientific thought.

Saudi Education In Recent Years
Alongside profoundly traditional views, Saudi planners today recognize that rapid industrialization requires a well-trained population.

Paulston (1977) sheds light on this phenomenon in his discussion of "equilibrium" and "conflict," paradigms for relating education to national development. Each paradigm was broken down into four theories. The equilibrium paradigm was subdivided into "Evolutionary," "NeoEvolutionary," "Structural Functionists," and "System." The conflict paradigm was subdivided into "Marxian," "NeoMarxian," "Cultural Revitalization," and "Anarchistic Utopian." These theories incorporated four development issues: (a) preconditions for educational change, (b) rationales for educational change, (c) scope and process of educational change, and (d) major outcomes sought. Of the eight theories, one of them seemed to reflect the situation in Saudi Arabia--the "Neo-Evolutionary" theory--of which rapid industrialization and training are characteristic.

The precondition for educational change includes "satisfactory completion of an earlier stage" (p.372). In Saudi Arabia that precondition is represented by the discovery of oil in Saudi Arabia in the 1930s. The second issue, rationales for educational change, includes "required to support national modernization efforts" (p.372). The significant efforts that the Saudi government is making to
modernize include: port construction, university reform, international trade agreements, educational reform, development of the agricultural sector, and extensive housing programs. The third issue, scope and process of educational change includes "institution building using Western models and technical assistance" (p.372) as one of its characteristics. Saudi planners have complied with this requirement by sending students to the United States and Europe for advanced training. The fourth issue, major outcomes sought, includes "new higher state of education and social differentiation/specialization" (p.372). In Saudi Arabia, this is reflected by the many specific programs designed to promote industrialization. Paulston (1977) encourages followers of this "Neo-Evolutionary" theory to identify specific changes to be made in priorities and programs of development. He also cautions them not to attempt this by "descending from the highers of generality and intuition." (p.379).

Saudi planners have encouraged a high percentage of the population to participate in some form of organized educational program. This precipitates a great enrollment increase, at all levels. In 1964, the number of students enrolled in school was 250,000. By 1982, that number that reached l,200,000 (Saudi Arabia, 1982).

Access to education is becoming a reality for nearly all persons under 15 years old. For example, approximately

90 percent of seven year old boys are now enrolled in first grade. Furthermore, this education is entirely subsidized by the government, and generous incentives to study are offered at all levels. The Saudi educational effort is especially significant because today half of Saudi Arabia's population is under age 15.

Currently there are 4,000 schools for boys and 3,200 schools for girls. The Third Development Plan (1980-1985) projects expenditures of $\$ 30$ billion for education alone-nearly a fifth of the Plan's total budget. During that period, a massive construction program is projected to add more than a combined total of 1,200 primary, intermediate, and secondary schools for boys and nearly 500 for girls. In fact, a new school open every other day in the Kingdom (Saudi Arabia, 1982).

Enrollments for girls were expected to increase to 190,000 by 1985 on the intermediate level and 80,000 on the secondary level. Increases in enrollments of 80 percent were also projected in teacher training and adult education programs. Between 1980 and 1985, the projected increase in the number of Ministry of Education graduates--covering all levels except university--was expected to be 58 percent, reaching more than 180,000 (Saudi Arabia, 1982).

The Saudi Schools

The types of schools, colleges, and centers under the supervision of the Ministry of Education can be grouped under the following categories:

1. basic schools--pre-elementary, elementary, intermediate, and secondary schools that provide K-12 education;
2. teacher training centers--prepare teachers for elementary, intermediate and, secondary schools;
3. community colleges--prepare teachers for the elementary school level.
4. science and math centers--accept only students who graduated with science majors in secondary schools;
5. technical education centers--prepare students for industrial, commercial, and agricultural occupations;
6. handicapped centers--assist persons who have mental and/or physical disabilities; and
7. adult education and literacy centers--provides basic academic skills or supplementary skills to adults.

The general education system for the development plan for boys' schools is included in Figure 2.2. The following section turns to the general question of enrollment in the sciences in the schools of different nations of the world.

The Proportional Decline of Secondary School Science Enrollment

Generally, the secondary school curriculum in the United States is different than Saudi Arabia's secondary

school curriculum, which follows the Egyptian model. In Saudi Arabia, upon completion of the tenth grade, students are required to choose either Arts or Science as an educational track. In the United States, most public schools allow students to elect specific courses in which they are interested, in addition to taking those that are required. For example, after successfully completing the required general science courses, higher level math and science courses (e.g., physics, chemistry, trigonmetry) are elective.
U.S. and European researchers, studying science education in the United States and Europe, are investigating why students choose science classes or why they stay away from them. Since there were few similar studies conducted in Saudi Arabia, and in order to understand that which might be applicable to the Saudi situation, the review of the literature depends heavily on research done in the United States and Europe. Some studies were not conducted with a general "science track". Therefore, studies are also included about students who have chosen physics, and chemistry curricula.

## Declining Science Enrollments

A decline in secondary physics enrollments was examined in the United States by Bryant and Doran (1977) who suggested that understanding why students choose or don't
choose to enroll in a physics course would be more appropriate than finding an explanation for the decline in physics enrollments in general.

Since the early l950s, when the decline in secondary physics enrollments was first observed, the subject of physics enrollments has been a frequent topic for science education research. However, even with all this research, physics enrollments remain low, and no full explanation has been found for the enrollment decline...it appears more appropriate at this time to try to develop a better understanding of the physics enrollment problem and in particular why students do, or do not, elect to enroll in a physics course. Previous research has demonstrated that physics enrollments are dependent on many interrelated variables whose relationships are not easily understood by a set of bivariate descriptive statistics. (Bryant \& Doran, 1977, p. 177)

Another study about the decline in the physics enrollments among high school students was done by van Koevering (1971), who described the situation in relation to the shortage of qualified secondary school physics teachers and an innovation of the recent curriculum.

The percentage of high school students enrolling in physics has been declining for more than half a century. The phenomenon has long been recognized, but for several reasons it has received substantial publicity only in recent years. Two situations which have accompanied the decline are: (l) an acute shortage of qualified high school physics teachers, and (2) recent curriculum innovations in high school physics which have not stemmed from that decline. Surprisingly, little research has been undertaken on this problem and consequently reasons for declining physics enrollment, remain in the realm of speculation (p.37)

Van Koevering (1972) in another study discussed high school physics and chemistry enrollment in Michigan and summarized several articles that dealt with this problem.

The observation that physics enrollments in high schools have been declining for the past several years will not come as a surprise to many readers. Numerous articles have appeared in the literature expressing concern over this situation. Some, on the other hand, have challanged the premise that decreasing enrollments in physics is a serious problem. The problem of decreasing enrollments has also been cited as an indication that substantial changes are needed in the structure and content of the high school physics courses. It is evident, however, from the implementation of PSSC physics that curriculum innovations and federal funding, amounting to nearly ten million dollars are not sufficient to reverse the trend of enrollment decline. From 1960, when PSSC physics was first made available to high schools, until 1965, high school physics enrollments dropped from 24.22 percent of seniors taking physics to 19.61 percent. A review of the literature for the past ten years reveals little agreements on either the severity of the problem or a course of action that will, hopefully, provide a solution. (p. 379)

This problem exists, not only in the United States and in Saudi Arabia, but in Israel as well. In a study by Tamir, Arzi, and zloto (1974) the possible effects of the low enrollments in physical sciences on the potential pool of teachers and engineers were discussed.

Low enrollment in the physical sciences have been a professional concern for some time, primarily because of their adverse effect on the general education of high school students, but also because of their possible impact on vocational choice, notably that of potential teachers (l). Several studies attempted to identify the reasons
for this phenomenon. Cooley has found that the greatest loss from the "potential scientist pool" (students planning careers in science and engineering) occurs in the eleventh and twelfth grade (2). This has been rightly interpreted to mean that "secondary chemistry and physics courses are screening out potential science majors. (p.75)

The following list of factors was offered as a partial explanation for this "screening out" process:

1. The scarcity of qualified teachers.
2. The nature of the physical science course content.
3. The "difficulty" of courses in the physical sciences.
4. The severity of grading by physics teachers.
5. Characteristics and attitudes of physics teachers.
6. Dissatisfaction developed while taking high school physics courses. (p.75)

Fletcher (1978) described the U.S. enrollment situation
in secondary school physics and noted that the number of students who enrolled in physics increased until the late 1960 s but declined continuously after that.

> Reports regarding enrollment in high school physics show that the number of students enrolled in physics increased until the late 1960 but the percentage enrollments in high school physics has dropped almost continuously. Some reasons for this are that physics courses are generally thought of as college preparatory curriculum and are sometimes directed at the few students who are interested in a college program in one of the sciences. (p.l)

Bridgham (1972) also studied the decline of science enrollment and mentioned that the number of enrollments in
chemistry is much higher than the number of enrollments in physics, but that more than half of the U.S. high school graduates have not studied physical science.

One of the concerns of those interested interested in secondary science education, especially education in the physical science, has been the decline in the percentage of eligible students enrolled in high school physics. The percentage decline in physics enrollments began around the turn of the century and has continued unabated since then. The enrollment picture in high school chemistry is somewhat better; it appears that the percentage of high school students enrolled in chemistry has remained reasonably stable over the past decade or so. Even so, only 40 percent of the eligible students choose to study chemistry and since there is an almost complete overlap of the 20 percent who study physics and those who study chemistry, more than half of the students leaving high school will not have studied a physical science. (p.323)

Additional consequences resulting from the decrease in enrollments in high school physics in recent years have also been identified.

The concern appears to stem from the assumption that high school physics can and does contribute to the development of individual scientific literacy rather than from the concern for attracting more people into the profession of physics-related areas (p.25).

In a study of physics teaching in Wisconsin schools, Dietrich and Pella (1974) found that enrollments in physics classes in secondary schools had been low for many years and had not increased in proportion to the population. It was noted that essentially the same findings findings would
apply for the other 49 states. In an earlier study, Nelson and Dietrich (1975) eviewed several explanations for the disproportionate decline in physics enrollment and concluded that the phenomenon was probably a result of several factors acting together, rather than any one or two single factors.
...many Science educators concerned with the
declining enrollments in physics...have
speculated on and searched for causes. Several
researchers have implied the decline is the
result of one or two factors; others have felt
several factors interact to affect enrollment.
It seems more plausible that a high school
student's decision to take or not take physics is
based on several factors which may interact.
(Nelson and Dietrich, 1975, p. 606)

In this response, six factors are examined which were identified in the literature and during interviews with principals of Saudi schools as those factors which might be associated with students' choice of Arts or Science as an educational track in Saudi Arabia.

## Factors Influencing Choice of Educational Track

A search was made of literature for studies bearing specifically on six variables chosen for examination in the present study: (a) student's interest; (b) teaching methods, (c) teachers' attitudes, (d) the difficulty of the curriculum, (e) family influence, and (f) restrictions of the system.

## Student's Interest

Some students may not choose to study mathematics, biology, chemistry, physics, or geology, because they find them boring, dislike working in labs, or are simply more interested in social studies, religion, etc.

Dietrich and Pella (1974), examined the variables that affect enrollment in physics, and found that the reason cited by students enrolled in physics was a personal interest in science. "The personal reasons cited by students in physics in high and low enrollment schools are similar and concerned with personal interest in science and the place of the course in future educational plans." (p.11)

In another study done in the U.S., a high school counselor found that the students who were not enrolled in physics did not consider it to be an exciting, dynamic subject (McClary, 1966). Welch (1969) found that the students who take physics are "...among the academically elite; the capable students with the kind of interest and values generally considered important for success in physics." (p.54) Elliot (1979), Dietrich (1970) and others have indicated that students who take physics have both high ability and high aspirations.

The Illinois state Physics Project is a cooperative enterprise involving twelve Illinois colleges and universities that has two related goals: (a) to increase interest in high school physics and (b) to increase
enrollments in high school physics classes. Although attainment of the first goal is more difficult to measure than the second, the authors feel that the attainment of the second goal, increased enrollments in physics, is a significant indication that the first goal, increasing interest in physics, has been accomplished (Miller, Prehn and Jensen, 1970).

Jordan (1971) suggests using a variety of techniques from day to day would stimulate interest in physics. The result of this teaching strategy could be more enrollments in physics.

In a study by Tamir, Arzi and zloto (1974) about the attitudes of Israeli high school students toward physics, reasons were given to explain the relatively low enrollment of girls in college physics. One of the reasons given was that physics is a rather "dry" and abstract discipline. While the attitude of female students is not the issue in this study, attitude of males and females may be similar in regard to physics classes in high school. This is similar to the situation in Saudi Arabia in that science subjects are considered to emphasize memorization of abstract material and lab work, whereas Arts subjects emphasize more general material that many students feel is more relevant to their own lives.

Brombacher (1983) noted that the student's choice of curriculum should be based on high interest in that
curriculum; that this increases motivation, self-discipline, and taking responsibility for one's own decisions.

> The interest of each child should really determine the instructional curriculum for students in the class. Meaningful instruction and learning takes place when specific goals are relevant to the individual learner. In teaching, we try to make life special for each student. The students must be involved in the learning process from beginning to end. Together, the teacher and students can consider different topics, methods, materials, resources, timelines, and modes of evaluation. When the kids become involved in the planning and the decision-making process, they begin to take ownership of their own learning. Interest levels remain high, while motivation and discipline seem to improve. Students need to help determine the curriculum. They must accept responsibility for the decisions they make about their own learning. (p.44)

Woolfolk and Nicolich (1980) emphasized that a logical way to increase motivation in the students is by creating a good relationship between the students' interests and the school learning experience. It is important for the students to master the basic skills to maintain interest.

One seemingly logical way to motivate students is to relate school learning experience to the interest of the students. However, this is not always an easy or even a desirable strategy. There are times when students must master basic skills that hold an intrinsic interest for them. But students interests can be part of many teaching strategies. (p.337)

Sylvia Ashton-Warner (1963), for example, describes a system for teaching reading through the use of the students' own stories about topics of interest to them. If a teacher
knows what students are interested in, much of the classroom work can be related to those interests. Since it is often impractical to permit students to choose activities freely, observation and other means are needed to discover the students' interests.

A number of ways of determining students' interest are suggested by Rust (1977). One way is to ask the students either by using a questionnaire or by talking with them. Interest inventories listing a number of activities are available on which students may rank learning techniques from the most to the least preferred. Teachers may also watch for attentiveness during classroom lessons to discover times when everyone is suddenly focused on a lecture topic or busily working at an assigned task.

Once teachers have some idea of what the students are interested in, they can use this information in making decisions about their teaching strategies. They may also help students to develop related new interests that will help them work more effectively in school and give them new interest to pursue after they leave school (Rust, 1977).

Wright and Hounshell (1978) examined the development of interest in science among high school students chosen to attend the 1978 North Carolina Junior Science and Humanities Symposium. Student participants (147 in all, 79 males and 68 females) completed a questionnaire designed to explore the depth and breadth of their interest in science.

Questionnaire items were designed to provide data to answer five research questions: (a) how intensive was their interest in science? (b) when did it begin? (c) how was this interest initiated and maintained? (d) in what areas of science was their interest strongest? and (e) was there a difference in scientific interest between male and female participants?

Responses to several questions indicated, as might be anticipated, that science was considered by the majority of both males and females to be their most interesting school subject, although some students indicated a "high" interest and others checked "medium."
In analyzing the difference in proportion of high
versus medium responses between males and
females, it was found that males' interest in
science was significantly higher (p .0l) than
females' interest.... It was (also) found that
males became interested in science at an earlier
age than did females..... Seventy-four percent of
the respondents indicated that their interest in
science was mainly developed through schools.
School was significantly more influential for
females than for males.... High school teachers '
were the most influential factor in the school
environment. (pp. $378-379)$

National Science Teacher Association (NSTA) in its fourth volume in a monograph series on what research is saying to science teachers, dealt in one section with attentiveness to science. Among the findings it was noted: (a) there was no growth in interest in science across the years students are in secondary school; (b) fewer than half
of high school graduates express any interest in science (only 30 percent of noncollege students); (c) interest in technology is significantly greater for all students than in science (Yager, 1983, p. 37)

Hofstein and Lunetta (1982) emphasized that teachers need to stimulate students' interest and shape their attitudes toward science in order to improve achievement in science coursework.

Developing favorable attitudes toward science has often been listed as one of the important goals of science teaching. Generally, writers have assumed that the availability of a wide variety of instructional materials will enable teachers to vary classroom procedures to avoid monotony, and to arose interest and attention. Smith, Walberg, Poorman and Schagrin (1968), Selmes, Ashton, Meredith and Newal (1969), Ben-Zvi, Hofstein, Samuel, and Kempa (1966:b), Hofstein et al (1976) and Raghubir (1979) found, for example, that students enjoy laboratory work in some courses and that it generally results in positive and improved attitudes toward and interest in the sciences. (p.210)

Florito and Dauffenback (1982), in their study about market and nonmarket influences on curriculum choice, found that "the results for the interest and ability variables suggest that greater attention must be given to these factors in empirical studies of curriculum choice" (p.100).

Teaching Methods and Teachers' Attitudes
Teachers' personal characteristics, academic
preparation, and instructional techniques of science and
math teachers, have often been investigated for their effects on science enrollments (DeAngelis, 1978; Jordan, 1971; Miller, Prehn \& Jensen, 1971; Dietrich \& Pella, 1974; Cowan, 1968; Green, 1969; Bridgham, 1972; and Fiske and Kersey, 1974.

In general these studies indicated that, in the United States, the above factors have had little or not influence on enrollment in science courses, except for the factor of teacher attitudes and feelings. Therefore, studies of this factor are emphasized here.

One of the basic goals of many teachers is to develop within students positive attitudes towards their subjects. Science, in particular, has experienced a decline in students choosing science courses beyond the minimum requirements, both in high school and college. Many changes and counterchanges have been made as to the causes for this response. One in particular is that of attitudes. Some suggest that course instruction is having a negative effect on the students, especially in the required courses, and the result is that students do not want to elect science beyond the minimum. Furthermore, some suggest that course material is not relevant outside the classroom. (DeAngelis, 1978, p. 4)

Science instructors have strived to develop in their students desirable attitudes related to science. Geneally, positive attitudes permit growth, while negative attitudes hinder growth. Underlining that point is DeAngelis' (1978) statement:

With respect to this dimension of science instruction on the development of attitudes, students with positive attitudes will pursue science learning both in and out of the classroom, while students with negative attitudes are not interested in science beyond the requirements of their course of study. Furthermore, one of the main reasons students do not choose science courses when given the opportunity is because of this negative attitude. (p.5).

McGarity and Butts (1984) hypothesized that teachers' management behavior is related to both students' interest and students' science achievement.

Those students taught by teachers exhibiting competency in classroom management spent more time engaged, than those students taught by teachers who did not exhibit competency in the management of their classrooms. In addition, these students also achieved more than those students taught by teachers who did not exhibit similar competencies.... The implications for science teachers and science teacher educators are evident. Science teachers should strive to present materials that will be interesting enough to promote engagement. The teacher should also exhibit behaviors that will keep students on task.... A classroom that is well managed and provides an atmosphere conducive to learning makes paying attention easier. A student can be engaged and not achieve, but it is hard for a student to learn a task who was not engaged while that task was being taught. (pp.58; 60)

Wright and Hounshell (1978) found high school teachers themselves to be the most influential factor in the school environment. Seventy-one percent of respondents in their study said that teachers in grades 10-12 were most influential in developing their interest in science. Junior
high teachers were rated as the second most influential factor (49 percent). That study also indicated that 74 percent of science-oriented students claimed that their strong interest in science was influenced primarily by high school and junior high school science teachers.

In Saudi Arabia, student options consist only in whether they will study an Arts curriculum (which does not include study of physics) or a Science curriculum (which requires the study of physics). The study of enrollments in specific sciences, in other nations, is not obviously relevant to the situation in Saudi Arabia. However, resulting from the examination of the above studies as well as those that follow, indicators may be identified that could have an impact on educational development in Saudi Arabia. Dietrich and Pella (1974) also assigned the responsibility for students' lack of interest in science to teachers who, instead of developing the students' interest in science, actually diminish the student's interest in science due to the teachers' conduct in the classroom.

Van Koevering (1971) established that physics teachers from high schools with high physics enrollments demonstrated more feeling; they showed more enthusiasm toward the subject they were teaching than their counterparts from high schools with low physics enrollments. In addition, by administering a questionnaire to access student opinion, it was discovered that students from high schools with high
physics enrollments believe that their physics teachers have a slightly more enthusiastic attitude toward the subject than do physics students from high schools with low physics enrollments.

Miller, Prehn, and Jensen (l971) suggested that, in order to increase physics enrollments, teachers need to make physics more interesting to the students through (a) phenomenological teaching and (b) active encouragement of students to take more classes in physics. Van Koevering (1971) supported this idea, but his own research indicated "that the characteristics of the physics teachers and the physics classes, as measured by the instruments used, for the most part do not have important influences on enrollment" (p.39).

The decision to concentrate this study on the personal reasons students' themselves have for choosing science as a field of study was based on the above findings. Those results notwithstanding, teachers' methods and attitudes may be more influential in Saudi Arabia since many of the courses in science are taught by foreign instructors.

Shaughnessy, Haladyna and Shaughnessy (1983) studied effects of student, teacher and learning environment variables on attitudes toward mathematics and verified that "the increase in research on attitudes toward mathematics may reflect recognition on the part of mathematics educators
that poor attitudes may be behind a decreased enrollment in advanced mathematics classes in high school." (p.2l).

Ignatz (1975) emphasized that teachers and administrators do not encourage black students to select more challenging academic programs. Many educators do not agree, but the factor exists and may be one of the most salient factors in low black enrollment in chemistry and physics courses. Olion and Gillis-Olion (1984) also talked about improving the assessment of black students by the teachers' involving him or herself as an active assistant.

Teachers have traditionally played a secondary role in the assessment of black students. Teachers, however, can attest to how students respond to various instructional strategies and classroom routines. Teachers have to realize that they must bring information to the test results as well as take information from them. Additionally, teachers must come to understand that the educational difficulties displayed by black students represent a difference rather than a special kind of intellectual deficit. Consequently, teachers should concentrate on how to get students to transfer skills they already have to tasks at hand. (p.27)

Saudi Arabia does not experience the issue of racism in school enrollments to the degree that U.S. schools do. In Saudi Arabia teacher involvement may help reduce contrasts between majority and minority groups. Nevertheless, discrimination is not unknown in Saudi Arabian society (e.g., discrimination of the Bedouin groups).

In a study conducted by Ben-Zvi et al., (1976a), chemistry students were asked to rate the relative effectiveness of instructional methods. Students rated personal laboratory work as the most effective instructional method for stimulating their interest and learning when contrasted with teacher demonstrations, group discussions, filmed experiments, and lectures. Bybee (1970) found similar results in comparing laboratory work with lecture demonstrations in a college-level earth science course. Charen (1966) and Smith et al. (1968) also established that laboratory work improved students' attitudes toward learning chemistry.

Yale (1966) in a study about the enrollments in physics, concluded that the teaching methods and teachers' attitudes influended students not to enroll in physics.

It is important that teachers help students concentrate on specific aspects of the learning experience. For example, learners' voluntary control over their attention span will be improved if the teachers' written material is carefully worded and includes explicitly stated objectives to clarify the intent of a lesson, instructions cover the important design features of the experiment during laboratory work, and methods are used to help students discover a worthwhile problem to be solved in carrying out a science activity.

Teachers also need to help learners use appropriate ideas from long-term memory in the comprehension of new information by providing appropriate retrieval cues. They can help with written materials by providing explanations, main ideas, inferences, summaries, advanced organizers, questions, analogies and examples (Woolfolk \& Nicholich, 1980).

## The Difficulty of the Curriculum

Many people believe that the low enrollment in physics is the result of the reputation of physics as a difficult course. "Difficulty," however, is not easy to define. To a student it may refer to conceptual demands that are great, that some of the demands are inconsistent with this own interests, or simply that the student's work is evaluated against a relatively severe standard. If the difficulty of physics is determined by conceptual demands, a redesign of the curriculum could make physics courses more appealing and attract more students. New physics courses have also appeared that attempt to make physics less difficult by redesigning the curriculum, but the result appears to be a relative loss in the percentage of students enrolled in physics (Bridgham \& Welch, 1969).

In a study by Dietrich and Pella (1974) students were asked to cite their personal reasons for not enrolling in physics. Their answers included the difficulty of mathematics, lack of interest, and fear of low grades. In
other studies, similar factors have been related to the declining enrollment in physics: inherent difficulty of the course scarcity of qualified teachers; and severity of physics teachers' grading practices (Bridgham \& Welch, 1969).

Thompson (1968) believes physics is inherently difficult due to its excellence in fostering creative thought, manipulation of ideas, and analysis of problems.

This is similar to the situation in Saudi Arabia where science has a reputation among students as a difficult field. This may reflect the limitations of a rigid, centralized curriculum which cannot be changed by local teachers to suit the needs and abilities of local students. In addition, due to the lack of qualified science teachers in Saudi Arabia, these subjects (more than Arts subjects) tend to be taught by foreign teachers who may fail to relate instructional material to the students' culture and environment, thus making it more difficult for them to understand.

Nelson and Dietrich (1975) related declining physics enrollments to its difficulty and indicated that the difficulty exists because the teachers are poorly prepared and lack the knowledge and experience to make physics courses less difficult.

> Other reasons advanced for declining enrollments stem from teacher characteristics. Cowan (1968) believes that colleges are not producing competent teachers of physics for the secondary school. Green (1969) asserts that a large percent of the secondary school physics classes are taught by teachers who have less than l8 semester hours preparation in physics, therefore, their interest lies in their own major subject and not in physics. As a result the physics course becomes too difficult or too dull. (p.609)

McClary (1966), in his study about the reasons for low enrollment in physics, listed four reasons that affect the students' decisions about not enrolling in physics courses: (a) the pressure for getting high grades, (b) physics is considered to be a boring subject, (c) physics is only for the intelligent students, and (d) the fear of mathematics.

Miller, Prehn and Jensen (1971) believe that the decline in physics enrollments is due to the fact that other academic courses are less difficult than physics courses. The study presented suggestions from the participant teachers, who "...have agreed that the subject shouldn't be made more difficult than other academic courses and students should be able to obtain equally good grades in physics as they do in other subjects" (pp. 98-99).

Bar-Tal and Guttman (1981) compared teachers', students and parents' explanations regarding students academic achievements and the factors that influence achievement. The causes listed were: "...(a) ability in mathematics, (b) interest in mathematics, (c) difficulty of the material
in mathematics, (d) and the difficulty of the exams on which the grade was largely based" (p. 303).

The finding also indicated that "failure was attributed by teachers mainly to lack of studying; by pupils mainly to lack of parents' help and difficulty of test; and by parents mainly to inappropriate home conditions and child's low level of interest and ability" (p.304). Comparisons of those teachers', pupils' and parents' explanations that were in agreement showed that "difficulty of material" and the "diligence of the pupil" were considered to be more important causes of success and failure by teachers, than by pupils and parents.

Welch (1973) reviewed the research and evaluation program of the Harvard physics project and found that physics is a difficult subject that needs to be reduced in difficulty.

Drozin (1966) agreed that difficulty is one aspect of the problem with physics enrollment and suggested a solution.

I attributed the continuous decline in percentage enrollment in physics in our high school to the fact that physics is a very difficult and probably the most difficult of all the high school subjects....

The problem to increase enrollment in high school physics is therefore equivalent to the problem of how to make the high school course in physics a less difficult and more attractive one to all or at least to a majority of students. (p. )

In a study by Yale (1966) about the reasons for declining enrollment in physics, he reached the following conclusions were reached:

At least three reasons appear to stand out as basic to all of the ones furnished by science teachers and administrators for low enrollments in the physical sciences in high school. Dominant among these is insufficient previous preparation by students to be able to do well in these science courses. Possibly related to this is the reason that students tend to avoid the difficult subjects in order that they may get good marks with least effort. That high school students are not receiving sufficient, positive advisement and encouragement to enroll in physical sciences is relevant to this problem. A fourth reason, although not mentioned by either the science teachers or the administrators, might well be the methods used together with the attitudes of the teacher. (p.326)

Welch (1969) found that "expressed course satisfaction is significantly related to indications of success in the course, [while] satisfaction with the physics course is negatively related to the perceived difficulty of physics" (p.56).

Osborne and Wittroch (1984) determined that students often find difficulty in the early stages of solving science problems. Apparently, they are unable to construct meaning from the problem statement or to link that meaning to appropriate knowledge structures, either because of inadequate linkages or because the structures have not been learned earlier. Teachers need to help pupils generate these knowledge structures and develop the ability to derive
meanings from problems which can be linked to these structures.

> To more clearly link instruction which develops sound understanding in science to the solution of problems, to overtly explore the range and type of problems which can be used by particular scientific models, and to overtly encourage strategies which enable pupils to construct meaning from problems, would all be pertinent in terms of the generative learning model. (p.50).

Since Saudi students need comparable effort and time in studying physics, attitudes toward the difficulty of physics in U.S. schools may be compared to attitudes about the difficulty of science in the Saudi schools. However, lab work is not included in the Saudi schools (before college) which may reduce the difficulty of science in Saudi Arabia.

## Family Influence

Family influence may play a large part in students' selection of an educational track. Parents may need their older children to work in a family business. In Saudi Arabia those parents may encourage a child to choose the Arts track because it requires less time than the Sciences. Other parents may want their child to work in the religious community so they advise him to choose the Arts which would best prepare him for that vocation. There may also be reasons that cause parents, uncles, or brothers of a student to require or advise him to choose one field of study rather
than the other. Whatever the reason these influences are frequently significant.

In the United States, the selection of engineering or science as a career is a selection that is often made during high school years and one in which the family of the student is often intimately involved. Pharris (1973) indicated that the choice of science as a major is often made with family involvement.

Imagine yourself to be a student. You have little confidence in your own ability to cope with mathematics, but you want to be an engineer and your family wants you, like papa, to be an engineer. (Pharris, 1973, p. 285)

In a survey of North Carolina students, Wright and Hounshell (1978) explored factors that influence students' interest in Science, both inside and outside the school. It was found that books and/or magazines were chosen as the number one factor in developing interest in Science (65 percent). Parents were the second most influential factors (40 percent). Television ranked third (35 percent). De Angelis' (1978) similar investigation of factors outside the classroom established that parental pressure toward practical job-related skills courses also influenced students' decisions (DeAngelis, l978).

Ignatz (1975) identified other factors that contribute to the low enrollment of black students in science courses.

He found that the parents failed to encourage their children to enroll in these courses.

> Many parents, black and white, may not show sufficient concern for their children's education, black parents are more likely to have had less education and fewer opportunities for advancement offered to them and therefore may not be aware of the opportunities and the differences among the high school courses.... Progress can be made, first of all, through communication. Guidance counselors and science teachers must become aware of the existing inequalities in educational opportunities wherever they are found. Parents also must become more aware of ore how they can help their children educationally. Money and legislation may speed efforts toward educational equality. (pp. 572-573)

This is similar to the situation in Saudi Arabia. Because the formal educational system there is relatively new (1940) and not yet universal or mandatory for all students. Parents who are illiterate or have limited schooling may fail to encourage their sons to take prerequisite science courses before the eleventh grade in order to be permitted to an educational track.

Studies of family influence cited above indicate how the family may improve constrains on student's enrollment choices. Conversely, schools may enlist family influence as a positive factor to foster choices of enrollment.

Law and Mincey (1983), who studied parents' role in decision-making, found that parents were to be included in the decision-making process regarding selection of their children's educational programs as well as the
administration of those programs. Studies by Lusthans,
 that parents want to play a more active role in the pla.! I , of educational programs for their children. Lusthans et al., (1981) stated that parents perceived their role as that of "information giver and receiver," and, that was the role they wished to play. According to the study, parents wanted to expand their role in three decision areas: (a) the kinds of information maintained on their children; (b) medical services for their children, and (c) transfer of their children to other schools. It was concluded that "parents and professionals tend to have similar ideas about who should be making educational decisions" (p. 257).

Students in high school may need more advice from their parents and family because they are not sure of what they want. Therefore, parental influence on students in high school is usually greater than parental influence on college students, but studies show that even in college, parents influence their sons' decisions.

The relationship between the college students' choice of major and the occupation of the father and mother is complex. Kelly (1976) attempted to determine whether a relationship existed between family background and students' tendencies to specialize in different subjects. Collier (1938) and Kensall (1957) agreed that following fathers into professions, particularly law and medicine, was a well-known
phenomenon. Other researchers have observed that science students tend to come from families with scientific backgrounds (Butcher, 1969).

Tillery (1973) agreed that the influence of parents and family was a factor in college choice, but saw the father's occupation as less significant than the general lifestyle of the family. Kahl (1953) evaluated the effects of parents social position, measured by the father's socioeconomic status (SES), on the educational and occupational plans of adolescent boys. It was established that higher socioeconomic status has a positive influence on educational aspirations.

Harrison (1977) pointed out that the range of parental influence on academic decisions varied from tacit support to strongly expressed demands regarding the students' future, accompanied by encouragement in particular directions. Rehberg and Westby (1967), in a study of the college plans of sophomore boys in Pennsylvania, found that parental influence, at least for certain populations, was the strongest indicator of college intentions. Another study, by Bordau (1960), acknowledge parental influence on offspring to pursue college educations. Encouragement from parents had a direct influence on college aspirations and more pressure was exerted on the girls than the boys.

The quality of parent-child interaction is measured by the level and quality of communication, as well as reliance
on parental advice. In determining external pressures on students, each are considerations in measuring the level of influence of the parents on the college choices made by their offspring (Morris, l964; Clausen, 1968; Furstenberg, 1971).

Other research has shown that the children themselves, in many cases, desire assistance and advice from parents on vocational and college choices (Hurlock, 1964; Venerable, 1974). Some studies have shown a positive relationship between parental concern regarding how well the child performs in school and the manner in which parents encourage a child to attend college (Williams, 1972; Schwarzweller, 1974). Simpson (1962), Brittain (1963), and McDill (1965), all agreed that parents play significant roles when their children make educational choices.

## Restrictions of the System

Few articles were found that dealt directly or indirectly with the effects of the restrictions of the system on students' important educational choices. The United States and other countries with well developed educational facilities do not emphasize the same restrictions on the educational system that exist in Saudi Arabia. Research studies done on Saudi education do not include this factor. Therefore, studies with topics that are even remotely related to "restriction of the system"
could serve as a starting point to examine the effects of those restrictions.

After the tenth grade, Saudi students decide whether to continue in the Arts or Science track. Later on, those who are in the Science track can change to the Arts by taking, and passing, a pretest. However, students in the Arts cannot transfer to Science, unless they return to the eleventh grade. If a male student decides he is interested in science during eleventh or twelfth grade or even after he has finished the high school arts curriculum, he cannot elect to go into the Science track unless he starts the eleventh grade over again. For the purpose of understanding the possible influence that "restrictions of the system" may have, studies were chosen whose topics may be indirectly related to the factor "restrictions of the system." The relationship between those studies and purposes of research described in the report is examined. Topics included: (a) restriction against black students; (b) including handicapped students in programs for educational and economic growth; (c) new educational practices by elementary school teachers; (d) general readiness for changes; (e) admission standards in England and Wales, (f) academic placement of students from Venezuela in educational institutions in the United States; (g) admission requirements based on equivalent backgrounds in Austria; (h) transfer problems of community college graduates; (i) the
transfer of undergraduate credits from abroad; and (j) transferring from one subject to another.

Restriction against black students. Limitations and bias in the educational system militate against enrollments in the sciences. In a study conducted by Ogbu (1975) it was reported that blacks were "tracked" within their system and low levels and given no alternatives for later decisionmaking. This is similar to the Saudi situation in which students are limited in making free choices. For example, if a student wishes to enter the Science track in the twelfth grade, he must go back to the beginning and do all the eleventh grade coursework. He must either repeat the eleventh grade or remain in the Arts. Likewise, a student who discovers his interest in science after he completes high school must repeat two grades to enter the science track. No tests or other means of demonstrating equivalent competency in skills is available to allow older students an alternative to repeating high school years if they decide they wish to enter Science after the start of eleventh grade.

Including handicapped students in programs for educational and economic growth. One of the recommendations from a national task force is that "states and school systems should specifically include handicapped students in programs for education and economic growth" (Task Force on Education for Economic Growth, 1983, p. ).

In this study, in order to improve education for economic growth, it was recommended that schools include handicapped, indeed, all students who desire to achieve. The Saudi situation regarding choices of the Arts or Science is similar. Arts students who desire to change to Science in order to achieve the country's goals, should be permitted to do so. This increase in the number of students who enrolled in Science would increase who may contribute to economic growth. This could be done by providing a pretest of science knowledge. Students should not be restricted by the system, especially if it causes some problems in educational achievement.

New educational practices by elementary school teachers
Gottlieb and Brookover (1966) discussed acceptance of new educational practices by elementary school teachers and suggested that one should not expect an individual to reject or accept a given change on the basis of his generalized orientation to change.

Acceptance or rejection of a given change would depend, in part, upon those attitudes that are directly associated with that change. In fact, we would be inclined to expect that the specific characteristics of any particular change and the conditions surrounding its use might, as a result of an individual's more intimate connection with the change and with the role behavior, be more important in influencing the perception of compatibilities and incompatibilities than would a generalized orientation. (p. )

Educational authorities in Saudi Arabia believe that
the change from the Arts to Science is not appropriate
because the Arts students will have difficulty with the Science materials.

General readiness for change. In the above study, it was observed that acceptance of change in general (as measured by the change scale) was influenced by a general readiness to accept "all" changes. So in the case of Saudi Arabian students, changes from the Arts to Science might be considered appropriate if they are "ready" for that (i.e., the Science major). There will be no harm if the student is completely ready for the Science major. The problem is to demonstrate in a way acceptable to educational authorities that students can be ready without starting eleventh grade over again.

Admission standards in England and Wales. In the World Education Series (1963) it was mentioned that ${ }^{n}$ in England and Wales, students gain admission to the secondary grammar school by obtaining a certain score in the eleven plus examination" (p.25). In Saudi Arabia the science students can gain admission into the Arts by taking a pretest. However, Arts students can not pass a test to change to Science. Some Saudi educators question why the Arts students can't change to Science simply by taking a similar pretest.

Academic placement of students from Venezuela in educatational institutions in the United States. In 1961, the World Education Series, discussed the academic placement of
students from Venezuela in educational institutions in the United States. There were restrictions for admission to military training which required particular courses and completion of secondary education.

To be eligible for admission to military training a student must have earned a Certificate of General Secondary Education (first cycle of Secondary Education) or must have completed the third year of normal school education. One of the goals of the military school is to complete the secondary education of the Cadet so that when he graduates as a second lieutenant he will also be awarded the degree of Bachelor. The academic subjects stressed are mathematics, language and literature, physics, chemistry, and the social sciences, especially world history and the history of Venezuela. (p.ll)

Admission measurement based on equivalent backgrounds
in Austria. The World Education Series (1910) in another study about Austrian education, reported that the requirements foreign students should possess in order to enroll in Austrian institutions of higher education, consist of the equivalent of the background required of Austrian students.

High schools in Saudi Arabia should have similar arrangements to enable Arts students to change to the Science field of study. In other words, if Arts students have the equivalent of the background required of Science students, they would be permitted to change from the Arts to Science if they wished to do so.

Transfer problems of community college students.
Remley and Stripling (1983) discussed transfer problems
experienced by community college graduates and referred to poor academic preparation and transfer difficulties as some of the problems that impede movement from community college to 4-year colleges and universities.
Early articulation literature indicated that
problems existed in the following areas:
transfer of courses from community colleges to
transfer institutions, poor academic preparation
of community college students, denial admission
and difficulties with quarter and semester
calendars (Remley and Stripling, l983 p. 43).

Educators in Saudi Arabia believe that students who are enrolled in the Arts major are poorly prepared for Science, and, therefore, would find it to difficult to achieve academically if they were allowed to change to Science.

Transfer of undergraduate credits from abroad. In a study by Haas (1982) about undergraduate transfer credits from abroad, it was mentioned that,


#### Abstract

It is no wonder that many of us feel at least a bit uneasy when trying to determine the acceptability of transfer credits. Part of our problem is the impression of what a credit means at our respective institutions. All of us are familiar with situations where there is an unevenness in the work required for say a three credit course. Only those of us with the worst memories would say all of the courses we personally completed were equal in the effort required for each credit (p.218).


This is similar to the problem educators in Saudi Arabia face in trying to equate Science and the Arts and allow the Arts students the same transfer privilges (to

Science) as Science majors are allowed (to transfer to the arts) by passing a test. Saudi educators believe that the two majors (Science and the Arts) are uneven in everything such as difficulty, abilities required, interest of the students, etc.

Transferring from one subject to another. In the same study by Haas (1982) it was suggested that students need at least one semester of maturation before transferring from one subject to another.

> Ostensibly, this procedure leads to at least another semester to maturation before the student would join your institution. A l3 year system may or may not be worthy of advanced standing. Was the extra year require because the student changed languages? Can the above average student complete the l3 (years) in l2? Were there laboratories available for the science courses? What educational qualifications were required of the teachers? (p.220)

Questions about a 13 th or even 14 th year are faced by any Arts student in Saudi Arabia who wants to change from the Arts to Science. Since he will need to repeat one year or more in order to transfer (by returning to eleventh grade), he has to consider whether the change to Science is worth the year(s) he will lose in order to make the transfers, whether it is worth the social costs of no longer attending classes with the friends he has shared classes with for many years, whether the changes is worth starting another year or two of high school when his age peers and former classmates are graduating and going to college, and
whether it is worth delaying his entry to paid employment for what are essentially a l3th or l4th year of school. These questions are especially difficult for boys in the later high school years.

As we will see later in this report, the peer group takes on major importance for llh and 12 th grade boys. Their progress toward adult status is also important. The administrative restriction--requiring those who want to transfer to Science to begin the llth grade over again--may be too great a penalty to pay for having made the wrong choice at loth grade. Boys who chose the Arts by suppressing their interest in Science because they weren't confident of their ability, but gained confidence as they matured, may be willing to hire tutors and double their class loads and home work to catch up. If they were allowed to take a qualifying exam and transfer, these boys could be lost to Science because of the restrictions of the system.

## Summary

In this chapter the related literature was reviewed in three parts. The first part was literature related to the background of Saudi Arabia and its educational system. The second part concerned literature related to declining Science enrollments, and the third part, reviewed literature related to the six factors, selected for this
study. Most of the above studies were done in cultures different than the one that is the subject of this research report. Many important factors that influenced students' choice of either the Arts of Science educational track were identified. Do these same factors influence Saudi Arabian students when they are choosing an educational track or are other factors more influential?

## METHODS, PROCEDURES, AND DESCRIPTIVE STATISTICS USED TO SELECT SAMPLE

The purpose of this chapter is to present the methods that were employed to investigate the impact of six factors affecting Saudi male students' selections of either the Science or Arts educational tracks. It includes a description of the sample, and the methods used to select the sample and collect the data. The research procedures and statistical techniques used for this study are also discussed.

## Methodology

Three methodologies were used as a means of collecting data. These were an analysis of written materials, survey questionnaires, and face-to-face interviews.

Analysis of Ministry Documents and Literature Review

Ministry of Education data and other official documents, including recent vital statistics, educational reports and policies, and other officially published information related to the study were obtained from the various educational administrators and from other
authorities in the Kingdom of Saudi Arabia. These documents were used to analyze the cause of the problem, and to make estimations of the prospective need for and supply of graduates in the science track. General literature in the field of science education and administration, student election of tracks and related areas was obtained from the Michigan State University Library and MSU's College of Education.

## Survey Questionnaires

Questionnaires were used to study selected factors which may affect high school students' choices in selecting or rejecting science as an educational track. With students who had already made their choice, questionnaires were used to determine how the decision about that choice was made (See Appendices B through E).

## Face-to-Face Interviews

Personal interviews were conducted by the researcher with students, family members, teachers, and principals to obtain the ideas and opinions of those who are responsible for education and have relevant experience with the subjects of the study. The researcher's goal was to determine the way in which the choice of an educational track was made, who made the decision, and how and when the decision was made. The interview was used to generate data in addition to that which was collected by using questionnaires during the
survey. It was hoped that the more open nature of a one-onone interview would identify other factors influencing choice of educational track. Interviews would also provide the researcher the opportunity to probe into the reasons why the subjects of the study reponded the way they did to items in the questionnaire. Each subject was asked orally about his ideas and opinions regarding the choice students must make and the factors that influenced him (or his son or student) in making the choice (See Appendices F through H).

## Hypotheses Established

To answer the first research question, the descriptive statistics of the questionnaire's first section and the data from face-to-face interviews were used. To answer the second research question, descriptive statistics of the second section of the questionnaire and face-to-face interview were employed.

To answer the third research question, delineated earlier, the following hypotheses were tested:

Hol: There will be no significant differences between tenth grade students who intend to enroll in the Arts track and those who intend to enroll in the Science track with respect to the six factors.

Ho2: There will be no significant differences between eleventh and twelfth grade students in Arts track and those in the Science track with respect to the six factors.

Ho3: There will be no significant differences between students in tenth grade and students in eleventh and twelfth grades with respect to the six factors.

## The Nature of the Population and the Sampling Procedure

The sample for the questionnaire survey was selected from the population of all male tenth, eleventh and twelfth grade students enrolled in five secondary (or high school) programs in Medina, Saudi Arabia. Sample subjects were selected from the following groups:

1. 100 tenth grade male students who were selecting Science or Arts as an educational track during the 1984-1985 academic year
2. 25 eleventh grade male students who had already selected Arts as their educational track.
3. 25 eleventh grade male students who had already selected the Science track.
4. 25 twelfth grade male students who had already selected the Arts as their field of study and were in the second dear in that track.
5. 25 twelfth grade male students who had selected Science as an educational track and were in the second year in that track (Table 3.1).

As noted, the location of the study was Medina, Saudi Arabia. Sample subjects were randomly selected (using school enrollment lists and a random numbers table for each of the five previously mentioned groups until a total sample of 200 had been drawn).

Table 3.1
Number of Completed Questionnaires

| Grade and Major | Number of <br> Respondents | Percent |
| :--- | :---: | :--- |
| 10th grade | 100 | 50 |
| 11th grade Arts | 25 | 12.5 |
| 11th grade Science | 25 | 12.5 |
| 12th grade Arts | 25 | 12.5 |
| 12th grade Science | 25 | 12.5 |
| Total | 200 | 100.0 |

After obtaining the permission and cooperation of school officials, the survey questionnaire was administered in Science and Arts classes during the regular school day, at all five schools. The focus of the questionnaire was on the reasons for the students' enrollment or non-enrollment in the science track and the most significant influences related to the students' choices.

The population for the face-to-face interviews consisted of male tenth grade, eleventh grade, and twelfth grade students; male principals, male teachers (Science and Arts, Saudi and non-Saudi), and male parents of the students interviewed. These subjects were selected from the five
secondary schools in Medina and are characterized as follows:

1. nine tenth grade male students ( 3 who intended to choose Science, 3 who intended to choose Arts, and 3 who had not decided yet).
2. three eleventh grade students who had already selected Science as their educational track.
3. three eleventh grade students who had already selected the Arts as their educational track.
4. Three twelfth grade students who had selected Science as their educational track and were in their second year in that track.
5. three twelfth grade students who had selected Arts as their educational track and were in their second year in that track.

Selections were made from the five schools using school enrollment lists and a random numbers table. The rationale for their selection was to get opinions from subjects with with diverse attitudes toward the two educational tracks. The total sample of tenth, eleventh, and twelfth grade students was 21 . They represented both fields of study and three levels of experience in their chosen tracks.
6. 21 male parents (or whoever was most responsible concerning the students' choice of educational track, such as guardians, uncles, brothers, etc.) of those students selected for the interview.

These subjects were selected to obtain opinions and ideas not only from the students, but their parents or those responsible for their choice of educational track as well.
7. Eight teachers were selected (using school employee lists and a random numbers table) from the five schools: two Saudi science teachers, two Saudi arts teachers, two non-Saudi science teachers, and two non-Saudi Arts teachers. These choices were made to get a variety of indigenous and foreign subjects from both Science and the Arts who may have different ideas and opinions regarding the issues of this study.
8. Five principals (one from each school) were interviewed because they had had experience with the students and teachers and might have some good ideas and opinions regarding the study's problem (Table 3.2).

## Procedures

In collecting the data the following procedures were used.

Development of Research Questionnaires and Interview Schedules

The development of the questionnaires and the interview schedules involved several steps:

Table 3.2
Interview Subjects by Group

Subjects
Number

| Students in the 10 th grade who will choose Science | 3 |
| :--- | :--- | :--- | :--- |
| Students in the l0th grade who will choose the Arts | 3 |
| Students in the 10 th grade who are not decided yet | 3 |

Students in the llth grade who already selected Science

3
Students in the 11 th grade who already selected the Arts

3

Students in the 12 th grade who already selected
Science $\quad 3 \begin{aligned} & \text { Students in the } 12 \text { th grade who already selected } \\ & \text { the Arts }\end{aligned}$

Male parents or guardians of above students
21

Saudi teachers who teach Science
Saudi teachers who teach Arts 2
Non-Saudi teachers who teach Science 2
Non-Saudi teachers who teach Arts 2

Principals of all five schools 5

TOTAL
55

1. A comprehensive review of the literature was performed to gain some knowledge in the construction of a questionnaire and interview schedule relevant to the study.
2. The pilot study with the principals clarified some points about student choice. As a result, questions asked in both the questionnaire and interviews were provided.
3. The researcher's experience as a science teacher in the intermediate schools helped with selecting, and organizing the questionnaire and interview items.
4. Advice was provided by the major advisor, as well as the other committee members, about questions that needed to be added or eliminated and about their organization.
5. Assistance was provided by a professional in questionnaire formation regarding the organization and wording of the questionnaire.
6. Assistance was also provided by several friends studying at MSU and who have good backgrounds in questionnaire and interview formation and organization.
7. Some help was provided by a research consultant who who helped identify questions that should be added or eliminated.
8. The questionnaire and interview were translated into Arabic by a bilingual professor under the researcher's supervision to make sure that the translated questions would elecit the data sought by the researcher.
9. Under the researcher's supervision, the translated questionnaire and interview schedule were edited by an Arabic professor who teaches Arabic.
10. The translated questionnaire and interview schedule were revised by the researcher and some Arab professors in science education to make sure that the questionnaire and interview schedule were in the best possible form.
11. The questionnaire was tested by the researcher using 60 students from four classes (two tenth grade classes of 15 students each, 15 eleventh grade Science students and 15 of twelfth grade students of the Arts). After scoring, the questionnaire was revised based on the results and observations made by students.
12. Finally, the questionnaire and interview schedules were typed in Arabic, copied and prepared for administration.

## Description of the Questionnaires

Two sets of questionnaires were developed, one for tenth grade students and one for eleventh and twelfth grade
students. Each of the two questionnaires consisted of two sections. The first section contained items designed to collect personal data relevant to the purpose of the study, such as class level, the person responsible for academic decisions, and parents' level of education. The second section contained a list of 42 items which were designed to collect reasons, feelings, and opinions that might reflect the students situation and attitudes toward each educational track.

The respondents were asked to indicate whether they fully agreed, agreed, were undecided, disagreed, or fully disagreed.

The items of the questionnaire were mixed in such a way as to avoid contaminating some responses by the content of previous items. This was also done to prevent bias caused by the emphasis of the research on Science enrollment. Questions were designed to reflect the influence of the following six factors on the student's choice of educational track:

1. student's interest
2. teachers' attitudes
3. teaching methods
4. difficulty of the curriculum
5. family influence
6. restrictions of the system.

The questionnaire was accompanied by a letter that explained the nature, purpose, and importance of the study. It also encouraged the subjects to be frank in their responses. Sample questionnaires and letters are in Appendices B and D (English Version) and Appendices C and E (Arabic Version).

Description of the Interviews

The researcher constructed five interview schedules for subjects in the following groups:

1. tenth grade students,
2. eleventh and twelfth grade students (in Science and Arts),
3. male parents or adult responsible for the students' academic decisions,
4. teachers (Saudis who teach Science, Saudis who teach Arts, non-Saudis who teach Science, and nonSaudis who teach Arts), and
5. school's principals.

Each of the five interview schedules consisted of two sections. The first section contained an introduction about the research and the purpose of the interview and encouraged the subjects to be frank. It assured them that their answers would be kept confidential. Individual responses would be seen only by the researcher. The second section was designed to elicit their comments, ideas, and opinions about the research questions. The interview schedules are
shown in Appendix $F$ (English version) and Appendix $H$ (Arabic version).

Validity of the Questionnaires
According to Mosher and Kalton (1972), "validity is the ability of the survey instrument to measure what it sets out to measure" (p.356). They pointed out that "the assessment of content validity is essentially a matter of judgment; the judgment may be made by the surveyor or, better, by a team of judges engaged for the purpose" (p.356).

The validity of the questionnaire and interview schedule were enhanced by the following actions:

1. consulting with members of the researcher's doctoral committee to receive their comments and suggestions.
2. seeking advice from graduate student friends who are studying at MSU and have been teachers in Saudi secondary schools.
3. testing the subject's understanding of the questionnaire items by pilot testing the instruments as described earlier in this chapter

Using the aforementioned procedures, the questionnaire was improved and was then readied to be administered to the subjects of the research.

Determination of the reliability of the questionnaire was a matter to be considered in doing the study.

Reliability refers to consistency, to obtaining the same results again.... The degree of reliability (consistency) sets limits to the degree of validity possible: validity cannot rise above a certain point if the measure is inconsistent to some degree. On the other hand, if we find that a measure has excellent validity, then it must also be reliable. (Oppenheim, 1966, pp. 69-70)

To test the reliability of the questionnaires, Cronbach's Alpha, a statistical approach to determining the reliability of a survey instrument, was used. Table 3.3 shows the Alpha Cronbach reliability coefficients for each of the questionnaires.

Table 3.3
Reliability of the Questionnaires

Questionnaire
Alpha Cronbach Reliability Coefficient

1. l0th grade questionnaire 0.77
2. 11th and 12 th grade questionnaire
0.76

The table indicates that these two questionnaire had high reliability coefficients, which meant there is high consistency in the students' responses to the questionnaire items. Thus, it could be concluded that the research questionnaire had an acceptable level of reliability for the purposes of the research.

## Pilot Study

Before deciding which factors would be used in this study, the researcher conducted as interview of about 30 minutes duration with each high school principal. Questions were asked about the reasons for which students choose a particular major. Factors were then obtained from their responses. Before developing the questionnaire of this study, the researcher initially selected nine factors that were generally agreed upon by the high school principals. Factors were also derived from literature that related to the decline in Science enrollments.

Before designing the study's questionnaire, the researcher had to exclude three of the nine factors in order to ask more questions about fewer factors. The three factors that were excluded are peer influence, reward system, and intention to leave school. The high school principals perceived these factors as least important. The literature also emphasized these factors the least.

Most of the related literature emphasized the importance of the students' interest, teachers method and attitudes, family influence, and the difficulty of the curriculum, in influencing the students' choice of a particular field of study. There was no emphasis in the literature on the restriction of the system as an important factor in influencing the student's choice of an educational track. However, resulting from the pilot interviews and the researcher's experience in the educational system in Saudi Arabia, this factor was considered to be as potentially significant as the others.

Before distributing the questionnaire to the study's sample, another pilot study with the questionnaire was used to identify the students reaction to the questionnaire items. Whether or not the items were understandable was also assessed. Sixty high school ( 30 tenth grade, 15 Science students in the llth grade and 15 students of the Arts in l2th grade) responded to the questionnaire items during a class period which lasted 45 minutes.

Several adjustments to the questionnaire were made based upon the student's reactions to the questionnaire items. For example, before the pilot study, the response alternatives were "strongly agree," "agree," "undecided," "disagree," and "strongly disagree." It was determined during the test that students thought the word "strongly" referred to a physical response, therefore, the researcher
had to change the responses to "fully agree," "agree," "undecided," "disagree," and "fully disagree".

Before the pilot study the students were asked to use $X$ in the desired column. During the test, some students reacted to that sign as an "undesired" item, therefore, the researcher had to change it to an ().

Some questions that included the words "attitudes," "reflect," and "criteria," were confusing for the students. Other words that have the general meaning in Arabic were used instead.

Finally, the questionnaire was revised, based on the feedback from the students. It was retyped and distributed to the main study sample.

Data Collection Procedures

To distribute the questionnaires and do the interviews, special arrangements had to be made. The researcher carried a letter from King Abdul Aziz University (College of Education) in Medina to the director of the General Directorate of Education in Medina. The letter explained the researcher's purpose and the study's goals and asked for cooperation from the general directorate in facilitating the research work.

The researcher received assistance, help, and cooperation from the director in Medina who sent each school
principal a letter asking for his cooperation with the research.

The researcher had a very short time to collect the data, but received so much help from each school principal that his task was easier than expected. Starting by meeting with each principal and explaining the goals of the study, the researcher received permission and cooperation in every school.

The researcher arranged with each school principal for the distribution of questionnaires and interviews. The principals introduced the researcher to teachers, students and parents by calling some of them and encouraging their cooperation. The researcher assured the principal, teachers, parents and students about the confidentiality of the information.

After the researcher collected his data he visited each principal to thank him and tell him how much he appreciated the cooperation that facilitated his task.

The interviews were conducted by the researcher who met with students, teachers, and principals in the schools and interviewed each subject individually. The responses were recorded by using check lists as well as copying the subjects' responses. A tape recorder was not used because it was thought it might affect the subject's responses. The researcher met with the family members at locations that
were convenient for them such as their homes or coffee shops.

Once the responses were recorded, they were coded in English. Similar responses were combined to make better comparisons. For example, students were asked about whether they had discussed choosing an educational track with anyone else.

Three students who had not decided yet replied as follows:

1. "I will not discuss choosing my major with anyone else because I am the only one who cares most about that choice."
2. "I will not discuss that with anybody because if I did not choose the right choice, nobody will be hurt but me."
3. "Nobody else, because everyone will care about himself more than anybody else, and I will have to think carefully before I choose."

The above are responses from three different students, but because of their similarity to combine them into one response which, once coded, became: "Nobody else, because nobody else would care about my choice." This procedure was used consistently when coding and combining the interview response of the students, parents, teachers, and principals.

Coding and combining the interview's responses, was also completed in the following case. When the students
were asked if their choice was the same as their family's choice and why three students who were to choose Science responded as follows:

1. "Yes, because my family wants me to be in the Science track."
2. "Yes, because Science has always been the favorite major of my father."
3. "Yes, because my father and mother want my brothers and I to be in the Science colleges so we can become medical doctors or engineers."

The three above quotes are also very similar and it is more reasonable to combine them as one response than analyze them as three different responses. They were combined as one response which is: "Yes, because they prefer that major."

Finally, the coding and combining of the interview respones were validated. After the interview items were coded and combined the interview and questionnaire responses were compared to determine if there was agreement between the two groups with regards to the most important factors influencing students' choice. How and why the responses were the same or different were also analyzed.

Statistical Techniques used for Data Analysis

Frequencies and means were used to investigate the processes and factors that influence male students' choices
of an educational track. The impact of: students' interest, teaching methods, teacher attitudes, the difficulty of the curriculum, family, and restrictions of the system were examined.

Then, the multivariate analysis of variance (MANOVA) was used to test hypothesized differences between grade levels and majors on the six selected factors associated with the students choice of field of study. Three hypothesis were tested at the significance level of 0.05 .

In the questionnaire, the respondents were asked to indicate on a Likert (five-point) scale whether they fully agreed, agreed, were undecided, disagreed, or fully disagreed with each item. The data were collected and coded for computer use. For each of the 42 items in the questionnaire that employed the five point scale, a point score was applied as follows: 1 for fully agree, 2 for agree, 3 for undecided, 4 for disagree, and 5 for fully disagree.

The SPSS package was used to carry out the analysis required and descriptive statistics were used to describe the distribution of each variable involved in the study. The descriptive statistics consisted of finding the mean, standard deviation, and frequencies.

The mean was used to indicate the influence of each item and showed whether the factor was very influential, influential, uninfluential or entirely uninfluential. The
lower the mean, the more influential the item was considered to be and vice versa.

The standard deviation was used to show how large a variance existed between respondents' answers on a particular item. If the standard deviation was low it meant that most of the responses were located around the mean of that item. If the standard deviation was high, it meant that the responses to that item were spread across the range of responses from the highest to the lowest. In other words, the lower the standard deviation, the more agreement existed between respondents. A higher standard deviation, meant there is less agreement between respondents.

The 42 items of the questionnaire represented six categories with each category representing one factor. The items within each factor were arranged in rank order according to their means from lowest to highest. This order helped to identify the items with respect to their influence within each of the six factors according to the following criteria:

1. items with means between 1.0 and 2.0 were considered very influential
2. items with means between 2.0 and 3.0 were considered influential.
3. items with means between 3.0 and 4.0 were considered as uninfluential.
4. items with means between 4.0 and 5.0 were considered entirely uninfluential.

To compare the tenth grade students and eleventh and twelfth grade students, with respect to all the six factors combined, a multivariate analysis of variance (MANOVA) was used to determine whether the two groups significantly differed from each other.

The same procedure was used to compare the loth grade students who intended to choose the Arts with those who intended to choose Science, and eleventh and twelfth grade students enrolled in the Arts with those enrolled in Science. A univariate analysis of variance was used to compare the two groups on each factor individually. This showed which factor, if any, were contributing significantly to the differences between the two groups.

The six factor categories each contained five to eight items designed to elicit student responses to clarify the influence of each of the six factors. To find out which factors were more significant than others, the overall mean for each factor was calculated by adding the students' scores for each of the items within each factor category then dividing the sum by the number of items in that category to derive an average score for each student on each factor. To get the mean for each factor the scores obtained for the students on each factor were averaged. The six factors were then rank ordered from low to high according to their means. The lower the mean, the more important the factor was considered to be, and vice versa.
In an effort to understand the processes by which students and their parents in Saudi Arabia make decisions about the selection of an educational track, surveys and face-to-face interviews were carried out. Students and personnel from five high schools in Medina were the respondents. This chapter includes a description and analysis of the data obtained from questionnaires used in the surveys and interviews. Data are presented in tabular and narrative form. The first section covers personnel and demographic information concerning the 200 tenth, eleventh and twelfth grade students who responded to the questionnaires. The second section presents data and analysis of all the students' responses to questionnaire items about the six factors that may affect their choice of a educational track: (a) students' interests, (b) teaching methods, (c) teachers' attitudes, (d) difficulty of the curriculum, (e) family influence and (f) restrictions of the system. In the third, fourth and fifth sections, the data are divided to indicate the influences on the students' choices of educational track by grade level in school. In
succeeding sections, then, comparisons are made between students of the Arts and Sciences. The results of interviews with students, parents, teachers, and principals are also discussed. Finally, a summary of the analysis concludes the chapter.

Demographic and Personal Data for Students in 10 th 11 th and 12 th Grades

Students from five high schools in Medina participated in the study, including 100 students in the tenth grade, fifty students in the eleventh grade, and fifty students in the twelfth grade (See Table 3.1).

Table 4.1 shows the ages of the students in all classes combined and then by grade level.

Ages of all students combined ranged from 15 to 22 years, with 89 percent of the students between 15-19 years old and about 10 percent older than 19 years. The mean age for all the students was 17.3, with a standard deviation of 1.667, which confirms that students' ages tended to cluster at the lower end of the age range.

Ages of tenth grade students rar.,ea from 15-20 years, with 85 percent of the students between 15-17 years, and about 15 percent older than 17 years. The mean of the tenth grade students' ages was 16.4 with a standard deviation of 1.217, which confirmed that 10 th grade students ages tended to cluster between 15 and 17 years old.
Table 4.1
Ages of Students Surveyed

| Age | CombinedAbsoluteFrequency(N) | ClassesAdjustedFrequency$(\%)$ | Tenth Grade |  | Eleventh Grade |  | Twelfth Grade |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Absolute Frequency (N) | $\begin{aligned} & \text { Adjusted } \\ & \text { Frequency } \\ & (\%) \end{aligned}$ | Absolute Frequency ( N ) | $\begin{aligned} & \text { Adjusted } \\ & \text { Frequency } \\ & (\%) \end{aligned}$ | Absolute Frequency (N) | Adjusted <br> Frequency <br> $(\%)$ |
| 15 | 24 | 12.0 | 23 | 23.0 | 1 | 2.0 | -- | -- |
| 16 | 44 | 22.0 | 37 | 37.0 | 5 | 10.0 | 2 | 4.0 |
| 17 | 57 | 23.5 | 24 | 24.0 | 25 | 50.0 | 8 | 16.0 |
| 18 | 25 | 13.0 | 8 | 8.0 | 8 | 16.0 | 10 | 20.0 |
| 19 | 27 | 13.5 | 6 | 6.0 | 8 | 16.0 | 13 | 26.0 |
| 20 | 11 | 5.5 | 2 | 2.0 | 2 | 4.0 | 7 | 14.0 |
| 21 | 8 | 4.0 | -- | -- | 1 | 2.0 | 7 | 14.0 |
| 22 | 3 | 1.5 | -- | -- | -- | -- | 3 | 6.0 |
| Total | 200 | 100.0 | 100 | 100.0 | 50 | 100.0 | 50 | 100.0 |

Source: Survey Data

Eleveth grade students ranged from 15 to 21 years of age, with 94 percent of the students between 15-19 years and 6 percent older than 19 years. The mean of the eleventh grade students' ages was 17.54 with a standard deviation of 1.182, which confirmed that llth grade students' ages tended to cluster between 16 and 18 years.

Ages of the twelfth grade students ranged from 16 to 22 years with 94 percent of the students between 16 and 21 years old and 6 percent older than 21 years. The means of the twelfth grade students' ages was 18.9 with a standard deviation of 1.577, which confirmed that 12 th grade students' ages tended to cluster between 17 and 20 years.

Table 4.2 shows the students' attitudes toward their choice of educational track. Those considered included the eleventh and twelfth grade students combined and those at each grade level. Tenth grade students were not included because they had not yet chosen their majors.

Table 4.2 shows that 81 eleventh and twelfth grade students ( 81 percent), a large majority, reported that they were content with their choices. Only 13 students indicated that they wished they had chosen the other track. Only two students said they had had little choice because someone else had made the decision for them.

Table 4.3 shows the 10 th grade students' plans for llth grade, as to whether they would choose Science, the Arts, or
Table 4.2
Eleventh and Twelfth Grade Students' Attitudes
Toward Their Choice of Educational Track

|  | Eleventh \& Twelfth <br> Grades Combined <br> Absolute Adjusted <br> Frequency Frequency <br> ( N ) <br> (\%) |  | Eleventh <br> Grade <br> Absolute Abjusted <br> Frequency  <br> (N)  |  | Twelfth Grade <br> Grade <br> Absolute <br> Frequency <br> (N) justed  <br> (N) (\%) |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Attitude Response |  |  |  |  |  |  |
| I am glad about my choice | 81 | 81.0 | 37 | 74.0 | 44 | 88.0 |
| I did not have much choice because someone else chose it for me | 2 | 2.0 | 1 | 2.0 | 1 | 2.0 |
| I am not sure that I made the right decision | 4 | 4.0 | 4 | 8.0 | -- | -- |
| I wish I had chosen the other field of study | 13 | 13.0 | 8 | 16.0 | 5 | 10.0 |
| Total | 100 | 100.0 | 50 | 100.0 | 50 | 100.0 |

Source: Survey Data

Table 4.3
Tenth Grade Students' Plans for Eleventh Grade

| Plans for <br> Major | Absolute <br> Frequency (N) | Adjusted <br> Frequency (\%) |
| :--- | :---: | :---: |
| Arts Section | 10 | 10.0 |
| Science Section | 67 | 67.0 |
| Undecided | 23 | 23.0 |
| Total | 100 | 100.0 |

Source: Survey Data
had not yet decided. These data were parallel to the data on attitude toward choice solicited from upper class students because the 10 th graders had not yet chosen their majors.

Table 4.3 indicates that the majority of the students ( 67 percent) were planning to choose Science as their field of study, only 10 percent were planning to choose the Arts, and 23 of the students had not decided their choices.

Table 4.4 shows the distribution of fathers' levels of education for all students correspond to students' by class level and track.

Overall, 60 percent of the fathers had had formal education at some level; 40 percent had no formal education. The mean of father's level of education, for all classes combined, was 3.655 , which falls between intermediate and elementary level with a standard deviation (SD) of 1.664 .
Table 4.4
Education of Student's Fathers


This indicates that the numbers were spread across all the grades. Lack of formal education was highest among fathers of twelfth graders (54 percent) and relatively few had gone beyond elementary school (28 percent). Science students seem to have better educated fathers.

Table 4.5 shows fathers' occupations for all student subjects corresponding to grades and tracks. It is apparent that the highest percentage (41.5 percent) of the fathers were employed in civil service. Another 21.5 percent were businessmen. On the other hand, very low percentages of the fathers were laborers, farmers, or professionals, occupations which are mostly filled by foreigners. Fathers of Science students in grades eleven and twelve include more businessmen and Civil Service workers than fathers of students of the Arts.

Table 4.6 indicates the educational level of the students' mother, for the combined grade levels and then by separate grades and tracks. Over 60 percent of students' mothers had no formal education. Very few were college, high school, or intermediate school graduates which was why the mean of the responses was 4.729, between the "elementary school" level and "literate but no formal education." The standard deviation (SD) was l.431. Science students seem to have better educated mothers.

Table 4.7 identifies the adults with whom the students lived. The data show that most of the students (84 percent)

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Source: Survey Data
Source: Survey Data

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\begin{gathered}
\text { Table } 4.6 \\
\text { Education of Students' Mothers }
\end{gathered}
$$

| Highest <br> Level of Education Completed | $\begin{aligned} & \text { Combined } \\ & \hline \text { Absolute } \\ & \text { Frequency } \\ & \text { (N) } \end{aligned}$ | $\begin{aligned} & \text { Classes } \\ & \hline \text { Adjusted } \\ & \text { Frequency } \\ & \text { (\%) } \end{aligned}$ | Tenth Grade |  | Eleventh and Twelfth Grade Students |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | Arts |  | Science |  |
|  |  |  | Absolute | Adjusted | Absolute | Adjusted | Absolute | Adjusted |
|  |  |  | Frequency <br> ( N ) | $\begin{aligned} & \text { Frequency } \\ & \text { (\%) } \end{aligned}$ | Frequency <br> (N) | $\begin{aligned} & \text { Frequency } \\ & \text { (\%) } \end{aligned}$ | (N) <br> Frequency | $\begin{aligned} & \text { Frequency } \\ & \text { (\%) } \end{aligned}$ |
| College |  |  |  |  |  |  |  |  |
| Graduate | 7 | 3.5 | 4 | 4.0 | -- | -- | 3 | 6.0 |
| High School |  |  |  |  |  |  |  |  |
| Graduate | 15 | 7.5 | 10 | 10.0 | 2 | 4.0 | 3 | 6.0 |
| Intermediate or Junior |  |  |  |  |  |  |  |  |
| High School | 13 | 6.5 | 7 | 7.0 | 4 | 8.0 | 2 | 4.0 |
| Elementary | 38 | 19.1 | 19 | 19.0 | 10 | 20.0 | 9 | 18.0 |
| Literate but |  |  |  |  |  |  |  |  |
| no Formal |  |  |  |  |  |  |  |  |
| Education | 43 | 21.6 | 12 | 12.0 | 12 | 24.0 | 19 | 38.0 |
| Illiterate | 84 | 41.7 | 48 | 48.0 | 22 | 44.0 | 14 | 28.0 |
| Total | 200 | 100.0 | 100 | 100.0 | 50 | 100.0 | 50 | 100.0 |

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\begin{aligned}
& \text { Table } 4.7 \\
& \text { Persons With Whom the Students Reside }
\end{aligned}
$$

| Category <br> Label | Combined Classes |  | Tenth Grade |  | Eleventh and Twelfth Grade Students |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Absolute | Adjusted | Absolute | Adjusted | Absolute | Adjusted | Absolute | Adjusted |
|  | Frequency <br> ( N ) | $\begin{aligned} & \text { Frequency } \\ & (\%) \end{aligned}$ | $\begin{aligned} & \text { Frequency } \\ & \text { (N) } \end{aligned}$ | $\begin{aligned} & \text { Frequency } \\ & \text { (\%) } \end{aligned}$ | Frequency <br> ( N ) | $\begin{aligned} & \text { Frequency } \\ & \text { (\%) } \end{aligned}$ | Frequency <br> (N) | $\begin{aligned} & \text { Frequency } \\ & \text { (\%) } \end{aligned}$ |
| Both |  |  |  |  |  |  |  |  |
| Parents | 168 | 84.0 | 85 | 85.0 | 42 | 84.0 | 41 | 82.0 |
| Father |  |  |  |  |  |  |  |  |
| Only | 10 | 5.0 | 7 | 7.0 | -- | -- | 3 | 6.0 |
| Mother |  |  |  |  |  |  |  |  |
| Only | 16 | 8.0 | 5 | 5.0 | 6 | 12.0 | 5 | 10.0 |
| Relatives | 4 | 2.0 | 2 | 2.0 | 1 | 2.0 | 1 | 2.0 |
| Other | 2 | 1.0 | 1 | 1.0 | 1 | 2.0 | -- | -- |
| Total | 200 | 100.0 | 100 | 100.0 | 50 | 100.0 | 50 | 100.0 |

Source: Survey Data
lived with both parents, a fact that may suggest considerable stability among Saudi Arabian families. Art students and Science students seem to have similar situations in regard with whom they like.

To help determine the influence of family members in the students' selection of educational track, students were asked whom they sought out for support and advice in making educational plans. By rank ordering a short list of family members, students indicated their first, second, third, (etc.) preferred sources for educational advice. Table 4.8 shows the first choices of all groups. In the majority of cases, the father was the first choice. This result was not unexpected since the father is considered the head of the household in Saudi Arabia. Male dominance in the society was further demonstrated by selection of a brother as the second most popular source of support and advice by 19.5 percent of the students, ahead of the mother who was selected by 14 percent. Arts and Science students seem to experience similar situations regarding from whom they seek support and advice.

In the following sections, family influence is further examined in addition to the examination of five other factors influencing students' choice of an educational track. All of the students' questionnaire responses are considered in the next section.

Source: Survey Data

Categorical Responses of Students to Six Factors That May Influence Their Choice of Educational Track

This section presents analysis of the responses of student subjects to the six topical areas of the questionnaire. Each category reflects items related to one of the six factors that may influence students' choice of major. The items of each category are rank-ordered from lowest to highest by mean value to show the importance of each item from very "influential" to "entirely uninfluential." The total mean of all items in each category is provided for comparison across categories.

The analytical procedure is carried out four times. Thus, the first subsection includes all classes to show overall mean and $S D$ for all items. It should be noted that the items for all classes are stated in the present tense, although they were stated in the future tense in the questionnaire completed by tenth grade students who had not yet chosen their majors. The same procedure is used in the second section to represent responses to the six areas and their related items by tenth grade students who will soon make their choice of majors. The third presentation includes responses to the six categories and their related items by eleventh grade students who have recently made the choice. The fourth subsection includes responses of twelfth grade students who have been enrolled in their choice of major for over a year. (The second, third and fourth sections are included in Appendix A).

Responses of all Students to Six Factors That May Influence Choice of Major

In Table 4.9 the eight items of Category $A$ which comprise items related to the students' interest are rank ordered from lowest to highest.

Table 4.9 shows that of the eight items related to students' interest, four items (numbers $15,1,18,14$ ) were considered to be very influential in the students' choice of field of study. Each of them had a mean between 1.0 and 2.0. Item number 15 was related to the importance of the field of study, number 1 was related to the subject's reflection of the students' interest, number 18 was related to the potential of the most demanding subject to be interesting, and number 14 was related to the frequency with which the student talked to his friends about his educational track.

Four of the items were considered to be moderately influential for the students' choice of educational track. Each of them had a mean between 2.0 and 3.0 (item numbers 26, 8, 11, and 7). Item number 26 was related to the importance of participating in activities related to the educational track, number 8 was related to whether the educational track is enjoyable, number 11 was related to the practical application of the curriculum in daily living, and number 7 was related to whether the educational track is boring. None of the items were considered to be uninfluential.

Table 4.9
Rank Order of Items Related to "Student Interest" for Grades Ten Through Twelve

| Rank Order By Mean | Item Number | Item | Mean | S.D. |
| :---: | :---: | :---: | :---: | :---: |
| 1 | 15 | My field of study is very important for my future life. | 1.465 | . 743 |
| 2 | 1 | The subjects in my field of study reflects my interests | 1.795 | . 822 |
| 3 | 18 | In even the most demanding subject areas, acquisition of academic knowledge is or can be more interesting and appealing to everyone | 1.799 | . 778 |
| 4 | 14 | I often talk to my friends about issues related to my field of study | 1.960 | . 892 |
| 5 | 26 | It is important to participate in the activities related to the subjects of my field of study | 2.010 | . 972 |
| 6 | 8 | The subjects in my field of study are very enjoyable | 2.110 | . 895 |
| 7 | 11 | In my field of study the criterion for deciding what to include in the curriculum depends on its practical application in daily living | 2.188 | . 942 |
| 8 | 7 | Most of the subjects in my field of study are boring | 2.589 | . 986 |
|  |  | Overall Mean $=$ | 1.987 | . 430 |

It seems from the items' means that the factor of student interest is very influential, a finding which is supported by the overall mean of all items which is 1.987 and the standard deviation 0.430. This factor is very influential because the overall mean is between 1.0 and 2.0 .

Table 4.10 shows the rank order from lowest to highest of the six items of Category $B$, which comprised items related to teaching methods.

Table 4.10 indicates that of the six items related to teaching methods, one item (number 17) was considered to be very influential in the students' choice of educational track, because it had a mean between 1.0 and 2.0. That item is related to praise from the teacher when the students answer correctly.

Four items were considered to be moderately influential for the students' choice of an educational track. Each of them had a mean between 2.0 and 3.0 (numbers 28, 12, 27, and 2). Item \#28 was related to teachers showing students how to correct their mistakes, \#12 was related to stimulation of motivation, \#27 concerned homework, and \#2 was related to the quality of teachers in the students' educational track.

One item (number 3 ) was considered to be uninfluential for the students' choice of educational track,because it had a mean between 3.0 and 4.0. Item number 3 was related to
Rank Order of Items Related to "Teaching Methods" for Grades Ten

| Rank Order by Mean | Item Number | Questionnaire Items | Mean | S.D. |
| :---: | :---: | :---: | :---: | :---: |
| 1 | 17 | In my field of study teachers praise me when I answer correctly | 1.670 | . 925 |
| 2 | 28 | In my field of study, teachers show me how to correct my mistakes | 2.196 | 1.018 |
| 3 | 12 | Most of the teachers in my field of study try to stimulate competition among students to increase motivation | 2.312 | 1.065 |
| 4 | 27 | In my field of study, teachers give a lot of homework | 2.520 | 1.169 |
| 5 | 2 | The high quality of teachers in my field of study was a strong factor in choosing it | 2.925 | 1.240 |
| 6 | 3 | The poor quality of teachers in the other field of study was a strong factor in choosing my field of study | 3.568 | 1.357 |
|  |  | Overall Mean $=$ | 2.461 | . 533 |

Source: Survey Data

$$
\text { Table } 4.10
$$

the influence of poor quality teachers on the student's choice of educational track.

The overall mean of all items in this category was 2.461 and the standard deviation 0.533. Using the criteria stated earlier, this indicates that "teaching method" is influential. Overall mean response to the item was between 2.0 and 3.0 .

Table 4.11 rank orders, from lowest to highest, the eight items in Category $C$, which contained questions related to teacher attitudes.

Two items are considered to be very influential in the students' choice of educational track, because they had means between 1.0 and 2.0. Item number 10 was related to teachers' long experience and item number 41 concerned good teacher-student relationships.

Five items, with means between 2.0 and 3.0 , are considered to be moderately influential for the students' choice of educational track. Those items were numbers 5, 16, 32. 39, and 4. Item number 5 concerned the teachers' fair and impartial treatment of students. Item number 16 was related to teacher enthusiasm. Item numbers 32, 39 and 4 were related to teachers' support of students in their studies, their attitude toward students, and their selfcontrol, respectively.

One item was considered to be uninfluential for the students' choice of educational track, because it had a mean between 3.0 and 4.0. Item number 31 was related to the
Rank Order of Items Related to "Teachers

| Rank Order by Mean | Item Number | Item | Mean | S.D. |
| :---: | :---: | :---: | :---: | :---: |
| 1 | 10 | Local schools should hire only those teachers who have had long experience in teaching | 1.400 | . 709 |
| 2 | 41 | I have a very good relationship with most of the teachers in my field of study | 1.915 | . 945 |
| 3 | 5 | Generally, teachers in my field of study are fair, impartial and objective in their treatment of students | 2.218 | 1.056 |
| 4 | 16 | Teachers in my field of study seem enthusiastic in teaching their subject | 2.295 | . 955 |
| 5 | 32 | Teachers in my field of study always give me support in my studies | 2.400 | 1.066 |
| 6 | 39 | Teachers in my field of study have a good attitude toward students | 2.465 | . 976 |
| 7 | 4 | Generally teachers in my field of study are self controlled and not easily upset | 2.505 | 1.012 |
| 8 | 31 | Foreign teachers make me like my field of study | 3.440 | 1.317 |
|  |  | Overall Mean = | 2.334 | . 565 |

Source: Survey Data

$$
\text { Table } 4.11
$$

influence of foreign teachers on students' attitudes toward their educational track.

The overall mean of all items in this category was 2.334, with a $S D$ of 0.565 . This indicates that teacher attitudes are influential because the overall mean falls between 2.0 and 3.0 .

Table 4.12 rank orders, from lowest to highest, the six items of Category $D$ which contained items related to the difficulty of the curriculum.

One item was considered to be very influential, for the students' choice of educational track, because it had a mean between 1.0 and 2.0. That item was number 19 which concerned the importance of understanding the subjects in the educational track. Two items were considered to be moderately influential with a mean between 2.0 and 3.0. These items were numbers 9 and 25. Item number 9 concerned the difficulty of the other educational track for the student and number 25 concerned the difficulty of the textbooks. The other three items (numbers 6, 34 and 33) were considered to be uninfluential for the students' choice of educational track. Thus, difficulty of the annual exams, difficulty in understanding the subjects or an educational track, and/or the difficulty of the homework do not appear to be of great influence in the students' choice of educational track.

The overall mean for all items in this category was 2.887. The standard deviation was 0.544. Based on an

[^0]Rank Order of Items Related to "Difficulty of the Curriculum" for Grades Ten Through Twelve

| Rank Order By Mean | Item <br> Number | Questionnaire Item | Mean | S.D. |
| :---: | :---: | :---: | :---: | :---: |
| 1 | 19 | An understanding of the academic subjects related to my field of study was an important factor in choosing my field of study | 1.77 | . 912 |
| 2 | 25 | In my field of study, the academic textbooks are easy to understand | 2.515 | 1.012 |
| 3 | 9 | The difficulty of some academic subjects offered in the other field was a strong factor in choosing my field of study | 2.995 | 1.448 |
| 4 | 6 | The annual exams are usually difficult | 3.050 | 1.079 |
| 5 | 34 | I have a very hard time understanding the subjects in my field of study | 3.445 | 1.092 |
| 6 | 33 | I always have a hard time getting the homework done | 3.545 | 1.106 |
|  |  | Overall Mean = | 2.887 | . 544 |

overall mean between 2.0 and 3.0 , then, the difficulty of the curriculum is moderately influential in the students' choice of educational track.

Table 4.13 rank orders, from lowest to highest, the eight items of questionnaire "Category $E$ " which contained items related to family influence.

Two items were considered to be moderately influential for the students' choice of educational track, because they had means between 2.0 and 3.0 (Item numbers 36 and 35). Item number 36 concerned obtaining family permission before changing majors and item number 35 asked whether the student discussed this decision with the family before the choice was made.

Five items were considered to be uninfluential because they had means between 3.0 and 4.0. (Item number 23, 20, 38, 13, and 29). Thus, the relationship of the educational track to the father's work, the influence of the family in their son's choice of major, the family's concern about whether the tenth grade student is mature enough to make this choice alone, whether they feel their son can achieve successfuly in a particular field of study, and the families' concern about their son's choice of field of study, were uninfluential. One item was considered entirely uninfluential or irrelevant for the students' choice of educational track, because it had a mean between 4.0 and 5.0; that item was number 24 which inquired whether the

student had much choice in selecting his educational track or his family chose it for him.

The overall mean of all items in this category was 3.318. The standard deviation was 0.653. It was indicated that this factor, family influence, is uninfluential because its overall mean for all items was between 3.0 and 4.0 .

Table 4.14 rank orders, from lowest to highest, the five items of "Category $F^{\prime \prime}$ which contained questionnaire items related to the restrictions of the system. Three items were considered to be moderately influential for the students' choice of educational track, because each one had a mean between 2.0 and 3.0. Those items were numberse 42, 22, and 21. Item number 42 asked whether it is a good idea to give qualification exams for those who want to change from one field to another. Item number 22 asked whether the students would consider changing his major if he had the opportunity to do so. Item number 21 considered the fairness of the restrictions of the system.

Two items, with means between 3.0 and 4.0 , were considered to be uninfluential for the students' choice of educational track. Those items, number 30 and 37, asked whether it would be a good idea to allow students to change more easily from one track to another after Grade 11 and whether the restrictions of the system influenced the students' choice of educational track.
Table 4.14

Source: Survey Data

The overall mean for all items in this category was 2.728 and the standard deviation was 0.597 . That indicated that the restrictions of the system are moderately influential because the overall mean was between 2.0 and 3.0 .

Table 4.15 rank orders, from lowest to highest, the six factor categories ( $A, B, C, D, E$, and $F$ ) by their mean values to compare their relative influence on students' choice across factors, in other words, to determine the most influential and the least influential factors.

Table 4.15 indicates, that of the factors that may influence of student's choice of educational track, one factor may be considered to be very influential in making that choice because it had a mean between 1.0 and 2.0. That factor is "student interest," which suggests that students care most about what they feel they like. This is supported by data in Table 4.2. When the students were asked to describe their feelings about their choice of major, more than 80 percent of them indicated that they were glad about their choice.

Four factors were considered to be moderately influential for the students' choice of educational track, because each one had a mean between 2.0 and 3.0. Those factors were teachers' attitudes (C), teaching method (B), restrictions of the system (F), and difficulty of the curriculum (D).
Source: Survey Data

$$
\begin{gathered}
\text { Table } 4.15 \\
\text { Rank Order of Factor Categories of Questionnaire } \\
\text { Items by Mean Value: Grades Ten } \\
\text { Through Twelve }
\end{gathered}
$$

| Rank <br> Order <br> by Mean |  | Category | Mean |
| :--- | :--- | :--- | :--- |
| 1 | (A) Student Interest | 1.987 | 0.430 |
| 2 | (C) Teacher Attitudes | 2.334 | 0.656 |
| 3 | (B) Teaching Method | 2.461 | 0.533 |
| 4 | (F) Restrictions of the System | 2.728 | 0.597 |
| 5 | (D) Difficulty of the Curriculum | 2.887 | 0.544 |
| 6 | (E) Family Influence | 3.318 | 0.653 |

Factors $C$ and $B$ which are related to the quality of teaching were expected to be influential because the students consider the teacher their model and the better he teaches and treats them, the more attracted to his subject they will be and vice versa.

Factor $F$, "restrictions of the system," was anticipated to be influential because it is a controversial issue in Saudi Arabia and students in eleventh and twelfth grades may suffer from these restrictions if they made a less than ideal choice after tenth grade. Factor $D$, "difficulty of the curriculum," was thought to be influential because the students worry about whether they will succeed or fail in the educational track they have chosen (or will soon choose).

One factor may be considered as having little influence on students' choice of educational track, because it had a mean between 3.0 and 4.0. That factor is the family influence (E). The finding that family influence (Factor E) exerts no substantial effect on the children's choice of educational track is partially explained by data shown in Tables 4.4, 4.6, and 4.8. The demographic data showed fathers' educational mean was between elementary and intermediate school, and mothers' mean level of education was between literate and elementary. This shows that the parents lack the educational experience to help their sons choose an educational track. On the other hand, most of
the students selected their fathers and mothers as the first people from whom to seek advice, so we can see that such advice may carry little weight because a large portion of parents have little education.

Also, by referring to Table 4.2, it is apparent that 81 percent of the respondents indicated that they are glad about their choice, which may be a good indication that the students chose what they liked, which may reduce the influence of the family. Moreover, in Table 4.2, only two students indicated that they did not have much choice of educational track because someone chose it for them. This low figure supports the lack of family influence on the students' choice of educational track. In addition, education in Saudi Arabia is very recent and not considered by most families to be sufficiently important so that they would be likely to offer advice and discuss it with their children.

However, the results from the data indicate that the "students' interest" was the most influential factor, "teacher attitudes" was the second most influential factor, "teaching methods" the third most influential factor, and "restrictions of the system" the fourth influential factor. The difficulty of the curriculum and family influence ranked fifth and sixth, respectively.

In Appendix A, tables A.l through A. 21 contain data regarding the students' responses to the six selected
factors, broken down by grade level (i.e., for tenth, eleventh and twelfth grade students). These tables represented the six categories that corresponded to the six factors. Also, the items within each factor were arranged in rank order according to their means from lowest to highest. This order helped to identify the items with respect to their influence within each of the six factors according to the same criteria used with all the classes combined. Table 4.16 is a summary of that data, that is, a comparison of the means and standard deviations for tenth, eleventh, and twelfth grades and all classes combined.

Table 4.16 shows the mean values of the six categories of the questionnaire according to the responses by tenth grade students, eleventh grade students, twelfth grade students, and all students combined.

Table 4.16 indicates that 10 th grade respondents, llth grade respondents, 12 th grade respondents, and all the respondents combined, agreed about the importance of the six factors. That is, that "student interest" was the most influential factor, "teacher attitude" the second most influential factor, "teaching method" was the third most influential factor, and "restrictions of the system " was the fourth most influential factor. " Difficulty of the curriculum" and "family influence" were not considered influential although some items in these categories were influential. This delineation answered the second research
Table 4.16

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| 19＊＊て | 089＊2 | $909^{\circ}$ Z | 0عモ・て |  | $\varepsilon$ |
| ๑عと・て | LIE・て | 000＊$冖$ | 0 โを＇て | əpп7！77\％גəчวeə山（0） | $\tau$ |
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|  <br>  |  |  |  |  |  |

Source：Survey Data
question which was: what are the most significant factors influencing students' educational track? That is, what is the comparative influence of "student's interest," "teaching methods," "teacher attitude," "difficulty of the curriculum", "family influence," and "restrictions of the system?"

The descriptive analysis of the first section of the questionnaire answered part of the first research question which was "How are the decisions about the educational track made? ${ }^{n}$ That is, who discussses it with the students and when is the decision made? More answers were provided to the first research question by data derived from the interviews of students, parents, teachers, and principals.

## Testing of the Hypotheses

Several hypotheses were developed in order to answer the third research question, which was: "How do students from different grades and different majors differ in their perceptions of the factors that influenced their choice of educational track?"

| Hypotheses 1: | "There will be no significant |
| ---: | :--- |
| differences between tenth grade |  |
| students who intend to enroll in the |  |
| Arts track and those who intend to |  |
| enroll in the Science track. with |  |
|  | respect to the six factors." |

A multivariate analysis of variance (MANOVA) was employed to test the hypothesis, using a significance level of 0.05. Table 4.17 shows the test for overall differences on the six factors between tenth grade students who intended to enroll in the Arts track and those who intended to enroll in Science.

Table 4.17
Multivariate Test of Significance for
Hypothesis l
Test $\quad$ Degree of
Name $\quad$ Value $\quad$ Significance Name

F Value
(D.F.)
of $F$
Wilks 2.400 (6, 70) 0.036*
*Significant at alpha $=.05$
Source: Survey Data
$F$ was significant at the .05 level, so the first hypothesis is rejected. This means there were significant differences between tenth grade students who intended to enroll in the Arts track and those who intended to enroll in the Science track with respect to the six factors. The results of a univariate analysis of variance carried out to compare the two groups on each factor individually are shown in Table 4.18. Table 4.18 shows the breakdown for comparison of the two groups on each of the six factors and that none of the six factors has a

| Table 4.18 <br> Univariate F -Test Results with 1,75 Degrees of Freedom: Tenth Grade Students |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Rank | Factor Category | $\begin{aligned} & \text { Hypothesis } \\ & \text { MS ** } \end{aligned}$ | $\begin{aligned} & \text { Error } \\ & \text { MS } \star \star \end{aligned}$ | F | $\begin{aligned} & \text { Significance } \\ & \text { of } F \end{aligned}$ |
| A | Student Interest | 0.913 | 0.234 | 0.390 | 0.534 |
| B | Teaching Method | 0.287 | 0.208 | 1.383 | 0.243 |
| C | Teacher Attitude | 0.287 | 0.208 | 1.383 | 0.243 |
| D | Difficulty of the Curriculum | 0.878 | 0.321 | 2.739 | 0.102 |
| E | Family Influence | 1.003 | 0.325 | 3.088 | 0.083 |
| F | Restrictions of the System | 0.001 | 0.276 | 0.006 | 0.940 |

[^1]
#### Abstract

significant $F$. The explanation is: the differences between the two groups' responses were very small on each individual factor (see Table 4.19). Therefore, the differences on each factor were not significant, but when the comparison was carried out for all six factors, combined, there was a significant difference between the two groups. Accordingly, the first hypothesis was rejected but which factor(s) caused the difference between tenth grade students who intend to enroll in the Arts track and those who intend to enroll in the Science track was not determined.


Hypothesis 2: There will be no significant differences between eleventh and twelfth grade students in the Arts track and those in the Science track with respect to the six factors.

A multivariate analysis of variance (MANOVA) was used to test the hypothesis at the significance level of 0.05 . Table 4.20 shows the test for overall differences on the six factors between eleventh and twelfth grade students in the Arts and those in Science.

It can be seen that $F$ is significant at. 05 , therefore the second hypothesis was rejected. This means there is a significant difference between eleventh and twelfth grade students in the Arts and those in Science, with respect to the six factors. To determine which factor category was responsible, a univariate analysis of variance was carried out to compare the two groups on each factor.

$$
\text { Table } 4.19
$$

$$
\begin{aligned}
& \text { Means and Standard Deviations for Tenth Grade Students } \\
& \text { Who Will Choose the Arts and Those Who Will Choose Science }
\end{aligned}
$$



[^2]Table 4.20
Multivariate Test of Significance for Hypothesis 2: Differences Between the Arts and Science Students in llth and 12 th Grades

| Test <br> Name | F <br> Value | Degrees of Freedom <br> (D.F.) | Significance of <br> F |
| :--- | :--- | :--- | :--- |
| Wilks | 2.805 | $(6,93)$ | $0.015 *$ |
| *Significant at alpha <br> Source: $\quad$ Survey Data |  |  |  |

Table 4.21 shows the breakdown for comparison of the two groups on each of the six factors. It is apparent that one of the six factors, the "difficulty of the curriculum," has a significant $F$, which indicates that there is a significant difference between eleventh and twelfth grade students in the Arts track and those in the Science track with respect to the difficulty of the curriculum. To determine which of the two groups considered the difficulty of the curriculum as a more important factor, the investigator referred to each group's mean with regards to that factor. Table 4.22 shows the mean of both groups for the six factors. The mean for eleventh and twelfth grade students in the Arts, regarding the difficulty of the curriculum, was 3.043 and the mean for eleventh and twelfth grade students in Science was 3. The eleventh and twelfth grade Art students considered the difficulty of the curriculum a more important factor, because their response
Table 4.21
Univariate $F$ Test With 1,98 Degrees of Freedom:
Eleventh and Twelfth Grade Students in Arts and Science

| Category | Hypothesis MS** | $\begin{aligned} & \text { Error } \\ & \text { MS** } \end{aligned}$ | F | Significance of $F$ |
| :---: | :---: | :---: | :---: | :---: |
| (A) Student Interest | 0.045 | 0.157 | 0.287 | 0.593 |
| (B) Teaching Method | 0.916 | 0.307 | 2.985 | 0.087 |
| (C) Teacher Attitude | 0.191 | 0.405 | 0.473 | 0.493 |
| (D) Difficulty of the Curriculum | 2.007 | 0.248 | 8.087 | $0.005^{*}$ |
| (E) Family Influence | 0.019 | 0.407 | 0.046 | 0.830 |
| (F) Restrictions of the System | 0.960 | 0.429 | 2.239 | 0.138 |
| *Significant at the 0.05 level |  |  |  |  |
| ** MS = Means Square |  |  |  |  |
| Source: Survey Data |  |  |  |  |

138
Table 4.22


|  | Me and $T$ | Standa Grade S | $22$ <br> tions <br> in Art | th nce |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Category |  | Eleventh and Twelfth Grade Students in Arts |  | Eleventh and Twelfth Grade Students in Science |  |
|  |  | Mean | SD | Mean | SD |
| (A) | Student Interest | 1.960 | 0.374 | 1.918 | 0.374 |
| (B) | Teaching Method | 2.688 | 0.536 | 2.497 | 0.572 |
| (C) | Teacher Attitude | 2.315 | 0.640 | 2.402 | 0.632 |
| ( D ) | Difficulty of the Curriculum | 3.043 | 0.563 | 3.326 | 0.423 |
| (E) | Family Influence | 3.358 | 0.588 | 3.385 | 0.684 |
| (F) | Restrictions of System | 2.692 | 0.749 | 2.888 | 0.543 |

Source: Survey Data
mean was less than the response mean of those who are in the Science track.

This may be explained by the fact that the Arts curriculum is considered by most students to be easier than the Science curriculum. Therefore, (besides not being interested in Science) the students who did not choose Science might be afraid of its difficulty. The reason that "difficulty of the curriculum" is more of a choice factor for them than for Science students may be that Science students are unlikely to have chosen their major due to concern for its degree of difficulty.

Hypothesis 3: There will be no significant differences between students in tenth grade and students in eleventh and twelfth grades with respect to the six factors.

A multivariate analysis of variance (MANOVA) was used to test the hypothesis, at a significance level of .05. Table 4.23 shows the test for the overall difference on the six factors between students in tenth grade and students in eleventh and twelfth grades.

Table 4.23
Multivariate Test of Significance for Hypothesis 3

| Test Name | Value | Degree of Freedom (D.F.) | Signifiance of $F$ |
| :---: | :---: | :---: | :---: |
| Wilks | 8.063 | (6, 193) | 0.000* |
| *Significance at alpha $=.05$ Source: Survey Data |  |  |  |

It is apparent that $F$ is significant at the .05 level. Therefore, the third hypothesis is rejected, which means there is a significant difference between students in the tenth grade and students in the eleventh and twelfth grades with respect to the six facctors.

A univariate analysis of variance was carried out to compare the two groups on each factor. Table 4.24 shows the breakdown for comparison of the two groups on each of the six factors indicating that three of the six factors have a significant $F$. That is, for the factors of "teaching method," "difficulty of the curriculum" and "family influence," there are significant differences between students in tenth grade and students in the eleventh and twelfth grades.

To find out which of the two groups considered each of these three factors to be more important, the means on each factor for each group were examined. Table 4.25 shows the means of both groups for the six factors. The tenth grade mean for teaching method was 2.330 and the eleventh and twelfth grade mean for teaching method was 2.592 .

In comparing the mean of the two groups, we find that tenth grade students placed more importance on teaching methods than the eleventh and twelfth grade students.

The explanation for this difference between the two groups is that the students who would decide what track to choose were compared to those who had already chosen a
Table 4.24

$$
\begin{aligned}
& \text { fth Grade Students }
\end{aligned}
$$

track. Thus, it was possible for someone to think that a particular factor would influence his choice but felt more affected by other factors when he made the actual decision. Also, when someone is asked about a decision he made almost two years ago, he may indicate factors that are different than the factors that actually affected his choice at the time.

The mean of students in the tenth grade for "difficulty of the curriculum" was 2.743 and 3.030 for students in eleventh and twelfth grades. In comparing the means of the two groups we find that the tenth grade students placed more importance on the "difficulty of the curriculum" than eleventh and twelfth grade students. The mean for tenth graders is less than the mean of those who are in the eleventh and twelfth grade. It is likely that in anticipation the difficulty of the curriculum appeared greater to tenth graders than it did in retrospect for eleventh and twelfth graders.

The mean for students in tenth grade on "family influence" was 3.157 and 3.479 for students in eleventh and twelfth grades. In comparing the means of the two groups it was determined that the tenth grade students placed more importance on family influence than the eleventh and twelfth grade students. Their mean was less than that of all eleventh and twelfth graders.
143
Means and Standard Deviations of Influencing Factors for Tenth Grade Students, and Eleventh and
Twelfth Grade Student Combined
Source: Survey Data

$$
\text { Table } 4.25
$$

This is supported by the findings in Table 4.16; that the older the students were the more independent of their families. It is also consistent with Hetherington and Parke's (1979) findings reported in their book about child development, that the older the child becomes the more independent from his home he will be and the more he will be influenced by his peers who are closer to his age.

The shift toward increased social play and a greater preference for playing with peers rather than adults.... It was found that not only parent-child interaction decreases markedly as the child grows older, but interactions with teachers decrease. (Hetherington and Parke, 1979, p. 479).

## Student Interview Results

Five groups of students were interviewed: (a) tenth grade students who intended to choose the Arts, (b) tenth grade students who intended to choose Science, (c) tenth grade students who had not yet decided, (d) eleventh and twelfth grade students who had chosen the Arts, and (e) eleventh and twelfth grade students who had chosen Science. The interviews were undertaken to answer the first research question: How are the decisions about the educational track made? That is, who discusses it with the students and when is the decision made?

The interview was also conducted to support the questionnaire data identifying the most significant factors
that influence the students' choice of educational track. For this reason, interview questions tended to follow the questionnaire (See Appendix F).

Sixteen questions were presented to the students to achieve the interview objectives, and all students were asked the same questions. A check list procedure was used during the interview to provide for accurate recording of data. Besides the checklist, the card sort procedure also was used. The questions and responses given by the students are reported below.

Question 1

The following question was intended to elicit information regarding the tenth grade students' plan for choosing an educational track and eleventh and twelfth grade students for the track they had already chosen.
> "What do you think you will chose as your educational track for the next year?" or "What is your educational track?"

This question was asked to identify the subject selection, put subjects at ease and focus their thinking for the rest of the interview. Otherwise it was unnecessary because the researcher had specifically selected three tenth grade students who said they would choose Arts, three who would choose Science, three students who had not decided
yet, six eleventh and twelfth grade students in Arts, and six eleventh and twelfth grade students in Science.

Question 2

The following question was intended to elicit information regarding the rationale supporting the students' choice of educational track.
"Why did (will) you choose that major?"

Responses of tenth grade students who will choose the
Arts. A total number of 3 students who will choose the Arts, responded to the question.

1. Because I like it and feel interested in it (2 out of 3 ).
2. Because it is easier, since my first interest was in Science (l out of 3 ).

Responses of the tenth grade students who will choose Science. A total number of 3 students who will choose Science, responded to the question.

1. Because 1 like it and feel interested in it (2 out of 3).
2. Because I wish to become a medical doctor (l out of 3 ).

Responses of the tenth grade students who have not
decided yet. A total number of 3 students who have not decided yet, responded to the question.

1. I will choose the major that I am interested in $(1$ out of 3).
2. I will choose the easier major (1 out of 3).
3. I will choose the major in which I will achieve (l out of 3).

Response of the eleventh and twelfth grade students in Arts. A total number of 6 students who had chosen the Arts, responded to the question.

1. Because $I$ am interested in that major ( 4 out of 6 ).
2. Because it is easier (2 out of 6).

Responses of the eleventh and twelfth grade students
in Science. A total number of 6 students who had chosen Science, responded to the question.

1. Because $I$ am interested in that track ( 4 out of 6 ).
2. Because I will have a wider range of options for jobs (1 out of 6).
3. Because I will achieve better in this track (l out of 6$)$.

Interpretation of Responses: For the students responses to question 2 A , it can be seen that most students of different grades and tracks considered their "interest" the important factor in their choice of educational track. However, "difficulty of the curriculum" was identified by two students of the Arts, one who will choose the Arts, and one undecided student as their reason for the choice. One Science student and one who will chose Science considered "future career" as a reason for their choice. Achievement potential was considered by one student in Science and one undecided student as a reason for the choice.

## Question 2B

The following question was intended to determine which influence students to make their decision about an educational track.
"How was (will) this choice (be) made?"

Responses of the tenth grade students who will choose
Arts. A total number of 3 students who will choose the Arts responded to the question.

1. My decision only (2 out of 3 ).
2. My parents provided me some advice (l out of 3).

Responses of the tenth grade students who will choose Sciene. A total number of 3 students who will choose Science, responded to the question.

1. My decision only (l out of 3 ).
2. My parents provided me some advice (2 out of 3).

Responses of the tenth grade students who have not yet Decided. A total number of 3 students, who have not decided yet, responded to the question.

1. I will decide independently (2 out of 3 ).
2. I will seek some advice from my parents (l out of $3)$.

Responses of the eleventh and twelfth grade students in arts. A total number of 6 students who had chosen the Arts, responded to the question.

1. My decision only (4 out of 6).
2. My father and brothers provided me some advice, then left me the freedom of choice (2 out of 6).

Responses of the eleventh and twelfth grade students
in Science. A total number of 6 students, who had chosen Science, responded to the question.

1. My decision only (3 out of 6).
2. My father and brothers provided me some advice, then left me the freedom of choice ( 2 out of 6 ).
3. My father advised me to chose it (1 out of 6).

Interpretation of responses. From the students' responses it may be noted that most of the students in different grades and tracks made their choices themselves, which means that the "students' interest" was important. Some students sought advice from their parents, but it was noted that the Science students were influenced more by their parents than the Arts students. Also, the eleventh and twelfth grade students sought advice from their brothers more than the tenth grade students. The family seems to provide advice and then leave the final choice to the student rather than selecting a particular educational track for them.

## Question 3

The following question was intended to provide information regarding the students' feeling about their choice.
"Do you (think you will) feel happy about your choice?"

Responses of all the students. A total number of 21 students responded to the question.

1. Yes, I (will) feel happy about my choice.

Interpretation of responses. Responses from all 21 students indicated that they are or will feel happy about their choices. This again underscores the importance of the students' interest in their choice of educational track.

Question 4
The following question was intended to elicit information regarding the rational for the students' feeling.
"Why, (what makes you happy or unhappy)?"

Responses of tenth grade students who will choose the
Arts. A total number of 3 students, who will choose the Arts, responded to the question.

1. Because I am interested in that major (2 out of 3 ).
2. Because it is easier (l out of 3 ).

Responses of tenth grade students who will choose
Science. A total number of 3 students, who will choose Science, responded to the question.

1. Because I am interested in that major (2 out of 3).
2. Because two of my brothers in that major are happy about it (l out of 3 ).

Responses of the tenth grade students who have not yet
Decided. A total number of 3 students who have not decided yet, responded to the question.

1. Because $I$ will choose the major that interests me (2 out of 3 ).
2. Because $I$ will choose the major in which $I$ can achieve well (l out of 3 ).

Responses of eleventh and twelfth grade students in the Arts. A total number of 6 students, who had chosen the Arts, responded to the question.

1. Because I am interested in that track (5 out of 6).
2. Because I found it easy (l out of 6).

Responses of eleventh and twelfth grade students in
Science. A total number of 6 students, who had chosen Science, responded to the question.

1. Because I am interested in that track (4 out of 6).
2. Because I like the teachers in that track (l out of 6) -
3. Because I am achieving well in that track (l out of 6) -

Interpretation of Responses. From the students' responses to Question 4, it can be seen that most of the


#### Abstract

students of different grades and tracks considered "student interest" as very important in their choice. However, "difficulty of the curriculum" was considered by one of the Arts students and one who will choose the Arts as a reason for their choice. One Science student and one undecided student considered "achievement" as a reason for his choice. Another student choose the major because he liked the teachers in his track.


## Question 5

The following question was intended to determine the influence of the students' choice on their future life.
"How will (does) this choice affect your future life?"

Responses of the tenth grade students who will choose the Arts. A total number of 3 students, who will choose the Arts, responded to the question.

1. It will restrict me to a few colleges ( 2 out of 3 ).
2. It will allow me some time to work part-time (l out of 3 ).

Responses of tenth grade students who will choose
Science. A total number of 3 students, who will choose Science, responded to the question.

1. I will have unlimited chances for finding a job (2 out of 3).
2. I will be admitted to the college of my choice (l out of 3).

Responses of tenth grade students who have not yet
decided. A total number of 3 students, who have not decided yet, responded to the question.

1. I will choose the major that gives me the best chance of find jobs (1 out of 3).
2. I will choose the major that allows me to be admitted to the college of my choice (1 out of 3 ).
3. I will choose the major that allows me to work part-time (l out of 3 ).

Responses of eleventh and twelfth grade students in the Arts. A total number of 6 students who had chosen the Arts, responded to the question.

1. It will restrict me to a few colleges (2 out of 6).
2. It will restrict me to a few jobs (2 out of 6).
3. It will give me a chance to work part-time $(2$ out of 6).

Responses of eleventh and twelfth grade students in
Science. A total number of 6 students, who had chosen Science, responded to the question.

1. It will give me unlimited chance of finding a job (2 out of 6).
2. I will be admitted to the college of my choice (3 out of 6).
3. I will be in a better social position, since every body respects the science person (l out of 6).

Interpretation of Responses. From the students' responses to question 5, it is apparent that many of the students considered the "restrictions of the system" to be an important consideration in choosing a major since the Arts students will be limited in the jobs and colleges to which they can realistically aspire. On the other hand, the science students have almost unlimited access to jobs and colleges. However, the Art students and undecided students considered working part-time as important, which is related to Factor $D$ (the difficulty of the curriculum), since the Arts major is considered to be easier giving the student a chance to work part-time.

## Question 6

The following question who intended to determine whether the student discussed his choice with the family.

[^3]Responses of tenth grade students who will choose the
Arts. A total number of 3 students, who will choose the Arts, responded to the question.

1. I have not discussed it with anybody, because I am the only one who knows what I like (l out of 3 ).
2. I discussed it with my parents and they gave me some advice before 1 chose (l out of 3 ).
3. They left me the full freedom to choose what I want (l out of 3 ).

Responses of tenth grade students who will choose
Science. A total number of 3 students, who will choose Science, responded to the question.

1. I discussed it with my father and he provided me with some advice before I decided (l out of 3 ).
2. My father advised me to choose this major (2 out of 3 ).

Response of tenth grade students who had not yet
Decided. A total number of 3 students, who had not decided yet, responded to the question.

1. I will decide about my major without any help from anybody, because nobody knows what I want but me (1 out of 3 ).
2. I will discuss it with my parents to seek advice from them before 1 decide (l out of 3 ).
3. I will discuss it with my older brother who has had experience in one of the two majors, then $I$ will decide about what to choose (l out of 3 ).

## Responses of eleventh and twelfth grade students in

Science. A total number of 6 students, who had chosen Science, responded to the question.

1. I did not discuss it with anybody because $I$ will be responsible for that choice (2 out of 6).
2. I discussed it with my father who provided me some advice, then left me full freedom to chose what I want (l out of 6).
3. I discussed it with my father and brother who gave me some advice before $I$ chose (1 out of 6).
4. I discussed it with my brother who advised me to choose what I wanted (2 out of 6).

Responses of eleventh and twelfth grade students in
Science. A total number of 6 students, who had chosen Science, responded to the question.

1. I did not discuss it with anybody because I know what I want (2 out of 6).
2. I discussed it with my father who encouraged me to choose this major (2 out of 6).
3. I discussed it with my father and uncle who supported my choice (l out of 6).
4. I discussed it with my brother who encouraged me to choose it (1 out of 6).

Interpretation of Responses. From the students' responses to Question 6, we can see that many students received some advice from family members. Most influence from the families was indirect since they just provided advice and support, rather than mandating or instructing their child to choose a particular major. The Science students, however, seemed to be under greater family pressure to choose that major than those in the Arts.

Another point is that the tenth grade students seemed to be more influenced by their parents than those who were in eleventh and twelfth grades, who tended to be influenced more by their brothers and other relatives.

## Question 7

The following question was intended to determine whether the student discussed the decision with others.

[^4]Responses of tenth grade students who will choose the
Arts. A total number of 3 students, who will choose the Arts, responded to the question.

1. Nobody else, because nobody else cares about my choice (l out of 3 ).
2. I have discussed it with my teacher, because he knows what major would be appropriate for me (2 out of 3 ).

Responses of tenth grade students who will choose
Science. A total number of 3 students, who will choose Science, responded to the question.

1. Nobody else, because nobody else cares about my choice (2 out of 3).
2. I have discussed it with my teacher, because he knows the major that would be appropriate for me (1 out of 3 ).

## Responses of tenth grade students who have not yet

Decided. A total number of 3 students, who have not decided yet, responded to the question.

1. Nobody else, because nobody else would care about my choice (3 out of 3).

Responses of eleventh and twelfth grade students in the Arts. A total number of 6 students, who had chosen the Arts, responded to the question.

1. Nobody else, because $I$ was the only one who was responsible for that choice (3 out of 6).
2. My friends, because we wanted to be together to continue our friendship (2 out of 6).
3. My teacher, because he knew about the major that would be appropriate for me (l out of 6).

Responses of eleventh and twelfth grade students in
Science. A total number of 6 students, who had chosen Science, responded to the question.

1. Nobody else, because I was the only one who was responsible for my choice (4 out of 6).
2. My friend, because we wanted to be together to continue our friendship (2 out of 6).

Interpretation of Responses. From the students' responses to question 7 , it can be seen that most of the students of different levels and majors didn't seek advice from persons outside their families. However, the tenth grade students did seem to discuss the choice of educational track with teachers more than the eleventh and twelfth grade students and the eleventh and twelfth grade students seemed
to discuss their choice of major with friends more often than the tenth grade students. It should be noted that we are comparing two different groups, the tenth graders who had not actually chosen a particular major, with those in the eleventh and twelfth grade who had decided one or two years ago. It is possible that some students might have planned to seek help from teachers, but will be influenced by others when he makes the actual decision.

Question 8

The following question was intended to elicit information regarding choice preferences of both the student and his family.
"Is your choice the same as the choice your family favors? Why?"

Responses of tenth grade students who will choose the
Arts. A total number of 3 students, who will choose the Arts, responded to the question.

1. Yes, because their favored major is the one that $I$ like (l out of 3 ).
2. No, because my family prefers the other major (2 out of 3).

Responses of the tenth grade students who will choose
Science. A total number of 3 students who will choose Science, responded to the question.

1. Yes, because they prefer that major (3 out of 3 ).

Responses of tenth grade students who have not yet
Decided. A total number of 3 students, who have not decided yet, responded to the question.

1. I have not decided yet, but my family prefers Science (2 out of 3).
2. My family doesn't have any particular major that they prefer and they will leave me full freedom to choose what I like (l out of 3).

Responses of eleventh and twelfth grade students in the Arts. A total number of 6 students, who have chosen the Arts, responded to the question.

1. Yes, because I convinced them about my educational track (2 out 6).
2. No, because they wanted me in the other educational track (3 out of 6).
3. Yes, because they wanted me to be a religious man and go to a religious college (l out of 6).

Responses of eleventh and twelfth grade students in
Science. A total number of 6 students, who had chosen Science, responded to the question.

1. Yes, because they want me to go to a Science college to study for a profession such as physician or engineer (4 out of 6).
2. Yes, because $I$ will have unlimited options of colleges and jobs (2 out of 6).

Interpretation of Responses. From the students' responses to Question 8, it can be seen that most of the families preferred to have their children choose Science. Although we can see that many students did not favor their family members' choice, they tended to respond to their interest more than anything else.

Question 9
The following question was intended to establish information regarding the students' vocational plan.
"Are you planning to follow your father's occupation or enter a family business? How? Why?"

Responses of tenth grade students who will choose the
Arts. A total number of 3 students, who will choose the Arts, responded to the question.

1. No, because it is different than my interest and the job I will choose (2 out of 3).
2. Yes, because my father needs me in that job to help him (l out of 3 ).

Responses of tenth grade students who will choose
Science. A total number of 3 students, who will choose Science, responded to the question.

1. No, because it is different from my interests and the job I will choose (2 out of 3).
2. Yes, because I like the same job (l out of 3 ).

Responses of tenth grade students who have not yet
decided. A total number of 3 students, who have not decided yet, responded to the question.

1. No, because it is different from my interests and the job I will choose (2 out of 3 ).
2. No, because my father advised me not to choose the same job (l out of 3 ).

Responses of eleventh and twelfth grade students in the Arts. A total number of 6 students, who had chosen the Arts, responded to the question.

1. No, because it is different than my interests and the job I will choose (5 out of 6).
2. Yes, because I like the same job (l out of 6).

Responses of eleventh and twelfth grade students in Science. A total number of 6 students, who had chosen Science, responded to the question.

1. No, because it is different than my interests and the job I will choose (4 out of 6).
2. No, because my father is having a hard time in that job (2 out of 6).

Interpretation of Responses. From the students' responses to Question 9 , it is apparent that most of the students of different grades and tracks were not planning to follow their fathers' occupations or join family businesses. Generally, they were not interested in the same job, but some of the Art students planned to help their fathers in their jobs. Some students plan to choose the same occupation because they like it. Other students would not choose their fathers' job because their fathers advised them not or or they noticed that their fathers' jobs are very hard.

Question 10
The following question was intended to elicit information regarding the influence of the students' choice on their planned occupation.
"How will (did) this affect your choice of track?"

Responses of tenth grade students who will choose the
Arts. A total number of 3 students, who will choose the Arts, responded to the question.

1. It will not affect my choice, because I choose the major that I like (2 out of 3 ).
2. I will choose my major so I can be admitted to a particular job (l out of 3 ).

Responses of tenth grade students who will choose
Science. A total number of 3 students, who will choose Science, responded to the question.

1. I will choose my major so I can be admitted to a particular college ( 2 out of 3 ).
2. I will choose my major so I can be admitted to a particular job (l out of 3).

Responses of tenth grade students who have not yet
decided. A total number of 3 students, who had not decided yet, responded to the question.

1. I will choose the major that allows me to enter a particular college (2 out of 3 ).
2. I will choose the major that allows me to enter a particular job (l out of 3 ).

Responses of eleventh and twelfth grade students in the Arts. A total number of 6 students, who had chosen the Arts, responded to the question.

1. I choose this major so I could work while I am studying (l out of 6).
2. I choose this major so I can enter the college I want (2 out of 6).
3. I choose this major so I can enter the job I like (3 out of 6).

Responses of eleventh and twelfth grade students in Science. A total number of six students, who had chosen Science, responded to the question.

1. I chose this major so I could enter the college I like (4 out of 6).
2. I chose this major so I can enter the job I like 2 out of 6).

Interpretation of Responses From the students' response to Question 10, it was apparent that most of the students chose their major so they could enter a particular college or a particular job. However, it was indicated by a student of the Arts that he choose his major so he could work parttime while he was attending school.

Question 11
The following question was intended to provide information regarding the influence of the students' academic preparation on their choice.
"How does (did) your own academic ability affect your choice? Why?"

Responses of tenth grade students who will choose the
Arts. A total number of 3 students, who will choose the Arts, responded to the question.

1. I don't have the ability to study a lot, therefore I'll choose the Arts major (l out of 3 ).
2. I don't have the ability to understand, but I like memorization (2 out of 3).

Responses of tenth grade students who will choose
Science. A total number of 3 students, who will choose Science, responded to the question.

1. I have the ability to study Science materials which I am interested in (2 out of 3 ).
2. I don't have the ability to memorize a lot but I have the ability to understand (l out of 3).

Responses of tenth grade students who have not yet decided. A total number of 3 students, who have not decided yet, responded to the question.

1. I will make sure to choose the major that I have the ability to deal with, otherwise my achievement will suffer (3 out of 3 ).

Responses of eleventh and twelfth grade students in the Arts. A total number of 6 students, who had chosen the Arts, responded to the question.

1. I don't have the ability to study a lot, therefore, I chose this major (2 out of 6).
2. I don't have the ability to understand, but I like to memorize (4 out of 6).

Responses of eleventh and twelfth grade students in
Science. A total number of 6 students, who had chosen Science, responded to the question.

1. I have the ability to deal easily with Science material in which I am interested (3 out of 6).
2. I have the ability to understand, but I don't like to memorize (3 out of 6).

Interpretation of Responses. The students' responses to question 11 , indicated that the choices of most of the students were affected by their perceptions of their own academic ability, which caused them to choose one major or the other. Some of the science students indicated that they like dealing with Science material in which they are
interested. Moreover, some of the Arts students indicated that they didn't have the ability to study a lot, which supports the notion that the science major is more demanding and time consuming.

Question 12
The following question was intended to elicit information regarding the relation between the students' high ability to learn and their choice.
"If you were a genius who could learn anything, very quickly, what would you choose to study first? Why?"

Responses of tenth grade students who will choose the Arts. A total number of 3 students, who will choose the Arts, responded to the question.

1. I will choose Science because it gives me a wider choice of options for future study and career (l out of 3).
2. I will choose the Arts because I am interested in that major (2 out of 3 ).

Respones of tenth grade students who will choose
Science. A total number of 3 students, who will choose Science, responded to the question.

1. I will choose Science because it gives me a wider choice of options for future study and career $(1$ out of 3).
2. I will choose Science because I am interested in that major (2 out of 3 ).

Responses of tenth grade students who have not yet
decided. A total number of 3 students, who have not decided yet, responded to the question.

1. I will choose Science because it gives me a wider choice of options for future study and career (1 out of 3 ).
2. I will choose the major that interests me (2 out of 3 ).

Responses of eleventh and twelfth grade students in the Arts. A total number of 6 students, who had chosen the Arts, responded to the question.

1. I will choose Science because it would give me a wider choice of options for future study and career (2 out of 6).
2. I would choose the Arts because I am interested in the Arts (4 out of 6).

Responses of eleventh and twelfth grade students in
Science. A total number of 6 students, who had chosen Science, responded to the question.

1. I would choose Science because it gives me a wider choice of options for future study and career $(3$ out of 6).
2. I would choose Science because I am interested in that major ( 3 out of 6 ).

Interpretation of Responses. The students' responses to question 12 , suggested that two reasons seemed to be important in the students' choices. These were the students' interest in a particular major, and access to a wider choice of future options for college and career. Even many of the Arts students would have chosen Science because of its advantages for colleges and career access, but the combination of their interest in the Arts and the reputed difficulty of the Science major, influenced their final choice, a point which is confirmed by data in Tables 4.19 and 4.22.

Question 13
The following question was intended to determine the teachers' impact on the students' choice.
"How have (did) your teachers influence your choice? Why?"

## Responses of tenth grade students who will choose the

Arts. A total number of 3 students, who will choose the Arts, responded to the question.

1. The teachers in the major I will choose are very friendly and attracted me more toward that major ( 2 out of 3 ).
2. The teachers in the other major are very stern and not friendly at all, which increases my desire to choose the other major (l out of 3 ).

Responses of tenth grade students who will choose
Science. A total number of 3 students, who will choose Science, responded to the question.

1. The teachers in the major I will choose use very good teaching methods which attracted me more toward this major (2 out of 3 ).
2. The teacher in the major $I$ will choose will keep us very busy with the homework, but $I$ am still interested in choosing that major (l out of 3).

Responses of tenth grade students who have not yet
decided. A total number of 3 students, who have not decided yet, responded to the question.

1. The teaching method and teachers' attitudes will attract me more toward a particular major $(2$ out of 3$)$.
2. If I like the teachers, I will like the classes they teach (l out of 3 ).

Responses of eleventh and twelfth grade students in the Arts. A total number of 6 students, who had chosen the Arts, responded to the question.

1. The teachers in my major are very friendly which increased my desire to choose this major (3 out of 6) -
2. The teachers in the other major are very stern which kept me from choosing that major (l out of $6)$ -
3. The teachers have no affect on my choice because my interest in that major is too strong to care about teachers (2 out of 6).

Responses of eleventh and twelfth grade students in
Science. A total number of six students, who had chosen Science, responded to the question.

1. The teachers in my major use good teaching methods which increased my interest in that major $(3$ out of 6).
2. The teachers in the other major let students depend on the book, not on their teaching ( 2 out of 6 ).
3. The teacher had no affect on my choice since my interest in this major was too strong to be affected by teachers (1 out of 6).

Interpretation of Responses. The students' responses to Question 13, indicated that the "teachers' methods and attitudes" have some influence on the students' choice. However, it is noted that the Arts students see their teachers as more friendly, and the Science students see their teachers as teaching better. Although we can see that most of the students considered the teachers to be an important factor in their choice, the tenth grade students considered the teachers a more important factor in their choice than the eleventh and twelfth grade students. Science students considered the teaching method more important, and students of the Arts considered the teachers' attitudes more important (See Table 4.19 and 4.22).

Question 14
The following question was intended to elicit information regarding the influence of "the restrictions" of the system" on the students' choice.

[^5]Responses of tenth grade students who will choose the
Arts. A total number of 3 students, who will choose the Arts, responded to the question.

1. No, because I will choose the major that $I$ want, so changing my major will not be a concern (3 out of 3).

Responses of tenth grade students who will choose
Science. A total number of 3 students, who will choose Science, responded to the question.

1. No, because $I$ will choose the major that $I$ am interested in, so changing will not be a concern (2 out of 3 ).
2. Yes, since $I$ have to be careful in making that choice (1 out of 3).

Responses of tenth grade students who have not yet
decided.

1. No, because $I$ will choose the major that $I$ am interested in without thinking about changing it (2 out of 3 ).
2. Yes, because $I$ have to be careful in making that choice (l out of 3 ).

Response of eleventh and twelfth grade students in the Arts. A total number of six students, who had chosen the Arts, responded to the question.

1. No, because $I$ chose the major that $I$ am interested in so I do not need to think about changing ( 5 out of 6 ).
2. Yes, because I had to think fully before I chose the major. I discussed that choice with my brother because I was worried about it (l out of 6).

Responses of eleventh and twelfth grade students in
Science. A total number of six students, who had chosen Science, responded to the question.

1. No, because $I$ choose the major that $I$ am interested in so I do not need to think about changing (4 out of 6).
2. Yes, because $I$ am not sure that $I$ will want to continue in my major (2 out of 6).

Interpretation of Responses. From the student responses to question 14 , it can be seen that most students were not affected by the "restrictions of the system," however, it was noted that three Science and one student of the Arts, one undecided student, and one who will choose

Science considered the "restrictions of the system" to be an important factor.

Question 15
The following question was intended to establish the importance of the factors on the students' choice.
> "The seven cards I am giving you show factors that may (have) influence(d) your choice of major. Please put them in order from most to least important."

> The influencing factors included:
> 1. My parents wanted me to choose it.
> 2. I chose (will choose) it because the teachers in that field of study teach better (more effectively).
3. I will choose it because it gives me a wider choice of options for future study and career.
4. I will choose it because I like the teachers in that field of study.
5. It is possible to change to the other major anytime.
6. The subjects interest me.
7. I need it for my career.

Two factors were included in the card sorts, but they were not included in the questionnaire: (a) study and career influence, and (b) need for career. The justification for including these two factors is derived from the researcher experiences working as a science teacher. That experience generated sufficient evidence to suggest that the two factors might be significant influences.

The researcher scored the responses to this question by giving seven points to the respondents' first choice, six points to the respondents' second choice, and so forth. Then, points of all the respondents on each item were added together to determine the items' weights. Since the first choice of three members of each tenth grade group would be worth 21 points $(3 \times 7)$, and the first choice of six members of each eleventh and twelfth grade group would be worth 42 points ( $6 \times 7$ ), the weighted scores for all items were divided by these "ideal" scores to determine what percent of the possible score each item had obtained (Table 4.26). In Table 4.27 the students' responses to question 15 (the card sort) are rank ordered.

Data derived from the students' responses to question 15 show that all respondents generally agreed that item $F$, "student interest," was the most important factor in their choices. For the Arts students and those who will choose the Arts, factors $F$, (student interest), D (teacher attitude), and B (teacher method) were the three most important reasons for their choice. Items A, C, G, and E seemed to be less important. The Science students, those who will choose Science, and the undecided students agreed that $F$ (student interest), $G$ (needed for career), $C$ (wider study/career options) and B (teacher methods) were the most important factors in their choices.

|  |  |  |  |
| :--- | :--- | :--- | :--- |
| Card Sort Item | Tenth Grade Students | Eleventh and Twelfth <br> Grade | Students |
| a. My parents wanted | Science | Undecided |  |
| Arts |  |  |  |

$121=14 \% \quad 15 / 42=36 \%$
$31 / 42=74 \%$
$23 / 42=55 \%$
$23 / 42=55 \%$
$18 / 42=43 \%$
$\% 8 L=Z \nabla / \varepsilon \varepsilon$
$\% 98=$ Zठ/9を
$\% \varepsilon \nabla=Z \nabla / 8 T$ $20 / 42=48 \% \quad 33 / 42=78 \%$ career
Source: Card Sort procedures administered to students
Table 4.27
Rank Order by Students of Seven Influencing Factors

|  | Tenth Grade Students |  |  | llth and l2th Grade Students |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Rank Order by Percentage | $\begin{aligned} & \text { Choosing Arts } \\ & (\mathrm{N}=3) \end{aligned}$ | Choosing Science $(\mathrm{N}=3)$ | Undecided $(N=3)$ | $\begin{aligned} & \text { In Arts } \\ & (\mathrm{N}=6) \end{aligned}$ | In Science $(N=6)$ |  |
| 1 | $F=95 \%$ | $F=81 \%$ | $F=90 \%$ | $\mathrm{F}=93 \%$ | $F=86 \%$ |  |
| 2 | $D=86 \%$ | $B=67 \%$ | $C=86 \%$ | $D=83 \%$ | $\mathrm{G}=78 \%$ |  |
| 3 | $B=76 \%$ | $G=62 \%$ | $G=76 \%$ | $B=78 \%$ | $\mathrm{C}=74 \%$ |  |
| 4 | $A=52 \%$ | $C=52 \%$ | $B=62 \%$ | $\mathrm{G}=48 \%$ | $B=55 \%$ |  |
| 5 | $G=43 \%$ | $E=52 \%$ | $D=38 \%$ | $\mathrm{C}=45 \%$ | $D=43 \%$ |  |
| 6 | C $=24 \%$ | $D=48 \%$ | $E=34 \%$ | $A=36 \%$ | $E=43 \%$ |  |
| 7 | $E=24 \%$ | $A=38 \%$ | $A=14 \%$ | $E=17 \%$ | $A=21 \%$ |  |

[^6]Students of the Arts considered less important factors were C (a wider choice of study/career options), G (subjects needed for career), and $E$ (restrictions of the system). All these are consistent with expectations, since those choosing the Arts are aware they will not have as wide a choice of college and career options as Science graduates, who are known to be more in demand. It would also be expected that the Arts majors, because of the nature of their major, would be less concerned with specific career preparation in high school. As with their more limited college and career options. The Arts students tacitly accepted the restrictions on changing majors when they choose the Arts major. If it can be assumed that students are aware of the restriction, it can also be assumed that any who felt they might want to change to Science would initially choose that major, knowing they can change to the Arts later just by taking a test.
"Wider study/career options" (C) and "subjects needed
for career" (G), two factors favored by Science students (after student interest), are consistent with expectations for them. $C$ and $G$ specifically refer to advantages and preparation peculiar to the Science track. Also consistent with expectations was the greater importance placed on "teacher methods" (B) by Science students and on "teacher attitudes" (D) by the Arts students. This was expected because the more objective course content of the Science
curriculum and the requirements of daily homework assignments mean Science majors will tend to be more concerned with how the material is taught. The more subjective content of the Arts curriculum would lead Arts students to be as concerned with the teacher's attitude as his methods. The low value Science students placed on "liking the teacher's (attitude)" may also indicate that Science students felt less comfortable with their Science teachers than the Arts students (who rated this factor second only to student interest), felt about teachers of the Arts. This, too, might be expected, since Arts teachers tend to be Saudis and many, if not most Science teachers, are non-Saudis. This does not indicate Science students dislike their foreign teachers. On the contrary, they value their competence very highly, especially those tenth graders who will choose Science--but they may not feel the personal affinity, nor identify as much, with teachers from another culture.

Responses on the card sort question of those tenth graders who would choose Science were more similar to the responses of the eleventh and twelfth graders enrolled in Science than the responses of other tenth graders. This was also the case for those who would choose, and those who were enrolled in the Arts. To accentuate the differences between students' responses by educational track, and to determine any differences between those committed to either field and
the undecided group, data for those who would choose and those who had already chosen were combined to form three groups: Committed to Arts, Committed to Science, and Undecided (Table 4.28).

When all the tenth, eleventh and twelfth graders who have declared their interest in pursuing Science as a field of study are grouped together, the differences between their responses and those of a similar group who have declared their interest in the Arts are even more distinctive. For example, after "student interest" which is the most influential factor for all groups, "teacher attitudes" is ranked second from the top by the Arts students-and second from the bottom by Science students. Therefore, it appears that this factor is one of the most, it not the most marked discriminator between those in the two majors. It suggests that those interested in increasing enrollment in Science might be advised to investigate the attitudes being projected by science teachers among younger students who have not yet made their choice of an educational track. If these students are given a chance to observe in the Science teachers the same attitudes they value in the Arts teachers, more of them might be influenced to major in Science. Comparing the undecided group with those in the Arts and those in science, it is clear that the factors considered most influential by those who haven't made up their minds resemble the rankings of the Science group with

Table 4.28
Students' Responses to Card Sort of Influence Items by Educational Track, Across Class Levels (Rank Ordered by Percentages)

| Rank Order | Commited <br> to Arts $N=9$ | Undecided $\mathrm{N}=3$ | Commited to Science $N=9$ |
| :---: | :---: | :---: | :---: |
| 1 | $\mathrm{F}=94 \%$ | $\mathrm{F}=96 \%$ | $\mathrm{F}=83.5 \%$ |
| 2 | D=84.5\% | C=86\% | $\mathrm{G}=70 \%$ |
| 3 | $\mathrm{B}=77 \%$ | $\mathrm{G}=76 \%$ | $\mathrm{C}=63 \%$ |
| 4 | $\mathrm{G}=45.5 \%$ | $\mathrm{B}=62 \%$ | $\mathrm{B}=61 \%$ |
| 5 | $\mathrm{A}=44 \%$ | D=38\% | $\mathrm{E}=47.5 \%$ |
| 6 | $\mathrm{C}=34.5 \%$ | $\mathrm{E}=34 \%$ | D=45.5\% |
| 7 | $\mathrm{E}=20.5 \%$ | $\mathrm{A}=14 \%$ | $\mathrm{A}=29.5 \%$ |

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A= Family Influence
B= Teacher Methods
C= Study and Career Options
D= Teacher Attitudes
E= Restrictions of the System
F= Student Interest
G= Needed for Career
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Source: Card Sort procedure administered to students
much more than those in the Arts groups, with the factors peculiar to the Science field ranked just behind "student interest." Given the factors these students consider important, it is likely they will enroll in Science next year. The only factor that suggests otherwise is the low ranking given "restrictions of the system" (E). Among those who are undecided, one would expect to find more interest in the factor that will force them to choose Science or make an almost irrevocable choice of the Arts that will require relinquishing any aspirations they may have in Science.

## Question 16

The following question was intended to determine more factors that may have influenced the students' choice.
"What other factors (do you think may have)
influence(d) your choice of educational track?

All of the students responded negatively to this question, indicating they could not suggest any more factors that might have influenced their choices, beyond those which have been listed or previously discussed. This was considered as an indication that the researcher had exhausted the range of possible influences on choice of major and the interviews were terminated. (It should be noted for clarification that in response to Question 15 , the card sort, two additional factors were found to influence
students' choice of educational track: (a) future study and career options, and (b) needed for career.)

## Family Interview Results

Twenty-one family members were interviewed to determine their responses and compare them with the students' responses. The family member could be a father, brother, or other close male relative of the students.

Question 1
The following question was intended to establish the respondents' occupations.
"What is your occupation?"

Responses of the family members. Family members' responses covered such a wide variety of occupations and employment that there is no advantage to be gained by listing them here.

Question 2
The following question was intended to identify the students' choice.
"What is (or will be) your sons' choice of educational track?"

Responses of the family members. A total number of 21 family members responded to the question.

1. Arts (6 out of 21).
2. Science (11 out of 21).
3. As he wishes or prefers, even though $I$ prefer Science (2 out of 21).
4. I don't care, as long as he chooses what he likes (2 out of 2l).

Interpretation of Responses. Family members' answers to question 2 establishes that most of their sons have chosen or will choose Science, while a minority have chosen the Arts. Two family members preferred Science for their sons, but left him the full freedom of the decision, while the two others indicated that they didn't have any preference as long as their sons chose what interested them.

## Question 3

The following question was intended to determine the family influence of the students' choices.
"How have you and your wife tried to influence your son's choice of field of study? Why?

Responses of the family members. A total number of 21 family members responded to the question.

1. We respect his choice, because he will be responsible for his decision, but we gave him some advice (9 out of 21).
2. We tried to advise him as to the best major for him, but then we left the final decision to him $(5$ out of 21).
3. We did not participate at all in his choice $(7$ out of 21).

Interpretation of Responses. From the family members responses to question 3, it is apparent that none of the family members felt their student was incapable of making this decision for himself, but most of them (two-thirds) consciously tried to influence his choice. The other third had not participated at all in the choice.

## Question 4

The following question was intended to determine whether the guardian's job had any impact on the student's choices.
"Will your job influence your son's choice of occupation? How? Why?"

Responses of the family members. A total number of 21 family members responded to the question.

1. Yes, because we don't want him in the same hard job, we want him to have a better position (5 out of 21).
2. No, he chooses what he wants, no matter what my job is (14 out of 21 ).
3. Yes, I want him to be in the same good job which I have (2 out of 21).

Interpretation of Responses. Family members' responses to question 4 , suggested that most family members did not think that their jobs had an influence on their sons choice of educational track. Some of the family members indicated that they advised their sons not to choose their occupations because it was hard work. Very few family members indicated that they wanted their sons to choose the same occupation for the advantages it offers.

## Question 5

The following question was intended to elicit information regarding the guardian's reaction if he was unhappy with the student's choices.
"If you feel you son's choice of educational track is not appropriate for him, why not? Will you try to change his mind? How?

Responses of the family members. A total number of 21 famy members, responded to the question.

1. We will interfere by providing him some advice about the mistake he could make, but we will leave
the final decision for him so he will be responsible for that choice (16 out of 21).
2. Because we want him to be in the best position and avoid making mistakes, we will insist that he choose what is best for him (5 out of 21).

Interpretation of Responses. The family members' responses, showed that while most of them would not insist on what they felt was best for the student, they would try to change his mind about what they felt was an inappropriate decision that could affect his future life. A minority of the family members said that they would insist that their sons choose the major they felt was appropriate.

## Question 6

The following question was intended to elicit information regarding the guardian participations about who should be responsible for the students' choice.
> "Do you think it is better to let tenth graders choose their field of interest for eleventh and twelfth grades or is this decision too important for teenagers to make and one their parents should make?"

Responses of the family members. A total number of 21
family members responded to the question.

1. The tenth graders is mature enough to choose what he likes and he should make the decision himself (9 out of 21).
2. The parents may give some advice, but the final decision should be the student's choice (8 out of 21).
3. The parents should make the decision because they have more experience about what is appropriate and the child is still uncertain about what is best for him (4 out of 2l).

Interpretation of Responses. From these responses, it was clear that a majority of the parents felt the tenth grade students were mature enough to decide what they want, although many of the family members indicated that they would provide some advice about the choice of educational track. Only a few of the family members indicated that they should make the choice because they don't think the student is mature enough to make an appropriate choice.

## Question 7

The following question was intended to provide information regarding the guardian's influence on the students' choices, if they needed the students' help.

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"If you are in need of your son's help to support
you, do you think it is reasonable to ask your son
to quit school or change his educational track on this
basis?"
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Responses of the family members. A total number of 21 family members responded to the question.

1. No, but I may ask him to help me when he has some free time (6 out of 21).
2. No, I would never ask him to quit school or change his major for any reason (12 out of 21).
3. If we were in a serious need I would ask him to do that because he is not supposed to be selfish and he may have young sisters and brothers that need support (3 out of 21).

Interpretation of Responses. Family members' responses to question 7, determined that the majority of the family members reported they would never ask their sons to change majors or quit school for any reason, even though some of them indicated that they might ask for their son's help when he had free time. Only a few of them indicated that they would ask their child to quit school or change majors because they need or want him to share the family responsibilities.

Question 8
The following question was intended to determine the guardian's perceptions of the factors that influence the students' choice.
> "What factors do you think (will) have most influence(d) your son's choice of educational" track?"

Responses of the family members. A total number of 21 family members responded to the question.

1. Student Interest (18 out of 21).
2. Teachers' Method and Attitudes (13 out of 21).
3. Family Influence (10 out of 21).
4. Career Influence (7 out of 21).
5. Difficulty of the Curriculum (5 out of 21 ).
6. Peer Influence (4 out of 21).
7. The Student's Achievement in a particular major (3 out of 21).

Interpretation of Responses. From the family members responses, it is apparent that most of them agreed with the students that "student interest" is very important factor in the choice of educational track, followed by "teachers' attitudes and methods". More of the family members than the students indicated that "family influence" is an important factor in the choice decision. The next largest group mentioned "career influence". Less than one-quarter
indicated the importance of "difficulty of the curriculum," "peer influence," or "student achievement in a particular major."

Teacher/Principal Interview Results

Five principals (one from each school participating in the study) and eight teachers (two Saudi Science teachers, two Saudi Arts teachers, two non-Saudi Science teachers, and two non-Saudi Arts teachers) were interviewed to determine their responses and compare these with the responses of the students and their parents regarding the choice of major. It should be noted that both teachers and principals were asked the same questions.

## Question 1

The following question was intended to determine the respondents' background in teaching.
"What subject do you teach? How long have you taught it? What is your backbround, Arts or Science?"

Responses of Teachers and Principals. Responses of the teachers to this question were already known because the researcher had selected four Science teachers and four Arts teachers. All the principals were found to have had an Arts background.

Question 2A

The following question was intended to elicit information regarding the school officials' perceptions of who should be responsible for the students' choice.
"Do you think it is better for the student to choose his own educational track by himself or is it better if he follows his fathers' wishes? Why?"

## Responses of the Teachers. A total number of 8

 teachers responded to the question.1. It is better if the student chooses his own field of study because he knows what he likes more than anyone else (4 out of 8).
2. It is better if he seeks some help and advice from his father and then decide himself about what he thinks the best for him, because the students may not think carefully about the future consequences of his choice ( 4 out of 8 ).

Responses of the Principals. A total number of 5 principals responded to the question.

1. Parents should provide some advice to their sons, the final decision should be the student's because he knows his interest and is old enough to decide by himself (5 out of 5).

The following question was intended to provide information regarding whose decision should prevail.
"If they don't agree, who should prevail?"

Responses from all teachers and principals indicated that the students should prevail. Only one teacher added that if the parents are highly educated, then they might appropriately prevail.

Interpretation of Responses. From the principals and teachers responses to question 2 , added to earlier data, it can be seen that, generally, everyone seemed to agree that the final decision in choosing a major should be made by the student himself, with some advice from his parents.

## Question 3

The following question was intended to elicit information regarding the relationship between the students' achievement and the source of the advice they followed.

> "How do you feel about the students' achievement if they follow their parents' wishes compared with their achievement if they choose their own major field of study? Why?"

Responses of the Teachers. A total number of 8 teachers responded to the question.

1. If he chooses his major himself, his achievement would be much better than if someone else chooses it, because he would choose what he likes and be responsible for that choice (7 out of 8).
2. His achievement would be better if the parents chose for him and continue supervising him, because they are more mature and have more experience (l out of 8).

Responses of the Principals. A total number of 5 principals responded to the question.

1. The student's achievement will be better if he chooses himself because he will know the major he wants and he will be responsible for that choice (5 out of 5).

Interpretation of Responses. From the teachers' and principals' responses to question 3 , it is clear they agree that the students' achievement will be better if they choose their majors themselves because they will be responsible for that choice. Only one teacher felt that the students' achievement would be better if the parents chose for them because they would then provide needed supervision of students work.

## Question 4

The following question was intended to establish the school personnel's advice to the student who wants to change his track.
"How would you advise a student with good grades who wishes to change from Science to Arts in the middle of the twelfth grade? Why? From Arts to Science?"

Responses of the Teachers. A total number of 8 teachers responded to the question.

1. I would advise him to choose what he wants and feels comfortable with, regardless of the major. The most important thing is that he studies what he wants (4 out of 8).
2. Because the country needs Science majors, I would advise him to continue in Science. If the Arts student is able to go to Science and do well, then $I$ would advise him to change to a Science major to help satisfy the country's needs and because of the advantages available to Science graduates (4 out of 8 ).

Responses of the Principals. A total number of 5 principals responded to the question.

1. I would advise him to change to his desired major, no matter what his major is, because he should choose what he feels he likes and wants (3 out of 5) •
2. I would advise him to consult his teachers, parents and school counselors before he makes any change, so he will not make a mistake. After that, he should decide what he wants and change if he feels it is needed (2 out of 5).

Interpretation of Responses. The teachers and principals responses to question 4 established that many of them believe that the student should change to the major he wants. Other teachers indicated that the student should not change from Science to the Arts, because of the country's need for Science majors. Moreover, some principals indicated that students should seek some advice from parents, teachers, and school counselors before making any change.

Question 5
The following question was intended to provide information regarding the teacher's influence on the students' choice.

[^7]Responses of the Teachers. A total number of 8 teachers responded to the question.

1. The teacher has a very strong influence (positive or negative) on the students' choice because the teachers' attitudes and methods of teaching could attract or discourage students from enrolling in that particular track ( 8 out of 8 ).

Responses of the Principals. A total number of 5 principals responded to the question.

1. The teacher has a strong influence (positive or negative) on the students' choice of major by the way he teaches and treats the students. He tends to increase or decrease their interest toward a major because he serves as the students' model (5 out of 5).

Interpretation of Responses. This unanimous response by the teachers and principals showed that the teachers have a very strong influence on students' choice of major by attracting or discouraging their interest.

Question 6
The following question was intended to elicit information regarding the school personnel's perceptions of the factors that may influence the students' choice.
"What are the factors you think may be influential in the students' choice of educational track?"

Responses of Teachers and Principals. A total number of 8 teachers and 5 principals responded to the question.

1. Student's Interest $(7$ out of 8 teachers, 5 out of 5 principals).
2. Teachers' Methods and Attitudes $(8$ out of 8 teachers, 5 out of 5 principals).
3. Family Influence (5 out of 8 teachers, 3 out of 5 principals).
4. Difficulty of the Curriculum (4 out of 8 teachers, 2 out of 5 principals).
5. Peer Influence ( 3 out of 8 teachers, 2 out of 5 principals).
6. Student Achievement (l out of 8 teachers).
7. Career Influence (l out of 8 teachers, 1 out of 5 principals).

Interpretation of Responses. From the teachers' and principals' responses to question 6 , it was determined that two factors were considered to be very important by all teachers and principals. Those factors were "students' interest" and "teachers methods and attitudes." Less emphasis was put on the other factors, such as "family

# influence," "difficulty of the curriculum," "peer influence," and "students' achievement." 

## Discussion of the Factors

The following discussion deals with the importance of the six selected factors that influenced students' choice of educational track. The survey results showed the influence of the six factors by their rank order and how different groups rated the six factors. The interview results provided more information regarding the process of how the decision about educational track was made. The interviews also identified two more factors that were considered by Science students as influential: (a) future study and career options, and (b) needed for career.

Student Interest

Responses to the questionnaire items demonstrate that "student interest" was the most important factor influencing students' choice of educational track. All students agreed that this factor was very influential in their choice of educational track (See Table 4.16).

This finding is supported by results of the interviews with students, family members, teachers, and principals who all agreed that "students' interest in either Science or, the Arts, was the essential factor in their choice of educational track. (See interpretations, pp. 148, 194 and
202). The strength of this factor was increased by the results of the card sort of seven potentially influencing factors incorporated in Question 15 of the student interviews. Results of the card sort showed that 81 percent to 95 percent of the various groups chose the card saying, "the subjects interest me," as the most important factor influencing them when they chose their educational track. (See Table 4.27).

The appropriateness of "student interest" as the major factor in tenth grade students' choices, was underscored by the eleventh and twelfth grade students' satisfaction with their choices, for which "student interest" was also an important factor.

When students, who had been enrolled in their majors for one or two years, were asked to describe their feelings about their choice, 74 percent of them indicated that they were content with their choice of educational track (Table 4.2).

These findings supported the emphasis on students' personal interest in other studies of variables affecting enrollment in science courses. Dietrich and Pella, (1974) for example, found their variable of "personal reasons" was of greatest importance across enrollments in physics.

The personal reasons cited by students in physics in high and low enrollment schools are similar and concerned with personal interest in Science and the place of the course in future educational plans. (p.11)

Therefore, it can be concluded that "students' interest" was ranked as the most important factor in the choice of a track by students at all levels of secondary school, their parents, their teachers, and their principals. The eleventh and twelfth grade students' satisfaction with the major they had chosen at the end of tenth grade tends to emphasize the suitability of "student interest" as the most significant factors in the choice of an educational track.

## Teaching Methods and Attitudes

Teaching methods and teachers' attitudes were considered influential in the choice of an educational track by all the students. Data derived from questionnaire responses (reported in Table 4.16) show that "teachers' attitudes" and "teaching methods" ranked as the second and third most important factors in the students' choice of major.

This was supported by interviews with students, family members, teachers, and principals (See interpretations, pp. 175, 194, 201 and 202). Although most of the students considered the teachers to be an important factor in their choice, the tenth grade students considered them relatively more important than did eleventh and twelfth grade students (see Tables 4.16, 4.25 and intrepretation p.175). Science students emphasized "teaching methods" over "teacher attitudes," but students of the Arts considered teachers'
attitudes to be more important than teaching methods (see Tables 4.19, 4.22, 4.27, 4.28 and interpretation p. 175). These findings were consistent for survey and interview data. Card sort results may have differed for Science students because two variables pertinent to Science (and not the Arts) intervened: (a) wider choice of options for study and career and (b) subjects needed for career.

The results from the survey and interviews showed that Science students put more importance on "teaching methods" than "teachers' attitudes," which may result from the belief that Science is more abstract requiring students to depend more on the teacher's role and competence in facilitating comprehension and learning. On the other hand, to students of the Arts, teaching methods may be less important because they may think it is possible to depend on the textbook and understand it without help from the teachers. Thus, "teachers' attitudes" and the manner in which teachers treat students may be the basis for judging teachers and their subject areas positively or negatively.

The card sort tables (4.26, 4.27 and 4.28) show different results with regards to the perceptions of students of the Arts and Science students toward teaching methods and teachers' attitudes. This may be partially explained by the fact that two factors were added (study and career options, and need for career) to the card sorts which were not included in the questionnaires and interviews.

These factors were very important for the Science students but not for students of the Arts which reduces the percentage of responses indicating that "teaching method" is more important.

Wright and Hounshell (1978) found that high school teachers were the most influential factor in the school environment. Seventy-one percent of the respondents in their study said that teachers in grades $10-12$ were most influential in developing their interest in Science. Junior high teachers were rated as the second most influential factor (49 percent). They noted that 74 percent of scienceoriented students claimed their interest in science had been developed primarily through school--and high school and junior high science teachers were the most influential factors in developing an interest in Science. Teachers' influence students' choices, especially among younger students.

This was confirmed by the research, which is the basis for this report. Interview and survey data revealed that tenth grade students more often seek advice from teachers than students in eleventh and twelfth grades who tend to seek advice from their peers. (see tables 4.16, 4.25 and interpretation $p .175)$. It can be concluded that:

1. teaching methods and teachers' attitudes were rank ordered as the second and third most influential factors in students' choice of majors;
2. the students of the Arts perceive their teachers as more friendly and Science students see their teachers as more competent professionals (see Tables 4.19, 4.22, and interpretation, p. l75). That is, students of the Arts care about the teachers' attitude and the Science students care more about the teaching methods; and
3. tenth grade students, more than eleventh and twelfth graders, consider teachers to be a more important factor in their choice of educational track (see Tables 4.16, 4.25 and interpretation p. 175).

Restrictions of the System
"Restrictions of the system" was considered to be an influencing factor by all the students. They ranked "restrictions of the system" as the fourth most influential factor in their choice of educational track, after student interest, teachers' attitudes, and teaching methods.

As a factor in the initial choice of an educational track, the administrative guidelines tended to encourage students to enroll in the Science track if they felt they could cope with the work it entailed and had the interest to do so. However, for students whose interest in Science or confidence in their ability to cope with difficult intellectual tasks improves after the tenth grade, "restrictions of the system" are a deterrent because they are not permitted to change without repeating grades.
"Restrictions of the system" was not seen as an important factor during interviews. Students who considered their "interest" in a particular track as very important in their choice, reported that "restrictions of the system" were not an important influence (see interpretation, p. 175).

Nonetheless, the survey data presented in Table 4.16 show the "restrictions of the system" to have some influence. Several questions were asked about the importance of being able to make the change from the Arts to the Science track more easily. Responses indicated that, in that situation, "restrictions of the system" was more influential. (See Table 4.14).

The results of the card sort did not support the importance of "restrictions of the system." That outcome may be explained by (a) students of the Arts were aware that if they should change their minds, they would not be permitted to change from the Arts to Science; the card that read, "it is possible to change to the other major any time" was not an option for them and, therefore, not considered, and (b) Science students tend to choose factors other than "restrictions of the system" that were more relevant to their situation, such as "career influence," and "a wider choice of study and career options" (see Tables 4.26, 4.27 and 4.28).

This factor was not considered by family members, teachers, or principals to be an important factor. Family members may not have considered this factor to be important simply because they were unaware of its implications (i.e., forty-seven percent of the sample of fathers had never been exposed to the formal educational system). (see Table 4.4). Teachers and principals who should be aware of the impact of "restrictions of the system" tended to to see it as influential because each school has provided a counselor whose job is to clarify educational track options and assist students make the right choices. Such assistance, however, does not guarantee that students making choices at 15 or 16 years of age would make the same choice two years, one year, or even six months later.

It can be suggested that:

1. "Restrictions of the system" was considered by survey respondents to be a moderately influential factor.
2. "Restrictions of the system" was ranked as the fourth most influential factor in the students' choice of educational track.
3. "Restrictions of the system" was not considered in the student interviews to be an important factor, because students who considered their "interest" in a particular major as a very important influence in their choice, did not find the restrictions to be very limiting.
4. "Restrictions of the system" was not considered by respondents to the card sort procedure to be an important factor because other factors intervened and reduced its importance to the Science subjects. Students who chose the Arts educational track ruled it out as an influential factor when choosing that track which they knew in advance would prohibit them from switching to Science without repeating a grade.
5. family members were likely to be unaware of the importance of this factor because of their low level of education and lack of knowledge about schools' administrative restrictions.
6. teachers and principals did not consider this factor important because they believe they have nullified the restrictions for students by providing a counselor in each school to help the students with their choices. It was assumed that the counselors would advise students considering the Arts track that, if they enrolled in the Arts, and later wanted to switch tracks, they would be required to start at the beginning of the Science educational track.

## Difficulty of the Curriculum

According to Bridgham and Welch (1969), low enrollments in physics are widely believed to result from the reputation of physics as a difficult course. During the
research, Physics and other discrete Science courses in the West were being equated with the Saudi Science major. In Saudi Arabia the reputation of the difficulty of the Science curriculum is also a definite factor in enrollment decisions. Survey results showed that tenth grade students considered "difficulty of the curriculum" as an influential factor, but eleventh and twelfth grade students considered it less influential. When all grades were combined, that factor was considered influential (see Tables 4.16 and 4.25).

An explanation for the response distribution may be that tenth grade students are about to make a serious decision and have to consider whether they'll be able to succeed in their choice or not. Thus, "difficulty of the curriculum" is one of the issues that they need to think about. Also, survey data used to test the second hypothesis showed that students of the Arts had been influenced more by the difficulty of the Science curriculum in making their choice of educational track (See Table 4.22). The reputation of Science as a difficult educational track may have kept some of the Arts students from enrolling in the Science major. While "difficulty of the curriculum" may have been considered by a few Science students, most were confident enough of their ability to achieve, or enjoyed the anticipation of the challenging assignments enough, that the reputation for difficulty did not deter them from enrolling.

Survey data were supported by interview results. Students from different grades and majors were asked what they would choose if they were geniuses and could learn anything very easily. When the choice was put in that context, many of the students in the loth grade and in the Arts major said that they would choose Science--thus suggesting that concern of the difficulty of the Science curriculum may have been a reason for avoiding it (see Interpretation, p. 172).

Although this factor was ranked in the survey data (Table 4.16) as fifth (out of six factors), it was ranked ordered higher by some students, particularly tenth graders (see Tables 4.16 and 4.25 ) and students of the Arts (see Table 4.22).

Eleventh and twelfth grade students, especially the Science majors, whose choice of major may have negated the importance of this factor for them, ranked ordered "difficulty of he curriculum" lower, thereby increasing the mean when the data were analyzed. This factor was not included in the card sort.

However, interviews with teachers and principals indicated that "difficulty of the curriculum" was comparable to the results of the survey and students' interviews. Parents rank ordered "difficulty of the curriculum" lower as an influencing factor in their children's choice of educational track. (see Interpretations p. 194 and 202).

It may be concluded that:

1. "Difficulty of the curriculum" was ranked fifth among six factors in the influence on choice of educational track by tenth grade students.
2. It was rank ordered fifth (of six factors) in the students' choice of educational track by eleventh and twelfth grade students.
3. For all classes combined, it was ranked ordered the fifth.
4. Students of the Arts were influenced more by the difficulty of the Science curriculum in making their choice of educational track. Interviews with the students, teachers, and principals supported this finding.
5. Family members may have rank ordered "difficulty of the curriculum" lower because they are not involved in the school.

Family Influence

All students rank ordered "family influence" lower than other factors. That is, it may have been of little importance in their choice of educational track. Tenth grade students seemed to be slightly more influenced by their parents (mainly the father) than those who were in eleventh and twelfth grade. This was supported by the survey data used to test hypothesis three (see Tables 4.16, 4.24 and 4.25).

It can be suggested that the older the student became the less he was influenced by his family. This is consistent with information provided by Hetherington and Parke (1979), in their book about child development, that the older the child becomes, the more independent from his parents he becomes and the more he is influenced by his peers.

Science students seemed to have better educated parents who may have understood that Saudi Arabia needs Science majors and that graduating in that major ensure a better career (see Tables 4.4 and 4.6).

Student interview results supported the survey data, with tenth grade students more influenced by their parents than eleventh and twelfth graders, who tended to be influenced more by their brothers. (see Interpretation, p. 150).

From the student interview responses, it is apparent that many students received some advice from family members about choosing a major. Most influence was indirect, consisting of advice and support, rather than restricting, instructing, or otherwise the students. Science students seemed to be under relatively greater family pressure to choose the Science major than those in the Arts as indicated by interpretation, p. 150).

The card sort provided additional evidence that family influence on students' choice of educational track decreased
as the student grew older (see Table 4.27). Although it appears at first glance that students intending to enroll in the Arts assigned more (52 percent) importance to "parent influence" (Table 4.27), closer inspection shows this came about because they were asked to rank order the seven cards from most to least important, but some of the cards contained factors that were not pertinent to the Arts major, factors such as: (G) subjects needed for career; (C) provides wider study and career options, and (E) the possibility of changing from one major to another. The clear irrelevancy of these factors for those choosing the Arts may indicate that they actually rank ordered only four factors that were potentially relevant to their own choices, putting (A) "parent influence" last. It should be observed that students who had the opportunity to rank order seven factors at least potentially relevant to their own choices generally ranked (A) parent influence as least or near least important.

Results from interviews with family members, teachers, and principals placed more importance on the "family influence" factor, but this was inconsistent with the students' perceptions about that factor (see Interpretations, p. 158, 194 and 202). This may say more about adolescents' traditional struggle for independence from parents or students' realization of their parents' inexperience with formal education than indicating
disrespect for their parents or rejection of their parents' views. However, students, parents, teachers, and principals all indicated that most parents tend to exert subtle and indirect influence by offering advice, support and encouragement to their children (see Interpretation, pp. 150, 191 and 195).

So it can be conclude that:

1. Students rank ordered "family influence" lower as an influencing factor in their choice of educational track.
2. Tenth grade students were slightly more influenced by family (mainly the father) than eleventh and twelfth graders.
3. Science students to be rank order "family influence" to choose the Science major lower than students of the Arts. Interview results supported this finding, but card sort results did not because of the interference of additional factors pertinent only to Science majors.
4. Science students have better educated parents, who may know the importance of that track for both Saudi Arabia's development efforts and the students' future.
5. Family members, teachers, and principals attribute more importance to the factor of parental influence than students.

The data indicated that most of the family members would have preferred to have their sons choose Science, a preference that may reflect their perceptions of the value
of Science graduates to a developing country like Saudi Arabia and the rewards available to them. Most of them do not force their sons to choose a particular major, but they do provide advice and then leave the final decision to the student.

Family influence was considered by all students to influence their choice of educational track less than other factors, but family members felt it should be more influential (see Interpretation, p. 194). While the influence of older family members on younger members reflects the traditional order in Saudi Arabia, the realization that most students' fathers are less educated than secondary school graduates (see Table 4.4), suggests that students may assign relatively little importance to the advice of their fathers.

Family members also indicated that the family business usually does not affect the sons' choice of educational track because the son has different interests than the father or his relatives. This can be explained by the fact that most of the fathers' occupations are in civil service or business (See Table 4.5), which are not desirable jobs compared to the professional positions, which are usually filled by foreigners in Saudi Arabia. Also, because family members' education is generally low, they want the new generation to be better educated and qualify for better occupations. Thus, family members do not strongly influence
their son's choice of educational track even to the point that they feel their son is not choosing the appropriate track, they will not insist that he change that decision, except to give him their advice. Only a few would interfere to the point of forcing their preference on the student. The researcher believes that the best way is to provide advice and show the students the advantages and disadvantages of both majors without insisting on one choice. The student must be interested in the major he chooses and take responsibility for his choice. Otherwise, he may fail to do as well as he can in a track that he has not chosen for himself.

The wisdom of the student making his own choice was supported by the survey results indicating that students were content with the choices they had made one or two years previously. Very few indicated that someone else had chosen their majors for them (see Table 4.2). Even if the family needs their son's help they said they would not ask him to change his major or quit school (see Interpretation p. 193).

When the family members were asked to indicate the factors that may (have) influence(d) their son's choice of educational track, most of them emphasized that students interest was the most important factor (see Interpretation, p. 194). This was supported by students' responses reflected in Table 4.16. Family members also indicated that teaching
methods and teachers' attitudes were important factors. Family members tendencies to overrate the importance of family influence on student choice was understandable but not supported by student survey results or the card sort (see Tables 4.16, 4.26, 4.27, 4.28 and Interpretation, p. 194).

It is likely that family members exert their influence on their son's choice by providing advice. This advice may not even be perceived by the student to be important, because he may believe that he is making his own decision based on the major he likes. There was little agreement among family members on the other factors.

Teachers and principals generally agreed that the student should choose his own educational track with some advice from his parents, because they believe that the students' interest in a particular subject is more important than his family's preferences. This, was consistent with earlier findings on the importance of "student interest." It was also found that student achievement was perceived to be better if the student followed his own interests rather than his family's wishes, because he tended to hold himself responsible for his choice (see Interpretation, p. 197).

It was determined that the Science major was considered more desirable by family members, teachers, and principals, (see Interpretations, pp 188 and 198) because it is considered more important for the country's development
needs and the society rewards Science graduates with greater access to colleges and jobs.

It was also found that teaching methods and teachers' attitudes are very important factors in the students' choice of educational track. The importance of these factors was affirmed by student survey data; interviews with family members, students, teachers, and principals, and the card sort of inflential factors (see Tables 4.16, 4.26, 4.27, 4.28, Interpretations, 175, 194 and 202).

Generally, it was evident that students of different grades and trakss perceived the influences of their choice of major differently, but almost all of them agreed that following their own interests was very important in making their choice. This was evident in the survey data, as well as information derived from student interviews and the card sort (see Tables 4.16, 4.26 4.27, 4.28; Interpretations, p. 148 and 152).

Second in importance to student interest, were teachers' attitudes and teaching methods. Students of the Arts were influenced more by teachers'attitudes and Science students were more concerned with good teaching methods (see Tables 4.16, 4.22; Interpretations, p. 175).

Science students also were found to be influenced by their access to college and careers. Students of the Arts were influenced by the difficulty of the other (Science) curriculum, as indicated by their responses when asked what
they would study if they were geniuses, and could learn whatever they wanted very quickly (see Tables 4.19, 4.22 and Interpreations p. 172).

The first research question which inquired into how the decision about the choice of an educational track was made, was answered by agreement between the demographic, survey, and interview data that the choice was made primarily by the student himself, based on his interest.

Some parents participated in the decision process by providing advice, support and encouragement to their sons. Parents' advice seemed to be more influential in the decisions of Science students and those who planned to enroll in Science.

Some students also sought advice from other persons. Teachers' and fathers' advice was sought more frequently by tenth grade students. Brothers' and friends' were consulted more frequently by eleventh and twelfth grade students (see Tables 4.2, 4.16; Interpretations, p. 150, 158, 160).

Among students of the Arts and those who would enroll in the Arts the opportunity for sufficient free time to undertake a part-time job seemed to be influential in deciding their majors (see Interpretation, p. 155).

Of all the factors influencing students' choices, however, it was markedly evident that the most influential factor for almost all students was their own interest.

Other factors assumed secondary or tertiary importance rather than alternating with "student interest" as the chief factor influencing students' decisions (see Tables 4.16, 4.26, 4.27, 4.28 and Interpretations, p. 148, 194, and 202) •

## Summary

In this chapter, data generated by the student survey and interviews with students, family members, teachers and principals of five all male secondary schools in Medina, Saudi Arabia were analyzed. Simple frequencies, comparisons of mean and standard deviation, multivariate analysis of variance (MANOVA), and univariate analysis of variance were used to identify the influence and comparative significance of six factors which may influence students' selection of a major educational track: students' interest, teaching methods, teachers' attitudes, difficulty of the curriculum, family influence, and restrictions of the system. Beyond identifying the significance of these factors, an attempt was made to determine how the decision about the choice of educational track was made.

Answers were also provided for the three research questions which guided this study.

1. How are the decisions about the educational track made? That is, who discusses it with the students and when is the decision made?
2. What are the most significant factors influencing students' choice of track. That is, what is the influence of: student interest, teaching methods, teachers' attitudes, difficulty of the curriculum, family influence, and restrictions of the system.
3. How do students from different grades and tracks, families, teachers, and principals differ in their perceptions of the factors influencing students' choice of educational track?

To answer the first research question, descriptive statistics for the first section of the survey questionnaire and the interview data seemed to agree that the decision was made mainly by the students, based on their interest in a particular educational track. Family members (primarily fathers and brothers) seemed to provide advice by pointing out advantages and disadvantages of one choice or the other, (with most parents preferring the Science track), but the final decision was left to the student. Even the tradition of a family business did not have much influence on the choice of major because student interest was such as influential factor in that choice.

For the second research question, descriptive statistics for the second section of the questionnaire and the interview data also demonstrated that "student interest" was the most influential factor affecting the students' choice of educational track. After student interest, the factors that affected students' choices were teachers' attitude, teaching method, restrictions of the system,
difficulty of the curriculum, and family influence, generally in that order.

The interviews identified two additional factors that were influential for the Science students: (a) future study and career options; and (b) needed for career. The interviews permitted the discovery of new information that the structured questionnaire could not.

Three null hypotheses were developed to answer the third research question:

HO : There will be no significant differences between 1 tenth grade students who intend to enroll in the Arts track and those who intend to enroll in the Science track with respect to the six factors.

HO : There will be no significant differences between 2 eleventh and twelfth grade students in the Arts track and those in the Science track with respect to the six factors.

HO : There will be no significant differences between 3 students in tenth grade, and students in eleventh and twelfth grades with respect to the six factors.

The three hypotheses were tested using a significance level of .05. The first hypothesis was rejected but it could not be determined which of the six factor(s) caused the rejection because the of the Arts students were not significantly different from those of the Science students for any of the factors. Tenth grade Arts students gave more emphasis than Science students to "student interest," "teachers' attitude," "difficulty of curriculum," and
"family influence" as influential factors in decision making, whereas Science students gave more emphasis to teaching method and restrictions of the system. The second hypothesis was also rejected. In this case the key factor in the choice by eleventh and twelfth grade students was "difficulty of the curriculum" which had a significant $F$ ration. Comparison between factor means showed that significantly more students of the Arts than science students considered "difficulty of the curriculum" an influential factor. The reputation of Science for difficulty has thus deterred some of the Arts students from enrolling in the other (Science) major.

The third hypothesis was rejected and the factors of teaching methods, difficulty of the curriculum, and family influence all had a significant F. Comparisons between factor means, indicated that tenth grade students considered "teaching method," "difficulty of the curriculum," and "family influence" significantly more important or influential than eleventh and twelfth grade students. This may have occurred because tenth grade students are planning for a serious decision that will affect their future lives. In contrast, eleventh and twelfth graders were long past the point of this critical choice and those factors that seemed forbidding in anticipation may have become benign.

## CHAPTER V

## SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The purpose of this chapter is to provide a summary of the study; draw conclusions based on the data analysis; and make recommendations for Saudi officials responsible for policy making, including those in the Ministry of Education, the Ministry of Information, and the Ministry of Planning. Recommendations and suggestions for further study are also provided. Because of governmental centralization and the consequent similarity of Saudi schools, it is felt the findings may be generalized to other secondary schools in Saudi Arabia and may also prove useful in other developing countries with similar school systems.

## Summary of the Study

The main purpose of this study was to investigate the processes by which male students choose their educational track in the Saudi secondary schools and (b) the factors that influence their choice.

The researcher attempted to understand the processes by which male secondary students and their parents make decisions about the selection of either the Arts or the

Science educational track. The objective was to identify those factors which influence the choice of educational track by male high school students in Saudi Arabia.

Three research questions were deverloped to guide the course of the research.

1. How are the decisions about the educational track made? That is, who discusses it with the students and when is the decision made?
2. What are the most significant factors influencing students' choice of track? That is, what is the influence of: students' interest, teaching methods, teachers' attitudes, difficulty of the curriculum, family influence, and restrictions of the system?
3. How do students from different grades and tracks, their families, teachers, and principals differ in their perceptions of the factors influencing students' choice of educational track.

For the purposes of the study, two data collection techniques were used: a survey questionnaire and face-toface interviews. Two questionnaires were developed for two groups of students, tenth grade students who would soon be making the choice of an educational track and eleventh and twelfth grade (Science and Arts) students who had made their choices up to two years earlier.

A sample of 200 secondary school students selected from five high schools in Medina, Saudi Arabia responded to the questionnaire. They included 100 tenth grade students and 100 eleventh and twelfth grade students (25 eleventh grade Science, 25 eleventh grade Arts, 25 twelfth grade Science
and 25 twelfth grade Arats). Random sampling techniques were used to choose the sample study.

Each of the two sets of questionnaires consisted of two sections. The first section contained items designed to elicit personal data relevant to this study such as class level, the persons responsible for academic decisions, and parents' level of education. The second section contained 42 items which were designed to collect reasons, feelings, and opinions that might reflect the students' situation and attitudes toward six factors that might (have) influenced their choice of educational track. The respondents were asked to indicate whether they fully agreed, agreed, were undecided, disagreed, or fully disagreed with the 42 questionnaire items.

In addition to the survey face-to-face interviews following a specific schedule of questions were conducted by the researcher to obtain the ideas and opinions of the students as well as from educational officials and others who had relevant experience with the study's subjects. The interviews were dividied into two sections, the first section included an introduction about the research and the purpose of the interview and encouraged the subjects to be frank. They were also assured that their answers would be kept confidential, with individual responses being seen only by the researcher. The reseracher then, in a second section, proceeded to elicit their comments, ideas and
opinions about the research questions. A checklist and card sort procedure were used to record the interview data.

These interviews were focused on how students make their choice of an educational track and factors that influence that choice. Interview subjects included 4 science teachers, (2 Saudi and 2 non-Saudi); 4 Arts teachers (2 Saudi and 2 non-Saudi); 5 administrators (school principals): 21 high schools students $(3$ tenth grade students who would choose the Arts; 3 who would choose Science; 3 tenth graders who had not decided yet; 3 eleventh graders in the Arts; 3 eleventh graders in Science; 3 twelfth graders in the Arts; and 3 twelfth graders in Science), and the students' male parent or guardian.

The interview was used as a research procedure in order to elicit additional general information and additional influencing factors that could not be elicited by the structured questionnaire alone. The responses to the interviews identified two new factors that were perceived by Science students as influencing their choice of educational track: (a) future study and career options, and (b) needed for career.

In order to answer the first research question, data from the interviews and the first section of the questionnaire were analyzed. To answer the second research question, data from the interviews and the second section of
the questionnaire were analyzed. Three hypotheses were generated and tested to answer the third research question. These hypotheses were:

HO : There will be no significant differences between 1 tenth grade students who intend to enroll in the Arts track and those who intend to enroll in the Science track with respect to the six factors.

HO : There will be no significant differences between 2 eleventh and twelfth grade students in the Arts track and those in the Science track with respect to the six factors.

HO : There will be no significant differences between 3 students in tenth grade and students in eleventh and twelfth grade with respect to the six factors.

Means, standard deviations, frequencies, a multivariate analysis of variance (MANOVA) and a univariate f-test were used to analyze the data generated by the survey questionnaires and interviews.

## Summary of the Findings

To answer the first research question, descriptive statistics were used to analyze data from the first section of the questionnaire and the interviews. Data generated by these two techniques seemed to agree that the decision about an educational track was made mainly by the students themselves, based on their interest in a particular educational track. Older family members (mostly the fathers and brothers) who tended to favor Science, provided a lot of
advice to the students so that they knew the advantages and disadvantages about each educational track, but they generally left the students the freedom to choose the track they liked.

It was also found that, from the students! responses, family members had less influence on students' choice of an educational track than other influencers. This may be explained partially by the low level of education among Saudi parents. However, data from the interviews of family members, teachers, and principals showed a slightly different view, since they believed that the family should be influential and participate in the decision by providing advice to students.

To answer the second research question, descriptive statistics were used to analyze data derived from the second section of the questionnaire and from the interviews, data which seemed to to be essentially in agreement. Tenth grade, eleventh grade and twelfth grade students generally agreed about the relative influence of the six factors on their choice of educational track. That is, "student interest" was considered the most influential factor, followed by "teachers' attitudes," "teaching methods," and "restrictions of the system." "Difficulty of the curriculum" and "family influence" were generally considered to be less influential factors (Table 4.16). The card sort result was different because of the interference of
additional factors ("study and career influence" and "needed for career").

However, the Arts students put more importance on "difficulty of the curriculum." According to the interview data this factor deterred them from enrolling in the Science track (see Table 4.22). Tenth grade students placed more importance on the "teachers," "difficulty of the curriculum" and "family influence" (see Table 4.25). This may be because they will soon need to make a serious decision that will affect their future study and career, so everything that impinges on that choice is important. They may feel differently just before, just after, or several months after they have made their choice.

The three null hypotheses were tested using a significance level of .05, to answer the third research question. All three hypotheses were rejected. The first hypothesis compared students planning to choose the Arts with the students planning to choose Science. Because their responses were so similar, it could not be determined which of the six factors caused the rejection. The second hypothesis compared the Arts students with Science students and showed that the Arts students gave more emphasis to the "difficulty of the curriculum" as an influential factor. The third hypothesis compared tenth grade students with eleventh and twelfth grade students. The results indicated that tenth grade students placed more emphasis on "teaching
method," "difficulty of the curriculum" and "family influence."

Tables 4.1 through 4.8 include the personal and family data for tenth grade, eleventh grade, and twelfth grade students; and all classes combined. Tables 4.9 through 4.15 demonstrate the rank of items, from lowest to highest, by their mean value related to each of the six factors for all classes combined. Table 4.16 shows a rank order of the six factors by all classes combined and for each grade separately. Tables 4.17 through 4.19 present data used to test the first hypothesis. The data in Tables 4.20 through 4.22 was used to test the second hypothesis and that in Tables 4.23 through 4.25 was applied to the third hypothesis. Results for the card sort item used in student interviews appear in Tables 4.26, 4.27, and 4.28.

Results from these data indicated that all the students considered "student interest" as a very influential factor. Influential factors included "teacher attitudes," "teaching methods," and "restrictions of the system". "Difficulty of the curriculum" was considered by tenth grade students as a more influential factor. The factor "family influence" was considered by all students as uninfluential. Data from the card sort supported that finding. However, results from the interview with family members, teachers, and principals, seemed to put more importance on "family influence." Less importance has been put by family members, teachers, and
principals on the "restrictions of the system." Family members also put less importance on "difficulty of the curriculum."

Conclusions

Data collected during the survey and interviews, support the following conclusions:

1. "Student interest" in a particular major is the most influential and important factor in students' choice of an educational track. This means the students tend to choose what they like and are interested in, so they will feel comfortable with the educational tasks and material. This was the clearest point generated by the research and the one on which the various groups of students, parents and school personnel agreed, according to both survey and interview data.
2. "Teaching methods" and "teacher attitudes" were also influential factors in students' choice of educational track and ranked as the second and third most influential factors. However, tenth grade students, were influenced more by teachers than eleventh and twelfth grade students. Students of the Arts were influenced more by "teachers' attitudes," and Science students by "teaching methods." Card sort results were different because of the interference of additional factors pertinent only to Science majors.
3. "Restrictions of the system" was considered to be an influential factor for students' choice of educational track because students who choose the Arts cannot later change to Science unless they return to the eleventh grade, but Science students may change to the Arts at anytime, simply by passing a pretest in the Arts material.
4. "Restrictions of the system" was not considered influential by family members, teachers or principals. Family members, most with little experience of the administrative restrictions of a highly, complex, formal educational system are unlikely to know anything about that factor. Teachers and principals tended to disregard it because counselors have been provided in each school who presumably help students make educational plans and choices aware of their inherent constraints.
5. "Difficulty of the curriculum" was considered to be a more influential factor by tenth grade students, than eleventh and twelfth grade students who had lived with the results of their choices for $1-2$ years. Given the reputation of Science for difficulty, it is likely that the dreaded difficulties seemed greater in anticipation by tenth grade students who had not yet made their choices. Eleventh and twelfth grade students who have had completed up to two years experience coping successfully with their chosen majors were not as concerned about this factor.
6. "Difficulty of the curriculum" was considered more influential by students of the Arts than by those in Science. Since few high school students go out of their way to seek courses they find difficult, "difficulty of the curriculum" is important mainly as a negative influence causing students to select an alternative educational track. For some students of the Arts, it kept them from enrolling in the Science major. While "difficulty of the curriculum" was probably considered by some of the Science students, they were confident enough of their ability to cope with the difficulty that it did not influence them to select the alternative major.
7. Interviews with the students, teachers, and principals showed that most of them considered "difficulty of the curriculum" to be an influencing factor, but family members put less importance on that factor. Thus, they either lacked enough experience with the schools to appreciate the difficulty or were so confident of their sons' abilities that it didn't matter.
8. "Family influence" was considered by students to be a less important factor in their choice of educational track. Its influence had a negative relationship with grade in school, that is, as grade in school increased, family influence decreased as students became more independent from their families.
9. Family members, teachers, and principals put more importance on the family influence as an influential factor in the students' choice of educational track.
10. Science students seemed to have been under greater family influence to choose that major than those in the Arts.
11. "Family influence" seems to be indirect since family members did not force their children to choose a particular major. They did provide advice to show them the advantages and disadvantages of each major.
12. "Family influence" seemed to be unusually unimportant, especially for a traditional culture where family ties are highly involved. One reason for that might be the low level of education of parents which limits them in their ability to participate effectively in their children's educational decisions. It is also important in students' perception of the credibility of parents' opinions and advice.
13. Tenth grade students who intended to choose the Arts seemed to differ significantly from students who intended to choose Science in the importance each group assigned the six factors. The particular factor that caused this difference could not be determined since none of the factors was significant by themselves.
14. The eleventh and twelfth grade students in the Arts major differed significantly from those in the Science
major in assigning importance to the six factors. The factor most reflecting the difference the most was "difficulty of the curriculum." It was found by breaking down the groups' responses that the Arts students considered the factor more influential than the Science students. This might be due to the fact that the Arts major has a reputation for being considerably less difficulty than the Science major and the Arts students usually do not have to work as hard as those in Science.
15. The tenth grade students seem to have significant differences from those in eleventh and twelfth grades in assigning importance to the six factors. This difference was discernible most in the responses about "teaching methods," "difficulty of the curriculum" and "family influence." It was found by the breakdown of the groups' responses that tenth grade students considered these three factors as significantly more influential than eleventh and twelfth grade students. These differences may exist because the tenth grade students are planning to choose their majors, but the eleventh and twelfth grade students are already experiencing theirs. Tenth graders' perceptions may not be the same next year after they have experienced their educational track.
16. "Career influence" was found to be an influential factor for the Science students but not for students of the Arts because the Science educational track allows graduates
to enter unlimited jobs and to continue in higher education; on the other hand, the Arts educational track only allows students to work as teachers or in the government as administrators.

## Recommendations

Recommendations that the researcher feels are important to improve decision making in the choice of educational track follow. They are based on the study's results and the review of related studies.

1. Saudi planners need to develop better understandings of factors shaping curriculum choices that may help to improve the productive capacity of the society (see Paulston, 1977).
2. Since "students interest" in a particular subject is very influential in choice of curriculum, the Science curriculum needs to be improved by curriculum designers to make it evoke students' interest toward the science major. This might be accomplished by providing more concrete experiments for Science students so the students will be more interested in Science and relate it to their everyday lives.
3. Teaching methods and teachers' attitudes also were found to be influential factors. The Ministry of Education in Saudi Arabia needs to provide greater supervision of
teachers, especially new teachers and foreign teachers, in order to improve their methods and attitudes. This could be achieved during frequent classroom observations and frequent meetings to demonstrate the strengths and weaknesses in their teaching.
4. Teachers need to teach more effectively and make Science more interesting. Since the teacher is an influential factor, the student's model, it seems reasonable to suggest that the more the students like the teacher, the more they will be attracted to his subject.
5. Because of the difficulty of observing problems related to teachers' methods and attitudes, since the teacher may act artifically in front of the observer, the researcher suggests the use of evaluation sheets on which the students can respond to questions about the subject as well as the teachers' behaviors and attitudes (as in U.S. universities). Anonymity permits students to assess the teaching by providing principals with information about teacher's methods and attitudes. Data already analyzed indicated that teaching methods and teachers attitudes were influential in educational track decisions.
6. The educational system must become more flexible if the number of students choosing the Science educational track is to increase. By allowing students who want to change from the Arts to Science to do so by passing a qualifying examination, Science enrollments may increase.
7. Family influence seemed to be a less influential factor, but it should be very influential. It is recommended that school officials frequently invite parents to meetings in order to inform them about important issues related to helping children make the best choice of educational tracks. Information should also be provided so parents can actively participate in their children's other school-related decisions.
8. The Ministry of Education should provide mass media (e.g. newspapers, t.v., radio, and magazines) with more information regarding Saudi Arabia's educational needs. This might include information about the country's future and the importance of the Science educational track in promoting economic development, decreasing the dependence on foreign scientists, and satisfying the country's technological needs. More information of this kind may permit family members to influence their children to choose the Science educational track.
9. Tenth grade students seemed to worry about their choice of educational track. Therefore, it might be a good idea to provide an opportunity during the summer vacation for tenth grade graduates to experience their desired major before making a firm decision.
10. Since teaching methods and teacher attitudes were found to be influential factors, the Ministry of Education needs to reduce the heavy load on the teachers in order to
allow them to do a better job. The researcher's experience as a teacher, teaching 24 classes every week, left little time or energy for improving instruction to attract and hold students' interest.

## Suggestions for Future Research

The following suggestions are based on data generated by the research.

1. During the pilot study, factors other than those chosen for the final study seemed to be important influencers in the students' choice of educational track. Since the researcher could not study all the factors related to choice of major, additional research is needed. Factors revealed in the pilot study as potentially influencing students' choice of educational track include: peer influence, the reward system, intention to leave school, and students' achievement in a particular field.
2. The sample for the study was from only one city. Further studies need to be done to replicate this study, incorporating students from all over the country. Even though all schools have the same system, there may be minor differences due to location. Thus the sample should be larger and from several cities.
3. The research upon which this report is based could also be replicated and made more valuable by using
additional research procedures, such as an ethnographic study which would permit a more thorough understanding of the factors influencing students' choice of educational track. This could be accomplished by conducting frequent interviews of students and their families as well as making frequent observations of students in the classroom to understand more completely the interaction between students and their teachers and students and the curriculum.
4. The research for this report focused on secondary school students and their choice of educational track. Another study could be carried out to understand the factors influencing choice of major.
5. It would be a good idea to replicate the research reported herein using two groups of students, one with well educated parents and the second with parents who have little or no education to facilitate a comparison study of the influence of the family based on level of education.
6. Research similar to that which was reported here could be repeated using two groups of students, one with very rich families, and the second with poor families. This would facilitate a comparison study of the influence of the family of different socioeconomic backgrounds.

APPENDICES

## APPENDIX A

TABLES RELFECTING RESULTS OF SURVEY OF TENTH, ELEVENTH, AND TWELFTH GRADE STUDENTS' ATTITUDES AND OPINIONS TOWARD SIX FACTORS THAT MAY INFLUENCE THEIR CHOICE OF A FIELD OF STUDY
Source: Survey Data
Table A.l

| Rank <br> Order <br> By Mean | Item Number | Questionnaire Item | Mean | S.D. |
| :---: | :---: | :---: | :---: | :---: |
| 1 | 15 | The field of study $I$ will choose is very important for my future career. | 1. 360 | 0.628 |
| 2 | 1 | I will make sure the subjects in the field of study that $I$ will choose will reflect my interests. | 1.790 | 0.769 |
| 3 | 18 | In even the most demanding subject areas acquisition of academic knowledge is or can be made interesting and appealing to everyone. | 1.798 | 0.903 |
| 4 | 26 | It is important to participate in activities related to the subjects of the field of study $I$ will choose. | 1.980 | 0.841 |
| 5 | 14 | I will talk to my friends about issues related to the field of study $I$ will choose. | 2.020 | 1.010 |
| 6 | 8 | I will make sure that the subjects in the field of study that $I$ will choose will be very enjoyable. | 2.070 | 0.913 |
| 7 | 11 | In the field of study $I$ will choose, the criterion for deciding what to include in the curriculum depends on its practical application in daily living. | 2.200 | 0.932 |
| 8 | 7 | Most of the subjects in the field of study $I$ will choose are boring. | 2.631 | 0.988 |
|  |  | Overall Mean = | 1.981 | 0.462 |


|  |  | ```Table A. } Rank Order of Items Related to Teaching Method of Tenth Grade Students``` |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Rank Order <br> By Mean | Item Number | Questionnaire Item | Mean | S.D. |
| $\frac{\text { By Mean }}{1}$ | 17 | Teachers in the field of study I will choose should praise me when I answer correctly. | 1.300 | S. 503 |
| 2 | 28 | Teachers in the field of study $I$ will choose should show me how to correct my mistakes. | 2.071 | . 895 |
| 3 | 12 | Most of the teachers in the field of study I will choose try to stimulate competition among students to increase motivation. | 2.232 | 1.028 |
| 4 | 2 | The high quality of teachers in my preferred field of study will be a strong factor in my choice. | 2.540 | 1.167 |
| 5 | 27 | Teachers in the field of study $I$ will choose give a lot of homework. | 2.860 | 1.189 |
| 6 | 3 | The poor quality of teachers in the field of study I will not choose will be a strong factor in my choice. | 3.253 | 1.402 |
|  |  | Overall Mean $=$ | 2.330 | 0.471 |

Source: Survey Data

|  |  | ```Table A. } Rank Order of Items Related to Teachers' Attitude for Tenth Grade Students``` |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Rank Order By Mean | Item <br> Number | Questionnaire Item | Mean | S.D. |
| 1 | 10 | Local schools should hire only those teachers who have had long experience in teaching. | 1.440 | . 743 |
| 2 | 41 | I have a very good relationship with most of the teachers in the field of study I will choose. | 2.080 | . 992 |
| 3 | 5 | Generally; teachers in the field of study I will choose are fair, impartial and objective in their treatment of students. | 2.121 | . 907 |
| 4 | 32 | Teachers in the field of study $I$ will choose always give me support in my studies. | 2.190 | . 950 |
| 5 | 16 | Teachers in the field of study $I$ will choose seem enthusiastic in teaching their subjects. | 2.300 | . 859 |
| 6 | 4 | ```Generally, teachers in the field of study I will choose are self-controlled and not easily upset.``` | 2.450 | . 936 |
| 7 | 39 | Teachers in the field of study I will choose have a good attitude toward students. | 2.460 | . 846 |
| 8 | 31 | The presence of foreign teachers makes a difference in my choice of a field of study. | $3.460$ | 1.337 |
| Overall Mean $=2.310$ |  |  |  | 0.487 |

Rank Order of the Items Related to the Difficulty of the Curriculum
for Tenth Grade Students

| Rank <br> Order <br> By Mean | Item <br> Number | Questionnaire Item | Mean |
| :--- | :--- | :--- | :--- |

[^8]$$
\text { Table A. } 4
$$
Table A. 5


|  |  | Table A. 6 <br> Rank Order of Items Related to the Restrictions of the System |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Rank Order By Mean | Item Number | Questionnaire Item | Mean | S.D. |
| 1 | 42 | It would be a good idea for those students who want to change their field of study to take qualification exams in the academic subjects of the new field of study. | 1.990 | 1.000 |
| 2 | 22 | If $I$ have an opportunity to change my field of study $I$ will not consider making the change. | 2.495 | 1. 248 |
| 3 | 21 | I think that the restrictions of the system on changing from one field of study to another are unfair to a lot of students. | 2.780 | 1.142 |
| 4 | 30 | It would be better if students could change from Arts to Science, more easily after Grade 11. | 2.930 | 1.343 |
| 5 | 37 | The restriction on changing one's field of study may influence my choice of a field of study. | 3.160 | 1.080 |
|  |  | Overall Mean $=$ | 2.666 | 0.523 |

Source: Survey Data

Source: Survey Data

| Rank Order of Items Related to Student Interest for Eleventh Grade Students |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Rank Order By Mean | Item <br> Number | Questionnaire Item | Mean | S.D. |
| 1 | 15 | My field of study is very important for my future career. | 1.460 | . 788 |
| 2 | 14 | I often talk to my friends about issues related to my field of study. | 1.700 | . 678 |
| 3 | 18 | In even the most demanding subjects, acquisition of academic knowledge is or can be made interesting and appealing to everyone. | 1.740 | . 664 |
| 4 | 26 | It is apparent to participate in activities related to the subjects of my field of study. | 1.860 | 1.125 |
| 5 | 1 | The subjects in my field of study reflect my interests . | 1.880 | 1.062 |
| 6 | 11 | In my field of study the criterion for deciding what to include in the curriculum depends on its practical application in daily living. | 2.286 | 1.041 |
| 7 | 8 | The subjects in my field of study are very enjoyable . | 2.300 | . 909 |
|  |  | Overall Mean $=$ | 1.977 | 0.440 |

[^9]Table A. 9

| Rank Order of the Items Related to Teaching Methods for Eleventh Grade Students |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Rank Order By Mean | Item Number | Questionnaire Item | Mean | S.D. |
| 1 | 28 | In my field of study, teachers show me how to correct my mistakes. | 2.100 | 1.147 |
| 2 | 17 | In my field of study, teachers praise me when $I$ answer correctly. | 2.100 | 1.165 |
| 3 | 12 | Most of the teachers in my field of study try to stimulate competition among students to increase motivation. | 2.380 | 1.193 |
| 4 | 27 | In my field of study, teachers give a lot of homework. | 2.440 | 1.181 |
| 5 | 2 | The high quality of teachers in my field of study was a strong factor in choosing it. | 3.240 | 1.238 |
| 6 | 3 | The poor quality of teachers in the other field of study was a strong factor in choosing my field of study. | 3.900 | 1.266 |
|  |  | Overall Mean = | 2.606 | 0.629 |

Source: Survey Data

|  |  | Rank Order of the Items Related to Teacher Attitude for Eleventh Grade Students |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Rank <br> Order <br> Item |  | Questionnaire Item | Mean | S.D. |
| 1 | 10 | Local schools should hire only those teachers who have had long experience in teaching. | 1.440 | . 812 |
| 2 | 41 | I have a very good relationship with most of the teachers in my field of study | $1.800$ | . 990 |
| 3 | 16 | Teachers in my field of study seem enthusiastic in teaching their subjects. | 2.220 | 1.036 |
| 4 | 5 | Generally, teachers in my field of study are fair, impartial and objective in their treatment of students. | 2.480 | 1.216 |
| 5 | 32 | Teachers in my field of study always give me support in my studies. | 2.640 | 1.174 |
| 6 | 39 | Teachers in my field of study have a good attitude toward students. | 2.640 | 1.174 |
| 7 | 4 | Generally, teachers in my field of study are self controlled and not easily upset. | 2.780 | 1.016 |
| 8 | 31 | Foreign teachers make me like my field of study. | 3.360 | 1.382 |
|  |  | Overall Mean $=$ | 2.400 | 0.692 |

[^10]Source: Survey Data
\[

$$
\begin{aligned}
& \text { Table A.ll } \\
& \text { Rank Order of Items Related to the Difficulty } \\
& \text { of the Curriculum for Eleventh Grade Students }
\end{aligned}
$$
\]

| Rank Order By Mean | Item <br> Number | Questionnaire Item | Mean | S.D. |
| :---: | :---: | :---: | :---: | :---: |
| 1 | 19 | An understanding of the academic subjects related to my field of study was an important factor in choosing my field of study. | 2.000 | 1.069 |
| 2 | 25 | In my field of study, the academic textbooks are easy to understand. | 2.480 | 1.092 |
| 3 | 9 | The difficulty of some academic subjects offered in the other field was a strong factor in choosing my field of study. | 3.100 | 1.515 |
| 4 | 6 | The annual exams are usually difficult. | 3.280 | 0.882 |
| 5 | 34 | I have a very hard time understanding the subjects in my field of study. | 3.680 | 1.019 |
| 6 | 33 | I always have a hard time getting the homework done. | 3.800 | 1.030 |
|  |  | Overall Mean $=$ | 3.050 | 0.447 |



[^11]Table A.l3

| Rank <br> Order <br> By Mean | Item <br> Number | Questionnaire Item |
| :--- | :--- | :--- | :--- | :--- |

Source: Survey Data
Rank Order of Items Related to the Restrictions
of the System for Eleventh Grade Students

|  | Rank Order of Factor Categories for Eleventh Grade Students, by Mean Value |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Rank Order by Mean |  | Category | Mean | S.D. |
| 1 | ( A$)$ | Student Interest | 1.977 | 0.440 |
| 2 | (C) | Teacher Attitude | 2.400 | 0.692 |
| 3 | ( B ) | Teaching Method | 2.606 | 0.629 |
| 4 | (F) | Restrictions of the System | 2.664 | 0.646 |
| 5 | ( D ) | Difficulty of the Curriculum | 3.050 | 0.447 |
| 6 | (E) | Family Influence | 3.437 | 0.635 |

Source: Survey Data
Table A. 15

|  |  | Rank Order of Items Related to Student Interest for Twelfth Grade Students |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Rank Order By Mean | Item <br> Number | Questionnaire Item | Mean | S.D. |
| 1 | 15 | My field of study is very important for my future career. | 1.680 | . 868 |
| 2 | 1 | The subjects in my field of study reflect my interest. | 1.720 | . 640 |
| 3 | 18 | In even the most demanding subject areas, acquisition of acadeluıc knowledge is or can be made interesting and appealing to everyone. | 1.860 | . 606 |
| 4 | 8 | The subjects in my field of study are enjoyable. | 2.000 | . 833 |
| 5 | 11 | In my field of study the criterion for deciding what to include in the curriculum depends on its practical application in daily living. | 2.063 | . 861 |
| 6 | 14 | I often talk to my friends about issues related to my field of study. | 2.100 | . 789 |
| 7 | 26 | It is important to participate in activities related to the subjects of my field of study. | 2.220 | 1.036 |
| 8 | 7 | Most of the subjects in my field of study are boring. | 2.290 | . 921 |
|  |  | Overall Mean $=$ | 1.990 | 0.348 |

Table A.l6
Rank Order of the Items Related to Teaching

| Rank Order By Mean | Item Number | Questionnaire Item | Mean | S.D. |
| :---: | :---: | :---: | :---: | :---: |
| 1 | 27 | In my field of study, teachers give a lot of homework. | 1.920 | . 829 |
| 2 | 17 | In my field of study, teachers praise me when $I$ answer correctly. | 1.980 | 1.020 |
| 3 | 12 | Most of the teachers in my field of study try to stimulate competition among students to increase motivation. | 2.400 | 1.010 |
| 4 | 28 | In my field of study, teachers show me how to correct my mistakes. | 2.540 | 1.054 |
| 5 | 2 | The high quality of teachers in my field of study was a strong factor in choosing it. | 3.380 | 1.159 |
| 6 | 3 | The poor quality of teachezs in the other field was a strong factor in choosing my field of study. | 3.860 | 1.229 |
|  |  | Overall Mean $=$ | 2.580 | 0.486 |


Source: Survey Data

| Rank Order of the Items Related to Difficulty of the Curriculum for Twelfth Grade Students |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Rank Order By Mean | Item Number | Questionnaire Item | Mean | S.D. |
| 1 | 19 | An understanding of the academic subjects related to my field of study was an important factor in choosing my field of study. | 1.880 | . 940 |
| 2 | 25 | In my field of study, the academic textbooks are easy to understand. | 2.560 | 1.033 |
| 3 | 6 | The annual exams are usually difficult. | 3.080 | 1.209 |
| 4 | 9 | The difficulty of some academic subjects offered in the other field was a strong factor in choosing my field of study. | 3.200 | 1.512 |
| 5 | 33 | I always have a hard time getting the homework done. | 3.653 | . 991 |
| 6 | 34 | I have a very hard time understanding the subjects in my field of study. | 3.660 | 1.002 |
|  |  | Overall Mean $=$ | 3.010 | 0.578 |

Source: Survey Data
Table A. 19



[^12]Table A. 21
Rank Order of Factor Category of Twelfth

| Rank Order <br> By Mean |  | Category | Mean | S.D. |
| :---: | :--- | :--- | :--- | :--- |
| 1 | (A) Student Interest | 1.990 | 0.348 |  |
| 2 | (C) Teacher Attitude | 2.317 | 0.573 |  |
| 3 | (B) Teaching Method | 2.580 | 0.486 |  |
| 4 | (F) Restrictions of the System | 2.916 | 0.654 |  |
| 5 | (D) Difficulty of the Curriculum | 3.010 | 0.578 |  |
| 6 | (E) Family Influence | 3.520 | 0.634 |  |

Source: Survey Data

## APPENDIX B

THE ENGLISH VERSION OF TENTH GRADE STUDENTS' QUESTIONNAIRE

## Cover Letter For Tenth Grade Questionnaire

Dear Student:
This questionnaire is a part of a doctoral research
study. It is designed to find out the factors that may af-
fect your choice of field of study that you will soon be making (Science, Arts). Your effort to answer this questionnaire will be appreciated very much. All the information will be kept confidential, since no names or any other identification are required.

This questionnaire consists of two sections. In the first section you are requested to give some general information about yourself. In Section Two you are requested to answer questions that are related to the factors that may affect your choice of field of study.

Please read each item carefully and indicate the most appropriate answer by putting an $V$ in the proper column. Thank you very much for your assistance.

## Questionnaire for Tenth Grade Students

SECTION I: PERSONAL INFORMATION

Name of Your School $\qquad$

Please mark the one choice that best describes your situation.

1. How old are you?

Under 15
15
16
17
18
19
20
21 or older
2. What is your plan for llth grade--Arts or Science?
(Mark one)
I would like to enroll in the Arts Section
I would like to enroll in the Science Section I have not decided yet
3. What is your father's level of education? College graduate High School graduate Intermediate or junior high school Elementary Literate but no formal education Illiterate
4. What is (was) your father's occupation? Laborer Civil Service (government) worker Farmer Businessman Professional (Doctor, lawyer, etc.) Other (please specify)
5. What is your mother's level of education? College graduate High School Graduate Intermediate or junior high school Elementary Literate but no formal education Illiterate
6. With whom do you live now?

Both parents

- Father only Mother only Relatives other than parents
$\qquad$ Other (Please specify) $\qquad$

7. From whom do you seek support and advice in making educational plans? Rank order by putting \#l before the most important and \#2 before the next most important, etc.

Father
Mother
Brother
_ Father's brother
Mother's brother
——Other (Please Specify)

Sample Questions for Section II
Please read these examples carefully before you start answering the second part of the questionnaire. The following five sample items show you how to respond to Section II.


In the first example you are $100 \%$ sure that Riyadh is the capital of Saudi Arabia. Therefore you mark an $V$ in the first column. That is, you strongly agree without any doubt that Riyadh is the capital of Saudi Arabia.

In the second example you are not $100 \%$ sure that Riyadh is the largest city in Saudi Arabia. However you assume since it is the capital of the country it might be the largest city. Thus you put an $V$ in the second column which means you agree with Riyadh is the largest city in Saudi Arabia because you are almost sure of it.

In the third example you have no idea whether it is the most beautiful city in the country or not and you cannot agree or disagree with the statement. Therefore, an $V$ is placed in the third column.

In the fourth example you know that Damman is closer to Riyadh than Jeddah. However, you are not $100 \%$ sure about it. Consequently you put an in the fourth column which means you generally disagree that Jeddah is closer to Riyadh than Damman.

Finally in example number five you are $100 \%$ sure that Riyadh is in the Central Province of Saudi Arabia, not the Western Province. Therefore you put an in the fith column which means that you strongly disagree that Riyadh is in the Western Province of Saudi Arabia.

## Important Notes

1. Mark only one $V$ for each item to indicate whether you strongly agree, agree, are undecided, disagree, or strongly disagree with the statement.
2. If you change your mind after you mark an $/ /$ cross it out by drawing several lines through it and make another $\checkmark$ in the desired column. The old /will be disregarded.
3. Please respond to all items.

Section II: Choice of Field of Study

|  |  | 0 0 0 0 ¢ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & .0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | 0 0 $\sim$ 0 0 0 0 $\sim$ 0 |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1. I will make sure the subjects in the field of study that $I$ will choose will reflect my interests |  |  |  |  |  |
| 2. The high quality of teachers in my preferred field of study will be a strong factor in choosing it. |  |  |  |  |  |
| 3. The poor quality of teachers in the field of study I do not choose will be a strong factor in my choice |  |  |  |  |  |
| 4. Generally, teachers in the field of study I will choose are selfcontrolled and not easily upset. |  |  |  |  |  |
| 5. Generally, teaches in the field of study I will choose are fair, impartial and objective in their treatment of students. |  |  |  |  |  |
| 6. The annual exams are usually difficult. |  |  |  |  |  |
| 7. Most of the subjects in the field of study I will choose are boring. |  |  |  |  |  |
| 8. I will make sure that the subjects in the field of study that I will chooose will be very enjoyable. |  |  |  |  |  |
| 9. The difficulty of some academic subjects in the field of study $I$ will not choose is a strong factor in choosing the other field of study. |  |  |  |  |  |
| 10. Local schools should hire only those teachers who have had long experience in teaching. |  |  |  |  |  |


|  |  |  | og 0 0 0 0 0 0 0 0 | $\begin{aligned} & 0 \\ & \stackrel{0}{\sim} \\ & \underset{\sim}{0} \\ & \tilde{0} \\ & .0 \\ & \ddot{0} \end{aligned}$ |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 11. In the field of study I will choose, the criterion for deciding what to include in the curriculum, depends on its practical applications in daily living. |  |  |  |  |  |
| 12. Most of the teachers in the field of study $I$ will choose try to stimulate competition among students to increase motivation. |  |  |  |  |  |
| 13. My family (parents, relatives) do not think $I$ can achieve successfully in the other field of study. |  |  |  |  |  |
| 14.I will talk to my friends about issues related to the field of study I will choose. |  |  |  |  |  |
| 15. The field of study I will choose is very important for my future career. |  |  |  |  |  |
| 16. Teachers in the field of study I will choose seem enthusiastic in teaching their subjects. |  |  |  |  |  |
| 17. Teachers in the field of study I will choose should praise me when I answer correctly. |  |  |  |  |  |
| 18. In even the most demanding subject areas, acquisition of academic knowledge is or can be made interesting and appealing to everyone. |  |  |  |  |  |
| 19. An understanding of the academic subjects related to the field of study $I$ will choose is an important factor in my choice |  |  |  |  |  |


|  | $\begin{aligned} & \lambda 0 \\ & \rightarrow 0 \\ & -\mathcal{J} \\ & \text { 工 } \\ & \text { H } \end{aligned}$ | $$ | 0 <br> 0 <br> 0 <br> 0 <br> 0 <br> 0 <br> 0 <br> 0 |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 20. My family (parents, relatives) will have a very strong influence on my choice of field of study. |  |  |  |  |  |
| 21. I think that the restrictions of the system on changing from one field of study to another are unfair to a lot of students. |  |  |  |  |  |
| 22. If I have an opportunity to change my field of study $I$ will not consider making the change. |  |  |  |  |  |
| 23. I will choose my field of study so that $I$ can help my father in his work. |  |  |  |  |  |
| 24. I will not have much choice in my field of study because my family (parents, relatives) will choose it for me. |  |  |  |  |  |
| 25. In the field of study $I$ will choose the academic textbooks are easy to understand. |  |  |  |  |  |
| 26. It is important to participate in activities related to the subjects of the field of study $I$ will choose |  |  |  |  |  |
| 27. Teachers in the field of study I will choose give a lot of home work. |  |  |  |  |  |
| 28. Teachers in the field of study $I$ will choose show me how to correct my mistakes. |  |  |  |  |  |
| 29. My family (parents, relatives) do not care about my choice of field of study. |  |  |  |  |  |
| 30. It would be better if students could change major froin Arts to Science, more easily after Grade 11 |  |  |  |  |  |


|  |  | $$ | $\begin{aligned} & \hline 0 \\ & 0 \\ & 0 \\ & \underset{\sim}{0} \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | O | $\begin{array}{rr} 0 \\ 0 \\ 2 & 0 \\ \lambda & 0 \\ -1 & 0 \\ 3 & 0 \\ 3 & 0 \\ 0 \end{array}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 31. The presence of foreign teachers makes a difference in my choice of a field of study. |  |  |  |  |  |
| 32. Teachers in the field of study I will choose always give me support in my studies. |  |  |  |  |  |
| 33. I always have a hard time in getting my homework done. |  |  |  |  |  |
| 34. I have a very hard time understanding the subjects in the field of study I will choose. |  |  |  |  |  |
| 35. My family (parents, relatives) will discuss with me, before I make my choice of field of study the reasons why they want me to choose a particular field of study. |  |  |  |  |  |
| 36. If I were to change my field fo study I would obtain the permission of my family before making the change. |  |  |  |  |  |
| 37. The restrictions on changing one's field of study will influence my choice of a field of study. |  |  |  |  |  |
| 38. In general, parents believe that students in the loth grade are not mature enough to choose their field of study independently. |  |  |  |  |  |
| 39. Teachers in the field of study I will choose have a good attitude toward students. |  |  |  |  |  |
| 40. Teaches in the field of study I will choose give everyone the opportunity to participate and ask questions in class. |  |  |  |  |  |



## APPENDIX C

THE ARABIC VERSION OF TENTH GRADE STUDENTS' QUESITONNAIRE

بسم الـلـه الـرحمن الــرحيم

عزيـزىالـطالـــــــب :-
يعتبر هذا الاستفتـا ج جز" من أطروحـة دكتور اه ويـرمى الـى الـتعرف على الـعوامـــــــلـ
 معنـا فى الاجـابـة على الاستفتـا • موضع تقديــــر كمـا أن الـمعلـومـات الـواردة ستككون سريــة ، اذ لـيس مطلـوبــ منـل ذكر اسمك ولا أية معلـومـــات شخصية اخرى


 يـرجـــى ترا وهة جيـــدة ووفع علامة ( ) ) مقـابـل الاجـابـة الاكثــر منـاسبة فى الـمكــان الـصحيع .• ونشكر لـك تعـاونـــــ معنــــــ ا
( استفتـ > الــنة الاولى ثـنــــــوى )
الـجز" الأول : معلـومـات شخعيـــــــة :-


P م
-

- أود الالـتحــاق بـالـقسم الـعلـمى.
- 
- مـامستوى والـدك الـعلـمــــــــى ؟

- متخرج من مدرسة ثـانـويـة .

- متخرج من مدرسة ابـتد اعية مـية
- متعلم تعلـيمـا غير رسمـى•

§ - مـاوظيفة والـدك ؟ ( فى الـمـاضى أو الـحاضر )."
- 
- موظف حكومى
- 
- 
- ماحب مهنـة ( طبيب ، محـامى ...... . الـخ ).
............

$$
\begin{aligned}
& \text { - 0 مـامستوى والـدتك الـعلـمـــــــــــــــ ؟ } \\
& \text { • } \\
& \text { - خريجة مدرسة ثـانـويـــــة • } \\
& \text { - خريجة مدرسة متوسطــــة • } \\
& \text { - خريجة مدرسة ابـتدا ايـية } \\
& \text { - متعلـمة تعليمـا غير رسمى• } \\
& \text { - لاتترأ ولا تكت }
\end{aligned}
$$

$$
\text { - } 7
$$

من تستشير فى موضوع خططك الـدراسية وتطلـب منه الـنميحـــــة ؟
 تستشير ثــنيـا ... وهكـــــــــا .

................... (

الـجز" الـثـانـــى : أمثلـة للـاجـابة عنـها :-

الاستفتـا ، وتـوضع هذه الامثلـة الـخمسـة كيـفيــة الاجـابة عنـها :-
















 ملاحظات هـمــة :-
 ، لاتستميع التتديد ، لاتوافق ، أو لاتوافق مطلــــــ على العبـارة المعطاه.


 - -

الـجز" الـثـانى : اختيـارالـتخعص الـدراســــى:-

| لا آو افق <br>  | لا أو افــق |  | أو افـق |  |  | م |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | ساتـاكدمن ان الـمواد فى <br>  <br>  | 1 |
|  |  |  |  |  | ستكون نوعية الـمدرســـيـن <br>  <br>  <br> اختيـارى | $r$ |
|  |  |  |  |  | ستكون نـوعيـة الـمدرســــين <br>  <br> الـتخصص الـذى لـن أختـاره <br> عـاملاقويــافىعدم اختيـــــاره | $r$ |
|  |  |  |  |  |  الـتخصص الـذى سأختــــــاره متزنـين (قـادريـن علـــــى <br>  بسهولـ | $\varepsilon$ |
|  |  |  |  |  | بعفة عـامة يعتبرمدرســــــو <br> الـتخمص الـذى سـاختـــــــاره <br>  <br> وموضوعيـين فى معـاملتـهم <br>  | - |
|  |  |  |  |  | الاختبـارات الـسنويــــــــة <br>  $\qquad$ ع <br> معبــــة | 7 |
|  |  |  |  |  | معظم مواد الـتخصــــــ الـذى سأختـاره مملـــــــة | V |
|  |  |  |  |  | سأتاكدمن أن تكون مواد <br>  <br> ممتعـعــ الذى | $\wedge$ |


|  | لا آو افــق |  | اوافــق |  |  | $p$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  الـتخهص الـذى لـن اختـــــاره <br>  <br>  | 9 |
|  |  |  |  |  | يجب علـى الـمد ارس الـمحلـية أن تختـار الـمدرسيــن ذوى اري الـخبـرة الــلويلـة فى مجــــال <br>  | 1. |
|  |  |  |  |  | يعتمد مقيـاس تقريـر الـمو اد <br>  الـتخصص الـذى سأختـاره علـى <br>  a $\qquad$ | 11 |
|  |  |  |  |  |  الـتخصص الـذى سـاختــــــاره <br>  <br> الـطلاب لـزيــادة الـدو افـــــعـع | IT |
|  |  |  |  |  | لاتعتقد أسرتى( والـــــــدى وأقربـا فى الـتخصص الـذى لـنـأختـاره | Ir |
|  |  |  |  |  | سـاتحدث مع أمدقــا مى عــن مو اضيع وثيـقة الــلـــــــــــة <br> بـالـتخمص الـذى ساختــــاره | $1 \varepsilon$ |
|  |  |  |  |  | الـتخصص الذى مـاختـــــاره $\qquad$ مهم جد العملى $\qquad$ | 10 |


|  | لا أوافــق |  | اوافـق | تمـامــــــــق |  | $p$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | يـبدو أن مدرسى الـتخهص الـذى سـاختـاره متحمسون <br>  | 17 |
|  |  |  |  |  | يجب على مدرسى الـتخسص <br>  عندمـا آجيب اجـابـة محيحـة | IV |
|  |  |  |  |  | من الـممكن جعل استعـاب <br>  حتى فـى الـــواداد الـتــــــــى <br>  | 11 |
|  |  |  |  |  | فـهم الــمواد الـتعلـيـيميـــــــة الـمتعلـتة بـالـتخصم الـذى سـاختـاره عـامل مهم فـــــى اختيـارى لـهذا الـتخمــــم | 19 |
|  |  |  |  |  | سيكون لاسرتى (والــــــدى وأقربـا فى) تـأثير قـــــوى <br>  <br>  | $\bigcirc \cdot$ |
|  |  |  |  |  | أعتقد أن الـقيود الـمفروضة علـى نظـام الـتغيرمن تخـي دراسى الـى آخر غيرعـادلـة لـلـكثيـر من الـطــــــــلاب | r1 |
|  |  |  |  |  | اذا سنحت لى فرمة تغيـر <br> الـتخمص الـذى سوف أختـاره <br> فلـن أغيــــــــــــــــــــــــــرا أـــره | rr |
|  |  |  |  |  |  <br>  مساعدة والـدى فـى عملـــهـ | rr |


|  | لا آو افـق |  | أوافــق | تاو افــــــقـق |  | $p$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | لـن تتاح لـى فرمة كبيــرة لاختيـار تخصصى الـدراس اسـى $\qquad$ الان أسرتى (والـ وأقربــى) سيختـاروه (وا لـى | 「乏 |
|  |  |  |  |  | تعتـبر الـكتب الـدراسيـــــة <br> فى الـتخصص الـذى سأختـاره <br>  | Yo |
|  |  |  |  |  | من الــهـم الاشتراك فـــــى نـشاطـات متعلـقة بـالـتـخصى <br>  | 77 |
|  |  |  |  |  | يعطى مدرسوالتتخص الدى <br>  <br>  | rY |
|  |  |  |  |  | يوضح لى مدرسو الـتخعـــي الذىى ساختـره كيف امحع <br>  | PA |
|  |  |  |  |  | لاتهتر أسرتى (والـــــــــدى <br> وأقربـا كـى) بــــا (وأختـاره <br>  | rq |
|  |  |  |  |  | ـ سيكون من تمكن الـطلاب من تغيـيـــــر تخصصهم الـدراسى من أدبى <br>  <br>  | $r \cdot$ |
|  |  |  |  |  | وجود مدرسين أجـانــــــبـ <br>  <br>  | rl |


|  | لا آو افــق |  | او افــق | تمـــامــــــــق |  | P |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  | rr |
|  |  |  |  |  | أجد أنه معب علي داممــا عمل واجبـاتى الـمنـزلـيـــــة | Tr |
|  |  |  |  |  | أجد معوبة فى فـهم مــواد الـتـخصى الـدراسى الـــــذى ه $\qquad$ بـاخت | r£ |
|  |  |  |  |  | مـأبحث مع أسرتى(والـــــدى وأتربـاسى) الاسبـاب الـتـــى أجلـها يـريـدونـنـى أن $\qquad$ معينـ قبـل أن أختـــــاره | ro |
|  |  |  |  |  | سيكون علي أن استـــــاذن <br>  <br>  | r7 |
|  |  |  |  |  | ستوثر الـقيـود الـمفـروضة على <br> نـظام الـتغييـر فـى اختيـرد الـيـرى <br>  | rV |
|  |  |  |  |  | يعتقدالـوالـد أن الـطـــلاب الأول الـثـانـــــــانـ $\qquad$ يـبــفوا قدرا كا <br> الـنضج يـؤهلـهم لاختيــــار تخصمهم الـدراسى بـمفردهــم | rı |
|  |  |  |  |  | لـمدرسى الـتخصص الـدراسـى الـذى سـاختـاره مو اقـــــــف <br>  | rq |



APPENDIX D
THE ENGLISH VERSION OF ELEVENTH AND TWELFTH GRADE STUDENTS' QUESTIONNAIRE

## Cover Letter for Eleventh and Twelfth Grade Questionnaire

Dear Student:
This questionnaire is a part of a doctoral research study. It is designed to find out the factors that affected your choice of the field of study in which you are now enrolled (Science, Arts). Your effort to answer this questionnaire will be appreciated very much. All the information will be kept confidential, since no names or any other identification are required.

This questionnaire consists of two sections. In the first section you are requested to give some general information about yourself. In Section Two you are requested to answer questions that are related to factors that affected your choice of a field of study.

Please read each item carefully and indicate the most appropriate answer by putting an $V$ in the proper column. Thank you very much for your assistance.

## Questionnaire for Eleventh and Twelfth Grade Questionnaire

Section I: Personal Information

Name of your school $\qquad$
Please make only one choice that best describes your situation.
l. How old are you?

15

- 16

| 16 |
| ---: |
| $-\quad 18$ |

$-20$

- 21

22 or older
2. What is your grade and major?
_I am in the llth grade Arts
—_I am in the llth grade Science
-I am in the 12 th grade Arts
—I am in the 12 th grade Science
3. Which one of the following best describes your feelings about your choice of the field of study you are in?

I am glad about my choice
_I did not have much choice because someone else chose it for me. I am not sure that I made the right decision I wish I had chosen the other field of study I can't tell yet.
4. What is your father's level of education? College graduate High school graduate Intermediate or junior high school Elementary Literate but no formal education Illiterate
5. What is (was) your father's occupation?

Laborer
Civil service (government) worker Farmer Businessman Professional (Doctor, lawyer, etc.)
6. What is your mother's level of education? College graduate High school graduate Intermediate or junior high school Elementary Literate but no formal education Illiterate
7. With whom do you live now? Both parents Father only Mother only Relatives other than parents Other, Please specify
8. From whom do you seek support and advice in making educational plans? Rank order by putting \#l before the most important, \#2 before the next most important, etc.

Father
Mother
Brothers
Father's brother
Mother's brother
Others (Please specify) $\qquad$

Sample Questions for Section II
Please read these examples carefully before you start answering the second part of the questionnaire. The following five sample items show you how to respond to Section II.

| Sample Questionnaire Items |
| :--- |
| S |

In the first example, you are $100 \%$ sure that Riyadh is the capital of Saudi Arabia. Therefore,you mark an $L$ in the first column. That is,you strongly agree without any doubt that Riyadh is the capital of Saudi Arabia.

In the second example you are not $100 \%$ sure that Riyadh is the largest city in Saudi Arabia. However, you assume since it is the capital of the country it might be the largest city. Thus you put an $V$ in the second column which means you agree that Riyadh is the largest city in Saudi Arabia because you are almost sure of it.

In the third example you have no idea whether it is the most beautiful city in the country or not and you cannot agree or disagree with the statement. Therefore, an $\downarrow$ is placed in the third column.

In the fourth example you know that Damman is closer to Riyadh than Jeddah. However, you are not $100 \%$ sure about it. Consequently, you put an $V$ in the fourth column which means you generally disagree that Jeddah is closer to Riyadh than Damman.

Finally, in example number five you are $100 \%$ sure that Riyadh is in the Central Province of Saudi Arabia, not the Western Province. Therefore you put an $V$ in the fifth column which means that you strongly disagree that Riyadh is in the Western Province of Saudi Arabia.

## Important Notes

l. Mark only one $V$ for each item to indicate whether you strongly agree, agree, are undecided, disagree or strongly disagree with the statement.
2. If you change your mind after you mark an $V$, cross it out by drawing several lines through it and make another $V^{\prime}$ in the desired column. The old will be disregarded.
3. Please respond to all items.

Section II: Choice of Field of Study
$\qquad$


1. The subjects in my field of study reflect my interests.
2. The high quality of teachers in my field of study was a strong factor in choosing it.
3. The poor quality of teachers in the other field of study was a strong factor in choosing my field of study
4. Generally, teachers in my field of study are self controlled and not easily upset.
5. Generally, teachers in my field of study are fair, impartial and objective in their treatment of students
6. The annual exams are usually difficul 4
7. Most of the subjects in my field of study are boring.
8. The subjects in my field of study are very enjoyable.

|  | $\begin{array}{ll} \lambda & 0 \\ \Rightarrow & 0 \\ \mathcal{J} & 0 \\ \cline { 1 - 1 } & 0 \\ \hline \end{array}$ | ( | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & \hline \end{aligned}$ |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 9. The difficulty of some academic subjects offered in the other field was a strong factor in choosing my field of study. |  |  |  |  |  |
| 10. Local schools should hire only those teachers who have had long experience in teaching. |  |  |  |  |  |
| 11. In my field of study the criterion for deciding what to include in the curriculum depends on its practical application in daily living. |  |  |  |  |  |
| 12. Most of the teachers in my field of study try to stimulate competition among students to increase motivation. |  |  |  |  |  |
| 13. My family (parents, relatives) do not think $I$ can achieve successfully in the other field of study. |  |  |  |  |  |
| 14.I often talk to my friends about issues related to my field of study. |  |  |  |  |  |
| 15. Teachers in my field of study seem enthusiastic in teaching their subjects. |  |  |  |  |  |
| 16. My field of study is very important for my future career. |  |  |  |  |  |
| 17. In my field of study, teachers praise me when $I$ answer correctly. |  |  |  |  |  |
| 18. In even the most demanding subject areas, acquisition of aca= demic knowledge is or can be made interesting and appealing to everyone. |  |  |  |  |  |




|  | $\begin{aligned} & 70 \\ & 70 \\ & 70 \\ & \text { Fex } \end{aligned}$ |  | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & -1 \\ & 0 \\ & 0 \\ & 0 \\ & 5 \end{aligned}$ |  | $\left.\left\lvert\, \begin{array}{l} 0 \\ 0 \\ 0 \\ \sim \\ \lambda \\ \hline \end{array}\right.\right]$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 29. My family (parents, relatives) did not care about my choice of a field of study. |  |  |  |  |  |
| 30. It would be better if students could change major, from Arts to Science, more easily after Grade ll. |  |  |  |  |  |
| 31. Foreign teachers make me like my field of study. |  |  |  |  |  |
| 32. Teachers in my field of study always give me support in my studies. |  |  |  |  |  |
| 33. I always have a hard time getting the homework done. |  |  |  |  |  |
| 34. I have very hard time understanding the subjects in my field of study. |  |  |  |  |  |
| 35. My family (parents, relatives) discussed with me, before I chose this field of study, the reasons why they wanted me to enter this field of study. |  |  |  |  |  |
| 36. If $I$ were to change my field of study I would obtain the permission of my family before making the change. |  |  |  |  |  |
| 37. The restrictions put on changing the field of study influenced my choice of the field of study. |  |  |  |  |  |
| 38. In general, parents believe that students who have just finished the loth grade are not mature enough to choose their field of study independently. |  |  |  |  |  |
| 39. Teachers in my field of study have a good attitude toward students. |  |  |  |  |  |


|  | $\begin{array}{ll} \lambda & 0 \\ = & 0 \\ 3 & 0 \\ \text { B } & 0 \\ \hline \end{array}$ |  0 <br>  0 <br> 0 0 <br> 0 0 <br> 0 0 <br> 0 0 <br> 0 0 <br> $\alpha$ 0 | $\begin{aligned} & 0 \\ & \hline \\ & \hline \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ |  |
| :---: | :---: | :---: | :---: | :---: |
| 40. In my field of study, teachers give everyone the opportunity to participate and ask questions in class. |  |  |  |  |
| 41. I have a wery good relationship with most of the teachers in my field of study. |  |  |  |  |
| 42. It would be a very good idea for those students who want to change their field of study to take qualification exams in the academic subjects of the new field of study. |  |  |  |  |

## APPENDIX E

THE ARABIC VERSION OF ELEVENTH AND TWELFTH GRADE STUDENTS' QUESTIONNAIRE
بـسم الـلــه الـرحمن الـرحيـم


يعتبر هذا الاستفتـ" جز" ا من أطروحـة دكتوراه ويـرمى الى الـتعرف على الـعوامـــــل
 معنـــــ فـى الاجـابــــــــة على الاستفتـــــ ستكون سريــــــة ، اذ لـيس مطلـوبـ منـ ذكـــر أسمك ولا أية معلـومـــات شخمية أخرى • ويـتكون الاستفتـا م من قسمين : يـطلـــــب منك فى الـقسم الاول اعطا




-•//ح

```
( (استغتـــــــــــ & الـسنة الـــانـية و الـثـالـثـة ثـانـوى)
```

اسم الـمدرســـــة : .........................................................
ارجو وفع علامة ( ) ا أمـام الاختيـار الـذى يـمثل حـالـتـــــ.

r - أى عبـارة من العبــــــارات الاتيـة تمف شعورك نحو اختيـارك لـلتخصص الـذى تدرسه .

-     - 



$$
\begin{aligned}
& \text { - } \\
& \text { - } \\
& \text { - } \\
& \text { - أنـا فى الـسنة الـثـالـثة ثـانـوى ، الــسم الـعلـمى• }
\end{aligned}
$$

$$
\begin{aligned}
& 0 \text { - مـاوظيفة والـدك ؟ ( فى الـمـاضى أو فى الـحـاضر ).. } \\
& \text { - }
\end{aligned}
$$

$$
\begin{aligned}
& \text { • } \\
& \text { - } \\
& \text { - ماحب مهنة ( طبيب ، محـامى ،............. } \\
& \text {................. ( غير ذلـك ا يـرجى الـتحديــد ا }
\end{aligned}
$$

$$
\begin{aligned}
& \text { - } \\
& \text { - خريجةة مدرسة ثـانـويـــــة • } \\
& \text { - خريجة مدرسة متوسطـة . } \\
& \text { - } \\
& \text { - }
\end{aligned}
$$

A سمحت ، يـوغع الـرقم (1) أمـام من تستشيـر أولا والـرقم (r) أمـام مـــــــــــ

$\qquad$

الـجز" الـثـنى : أمثلـة لـلاجـابة عنـهـا:-
يرجى قراءة الامثلـة الـتـلـية بعنـايـة قبل أن تبدأ بـالاجـابة على الـجزء الـثـنى مـــن الاستفتـ * ، وتوضع هذه الأمثلـة الـخمسة كيفيــــة الاجـابـة عنـا :-

| لا أو افـقـق | لا آوافق | الـا آستطيـيـ | أوافـق |  | الــــــــــــوال | $p$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\checkmark$ | $\sqrt{ }$ | $\checkmark$ | $\checkmark$ | $r$ | الـريــاض عـامعة الـمملـــــــــــــــة <br>  <br>  الـريــاض أقرب لـجدة منـهـالـلـدمـا تقع الـريــاض فـى الـمنـطقــــــــــــة الـغربيـة لـلـمملـى | 1 $r$ $r$ g 0 |

فى الـمثـال الاول أنت متـاكد .. 1 من أن الـريـاض هى عـاصمة الـمملـكة ولـهذا تضع علامــــة

 ولـكنــك تعتقد أنهـا من الـممكن أن تكون كبرى الـمدن فى الـمملـكة حيـث أنهـا الـعـامـــــــــــــة
 مدن الـمملكة لأنك متـاكد تقريـبـا من ذلك.




 بـمفة عـامــــــة على أن جدة أقرب الـى الـريــاض من الـدمــــام

 يعنى أنك لاتوافـق مطلـــا على أن الـريـاض تقع فى الـمنطقة الـغربـية من الـمملـكة .

- ملاحظـات هـامـــــــة
 الـتحديد ، لاتوافق ، أو لاتو افق مطلـقــــ على الـعبـارة الـمعطاه .
 بعدة خطوط بـحيث يـظهر أنك غيرتها ، شم فع علامــة ألـا فى الـعمود الـجديـ الـذى أخترته وسوف تلـفى الاجـابـــــة الاولـى

|  | لا أو افــق | لا أستـتطيـد | او افـق |  |  | $p$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  <br>  | 1 |
|  |  |  |  |  |  <br>  <br>  | $r$ |
|  |  |  |  |  |  <br>  <br>  عدم اختيـارى لـتختسمالاخر | $r$ |
|  |  |  |  |  | بمغة عـامة يعتبر مدرسو تخصصى الـدراسى متزنـيــنـن ( ولايغضبـــــــون بسهولـــــــــة | $\varepsilon$ |
|  |  |  |  |  | بمفة عـامة يعتبر مدرسو تخعصى الـدراسى مـادليــــنـ غير منــازين وموضوعيـين فى معـاملتـهم لـلـطـــــــلاب | 0 |
|  |  |  |  |  | دالاغمتبــارات الـسنويـة معبــة | 7 |
|  |  |  |  |  | معظم مواد الـتـخمص الـذى | $\checkmark$ |
|  |  |  |  |  |  12 $\qquad$ ممتعة جـ | $\wedge$ |
|  |  |  |  |  | كانت معوبة الـمواد فــــى <br> الـتخمص الذى لـم أخــــتره <br>  <br>  | 9 |


|  | لا أو افــق |  | أوافــق |  |  | $p$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | يجب علـى الــد ارس الـمحلـيـة <br>  الـخبـرة الـطويـلـة فـى مجـــال <br>  | $1 \cdot$ |
|  |  |  |  |  | يعتمدمقيـاس تقريـرالـمواد <br>  الـتـخصص الـدى اختـرته على مدى تطبـيـته فى الـحيـــــــــــــة a $\qquad$ | 11 |
|  |  |  |  |  | يحـاول معظممدرسى الـتخصص الـذى اختـرته اشــــــــــارة لـمنـافسة بـيـن الـطلاب لـزيــادة <br>  | 17 |
|  |  |  |  |  | لاتعتقد أسرتى (أبـــــوي <br>  فى الـتخصص الـذى لـم آختـاره | Ir |
|  |  |  |  |  |  <br>  تتعلق بتـخصصى الـدراســى | $1 \varepsilon$ |
|  |  |  |  |  | تخعصى الـدراسى مهم جــدا <br>  | 10 |
|  |  |  |  |  |  الـدراسى متحمسون لـتدريـس مو ادهـ | 17 |
|  |  |  |  |  | فى تخمصىالـدراسى يشجعنى الـمدرسين عندمـا أجيـــــبـ $\qquad$ أجابة | IV |


|  | لا أو افــق | لا آستـتـيـيع | اوافــق | تاو افــــــــــ* |  | $p$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | من الـممكن جعل استيعـاب <br>  <br>  الـتـى تتطلـب جهــــــد كبـير | 11 |
|  |  |  |  |  | فـهم الـمواد الـتعلـيميــــة الـمتعلـقة بـتخصعى الـدراسى <br>  | 19 |
|  |  |  |  |  | كــان لاسرتى( أبويو اتربـا كـم <br>  <br>  | r |
|  |  |  |  |  | أعتقد أن الـقيود علــــــى الـتغييـر من تخصص دراسـى الـى آخر غير عـادلـةـلــكثيـر  $\qquad$ من الـط | PI |
|  |  |  |  |  | اذا سنحت لى فرمة لـتغيـير تخصعى الـدراسى فلـن أغيره | Yr |
|  |  |  |  |  | \|اخترت تخصصى الـدراسى لـكى أتمكن من مسـاعدة والـدى فى عملـ | rr |
|  |  |  |  |  | لـم تتـع لـى فرصة كبـيرة- <br>  لان أسرتى ( أبـــــــــــوي وأقربــى ) اختـاروه لـى | ケย |
|  |  |  |  |  | تعتبر الـكتب الـدراسيـــــة فى تخصع الـدراسى سهلــة الـفـهـ | ro |


|  | لاأو افــق | الـتـحديـدي ا أستطيـ | أوافــق |  |  | $p$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | من الـمهم جدا الاشتراك فى نشاطات متعلـقة بـتخصسى <br>  | r7 |
|  |  |  |  |  | يعطى مدرسوتخصعىالـدراسى <br> الـكثيـر من الـواجبـــــــــات <br> a $\qquad$ الـمنـزل | rY |
|  |  |  |  |  |  <br>  | 「1 |
|  |  |  |  |  | لـم تهتم أسرتى( أبـــــوي وأقربــى الاختيـارى لـهذا <br>  | P9 |
|  |  |  |  |  | سيكون من الافضل لـو تمكن الـطلاب من تغييـر تخنمصهـم <br>  <br>  <br>  | r. |
|  |  |  |  |  |  لـتخصصى الـدراسى يـجعلـنــى <br>  | rl |
|  |  |  |  |  |  <br>  | rr |
|  |  |  |  |  | أجد داعمــا معوبـة فى عمل <br>  | rr |
|  |  |  |  |  | أجد صعوبة فى فـهم مواد <br>  | 「£ |


|  | لاأو افـّق | لا أستـديـيـع | أوافــق |  |  | $p$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | بحثت مع أسرتى ( أبــوي واجربـاعى) الاسبـاب الـتـى من أجلـها ارادونـا اونـى أن <br>  قبل أختيـارى | ro |
|  |  |  |  |  | - سيكون علي أن استادن <br>  <br>  | r7 |
|  |  |  |  |  | اثرت الـتيود الـمغروضــــة <br>  اختيـارى لـهذا الـتخعـــــر | rV |
|  |  | . |  |  | يعتقد الـوالـدان أنالـطلاب الـذين قد انتـهوا لـتـوهــم من الـمف الأول شــانـوى لـــم يـبـنفوا قدرا كـافيـا مــن <br>  تخعصهم الـدراسى بـمفردهـم | rı |
|  |  |  |  |  | لـدرسى الـتخمص الـدراسـى الذى الـتر الـته مواقف جيدة $\qquad$ | rq |
|  |  |  |  |  | يعطى مدرسوتخمصىالـدراسى فـرمة لـلـجميع لـكى يـتركوا <br>  | $\varepsilon \cdot$ |
|  |  |  |  |  | علاقـاتى مع مدرسى الـتـخصى الـذى أخترته حسنةـلــفـايـة | \&1 |



## APPENDIX F

THE ENGLISH VERSION OF THE INTERVIEW
SCHEDULES USED WITH STUDENTS, PARENTS, TEACHERS, AND PRINCIPALS

## Tenth Grade Students' Interview Schedule

INTRODUCTION: Hello, MY NAME IS MANSOUR. SOON YOU WILL BE CHOOSING A MAJOR FIELD OF STUDY. I WOULD LIKE TO KNOW WHAT YOU WILL CHOOSE AND WOULD LIKE TO ASK YOU SOME QUESTIONS ABOUT HOW YOU WILL MAKE YOUR CHOICE. YOUR ANSWERS WILL BE KEPT CONFIDENTIAL.

1. What do you think you will choose as your field of study for the next year?
2. Why will you choose that major? How?
3. Do you think you will feel happy about what you will choose?
4. Why?
5. How will this choice affect your future life?
6. Have you discussed choosing a major with your family? Who? How? Why?
7. Have you discussed it with anyone else? Who? Why? How?
8. Is your choice the same as the choice your family favors? Why?
9. Are you planning to follow your father's occupation or enter a family business? How? Why?
l0. How will this affect your choice of major?
ll. How does your own academic ability affect your choice? Why?
10. If you were a genius who could learn anything, very quickly, what would you choose to study first? Why?
11. How have your teachers influenced your choice? Why?
12. Will the restriction of the system in changing from a major to another have any influence in your choice? How? Why?
13. The seven cards I am giving you show factors that may have influenced your choice of major. Please put them in order from most to least important.
a.my parents wanted me to choose it.
b.I will choose it because the teachers in that field of study teach better (more effectively).
c.I will choose it because it gives me a wider choice of options for future study and career.
d.I will choose it because $I$ like the teachers in that field of study.
e.It is possible to change to the other major anytime.
f.The subjects interest me.
g.I need it for my career.
14. What other factors do you think may influence your choice of field of study?

Concluding Remarks:

THANK YOU FOR TALKING WITH ME.

## Eleventh and Twelfth Grade Students'

 Interview ScheduleINTRODUCTION: HELLO, $\qquad$ ,MY NAME IS MANSOUR. AT THE BEGINNING OF THIS SCHOOL YEAR YOU CHOSE YOUR MAJOR FIELD OF STUDY. I WOULD LIKE TO ASK YOU SOME QUESTIONS ABOUT HOW YOU MADE YOUR CHOICE. ALL YOUR ANSWERS WILL BE KEPT CONFIDENTIAL.

1. What is your major field of study?
2. Why did you choose that major? How?
3. Do you feel happy about your choice?
4. Why? What makes your feel happy (or unhappy)?
5. How does this choice affect your future life?
6. Did you discuss your choice of major with your family? Who? How? Why?
7. Did you discuss it with anyone else? Who? Why? How?
8. Is your choice the same as the choice of your family favor? Why?
9. Are you planning to follow your father's occupation or enter a family business? How? Why?
10. How did this affect your choice of major?
ll. How did your own academic ability affect your choice? Why?
11. If you were a genius who could learn anything very quickly, what would you choose to study first? Why?
12. How did your teachers influence your choice?
13. Did the restriction of the system in changing from one major to another have any influence on your choice? How? Why?
14. The seven cards I am giving you show factors that may have influenced your choice of majors. Please put them in order from most to least important.
a. I need it for my career.
b. I chose it because the teachers teach better (more effectively).
c. I chose it because it gives me a wider choice of options for future study and career.
d. I chose it because I like the teachers in that field of study.
e. It is possible to change to another major anytime.
f. The subjects interest me.
g. My parents wanted me to choose it.
15. What other factors influenced your choice of field of study?

INTRODUCTION: HELLO,
MY NAME IS MANSOUR GHAWANNI AND I WOULD LIKE TO ASK YOU A FEW QUESTIONS ABOUT HOW YOU SON CHOSE HIS MAJOR FIELD OF STUDY. ALL OF YOUR ANSWERS WILL BE KEPT CONFIDENTIAL.

1. What is your occupation?
2. What is (or will be) your son's choice of a field of study?
3. How have you and your wife tried to influence your son's choice of field of study? Why?
4. Will your job influence your son's choice of occupation? How? Why?
(a) Yes
(b) No
5. If you feel your son's choice of field of study is not appropriate for him, why not? Will you try to change his mind? How?
6. Do you think it is better to let loth graders choose their own fields of interest for llth and l2th graders or is this a decision that is too important for teenagers to make and their parents should make it?

Against the son's wishes?
7. If you are in need of your son's help to support you, do you think it is reasonable to ask your son to quit school or change his field of study on this basis?
8. What factors do you think have (or will) most influence your son's choice of field of study?

Concluding Remarks:

THANK YOU FOR TALKING WITH ME.

INTRODUCTION: HELLO, MR.
MY NAME IS
MANSOUR GHAWANNI AND I WOULD LIKE TO ASK YOU SOME QUESTIONS ABOUT HOW STUDENTS CHOOSE THEIR MAJORS AND WHO SHOULD HELP THEM MAKE THE CHOICE. ALL YOUR ANSWERS WILL BE KEPT CONFIDENTIAL.

1. What subject do you teach? How long have you taught it?
2. Do you think it is better for the students to choose his own field of study by himself or is it better if he follows his father's wishes? Why?

If they don't agree, who should prevail?
3. How do you feel about the student's achievement if they follow their parent's wishes compared with their achievement if they choose their own major field of study? Why?
4. How would you advise a student with good grades who wished to change from Science or Arts in the middle of the twelfth grade? Why?

From Arts to Science?
5. How do you think teachers' attitudes toward their subject and students affect students' choice of field of study?
6. What are the factors you think may have influence in the students' choice of field of study?

## Concluding Remarks:

## Principals' Interview Schedule

INTRODUCTION: HELLO, MR., MY NAME IS MANSOUR GHAWANNI AND I WOULD LIKE TO ASK YOU SOME QUESTIONS ABOUT HOW STUDENTS CHOOSE THEIR FIELD OF STUDY AND WHO SHOULD HELP THEM WITH THAT CHOICE.
l. What is your academic background, Arts or Science?
2. Do you think it is better for the student to choose his own major field of study himself, or is it better if he follows his parents wishes? Why?

If they do not agree, who should prevail?
3. How do you feel about the students' achievement if they follow their parents' wishes, compared with the students' achievement if they choose their own major field of study? Why?
4. How would you advise a student with good grades, who wanted to change from Science ot Arts? Why?

## From Arts to Science?

5. How do you think teachers' attitudes toward their subject and students affect students' choice of field of study?
6. What are the factors you think may have influence in the students' choice of field of study?

Concluding Remarks:

## APPENDIX G

THE ENGLISH VERSION OF THE INTERVIEW CHECKLIST

CHECK LIST FOR TENTH GRADE INTERVIEW

| Factors | Basic Questions | Reminders |
| :---: | :---: | :---: |
|  | 1) What do you think you will choose? |  |
|  | 2) Why? How? |  |
| student interest | 3) Do you think you'll be happy about it? |  |
| " " | 4) Why? |  |
| " " | 5) How will this choice affect your future? |  |
| family influence | 6) Have you discussed that with your family? Who? How? Why? |  |
| " " | 7) With anyone else? Who? Why? How? |  |
| " " | 8) Is your choice the same as your family? Why? |  |
| " " | 9) Are you planning to. . . father or family? How? Why? |  |
| " " | 10) How will this affect your choice of major? |  |
| difficulty | 11) How does your academic affect? Why? |  |
| " | 12) If you were a genius, what you'll choose? Why? |  |
| teach. meth. \& attitude | 13) How have your teachers influenced? Why? |  |
| Restriction of System | 14) Will the restriction influence? How? Why? |  |
|  | 15) The seven cards--please put them in order from most to least. |  |
|  | 16) What other factors will influence your choice? |  |



```
CHECK LIST FOR FAMILY MEMBERS' INTERVIEW
```

| Factors | Basic Questions | Reminders |
| :---: | :---: | :---: |
|  | 1) What is your occupation? <br> 2) What is (or will be) your son's choice? <br> 3) How have you and your wife influenced your son's choice? Why? <br> 4) Will your job influence your son's choice of occupation? How? Why? <br> (a) Yes <br> (b) No <br> 5) If you feel your son's choice is not appropriate, why not? Will you change it? How? <br> 6) Do you think it is better to let 10th grade choose or parent should make it? Against son's wishes? <br> 7) If you are in need of your son's help to support you. . .? <br> 8) What factors do you think have (or will) most influence your son's choice? |  |

CHECK LIST FOR TEACHERS' INTERVIEW

| Factors | Basic Questions | Reminders |
| :---: | :---: | :---: |
|  | 1) What subject do you teach? How long have you taught it? <br> 2) Do you think it is better for the students to choose his own career or follow his father's wishes? Why? <br> If they do not agree, who should prevail? <br> 3) How do you feel about the students achievement if they follow their parents' wishes? Why? <br> 4) How would you advise a student with good grade. . . from Science to Arts? from Arts to Science? <br> 5) How do you think teacher attitudes affect student choice? <br> 6) What are the factors you may think have influence in the students' choice? |  |

CHECK LIST FOR PRINCIPALS' INTERVIEW

| Factors | Basic Questions | Reminder |
| :---: | :---: | :---: |
|  | 1) What is your academic background, Arts or Science? <br> 2) Do you think it's better for the students to choose his own major or is it better if he follows his parents wishes? Why? If they don't agree, who should prevail? <br> 3) How do you feel about the students' achievement if they follow their parents' wishes? . . ? Why? <br> 4) How should you advise a student with good grades. . . from Science to Arts? From Arts to Science? Why? <br> 5) How do you think teachers' attitudes. . . affect student choice? <br> 6) What are the factors you may think have influence in the students' choice of. . . ? |  |

APPENDIX H

THE ARABIC VERSION OF THE INTERVIEW SCHEDULE USED WITH STUDENTS, PARENTS, TEACHERS, AND PRINCIPALS

$$
\begin{aligned}
& \text { بسم الـلـه الـرحمـــنـن الـرحيـم } \\
& \text { ( جدول مقـابــلات طلـبـــــة الـــــنـة الاولـــــى ثـانـــــوى ) }
\end{aligned}
$$

مقدمة : أهـلا ........... اسمى منمـور .. قريبـ سوف تختـار تخمص دراسـى معين، وأنـ أرغب فى الـحصول على بعض الـمعلـومـــــات عندمـا سوف تختـار وارغب فـى ســــوا الـك بعض الاسـعلـة عن ذلـك الاختيـــــار ، جميع الاجـابـة ستكون سريـة لـلــايـــــــــة .. 1 - مـا الـتخصم الـدراسى الـذى تعتقــــد أنك ستختـره فى الـسنة الـقـادمة ؟. - Y r - هل تعتقد أنك ستكون سعيد ا بـمـ سوف تختـره ؟.

0 - هل سيـؤثر هذا الاختيــر على حيـاتك فى الـمستقبل ؟ وكيف ؟. - 7
 ^ - هل يـتفق اختيـارك مع رغبة عـاعلـتك ؟ ولـــــــاذا ؟.

9- هل تخطط على أن تعمل فى الـمجـال الـذى يعمل فيـه والـدك ؟ أو فى الـمجـال الــــذى تعمل فيه الأســـرة ؟ كيــ


1ا- هل توشُر قدراتك الـعلـمية علـى الاختيــر ؟ كيـــف ؟ ولـمـاذا ؟.

Y Yا- اذا كـانت لـديـك قدرات خـامة مميزة على الـتعلـيم بسرعة فى الـمجـال الـدراسى الـــــى تختــــاره أو تفضلــــــه ؟ ؟ ولـــــــــــاذ ؟ ؟. -lr هل يـوثر مدرسوك علـى اختيـارك ؟ كيـــف ؟ ولـمــاذا ؟.
£ ا- هل تتوقع أن يكون لـلـقواعد الـخاصة بـتحديد الـتخصص أو تغييـره تـأثيـر فى اختيـارك؟
كيـــــف ؟ ولـمـــــــــاذا ؟.

$$
\begin{aligned}
& \text { فـالـرجــا } \\
& \text { أ }
\end{aligned}
$$

$$
\begin{aligned}
& \text { د - سـأختـاره لأننـى أحب الـمدرسين الـذين يـدرسونـه . }
\end{aligned}
$$

$$
\begin{aligned}
& \text { و - سـاختـاره لأنه تتخص مـهم ويعنـيـنى مبـاشـــــــرة • }
\end{aligned}
$$


بـسم الـــه الــرحمـنـالـرحيـم
( جـــــدول مقـابــلات طلبــــة الـســنة الــــانيـةو الــــالـثة شــانوى )

مقدمة : أهـلا . . . . . . . اسمى منـمــور . . فی بـد ابـة هذه الـسنـة الـدر اسيـة قـمت بـاختتيـار

الاجـابـــــــة ستـكون سريـة لـلـفـا يـــــــــــــة . .




ع - مـا الـذى يجعلـك سعيـد ا أو غيـر سعيـد ا بـهذ ا الاختيـار؟. 0 - هل يـؤـر هذ الاختتيـار علـى حيـاتك فى الـمستقبـل ؟ وكيـف ؟. - 7
 - 9 هل - Y
 ه - 1

Q - هل تخطط علـى أن تعمل فى الـمجـال الـذى يـعمل فيـه والــك ؟ أو فـى الـمجـال الـــــذى
 - ا- هل يـؤـر ذلـك علـى اختتيـارك لـلـتخمص ؟ ولـمـــــــاذ ؟ •

اا- هل تـوشُر قدراتك الـعلـمية علـى هذا الاختتيـار؟ كيــف ؟ ولـمـــاذا ؟•
 الـذى تختـاره أو تفضلـه ؟ ولـمـــــــاذا ؟ rir هل يـؤُر مدرسوك علـى اختتيـارك ؟ كيـــف ولـمــــــــاذ ؟.


..... ( $P$ )

ها- تفـترض الـبطـاقـات الآتيـة الـعوامل الـتى ربـمـا تؤثر فى اختيـــرك لـلـتخمـــــــــــــ فـلـرجـا


 د - أخترته لاننـى أحب الـمدرسين الـذيـن يـدرســـــوه .



-•//と

الـمقدمة : اهلا وسهلا يـاســـــيد ال............. اسمى منصـور غونــى .. واانـ ارغب فــى
توجيــه بعض الاســـيلـة الـيك عن كيفيــة اختيـارك ابـنك لـتخصعه الـدراســــى ، والان احتفـــــط بسـريـة جميع أجـابـاتك ..

1 - مـاوظيفتـــــــــ الـحـاليـــــــة ؟.

م - Y

 ولـمــــــــــــــــاذا ؟
§ - هل بـؤر عملـ هذا على اختيـــار ابـنك لـوظيفة معينة ؟ كيف ؟ ولـمـــــاذا ؟.

0 - اذا أحستت بـان اختيـار ابـنك لـتخصصه الـدراسسى غيـر منـاسب لـه . . فـهل تحـــــــاول

1 - هل تعتقد أنه من اغاففل أن يختـــار طلاب الـمرحلـة الـعـاشرة تخعمهم الـذى يرغبــون


 أن تطلب منــه ترك الـمدرسـة أو تغيـيـر تخهعه الـدراسى على هذا الاساس ؟.

1 - مـا آهم الـعوامل الـتى تعتقــــد انـهـا توثر على اختيــار ابـنك لـتخصعـه الـدراسـى ؟.



مسـاعدتهــم فى اتخـاذ هذا الـقــــرار. . اجـابـتك ستكون سريـة لـلـغـيـــــــــة .

$$
1 \text { - مـا الـمـادة الـتى تقوم بـتدريسهـ ؟ منـذ متى تدرسهـــــ ؟. }
$$

r -

واذا لـم يـوافــق الـوالــدان علـى اختتيـار ابـــهمـا ، فـأى رآى يـنبغى آن يسود ؟.
 والـديـــه أو اذا اختـار لـنفســـــــه ؟.
 الـعلـمـى الـى الـقسم الأدبـــى فى منتـعف الـمرحلـة الــــانيـة عشرة ؟ واد ولـمـــاذا ؟.
ومن الــعــــم الادبـى الـى الـقســـم الـعلـمى ؟.

0 - كيف يـوثر ميـول الاسـاتــــذة نحو موادهم وطلابـهم فى اختيـار الـطلاب لـتخصعاتـهـــــ الـمدرســـــــية ؟. 7 - 7

## بسم الـلـه الـرحمـنـالـرحيـم

( جـدول الـمقـبــلات الـشخميةـلــمديــــــــــر )

الـمقدمة : اهــلا بـلـسيدالاستـاذ ........... اسمى منمور غونى . . وأنـ أود أن أخـرج علـيك بعض الاســــئلـة عن كيفيــــة اختيـار الـطــــــــــلاب ..

1 - مـا الـمجـال الـدراسى الـذى تخعمت فيـــــــــــه ؟.

Y اواففــل أن يستجيب لـرغبــــات والـديه ؟ ؟ ولـــــــــاذا ؟
واذا لـم يـوافق الـوالـدان على اختيـار ابـنهمـا فـأى رأى يـنبغى أن يســــــــــود؟.
 والـديـــــه أو اذا اختـار لـنغســــه ؟.

$$
\begin{aligned}
& \text { ₹ - بـمـاذا تنصع طالـب حاملا على درجــــات جيدة واراد تغيـير تخصمـــه من الـقس }
\end{aligned}
$$

> 0 - كيغ يـوثرميـول ومواقف الأسـاتذة نـحـــوموادهموطلابهمفى اختيـار الـطلاب لـتخصماتهــــم الـمدرســـــيـة ؟.
> 7 - مـا الـعوامل الـتى تعتقــــد أنها قد توثر فى اختيـار الـطلاب لـتخصعاتهم الـدراسية ؟.

## APPENDIX I

LETTERS

December 5, 1984

TO WHOM IT MAY CONCERN:
Mansour Ghawanni has embarked on a study that will serve as the basis for his doctoral dissertation. He will be collecting data for this study during his current visit to Saudi Arabia.

His study is an important one for educators in Saudi Arabia because it will help understand the process by which students select their area of concentration for grades 11 and 12. As you know, this choice is of importance to the student individually and to the nation's accomplishment of national goals. Therefore, Mr. Ghawanni's study is of both practical and academic value.

I urge you to give your fullest cooperation in making it possible for him to acquire the essential data for this study. The findings will be of significance to educators in your nation.

Thank you for your help.
Sincerely,


Professor
JJG:pjm

KINGDOM OF SAUDI ARABIA
Ministry of Higher Education
KING ABDULAZIZ UNIVERSITY
College of Education
MADIMAH MUMAWWARAK

Ref.
Date


Ax-f (2) $-0 \times 119$ التاريخ



أحيط سعـادتكم علمـا بـان اواستـذ/ منصور أحمد عمر غونــــى الـععيد بـكلية الـتربيـة


 ( دراسـة الـعوامل الـتى توثــــر على اختيــر الـطـلـب لاحدى الـمجـالـين العلـمى والأدبى)

الـموقــــرة لانـها > هذا الـبـــث .

نـامل من معـادتكم الـتغضل بـتعميد من يلـزم للعمل على تسهيل مـهمتــهومساعدته.

$$
\begin{aligned}
& \text { شاكريـنومقدريـلـسعـادتكم حسنتعـاونكم ، ، } \\
& \text { لا والـلام علـيكمورحمة الـلـهوبـركاتــــــه ، ، }
\end{aligned}
$$

## عميدكليهة لهتربـبة بـالـدينة الـمنـــــورة



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[^0]:    Source: Survey Data

[^1]:    **MS = Mean Square
    Source: Survey Data

[^2]:    Source: Survey Data

[^3]:    "Have (did) you discussed choosing a major with your family? Who? How? Why?

[^4]:    "Have you discussed it with anyone else? Who? Why? How?"

[^5]:    "Will (did) the restrictions of the system on changing from one major to another have any influence on your choice? How? Why?

[^6]:    $A=$ Parent Influence
    B = Teacher Methods
    $C=$ Study \& Career Options
    D = Teacher Attitudes
    = Restrictions of System
    $\mathrm{F}=$ Student Interest
    Source: Card Sort procedure administered to students

[^7]:    "How do you think teachers' attitudes toward their subject and toward students affect students' choice of educational track?"

[^8]:    Source: Survey Data

[^9]:    Source: Survey Data

[^10]:    Source: Survey Data

[^11]:    Source: Survey Data

[^12]:    Source: Survey Data

