An Analysis of the Delivery of Health Education by Upper Basic Stage Science Teachers in Jordan

by

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Abstract

This study investigates the delivery of health education within the upper basic stage science curriculum in Jordan, which covers the crucial age range 13-16. It begins by exploring various definitions and models relating to health education with a view to selecting the most appropriate for use in this study. This is followed by a review of the literature to examine the different ways in which health education is delivered.

Within Jordan, the policy on health education, as revealed by official documents and guidance issued to science teachers, is analysed. The teaching methods used by science teachers in the delivery of health education are also investigated, together with the content and nature of the various health education topics delivered.

A variety of data collection methods were employed; questionnaires to establish the amount and content of health education taught, semi-structured interviews to find out the range of teaching and learning methods being employed and analysis of documentary materials.

The study attempts to determine whether there are any particular factors that affect the amount and content of health education taught; these are teacher gender, region of Jordan, teaching subject (biology, chemistry or physics), qualifications in that subject, and teaching qualifications and experience. The data were collected in Jordan between September 1999 and January 2000.

One of the major findings of the study was that the current policy regarding health education in Jordan is not clear. There is a tendency to emphasise theoretical aspects rather than practical ones, and the affective domain, resulting in values and behaviour change, receives very little attention. It was found that at present, five health areas are being delivered within the science curriculum; these are personal health, nutritional health, disease and prophylaxis, environmental health and education for married life. The amount of health education taught was in the 'moderate' or 'low' categories used in the study, with environmental health receiving the greatest emphasis, and education for family life the least. The latter was particularly variable, with significant differences among male and female teachers. This could be due to religious and cultural factors.

The study suggests that the variation in the delivery of health education by science teachers is probably related to the lack of a clear policy from the Jordanian Ministry of Education, and the fact that health education topics are not clearly identified in the official curriculum documents. It recommends that a national policy is developed, from which regional and local policies can be adapted to meet different needs. Schools should also develop their own policies, particularly for the teaching of education for family life, with teachers, health professionals and local community leaders also involved. A greater precision in the description of health topics in the curriculum and the production of teacher guidance and relevant textbooks are also recommended.

It is hoped that this study will help develop new strategies for the future of health education in Jordan and the future health of the nation.

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The Researcher

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Chapter One: Introduction and Background of the Study

1.1 Introduction

This chapter provides background information on Jordan and its educational system. It aims also to give a background to the present study, its aims, its research questions, rationale and significance.

This information will serve to provide pointers to the conditions and considerations - political, social, cultural, ethical, economical, environmental, educational and religious - within which health education is developed, planned, implemented and delivered in Jordan. It seeks to place health education within the context of general education and identifies cultural and religious issues which might impact on the teaching and learning of health education. This chapter also aims to clarify the general educational provision within Jordan with particular reference to the delivery of health education within the science curriculum.

1.2 The Hashemite Kingdom of Jordan

Jordan is one of the small developing countries of the Arab world with limited natural resources. It is bounded by Syria in the north, Iraq in the east, Saudi Arabia on the south-east and south, and Palestine and Israel on the west. It gained its independence from Britain in 1946 (Fisher, 1987; Ministry of Education (MoE), 1992; National Information Centre (NIC), 1997). Officially, Jordan is referred to as the Hashemite Kingdom of Jordan and is made up of twelve local governerates. In 1997, more than 70 % of the population lived in three urban governerates: Amman, Zarqa and Irbid. The

majority of Jordan's population is concentrated in one-eighth of the land, mainly in the northwest highlands.

The country has a total area of 89,213 sq. km. with almost 90 % of its lands as desert. A substantial part of Jordan may be classified as 'dead areas' or desert especially in the eastern and southern regions. Because of lack of ground water resources and the extended desert areas, much of Jordan is dependent on rain water which is sufficiently rare to lead to a progressive increase in the dryness of the land. Yet in spite of the limited resources, clean water is available for 99 % of the total population (Shuna, 1993).

The population of Jordan amounted, in the year 2000, to five million (Al-Ra'i Newspaper: Jordan, 2000) with approximately a 3.6 percent rate of population growth, among the highest in the world. One person in every five is between the ages of 15 and 24 (NIC, 1997). According to the 1994 population and housing census, young people under the age of 15 make up 41 % of the total population. This makes health education, and in particular, family planning, a central issue for the Jordanian government. The national population strategies for family care, planning and birth spacing are seeking to:

- expand family planning services.
- encourage the practice of birth control.
- enhance civil and voluntary participation in providing family planning services.
- make the best use of available opportunities for the introduction of family planning programmes to society.
- provide effective educational and media materials on reproductive health including

family planning and birth spacing.

- create positive attitudes towards population issues by spreading awareness of their implications on the quality of life for the family and substainable development for the nation as a whole.

It is noteworthy that in 1997, among currently married women, 38 % of them are choosing to use modern contraceptive methods to plan their families. The largest health care provider is the public sector, providing comprehensive services to approximately 60 % of the population for free or at a minimal fee (The Columbia Encyclopedia, 2001).

The great majority of the Jordanian people are Muslims, with Christians constituting about four percent of the total population. Most Christian Jordanians share many cultural habits and values with Muslim Jordanians. Christians interact daily with Muslims, working, studying and socialising together. However, intermarriage between Muslim and Christians remains infrequent.

Regarding health education, the religious composition of the population must be remembered when considering the norms, traditions, beliefs and daily habits of people, which will impact, either positively or negatively, on the educational system. This impact could be at various levels, whether those groups are parents, teachers or students. This situation requires the policy-makers in Jordan to take into consideration the religious composition of the population when planning, implementing and evaluating any aspect of health education.

Arabic is the official language in Jordan. English is widely spoken, and taught as a second language in all schools within the educational system. The language of post-school education provided by colleges and universities depends on the field of academic specialisation. Most of the scientific specialisms such as chemistry, biology and physics are taught in English. This teaching and learning of science through the medium of English in the universities could affect the school health education in two ways. Firstly, the teachers' learning through English may affect the subsequent translation and transfer of health knowledge and the understanding of pupils in Jordan's schools, especially in the early stages of employment of new practising science teachers, as health education is delivered within science education. Secondly, university tutors contribute to the development of school textbooks, and they may on occasions use foreign references when selecting the activities and content to include in the texts. Some of these activities may not be suitable for the Jordanian environment and may negatively affect the attitudes of students towards science or the health education taught within science.

Therefore, the social and cultural background of Jordan is an important factor in shaping the health behaviour of individuals. This factor needs to receive attention from the educational policy-makers when planning the science and health education curriculum and training courses for teachers. More information on the importance of the social and cultural background is provided in the next section.

1.3 Social and Cultural Background

The basic form of social organisation in Transjordan in 1920 was tribal. The tribal social structure was based on the ramification of patrilineal ties among men. The patrilineal

ties were significant in providing access to material and social resources. Bedouins traditionally have placed great importance on the concept of honour: slight or injury to a member of a tribal group was an injury to all member of that group, similarly, all members were responsible for actions of a fellow tribal member.

By the early 1970s, the Bedouin tribes constituted no more than 5 % of Jordan's population, and had dwindled to less than 3 % by the late 1970s. Their small numbers, however, did not correspond to their cultural and political importance in Jordan. Tribalism and tradition lent legitimacy to Hashemite rule. In the 1980s, a debate raged among Jordanians and observers of Jordanian society over the part that tribal influence and tradition should play in a modern state. In early 1985, in the midst of this debate, King Hussein publicly supported the role of tribe and tradition in Jordan's past and future by stating "whatever harms tribes is considered harmful to us. Law will remain closely connected to norms, customs, and traditions.... Our traditions should be made to preserve the fabric of society. Disintegration of tribes is very painful, negative and subversive" (The Columbia Encyclopedia, 2001, p. 5).

Thus, the role of tribes and tribalism, although changed over the last 70 years, remains fundamental to both society and political culture. Although numerically few Jordanians live the traditional life of the nomadic bedouin, the cultural traditions based on this lifestyle are hardly diminished, but remain deeply intertwined with the country's bedouin heritage especially in the south of country. The social control and politics at the village level traditionally grew out of the interaction of kin groups at various levels. Social control over individual behaviour was achieved through the process of

socialisation and a system that imposed sanctions for unacceptable behaviour. Such sanctions could range from gossip damaging to one's reputation and that of one's kin, to censure by one's kin group, to penalties imposed by the state for infractions of its criminal codes.

Class structure in Jordan resembles a pyramid. At the top is a small, wealthy group comprising large landowners, industrialists, and leading financial figures. The oil boom of the 1970s and early 1980s also created a new class of wealthy Jordanians who made large amounts of money abroad, which was displayed by conspicuous consumption at home. Just below this group are professionals such as army officers, and government officials who live a somewhat less grand but still comfortable life. White-collar workers, schoolteachers, and returning migrants struggle to retain a style of life that separates them socially from the small shopkeepers and artisans below them. At the bottom of the pyramid, a large lower class includes increasing numbers of the unemployed.

The extended family continues to be a viable form of household. More families have begun to live in nuclear households, but Jordanians continue to rely on extended kin relations for a variety of purposes, which can be described as 'exchanges'. Exchanges might include financial support, job information, social connections, access to strategic resources, marital partners, protection, support in the event of conflict, child care and domestic services and emotional sustenance. In turn, an individual's social identity and loyalty continue to be oriented largely to the family.

The social milieu in which a Jordanian family lives significantly affects the position of the wife and her degree of autonomy. In rural agricultural areas and among the urban poor, women fulfil important economic functions. Traditionally, some women of poor urban families work outside the home, and rural women perform a wide variety of tasks in the household and in the fields. Such women occupy a position of relative importance and enjoy a modicum of freedom within the village or neighborhood.

Although casual social contact between sexes of the kind common in the West is less frequent, segregation of the sexes in rural areas is less pronounced than in the towns. Among the traditional urban bourgeoisie, women fulfil fewer and less important economic functions. Artisan and merchant families earn their living from the skilled work of the men, whilst womens' responsibilities are more confined to the home. Among the new urban middle class, women occupy a variety of positions, some of them contradictory. Some women of this class are educated and employed, and enjoy a fair measure of mobility within society; others, also educated and skilled, lived a more sheltered life, with minimal mobility. Both groups of women are still frequently seen in the streets wearing Islamic dress.

The allocation of space within the home is often gender specific. The houses of prosperous urban and rural families traditionally contain distinct men's and women's areas: the reception room where the men of the family entertained male guests and the women's quarters from which adult males other than relatives and servants were excluded. In poorer rural areas, men and women often socialise together in the house.

Segregation by gender is tied closely to the concept of honour. Honour could be lost through the failure of sisters, wives, and daughters to behave modestly and through the failure of men to extent self-restraint over their emotions towards women. For women, the constraints of modesty are not confined to sexual matters; loud speech, a woman's bearing or dress, or her appearing in public places could lead to a loss of honour. For men, overt expressions of emotions (such as romantic love) that revealed vulnerability to women could cause a man's strength to be questioned, leading to a loss of honour. Men are expected to be above such matters of the heart.

A wife's failure to behave properly reflected on the honour of the husband and his kin, but even more on her father and brothers and others of the group from which she came. A man's failure to conform to the norms of self-control and invulnerability to women shamed his immediate and extended kin group. The penalties for violation of the honour code differ for men and women. Custom grants the males of the family the right to kill female kin known to have engaged in illicit sexual relations. A more common practice, however, was for families involved to arrange a hasty marriage. Men who lost honour through their actions were ostracised and lost face and standing in the community.

In the past, the segregation of women acted to minimise the chances that a family's honour would be lost or diminished. However, the education of women and their participation in a modern work force has tended to erode the traditional concept of honour by promoting the mingling of the sexes in public life. It can be seen from the above, that the social and cultural background of Jordan will need to be taken into account when making recommendations about the content and teaching methods of the

health education aspects in Jordan.

1.4 The Educational System in Jordan

The Jordanian educational system is managed, administratively and financially, by the Ministry of Education. The MoE is highly centralised and has a full and direct responsibility for preparing future generations. Consequently, there is a lesser role for teachers, parents and other agencies than in some other countries. This situation contradicts the educational slogan of the First National Conference on Education Development conducted in Amman 1987, which stated that the educational process is a national responsibility and all parts of society should participate in the preparation, implementation and evaluation processes (MoE, 1994).

The general objectives of education in Jordan are to build up citizens' belief in God, their affiliation to their country and nation, to endow them with human virtues and 'perfection' and to fully develop their personality in its various aspects: physical, mental, spiritual, emotional and social (Abu Sheikha, 1994).

Only about 70 percent of the schools in Jordan are public schools; the other 30 percent are non-public, administered by private sectors such as the United Nations Relief and Works Agency for Palestinian Refugees (UNRWA), the armed forces and other voluntary organisations. All, however, are under the supervision of the Ministry (MoE, 1992).

All schools in Jordan at all levels are required to follow the same curricula, designed and provided by the MoE. The common core curriculum comprises the following subjects: Arabic language, Islamic education, Maths, Sciences, Social education, English language, Pre-vocational education, Physical education, Art and Music. The educational system in Jordan can be considered to lack flexibility in that teachers are not able to employ different types of textbooks depending on issues such as their quality, or suitability for different parts of Jordan, but must use those designed and provided by the MoE. In terms of the present study, this means that textbooks must be able to meet students' health education needs irrespective of their religion, gender, region and traditional background.

According to the Jordanian MoE, democratic education is an urgent necessity for all regions of the country. This is education which is capable of accommodating the needs of all children, at various educational stages, and can support a student in achieving his or her academic and professional objectives in a way that suits his or her abilities and attitudes (MoE, 1993).

There are currently four stages of education (MoE, 1997):

- **Kindergarten or Pre-School Education,** covering a period of two years. Children within the age range 4-6 years may join on a voluntary basis. It is a fee-paying educational phase that is run under the management and supervision of the private sector. This level aims to provide an atmosphere that enables children to develop sound health habits, social relations and positive attitudes towards school. Thus some health education topics must be provided, even at this early stage of education.

Currently (1999-2000), the MoE is implementing a project to support the setting up of kindergartens and all administrative and technical provisions associated with them. The Ministry has opened kindergarten classes in some of its schools in an attempt to integrate these into the structure of formal Basic education (Al-Ra'i Newspaper: Jordan, 2000). This means that basic education will start from age five instead of the current starting age of 6 years.

- **Basic Education** is the foundation stage of education in Jordan. This level involves the first ten classes (ages 6-16 years), and is compulsory and free-of-charge. It aims to achieve the general academic objectives of education and also prepare children in physical, mental, spiritual, emotional and social aspects such as self-awareness. It seeks to enable citizens to live in harmony with their society and, if opportunities permit, to continue into secondary education successfully. This situation recognises the importance health education topics and the need to provide students with health knowledge before they leave school.

- **Secondary Education** is the link between basic and higher education and is not compulsory. It is a more specialised education that involves two years of study for students within the age range 16-18 years. Secondary education has two basic streams: an 'academic' one which covers various academic and professional fields, and an applied or 'vocational' one which is based on preparation and training to provide skilled labour for employment. Students are assigned to one of these two streams in a way that suits their abilities and the current and potential needs of

Jordanian society and the employment market. There is a decreased provision of health education at each educational stage, which reflects the transfer of health education responsibility from the schools to the students themselves.

- **Higher Education** is the final stage of formal education and is overseen by the Higher Education Council. Enrolment to this stage is based on results in the General Secondary Education Examination (GSEE) taken at age 18 and is within two streams. Colleges and other educational institutions offer 2-3 year degree and diploma courses in subjects such as education, nursing and industry. Universities offer full-time first degrees courses that usually require four years of study. Post-graduate Diplomas and Master's programmes are also available in most disciplines. Doctoral programmes are available in two universities out of the seventeen in Jordan, but only in a limited number of disciplines such as Arabic language and History (Masri and Bermamet, 1994; MoE, 1988), although new Doctoral programmes in areas of education such as management in education and philosophy of education are being introduced.

There are no courses at this level of education dealing with health education topics unless they are a specific part of the academic course. An analysis of pre-service teacher education programmes in Jordan has indicated that there is no input on health education. An important consequence of this is that student teachers receiving training in the universities will not develop any personal health education knowledge. Subsequently their ability to deliver this subject may be compromised.

1.5 Issues Affecting the Jordanian Educational System

Although education in Jordan has made good progress over the last few decades, it still suffers from various internal and external influences which reflect negatively on the quality and the variety of education. Some key aspects of these influences, particularly those relating to health education are discussed below:

(i) The continual waves of refugees entering Jordan from the various wars and regional conflicts in the Middle East are a major recurrent problem. At the outset of the Gulf crisis, for example, the educational system was under pressure to serve no less than 70,000 additional students (Lorfing and Govenda, 1994). Furthermore, a high proportion of Jordanian national wealth has become committed to the preparation of the armed forces in order to maintain national security, instead of spending on education, health services and social welfare (Shuna, 1993).

(ii) The Jordanian economy is still poor and suffers from external political and economical factors. To manage this problem Jordan tends to adopt policies in accordance with the World Bank and the International Monetary Fund directives regarding privatisation. This has led to a further decrease in spending on the social services such as health, resulting in the need for payment for some services which in the past were provided free. Cost and availability of many foodstuffs has been adversely affected. This affects the poorer sectors of the population, and requires the system to provide education about food and nutrition. The lack of food and nutrition may decrease a child's physiological and mental development and cause a reduction of his or her learning abilities.

(iii) The high rate of population growth referred to at the start of this chapter places a strain on government capacity to provide high quality health services, and limits the availability of suitable housing. So it is essential that the educational system in Jordan is closely concerned with family life, family planning and healthy living. For example, the level of education of mothers determines whether or they not use antenatal clinics. Surveys in Jordan indicate that 65 % of uneducated women use this service, whereas this percentage increases to 75 % among women who finished basic education, and rose to 93 % among those who finished higher education (Shuna, 1993).

(iv) The continual and rapid changes in the Jordanian government, including the Ministers of Education (Jordan witnessed 85 government changes from 1921-2000), gives little opportunity for Ministers to implement their educational policies and plans. This reflects negatively on the quality of education and on the development of the educational system.

(v) Jordan has many local industries, such as phosphate mining, potash and cement production, petroleum refining, and some natural gas generation. These industries can cause pollution which affects the fertility of the soil, and the purity of water and air. The disposal of household refuse and waste adds to the problem (MoE, 1991). So education must include care and maintenance of the environment, and awareness of pollution and its effects on health in order for students to take a positive role in transferring proper health messages to their families and neighborhoods.

(vi) The Jordanian people currently suffer from health problems such as smoking and drug misuse and social problems such as robbery and other crimes (MoE, 1991). Some of these problems have not been apparent in the past and may have arisen because of the increase in the number of refugees from different cultures together with local socio-economic factors. So the educational system is being charged with the reduction of these bad habits in order to address the behaviour of school children (MoE, 1998). The educational system therefore is required to rework the 'value system' and attitudes of students towards these issues.

Therefore, it is clear that, in order to respond to current and future development needs, the education system must introduce health education and related topics throughout basic education as a national priority (Lorfing and Govenda, 1994), and must develop practical strategies to do so.

1.6 Educational Policy in Jordan

Educational policy in Jordan has developed through various stages and under the influence of many economic, political, social, and environmental factors. In its early phase, this policy sought to provide opportunities for education for all citizens in all locations. Later policies tended to emphasise quality in education in order to meet society's needs and developmental aspirations.

Educational policy is integrated within other national policies within a framework of participation, guidance and responsibility. While the political leadership is keen on exercising methods of dialogue and participation in policy development and decision

making, it also seeks direct accountability for the various parts of its operations. However, it is committed to the provision of material and moral support for the process of implementation of educational initiatives (Bani Khalaf, 1995).

Throughout the fifties and sixties, policies concentrated on expanding education and making it both compulsory and free. Understandably education was rather quantity orientated at the time. During the seventies, policy moved towards diversifying opportunities for education by supporting vocational education at secondary school level. In the eighties and after, policies were characterised by a focus on quality in education in an attempt to make it appropriate to the needs of society and national development. These educational policies were forward-looking and influenced by a vision of the nature of education in Jordan in the twenty-first century (Bani Khalaf, 1995).

At the symposium on education held in Amman in November 1992, Al-Khateeb presented a paper with suggestions and visions for future policies in Jordan. The following are the most significant of these suggestions:

- relating educational plans, policies, and objectives to the needs of national development.
- adopting the principle of flexibility in school plans and curriculum.
- supporting strategies for continuous modernisation.
- obtaining a balance between theoretical and applied aspects.
- supporting the status of the teaching profession by emphasising the continuous development of teachers.

- developing a quality system of teacher evaluation.

At the same symposium, Al-Sheik (1992) presented a paper in which he discussed some of the factors that should be taken into account when developing any model for future education in Jordan. These factors included:

- democratic transition.
- relationships between national and Pan-Arab values.
- openness of information.
- the need to address the disintegration of national culture.
- the information revolution.
- the ethics of work.
- the role of the young generation.
- poverty and unemployment.

Some of these factors have implications for health education.

1.7 Educational Policy Regarding Health Education

The basic education system is the essential foundation for any education in Jordan. An effective education system will provide for the health of children and lay foundations for their future health and that of their families. Believing in the importance of the role played by health education in the life of children, and as an insurance of future growth, Jordan has expressed, through its political leaders, a determination to enhance concepts of health among school students (MoE, 1991). This is intended to encourage children to keep themselves in good health, take necessary measures to avoid the occurrence of

sickness in their families and communities, and be able to deal with illness which they themselves can treat, and recognise the existence of cases that require professional help. They should also be able to communicate health information to those who lack it and provide health assistance to those who need it, and maintain and improve the environment around them. This corresponds with the child-to-child approach which is used in promoting health knowledge in different societies especially poor ones (Pridmore, 1996).

There are some examples in Jordan of the positive outcomes of health education such as the practice of a healthy life style by some students, for example by criticism of their 'smoker' parents. The health policy in Jordan emphasises the need for individuals to take responsibility for their own health care rather than waiting to receive health care from others (Hues and Skotshmer, 1993). Education policy must therefore offer health education to students in the basic stage, through an integrated curriculum which links scientific and health concepts and emphasises the understanding of health problems through the knowledge provided.

Educational policy seeks to plan the future curriculum to correspond with the direction taken by other countries towards providing health education that enables students to acquire health education information related to theoretical concepts such as the human body and its health (MoE, 1991). This should enable students to apply the knowledge associated with these concepts in an integrated manner in order for them to manage problems that they encounter in their lives and help them to acquire behaviour and attitudes which result in desirable health and social outcomes.

Health education was first emphasised in the First National Conference on Education Development held in Amman in 1987 (MoE, 1988). This stressed the role of the school in guiding students toward appropriate health behaviour. Schools were told to introduce information about the basic health services together with an understanding of the individuals' responsibility for preventive and remedial aspects of health. They should provide health information programmes, using leaflets, brochures and propaganda health education films. In addition, topics concerning public health should be introduced, to enhance the needs of the present generation in developing sound health trends (MoE, 1988). This is emphasised in the special report (MoE, 1988) concerning the expected performance in future curricula and syllabuses, which proposes the introduction of population growth concepts, and environmental and health education in basic stage schooling. In 1994 a series of guides to health education for grades one to six was produced in co-operation with UNICEF (MoE, 1994). The view for the future of basic education was the delivery of health education within other syllabuses such as religious education, social education and languages (MoE, 1994).

As discussed above, since the 1980s, Jordan has experienced a movement towards improving the curricula for the different teaching stages, but particularly the basic stage, ages 6 to 16. This is the age range that has the ability to generalise and internalise health awareness as a way of life (Bani Khalaf, 1994). This stage also contributes significantly to the formation of the personality of the student, and the acquisition of sound ways of thinking and emotional health, the ability to take leadership roles in daily life, and contribute to solving health problems. Thus this stage must reinforce values and develop

students' concepts of scientific and health perspectives (Bani Khalaf, 1994). By increasing the student's knowledge, he or she can be encouraged to develop behaviour, habits, attitudes and knowledge that lead to the prevention of disease, and to the building of general health through a balanced diet and healthy life style (MoE, 1991). By the end of the basic stage, attitudes, tendencies, thoughts and scientific perceptions should be so developed that the student becomes more self-reliant and socially adept (Rash and Pigg, 1979).

Since the beginning of the 1990s, the science curriculum in the basic stage in Jordan has undergone many changes, including content and teaching methods and the introduction of health education to the curriculum (MoE, 1994), making health education and science two closely related subjects. Thus the science curriculum has become the main 'carrier' discipline for health education in Jordan, and one of its 'promoter' subjects (Hues and Skotshmer, 1993).

Health education is considered the 'functional face' of the science curriculum because it can contribute to appropriate health awareness among students. It can help them accept the changes associated with adolescence, as well as preparing them for married life, childbirth and baby care. Also, it can increase the awareness of new health concepts, such as the pre-marriage medical test (Al-Qudah, 1998). It can promote aspects of health such as diet, exercise, sleep, hygiene, mental health and sex to avoid disease (Harrison and Edwards, 1994). In addition, it is appropriate for the curriculum to spread awareness about bad practices and behaviour that may, in addition to their health implications, contradict the religion, laws, and habits of Jordanian society. Such awareness includes

prohibitions on pre-marital sexual relations by encouraging ethical practices relating to themselves and others (Al-Haithemi, 1983). Finally, health education can enable students to give advice in the health area, and play their role in the domains of safety and first aid. In short, across a wide range of outcomes the information, attitudinal and behavioural aspects of health education need to be closely integrated into the science curriculum.

Research into health education in Jordan may be considered as a new area of interest especially when we realise that this discipline has only recently been introduced into science curriculum of Basic Education stage. Reviewing the educational literature on this subject reveals that health education has not received sufficient attention in Jordan; there are few studies on this subject. Due to this shortage of information, an extensive study must be conducted to identify the reality of delivery of health education by basic stage science teachers in Jordan. This is especially true because most research on this subject has involved foreign studies carried out in societies with different educational philosophies, financial capacities and cultural and social structures.

1.8 Rationale of the Study

(i) As a teacher and then teacher trainer for pupils of grades seven to ten in the Jordanian basic schools, the researcher has become increasingly concerned that, in spite of the importance placed on health education by the MoE, the science syllabus of grades seven to ten (ages 13-16) ignores important areas of health education such as drug abuse and does not include moral issues and the effects of various practices on the individual and the community. This is of great concern, especially in this age range (13-16 years) which

is generally considered to be the beginning of adolescence. In spite of the deficiencies of the syllabus and accompanying textbooks, the specialists in science education emphasise that the science teacher can substitute any materials to make-up for deficiencies in curricula and textbooks. However this substitution can only be achieved if the science teacher has a good knowledge of the health topics that should be provided, and does not feel inhibited (on social, religious or gender grounds) from presenting this information and translating it into a real situation or practical behaviour (Zaiton, 1994).

(ii) The integration of health education within the science curriculum, if done well, can result in many positive outcomes. Teaching science and scientific thinking can lead among other outcomes, to an emphasis on the importance of health. In turn, health education can contribute to scientific thinking through the development of problem-solving skills arising from health issues. However, health education is more associated with attitudinal and behaviour change than it is associated with the cognitive side of academic achievement. It is also associated with social, cultural and political values, which must be inculcated in the student in his or her early stages of education, in a practical rather than an academic way. The need for these differing approaches may result in uncertainties over the most appropriate teaching and learning methods to employ, as the delivery of information and development of practical laboratory skills associated with the science curriculum may not be the most appropriate for inculcating health attitudes and values.

(iii) There is little time for health education in the already crowded science curriculum. Also there is a lack of teachers, qualified either by in-service training courses or

academic specialisation, to teach health education. The teaching is usually undertaken by science teachers, but teachers of other subjects such as religious education, physical education and vocational education may be involved. Invited speakers rarely contribute.

(iv) From the researcher's experience in Jordanian basic schools, students of grades seven to ten who have undertaken the new integrated curriculum still complain of health 'illiteracy', and their ignorance of the subject makes them unable to deal with their individual and community problems. This leads inevitably to poor health practices. The spreading of disease and decreasing standards of health cannot all result from inadequacies in the level of health services, but may be related to ignorance of the right preventive behaviour and limited awareness of responsibility for the health of others (Tantawi, 1989). These issues are a serious consideration, if children are not prepared to undertake their roles and responsibilities as future fathers and mothers.

(v) The Jordanian leadership has showed concern of the many problems relating to health practices and standards (MoE, 1988), and from the researcher's experience, there are increasing complaints from many people across society about the general behaviour of students, especially students of ages 13 to 16. However, this is mostly discussed privately. There is general reluctance to address some issues, especially regarding sex and problems such as child abuse, because it may cause shame, isolation, or even suicide to the person concerned or to his or her family, especially in an Islamic society. There are many cases documented in the departments such as Centres of Health and Police, which identify the existence of health and sex problems. In general family life, due to the large size of Arab families, and Jordanian families especially, it is rare to

separate male and female children in their beds. This is mainly a result of economic factors, so this situation will increase the possibility of abuse between brothers and sisters, in addition to increasing the possibility of infection or the spreading of disease. Poor communication between parents and their children as in other countries and the inability to controlling adolescents' behaviour, may mean that adolescent students go to other sources to find out about health (Rash and Pigg, 1979; Hendry, Shucksmith and Philip, 1995). These sources may be inaccurate, and confuse their thinking, or may provide them with information unsuitable for their stage of development. Therefore it is vital that the basic education stage provides children with timely, accurate information that is suitable for their age and stage of development.

In general, the success of the delivery of health education depends upon the provision of necessary facilities and qualified teachers. It also depends on appropriate teaching styles being used by those involved in its implementation. Therefore, the investigation of the actual delivery of different aspects of the health education programme by science teachers will be a central part of this research. If the delivery and practices of the science teachers are not compatible with the expectations of the policy makers and the declared objectives of health education, then there will not be effective health practices by young people.

1.9 Aims of the Study and Research Questions

It is clear, through reviewing literature related to this study that while there is a mass of literature on health education in the west, research on this subject has not received adequate attention in Jordan. Accordingly, the general aims are presented below:

(i) To explore the official policy on health education in Jordan as indicated in the official policy and curriculum documents provided for science teachers.

(ii) To analyse the content and nature of health education topics delivered by science teachers in the upper basic education stage in Jordan.

(iii) To investigate the teaching methods used by science teachers in the delivery of health education in Jordan. Variables to be considered in the study include: gender of the teacher, region of the country, the science subject being studied, the teachers' qualifications in science, and in education and their teaching experience.

These general aims will guide the researcher and direct the research from literature review into analysis and discussion and conclude with recommendations. The first aim will be covered mainly by documentary analysis, the second mainly by the use of questionnaires and the third mainly by interviews. The overall findings from these three research methods will be summarised, analysed and discussed, and will conclude with recommendations for the future of health education within Jordan.

To fulfil the aims of the study, and to determine the most important knowledge and practices related to the promotion of health, and to ensure that students are make aware of these, the research will answer the following questions:

- What aspects of health education are reflected by educational policy within official Jordanian policy documents?

- What is the reality of the delivery of health education by upper basic stage science teachers in Jordan?

- What teaching methods are usually used by science teachers in the delivery of health education?

- What teaching methods may have a stronger influence on changing students' health behaviour?

- What percentage of time does the science teacher spend on health education compared to the total number of science lessons?

- What problems, if any, face science teachers in the delivery of health education

- Does the delivery of health education differ according to the teacher's gender, the region of the country in which he or she teaches, or the interaction between these two variables?

- Does the delivery of health education differ according to the qualifications in science, the teaching experience of the teacher, or the interaction between these two variables?

- Does the delivery of health education differ according to the qualifications in education, the science subject taught, or the interaction between these two variables?

1.10 Significance of the Study

Health education means different things to different people (Department of Education and Science, 1977; Sutherland, 1979). This will be explored more fully in the next chapter. However, the importance of health education lies in its effects on daily life more than on achievement in the classroom. The significance of this study therefore reflects the importance of health education in providing guidance from childhood into adulthood and old age. It not limited to presenting health information and awareness for children themselves, but encourages them to take a role in spreading health messages among their families and in society more widely. Responsibility for achieving this is shared between policy makers, persons who prepare and organise health programmes, writers of relevant materials, trainers of teachers in the health and science fields, and workers with children and their families within and outside school (Hues and Skotshmer, 1993).

This study will assist curriculum planners to develop appropriate materials for the classroom and help them to identify factors that may hinder the effective implementation of the science and health education curriculum. It will help to determine suitable criteria for the development of textbooks and may also enable curriculum planners to identify strategies to encourage students to apply their learning in practice. Self-evidently, unless we are prepared to analyse seriously the various health education topics and outcomes, and also to consider the experiences of science teachers involved

in the implementation of the teaching, it will not be possible to meet the aims of the MoE with regard to the improvement of the nation's health.

Since the ultimate aim of most research is to contribute to knowledge and to development and improvement, the overall results from the study are expected to contribute to the understanding of the performance of science teachers in Jordan by providing analyses of their strengths and weaknesses in delivery of health education topics. Thus, the main importance of this research is related to its ability to provide the decision makers at the MoE with information on aspects of health education that require improvement and which need to be supported.

There are several other reasons why this research is particularly significant. Much educational research focuses on change, but from the perspective of planners and managers, rather than from the perspective of the teacher who has to deliver and handle change. The MoE has relatively recently embarked on major changes to the science curriculum, which makes this an opportune moment for this study, particularly as there has been a lack of research into the delivery and practice of health education in Jordan in the past.

1.11 Summary

The present research seeks to study, investigate and analyse the delivery of health education in Jordan as laid down by the Ministry of Education according to official guidelines and the curriculum. These locate health education specifically within science education, although it is recognised that other subjects such as Islamic Education and

social studies can and do contribute to some aspects. Through reviewing literature, it is clear that the educational systems of different countries do indeed locate health education in different parts of the curriculum. This will be considered in Chapter three. Locating health education specifically within science education provides the only realistic context within which to undertake the study. In other words, it is not necessarily the case that this study will adopt the approach of the Ministry of Education that health education should build on the basis of science education. The important factor which will determine whether to accept or not accept this approach will be the research findings based on the analysis of the reality of health education delivery by science teachers, and the problems, if any, that face teachers in delivery of health education in this way. Much educational development focuses on change, but from the perspective of policy-makers, planners and managers, rather than from the perspective of the teacher who has to deliver the changes. Teachers might consider that the most appropriate way to influence students' health behaviour is to deliver health education within science education, or as a cross-curricular theme or as a separate subject. Where health education should be located within the school curriculum in Jordan will be considered during this study.

Chapter Two: Concepts of Health Education

2.1 Introduction

This chapter explores the philosophy of health and the definitions which reflect the nature of health education. It identifies various theoretical and practical models for delivering health education and discusses the relationship between health education and health promotion. It explores potential discrepancies between policy-makers and teachers who are implementing health education content. It also identifies the possible tensions with social, cultural, and religious norms in countries such as Jordan regarding health education topics, especially sex education issues.

2.2 Philosophy of Health Education

The philosophy of the individual is the foundation of all human behaviour. The term philosophy has many meanings, but the simplest one is that: "one's philosophy is what one believes" (Rash and Pigg, 1979, p. 17). In this respect there may be a significant divergence between what one knows and what one believes. Since the earliest recorded efforts to influence health behaviour through education, in early Biblical times, health education has meant different things to different people. Health education has become a commonly used term in international, governmental and non-governmental documents, on television and radio, and in the press. Many see health education as a way of solving a number of the problems from which society suffers. It is seen by a small minority of the young as a way of "fitting idealism to a useful purpose" (Sutherland, 1979, p. 3).

The practical way to understand and to deal with the nature of term 'health education' depends on the context in which it is set (Baelz, 1979). In matters of health education the context varies significantly. It may be broad or narrow. It may be, on the one hand, the treatment and prevention of illness and on the other, a general health context. Such contexts include physical illness, mental illness, psychological illness, physical fitness, mental health, psychological health. Health education considerations may also merge with ethical and political considerations. Moral, cultural, environmental, legal, political and social contexts may also need to be considered. This means that the context may extend from the molecule to cell to organ to body, to the whole person, to the family, to the community, to society, to the nation, and so to a world context, including beliefs, attitudes and values.

Once health education is set in the context of human values, the understanding of the nature of health education is inevitably affected. It will no longer be enough to transmit information about the harmful consequences of doing this or failing to do that. Warnings of what may happen in the future have only limited effect; knowledge is not the same as wisdom, therefore, health education must include more than instruction in hygiene and the rules of self-preservation. It must concern itself with values and attitudes, with self-understanding and commitment (Baelz, 1979).

When health is considered as a human value, wisdom and authority are widely diffused. Authority cannot be imposed; it has to be acknowledged. It relates to respect for the individual and his or her freedom. Within this context, the process of growth from dependence through independence to a freedom-in-dependence should be considered.

Influencing one another's beliefs and attitudes is considered an aspect of education. This could happen within the family, the school or within the community. The examples of parents, teachers and peers play an important part in educating the child (Baelz, 1979). Furthermore, the educator often becomes the learner. The process of teaching works in both directions in effective learning situations. Thus in the context of human values, health education is never simply the imparting of information by the one who knows to the one who does not know. It is a communication of insights, a shared exploration, where the context of personal relationships is highly important.

In the context of human values health has a community basis. 'Look after yourself' may be good advice and a useful slogan to publicise the importance of health education, but "children learn what they live" (Baelz, 1979, p. 34). Responsibility for the health of the community must be accepted by the community as a whole. "In a truly healthy society, each man would see himself as partly responsible for the whole of it, rather than wholly responsible for a part of it" (Mathers, 1976, p. 18). If health is a human value, then every member of the human community has a right to participate in it and a duty to contribute to it.

Regarding the philosophy of health education relating to schools, Williams and Aspin (1981) said that the basic philosophy of health education comprises of three questions: "what is it? why do it? and on what basis do we set about it?" (p. 41); in other words definition, epistemology and ethics. They noted that although one might expect non-health specialists to lack understanding of this subject, it appears that there is not even consensus about the definition of the subject among health educators themselves.

Definitions which are offered in an attempt to obtain conceptual clarity are of various kinds, all of which are, philosophically speaking, open to severe criticism. Definitions of health education are explored further in the next section.

As for the epistemology of health education, Williams and Aspin (1981) discuss the nature and the scope of those forms of thought and awareness that give health education its identity and purpose. In their view, health education should be oriented towards the production of practical policies that set out to give practical answers to questions such as:

- What sort of behaviour enhances or diminishes health?
- What sort of knowledge do people need in order to be able to make rational decisions about their own health behaviour?
- How relevant are the existing educational methods which are used in order to help people to make rational decisions concerning their health?
- What sort of factors need to be taken into consideration when planning a health education curriculum?
- What will constitute a successful outcome to such a curriculum, and by what means is success to be evaluated?

These, and other similar questions, may inform the curriculum for health education.

As for ethics, Williams and Aspin (1981) state that one of the most compelling moral problems in the field of health education is that of intervention, and its justification. The question is whether, as a matter of policy, health educators ought to attempt to influence or alter attitudes and health behaviour, rather than allowing people to make their own

choices and cope with the outcomes in their own way. It might be claimed that such interference takes away a person's autonomy, and influences the person to follow the health educator's 'preferred lifestyle' rather than his or her own.

One particular difficulty involves asking what particular strategies of intervention ought to adopted. Here there will be a number of different views and variety of practices among health educators. Such divergence of views rests not only upon the individual health educator's beliefs about what constitutes a moral way of dealing with health education issues, but also, in turn, upon the metaphysical basis of such moral views, namely the whole range of individual beliefs about the nature of mankind and of his relationship to his fellows (Williams and Aspin, 1981).

2.3 Definitions of Health Education

Over the years, many researchers and professionals working in the area of health education have attempted to define the term (Wilson, 1992). That is because the term 'health education' has undergone evolutionary development, and since it became in common use it has been open to various interpretations (Health Education Council, 1976; Hughf, 1994). There are many definitions, some are clearer and more useful than others. Three very general definitions are given below:

> "In the broadest interpretation, health education concerns all those experiences of a individual, group, or community that influence beliefs, attitudes and behaviour with respect to health, as well as the processes and efforts of producing change when this is necessary for optimal health"(Health Education Council, 1976, p. 1).

> "In the widest sense, Health Education may be defined as the sum total of all influences that collectively determine knowledge, belief and behaviour related to the promotion, maintenance and restoration of health in individuals and communities. These

> influences comprise formal and informal education in the family, in the school and in society at large, as well as in the special context of health service activity" (Smith, 1979, p. 93).

As long ago as the 1950s, the World Health Organisation (WHO), in their report on health education, stated:

> "Health Education, like general education, is concerned with change in the knowledge, feeling and behaviour of people. In its most usual form it concentrates on delivering such health practices as are believed to bring about the best possible state of well-being. In order to be effective, its planning methods and procedures must take into consideration both the processes by which people acquire knowledge, change their feeling and modify their behaviour and the factors that influence such changes" (WHO, 1954, p. 1).

This definition implies that health education has knowledge, attitude and behavioural components and appeared to be ahead of its time, since health education in the 1950s and 1960s was not so wide-ranging, tending to concentrate on medical aspects of health and disease.

There is no definition which is 'ideal' to use in defining the term (Habboosh, 1982). However, there are some examples of definitions which attempt to address the issue of curriculum content and delivery. Generally speaking there appears to be some consensus among writers in the field with regard to the content of health education, but there are differing views about methods (Middleton, 1987). Pring (1985) suggested that a curriculum in health education:

> "might cover such diverse skills, habits, bits of knowledge, attitudes and behaviours as 'living and working together amicably'. 'self-esteem and self-confidence', 'social competence' and even 'appropriate attitude toward sex, parenthood, smoking, drink and exercise" (Pring , 1985, p. 187)

Hopson and Scally (1981) stated that health education methods in school:

> "should be expressive rather than instructive, stimulating not boring; peaceful not aggressive; concentrating on strengths not weaknesses; fun not dour; uplifting not depressing; communal not solitary; about self-discipline not punishment; about ideas not rituals; creative not conformist; focused on achievement not intentions" (Hopson and Scally, 1981, p. 18)

These teaching methods highlight the need for a shift from traditional methods such as lectures and other tutor-led activities to more practical student-centred ones.

Within the school environment, there are two broad classifications of health education (Rash and Pigg, 1979). Indirect health education, which is sometimes known as incidental or concomitant, is generated from everyday experiences: it is acquired by being accustomed to clean and healthy surroundings and feeling uncomfortable when they are not hygienic and healthy. Direct health education or health instruction consists of learning experiences within or outside the classroom for the express purpose of influencing knowledge, attitudes and practices that will make possible the intelligent self-direction of health behaviour. Health instruction may be provided effectively in health education courses, or lessons in other subjects by showing the relationship of a health problem to the subject being studied. In the latter situation, one could argue that every teacher is to some extent a health education teacher and should make use of opportunities to develop understanding in these areas (Rash and Pigg, 1979).

According to Tones and Tilford (1994, p. 11), direct health education is:

> "any intentional activity which is designed to achieve health or illness related learning".

Many of the definitions discussed in this section are too wide for the purposes of this study (e.g Health Education Council, 1976; Smith, 1979). The definition that is most applicable for current purposes is that of Tones and Tilford (1994). So, the term 'health education' in this study means all the 'intentional' aspects of health education which are delivered within the science curriculum of the 7th to 10th grades in the Jordanian education system.

However, Pring's (1985) suggested health education curriculum, mentioned above, is broader than that currently offered in Jordan, and will be kept under consideration in this study.

2.4 Models of Health Education

The literature emphasises that health education programmes which concentrate on improving the level of health information are unlikely to be effective; they will not alone lead to changes in individual behaviour or to an increase in the level of health awareness. A number of different models of health education exist, each with a different approach. The nature of these models serve to provide key pointers about the optimal conditions in which to assist people in making reasonable choices about their own health. On the other hand, use of some of these models by health educators may explain some of the dissonance between knowledge and action in the delivery of health education. The fact that a range of models exists reveals the controversial issues and the conflicting theoretical perspectives which result from the wide variety of understanding of health education. Some of these models are discussed briefly below:

- **Knowledge - Attitudes - Behaviour Model**: This model can be summarised as giving specific information about an identified health topic with the intention that this information will lead to forming attitudes (positive or negative) toward this topic, and these attitudes will lead to changes in behaviour. According to Hendry et al (1995), this model results in the failure of most health education projects which are based upon it because 'delivered' information may not be received.

- **The Health Belief Model:** This model concentrates on the absence of disease rather than operating from a perspective of general well-being. It looks at disease prevention rather than taking an overall positive health promotion perspective (Ghazizadeh, 1992; Pridmore, 1996). Supporters of this model (Becker, 1984; Tones, Tilford and Robinson, 1990) argue that it could be a successful model if the 'belief' elements are present, such that the person recognises himself or herself to be susceptible to disease or illness; the person believes the disease or illness is serious; the person believes the proposed healthy choice will be successful; and the person believes that the benefits of treatment or action will outweigh the cost.

- **The Health Action Model**: This model examines the interaction of the factors that influence the balance between the conscious desire for change and the unconscious desire to avoid change. These factors are: cognitive factors (knowledge, skills and beliefs, beliefs about how we feel about ourselves), motivating factors (values, attitudes and drives), and the influence of the social norms of the community (Hendry et al, 1995). Supporters of this model have argued that schools have neglected the metacognitive skills of decision-making and critical thinking (Baron

and Brown, 1991). They believe that young people need to be encouraged to understand cause, effect and consequences and to be helped to understand the strategies that lead to effective decision-making not only in the cognitive domain but in the social context too. This highlights the complexity of attitudes and values which interact to determine whether or not the individual will be favourably disposed toward making the change. Values are acquired through socialisation, so someone who happens to be a smoker may desire to make a healthy choice to live in a smoke-free environment.

In organising teaching and learning in health education there are further 'models' to be considered. These models are discussed below:

- **The Information Giving Model**: This model is usually used in formal education settings, focusing on the need for the individual to change rather than society. According to this model, the educator's role is that of passing on of information to a rational audience who will then internalise the messages and act accordingly (Bamborough, 1984;Tones et al, 1990). It has similarities with the Knowledge - Attitudes - Behaviour model discussed above. Concerns about the effectiveness of this approach appear in relation to smoking education, alcohol education and most of all, in education related to Aids (Bloomer, 1988). A number of surveys on the knowledge, beliefs and understanding of young people in relation to Aids have clearly identified that acquisition of knowledge is only one of a range of factors which will affect future behaviour. Programmes based on this model may have counter-productive effects in stimulating interest rather than discouraging use,

especially of alcohol and drugs (Hendry et al, 1995).

- **The Self-Empowerment or Person-Centred Approach**: This model recognises that beliefs and experiences play an important part in how people understand and make sense of the processes of health. It assumes that through building up self-esteem and confidence, individuals will be in a better position to make positive decisions about their health and to develop the skills to act on these (Turner, 1992). Some people argue that teaching using this model is like teaching better swimming skills, where the "essential problem further upstream" remains unchallenged (Hendry et al, 1995).

- **The Community Development Approach**: This approach falls under the umbrella of 'health promotion' which is a wider concept that includes health education. It explicitly recognises that social, political and economic factors are very important in health education (Garrard, 1986). Supporters of this approach argue that health education is a political issue (Garrard, 1986; Hendry et al, 1995). They state that health issues are related to the policies of governments, because governments control the nature and status of health education and schools are under pressure to implement government policies. Also, inside schools there are many issues related to teachers and students themselves; these issues result in a desire or lack of desire for teaching and learning health education topics. The extent to which certain topics can be discussed based on social, moral and cultural dimensions predominant in their society is also relevant here (Measor, Tilford and Miller, 2000).

Other controversial issues which surround health education, especially sex education, include the age at which it should start, the methodologies to be used, the moral framework within which it should take place, the rights of parents to withdraw their children (again mainly related to sex education) whether classes should be single sex, who should undertake the teaching, the training which teachers should receive and where within the school curriculum it should be taught (Reiss, 1998).

Within these different models and approaches, the school's role in implementing health education within science education becomes more difficult and complex, especially if there is a concentration on the technological aspects. At present in Jordan, health education delivery appears to be based on the Knowledge - Attitudes - Behaviour Model (Hendry et al, 1995) as the health education content of the science curriculum. Yet this is considered to not be most effective approach (Hendry et al, 1995). The Health Belief Model (Ghazizadeh, 1992; Pridmore, 1996) may also be of relevance in less developed areas of the country where basic hygiene and clean water supplies are important issues. However, the Health Action Model, with its emphasis on values and attitude change as well as knowledge and action is likely to be the most effective in the long term (Baron and Brown, 1991). In relation to curriculum delivery, all three models will be considered: 'Self-Empowerment' and 'community development' as well as the 'Information Giving' model currently in use.

2.5 Health Education versus Health Promotion

Until the mid-1980s the term health education was widely used to describe the work of practitioners such as nurses and doctors in promoting health. An awareness that

individuals make health choices which can contribute to the development of disease led to the view that it was possible to inform people about the prevention of disease, to motivate them to change their behaviour through persuasion and mass communication techniques, and to equip them through education with the skills for a healthy lifestyle (Ewles and Simnett, 1992; Naidoo and Wills, 2000).

One of the paradoxes of health education and a prevailing professional dilemma is the degree of voluntarism or free choice. Health education is based on an 'expert authority' model derived from both medicine and education. It is the health educator or doctor who pronounces on the adequacy of an individual's lifestyle, decides if there is a health need and decides on the nature of the intervention and who tries to ensure compliance, and who will decide if the intervention has worked (Naidoo and Wills, 2000).

Thus health education rests on a somewhat uneasy fusion of the disciplines of education and preventive medicine. These, however, have different philosophical bases, and educative goals are not always compatible with the socio-political and behavioural goals of preventive medicine (Garrard, 1986). Preventive medicine has two concerns: public health measures which are achieved mainly through legislative control, and individual behaviour which can be influenced through the various techniques of persuasion and education. For example, in practice, limited legislative controls such as the banning of cigarette smoking in certain public places, restrictions on advertising and severe taxation are used in conjunction with various attempts to influence behaviour at the individual level (Tuckett, 1980). Based on this, health education may be described as:

> "planned opportunities for people to learn about health and make changes in their behaviour. It includes: raising awareness of health issues and factors contributing to ill health, providing information,

> motivating and persuading people to make changes in their lifestyle for their health, and equipping people with the skills and confidence to make those changes." (Naidoo and Wills, 2000 p. 81).

The World Health Organisation has shifted the emphasis away from health education to health promotion, away from prevention of specific disease or the detection of risk groups, towards the health and well-being of the whole population. Instead of experts and professionals diagnosing problems, the people themselves define health issues of relevance to them in their local community. Teachers, primary health-care workers, workplace managers, social and welfare workers can all be involved in promoting health. Instead of health being seen as the responsibility of individuals alone, the social factors determining health are taken into account, and health is viewed as a collective responsibility of society which needs to be prioritised by organisations and government in their decision-making (Naidoo and Wills, 2000).

In other words, the shift in emphasis towards the well-being aspects of health has resulted in a corresponding shift from preventive medicine/illness prevention towards the more comprehensive concept of health promotion. Health promotion aims, not simply to prevent disease, but also to actively foster the positive well-being of people (Petosa, 1984). Its goals include the development of physical, mental, and social well-being. Like illness prevention, health promotion involves intervention at the social and political levels as well as at the individual level. Thus Garrard (1986) defines health promotion as:

> "the sum total of all influences that collectively determine knowledge, belief and behaviour related to the promotion, maintenance and restoration of health in individual and communities." (Garrard, 1986 p. 6).

Because health promotion, through its historical links with preventive medicine, stresses early intervention in order to shape or modify health related behaviour, children and adolescents are seen as appropriate targets for health promotion activities (Harrison, 2000). This has led to the inclusion of health promotion in school health education provision, a move which has not been seen as appropriate by all health educators (Garrard, 1986). Thus health promotion includes public health measures, community health education, and school health education (Naidoo and Wills, 2000).

Although the terms 'health education' and 'health promotion' are frequently used interchangeably (Chambers, 2000), many health education researchers make some distinctions between the mainly educative role of health education and the more behaviourally oriented role of health promotion. These distinctions are reflected in the differing perspectives of health education and health promotion in terms of goals, methods, and evaluation of outcomes (Garrard, 1986). The ultimate aims of health education are argued to be commonly agreed; they are said to be fourfold (Chambers, 2000). These are:

- individual decision making
- the use of appropriate health services
- the development of public health policy
- its implementation.

A key feature which distinguishes health promotion from health education is that health promotion also involves environmental and political actions (Naidoo and Wills, 2000). Whilst health educators may respect cultural norms and take account of the social and

economic constraints which affect people's ability to make health choices, essentially people are helped to make their own informed choice about health behaviour; environmental and political issues are rarely considered (French, 1990).

In practice, health promotion encompasses different political orientations which can be characterised as the individual versus structural approaches (Naidoo and Wills, 2000). However, different viewpoints exist in relation to the scope of health promotion. For some, health promotion is a narrow field of activity which seeks to explain health status by reference to individual lifestyle and is a process largely determined by an expert. In its emphasis on personal responsibility it sees a minimal role for the state and, thus, has come to be associated with a conservative viewpoint. For others, including the World Health Organisation, health promotion recognises that health and wealth are inextricably linked, and seeks to address the root causes of ill health and the problems of inequity by using radical and changing approaches (Naidoo and Wills, 2000).

In many countries health promotion is based on the World Health Organisation's declarations (Poskiparta, Liimatainen and Sjogren, 2000), *The Ottawa Charter 1986* (WHO, 1986) and *The Health For All 2000* (Social and Health Ministry of Finland, 1993). In these declarations the principles, aims and activities of health promotion are emphasised in different ways. *The Ottawa Charter* (1986), describes necessary health activities on five levels: building public health policy, creating supportive environments, strengthening community action, developing peoples' personal skills and reorienting the health care system towards a greater emphasis on health promotion (Bunting, 1997).

The Health For All 2000 (1993) completed *The Ottawa Charter* (1986) by encouraging qualitative approaches to life and health promotion. The goal of the declaration was to minimise the differences in the world population relating to health standards. The main action principles are promoting healthy life habits, minimising health problems and developing appropriate health services. In the universally accepted WHO (1984) definition, health promotion is determined as a process which enables a person to increase and improve control of his or her health (Poskiparta et al, 2000, p. 629).

For the purposes of the current study, and based on the Jordanian context within which health education is delivered, the researcher has adopted the definition of school health *education* that emphases the individual's (pupil's) health (both material and moral) and will consider health *promotion* as an extra educational activity, perhaps using materials provided from outside the school setting (from governmental, non-governmental or voluntarily agencies). As such it will be a supportive agent for the ultimate aim of a school health education that emphasis the population's health as a whole, but will not be considered in detail in this study. This is because, in Jordan, the Ministry of Education has full responsibility for health education aimed at directing students' behaviour and constructing the attitudes and the values system of generations. On the other hand, health promotion should be oriented to all sectors of the population and might be the responsibility of the Ministry of Health. This proposed approach does not ignore or deny the co-operation required between the Ministries of Health and Education in terms of experiences, training and material resources in order to achieve the common goal of a healthy nation.

2.6 Summary

This chapter has presented a discussion on the philosophy of health education, and attempted to synthesise, from the range of definitions and models found in the literature, a working definition that will be used in this study. This is as follows:

Health education is:

> "any intentional activity which is designed to achieve health or illness related learning" (Tones and Tilford, 1994, p. 11).

The nature of health education versus health promotion has also been considered with the decision that this study will focus on health education, as delivered within the formal science curriculum, rather than attempting to encompass the wider dimensions of health promotion.

Using this framework as a basis for further discussion, the next chapter will examine the background relating to the delivery of health education, and will also review how health education is delivered in other countries, with particular reference to the UK.

Chapter Three: Experiences of Health Education

3.1 Introduction

This chapter begins by examining the role of the school in the promotion of good health, especially in less developed countries where it may become the focus of such activities. It then goes on to discuss various international initiatives that have taken place over the past decade which emphasise the rights of children, to in particular, a healthy way of life. These are discussed in the light of the current situation in Jordan.

The delivery of health education in a number of other countries is then examined; although this study is not strictly a comparative one, an evaluation of ideas and initiatives in other countries may enable the researcher to identify good practices which will also be appropriate for the Jordanian setting taking into account differences in culture and religion. The chapter concludes with a summary of the key findings, which will be used to inform the rest of the study.

3.2 Importance of the School in Promoting Good Health

Writers in general tend to use the expression 'school health' to refer to both formal and informal health education within the school. The quality of school health services, the provision of a healthy school environment and a comprehensive school health education policy should help inculcate sound knowledge, realistic beliefs, changes in attitudes and a commitment to safe daily habits (Newman, 1985). A healthy body and mind are essential requirements for optimal school achievement (Creswell and Newman, 1989). In this context, the School Health Department in Jordan has put forward the following objectives: to provide preventive health services by providing

comprehensive routine physical examinations, to promote health awareness among students at all stages, and general school environment improvment (Zeidan, 1992; Hamdi, 1995).

Many studies have shown that investment in the health of school students is fruitful. According to the report of the World Bank titled *Summer Labour: Improving School Performance in the Developing Countries through Better Health and Nutrition* (United Nations Educational, Scientific and Cultural Organisation (UNESCO), 1998), it has been shown that better health leads to an improvement in school attendance and the capacity to learn. As the number of schools is larger than that of medical clinics in Jordan, the school becomes the focus for health promotion activities, as it forms a population which is easy to reach, and grants access to groups such as adolescent girls and poor countrymen who are otherwise difficult to reach. The United Nation Children's Fund (UNICEF) report in 1998 *The Conditions of World Children* also mentions that poor health in children prevents them from going to school, causing poor achievement and withdrawal from school; and that poor nutrition in the longer term can cause health problems related to seeing and hearing (UNESCO, 1998). The experience of the World Food Programme in studies in Jamaica and Peru, shows that providing a light meal which is rich in energy in the morning achieves the best results, as it leads to increased school attendance and improved school marks (UNESCO, 1998).

An earlier study conducted by UNESCO in 1995 (cited in UNESCO, 1998), in the poorest countries in the world, showed that where schools are severely crowded, these

conditions encourage the spread of infectious diseases. As children who are below the age of five years are the target group in vaccination programmes, schools have a role to perform in enhancing the health of their pupils.

Schools with poor sanitation facilities or those which do not have such facilities may endanger children's health and prevent girls from going to school. A study in Vietnam showed that progress in the field of general school health was achieved after implementing a health education policy in elementary schools in 1988 (UNESCO, 1998). One of the main reasons for girls not joining school is the lack of proper hygienic conditions and special bathrooms for the beginning of the monthly period which causes girls to not attend school because of shyness about their condition.

School age involves both childhood diseases and adolescent and adult health issues (Moran, 2000). Students in the basic education stage in Jordan represent an important sector of the community. This sector involves the age of adolescence which, researchers note, does not put priority on health in its culture (Zaki, 1989). The fact is that this critical age category - the sector of young people and adolescents - tends to be neglected in Jordanian society. The adolescent at home tends not find anyone who can understand him or her and the deep changes in his or her personality; nor may he or she feel that the education system understands and develops capabilities, energies and talents. Regarding communication, these young people are lost between the communication media of children, which they feel that they have left behind, and the expectations and the communication media of adults. These media do not often touch their conscience nor help them express their problems, expectations and ambitions (Zaki, 1989).

The increased occurrence of sexually transmitted diseases suggests that many schools hesitate to tackle these issues. According to the United Nations Programme on AIDS (UNAIDS), it is expected that 40 million people will be infected by AIDS (by 2000) if the current pattern continues (UNESCO, 1998). The increase of the sexual activity of adolescents is an established fact which raises ethical problems (UNESCO, 1998). Even in countries such as Jordan where reproduction education and sexual health issues are the subject of much debate, experience shows that it is possible to introduce these issues into lessons about family planning, respect for others, self-respect, attitudes towards women, and the ability to withstand peer group pressure (UNESCO, 1998).

The major health problem that faces schools is tobacco, the 'Real Killer', (UNESCO, 1998). It is a major cause of sickness and death, and yet can be avoided. Estimates are that 300 million of today's children and adolescents will be die in adulthood due to causes related to smoking tobacco, if the present trends continue. These trends show an early usage of tobacco among young males and females and an increasing consumption in the developing countries. The World Health Organisation (WHO) expects that tobacco will kill more people in these countries within 30 years than those who will be killed by AIDS, tuberculosis and birth complications together (UNESCO, 1998).

3.3 Health Education in the Arab World

In Jordan, basic education (ages 6 - 16) is considered as the most important stage of the educational system in building future Jordanian society. Education provides society with most of its thinking and creativity energy, supplies it with appropriate manual workers and develops effective members in social, cultural and health terms (Bani

Khalaf, 1994).

Interest in basic education goes back to cultural fundamentals, seeking, through young people, to build generations with good mental and physical health, who follow healthy behaviour regarding themselves, their society and their environment (Bani Khalaf, 1994). Education seeks to build a generation of 'antibodies', which can generate, create, build and implant into the blood of the society, generation after generation, until it achieves immunity and strength against all social and behavioural illnesses (Zaki, 1989).

Therefore, many nations have learned to make serious efforts to ensure that children start their lives in a strong and healthy manner, in order to lay the foundations for future prosperity, fewer social illnesses and greater opportunity for the citizens of the world to lead an enjoyable life (UNESCO, 1997). Due to the importance of the role played by basic education in the lives of children, and its contribution to the achievement of social goals (human rights, peace, protection of environment, health improvements and proverty fighting), basic education has attracted the interest of the whole world (UNESCO, 1997).

An *International Conference on Childhood* was held in New York in 1990, in which the representatives of 159 countries met to discuss childhood problems and suggest suitable solutions. The holding of this international conference which specialised in childhood affairs, is a testament to the priority which childhood issues occupy. The outcome of this conference was agreement on comprehensive proposals to minimise poor nutrition

and communicable diseases, to eradicating some diseases completely and to providing clean, potable water (Al-Sarayreh, Al-Qadri, Al-Batayneh, Shalabieh and Al-Shrideh, 1995).

Activities from Child to Child (Hawes, Nicholson and Bonati, 1994) was prepared as a documental series within UNESCO's childhood programme. These activities were produced as a result of co-operation between international education and health experts and are related to learning science and technology. This co-operation is intended to help in developing science education as a common activity which links science to health education, taking into account local conditions. The approaches avocated, to use children as a source of health information for their families and neighbourhood, has been tested in the field for ten years. They are now used in more than 70 countries. As the documents were translated, their contents were adapted to suit the national character of each country. *The Arab Resources Workshop* for health care and society development took the initiative in preparing and adapting its basic resources in Arabic and began to hold training workshops on implementing these activities. This programme is currently used in different forms in several Arab countries including Jordan (Hawes et al, 1994).

In addition, many international agencies have developed material and moral incentives to support and encourage co-operation in order to increase levels of health. The United Nation Children's Fund (UNICEF) in co-operation with the World Health Organisation (WHO), and the United Nations Educational, Scientific and Cultural Organisation (UNESCO) were the first supporters and advocators of this practical orientation. These organisations compiled knowledge and information related to the health of the mother

and the child and put them in the form of a booklet entitled *Facts for Life*, which is published and circulated widely around the world (Al-Sarayreh et al, 1995). However, these alliances were not restricted to international organisations and establishments, but involved various sectors, individuals and groups. In Jordan, such alliances in their various shapes were established between educators, teachers and universities, between social and professional organisations, clubs and labour Unions, and with the information sector. This collaborative approach, particularly between educators and health professionals, has great potential.

The *Seventeenth Conference of Arab Children* was held in Amman in 1997 with the aim of showing the reality of the Arab child and to shed light on the efforts exerted to protect children by promoting childhood services in the Arab World. This conference, which was monitored by the Noor Al-Hussein Establishment in Jordan, confirmed the importance of providing free health insurance for all children and free vaccination for children in poor countries, in order to eliminate destructive diseases, to increase health awareness about the dangers of, for example, widespread drug abuse, to develop information, cultural and educational programmes for children and to enhance awareness of environmental issues (Noor Al-Hussein Establishment, 1997).

Subsequently, the Noor Al-Hussein Establishment and the Ministry of Health, with technical help from the American Educational Development Academy and the American International Development Agency, executed a programme about family planning and natural feeding within the framework of a health information project (Al-Sarayreh et al, 1995). As the child derives his or her health education from sources such

as the family and mass media, information and communication play a significant role in the life of students, especially in providing information about health problems. The media can be used to raise the level of students' awareness and to create positive health tendencies and practices. The ultimate objective of this strategy is to develop better practices through activities which shape a planned combination of information, educational and communication activities (Al-Sarayreh, Ayesh and Bahooth, 1994).

Studies have shown that application of information, education and communication in educational systems is considered to be one of the best techniques for building sound knowledge, attitudes and practices related to developmental issues. In the field of health education it is considered to be desirable and effective in achieving far-reaching objectives related to aspects of health (Al-Sarayreh et al, 1995).

The *Television Guide Book* (1993) prepared by UNICEF in the field of health and education is considered to be a significant contribuation to the promotion of health concepts. The 'Medical Prescription' programme, for example, deals with the issues of the spreading of diseases from polluted of water, poor public health practices and the lack of procedures which can prevent the spread of diseases. The methods can employ drama, as in the case of the Indian TV programme 'We and the People', and use songs such as in Goti and Tatiana's project, which promote the concept of sexual responsibility (Al-Sarayreh et al, 1995).

Among the efforts exerted towards children in basic education are those emphasised by the *Child Rights' Agreement* (UNICEF, 1990) which is concerned with everything

which may endanger or violate the rights of children. Article 24 emphasises the child's right to receive the highest level of health and medical care, and that the state is obliged to provide primary and protective medical care, to spread public health education, and to work on decreasing child mortality. Furthermore, it encourages international co-operation in these regards and seeks to ensure that no child is deprived of effective medical services (UNICEF, 1990). Regarding working children, Article 32 emphasises the child's right to be protected from any work which may endanger his or her health, education and growth. Article 33, related to drug taking, emphasises the child's right to be protected from opiates and dangerous drugs, as well as from being involved in producing or distributing them.

Regarding sexual exploitation, Article 34 emphasises that the state must protect children from sexual exploitation or aggression including prostitution and involvement in the production of pornographic materials. Also, Article 36 emphasises that the child has the right to be protected from any kind of exploitation which may harm any aspect of the child's welfare which is not otherwise mentioned in Articles 32, 33, 34 and 35.

The *Child Rights Agreement* focused on the role of all the non-governmental organisations and information media in advocating the child's rights, as these organisations provide services to children in general, and to those who are subject to sexual mistreatment in particular. These organisations can play an effective role in explaining and publicising the *Child Rights Agreement.* This became an international agreement on September 2nd, 1990. The organisations concerned identified a number of health related objectives, the first of which was the spread of health activities in

each country and region. A number of sub-groups were set up, of which the main ones are: teenagers in trouble with the law; working children under legal age; and children who are subject to sexual assault.

Non-governmental organisations played an effective and fundamental role in relation to signing and implementing the agreement and in raising public awareness among all social classes about the rights of the child. These organisations participated in providing information to the public, including children themselves. Moreover, much of the material prepared for different projects and activities related to the field of health education. These non-governmental organisations have become important providers of financial and technical resources to develop and care for the child.

The *Charter of the Rights of the Arab Child* (The Arab State Union, *c.l* 1990) states the fundamental rights of the Arab Child in Articles 9-13. These articles emphasise the right of the Arab Child to grow up in good health, based on the provision of preventive and remedial care for mother and child from the first days of pregnancy. They state that this can be done by improving the environment in which children live and by providing them with an adequate balanced diet which is suitable to their stage of growth. Also, the charter emphasises the child's right to receive integrated and balanced social services in a way that ensures the opportunity of good living and proper growth. The charter also emphasises the child's right to protection from exploitation and from physical and spiritual negligence; nor should he or she occupy a job which might damage health or involve exposure to danger. Nothing should be done to obstruct his or her growth in physical, mental, psychological, ethical or social respects. Action is

needed to realise this vision through the provision of preventive and remedial care and the establishment of social practices that offer protection against, and treatment of, juvenile delinquency (The Arab State Union, *c./* 1990).

The *World Charter for the Survival, Protection and Growth of the Child* (UNICEF, 1990) mentioned that one of the main objectives related to children during the nineties was the effort to improve children's protection, especially in unfavourable conditions. Among the rights indentified, was to be protected from constraint, assault, negligence, economic exploitation, drug addiction, and sexual blackmail.

Despite the efforts which have been exerted in familiarising people about the rights of the child, we still observe a gap between planning on one hand and what is achieved in practice. This is emphasised in the *Child's Rights Agreement*, as it became clear that only 10 % of government expenditure in the developing countries is assigned for basic needs such as health care, water supplies, drainage facilities and nutrition.

In Jordan, it is believed that poor nutrition, especially anaemia, is increasing due to economic decline. It is stated that 33 % of 40,000 women in one study suffered from anaemia (Shuna, 1993). Since the health of children is intertwined with that of their mothers, many children start their lives subject to infection and poor nutrition. Also, early marriage and giving birth to many children within a short time consumes a woman's strength, resulting in giving birth to poorly nourished children. It is a fact that more than half of married Arab women were married before maturity (Shuna, 1993).

It is clear that a great deal still needs to be done in terms of increasing general health awareness, especially in social, cultural, ethical and moral issues. These initiatives have had little effect on the teaching of health education. Educational systems provide one method for the circulation of health concepts, especially in the basic education stage, and in so doing they help to decrease governmental expenditure on the treatment of disease. Good health supports successful learning just as successful learning supports health (UNESCO, 1998).

Health education is a relatively new subject in the basic school curriculum of Jordan, introduced in the beginning of 1990s, and the majority of health education content appears in the science curriculum. It is introduced as concepts and issues within the science lessons and not as a separate subject. Further details on the science/health education curriculum will be provided in Chapter Six.

From the researcher's experience, despite the new curriculum, health education is still not receiving much attention in Jordan. Through reviewing the literature related to this study, the researcher has found relatively little published research. For example, a piece of research done in 1987, focused on health awareness among secondary school students (age 18 years) in three regions in Jordan (Khaleely, Al-shaikh and Dheis, 1987). The results showed that students had not acquired the appropriate knowledge for an acceptable level of health awareness.

A second empirical study was carried out by the Commission For Biological Education of the International Union of Sciences, in Jordan (for age range 14 - 15) and

West Germany (for age range 13) (Kelly and Lewis, 1987). Upon hearing the key-word 'Health', students were asked to write down spontaneously what comes to mind, using a Free Association Test, which reflects the reactions of students which are likely in real-life situations. The positive reactions centred around health (exercise, good food, smiling faces, happiness, sport, etc.), the negative ones around disease (sickness, hospital, pain, doctor, etc.). A number of associations were neither positive or negative (shape, body, condition, etc.). The results obtained shows the following:

- The concept of 'Health', as measured by the Free-Association Test, has much more positive connotations in Jordan than in West Germany. It was suggested that developing countries may have a more positive attitude toward health perhaps because in these countries, with scarce medical technology, a positive attitude towards life and health is a matter of survival.

- The differences between the sexes is striking. Independent of country, there seems to be a tendency for females to hold more positive attitudes toward health, whilst there was a more negative attitude among males. Females might think more positively about health because they are concerned with themselves and their families. Males tend more towards external connotations of health including technical solutions for health problems. This study suggest, therefore, that gender differences should be taken into account when planning health education programmes.

Nowadays in Jordan, there are many controversial issues relating to health education topics, such as the most suitable age for delivery of certain topics, or whether certain topics should be discussed in a public manner. Also the issues of clothing, hair dressing and make-up are under debate especially in girls' schools; smoking and drugs are issues also. So, schools are encountering difficulties, and it is becoming increasingly important to face these issues at all levels, from the goverment to community.

3.4 International Perspectives on Health Education

In this section, aspects of the delivery of health education in different parts of the world will be discussed. Countries vary in many features such as their educational philosophy, culture, religion and beliefs, size of population and geography and degree of 'westernisation'. These factors will need to be taken into account in order to understand the health education context.

This section aims to determine which factors are important in the delivery of health education from the experiences of different countries and to compare these with the present situation of health education in Jordan. Factors that might be examined include:

- the circumstances - political, cultural, ethical and moral, within which health education is planned and delivered
- the health education content
- the general aims of health education
- the teaching methods used
- the health education materials provided

- assessment and evaluation methods
- the age at which health education is offered
- attitudes of the teachers towards health education
- the provision of teacher training in health education
- the place in the curriculum where health education is delivered
- the time devoted to health education
- any problems and obstacles which affect the delivery
- the nature of the subject, is it a personal or national responsibility, is it delivered formally or informally?

As this research study has been undertaken in the UK, the delivery of health education in England, Wales and Scotland will be the focus of this section, followed by a brief review of the situation in other countries. This section will end with a summary of the good practice identified.

Johnson (1981) highlighted some key issues that emphasise the importance of health education being taught in schools rather than in any other setting. Although rather dated, this still has relevance today. The first point Johnson makes is that children of the primary school age-range (five to eleven) are growing and developing extremely rapidly not merely in physical terms but also socially, intellectually, emotionally and morally. Children of this age are open to many educational pressures with attitudes developing as a result of experiences at home, in formal school, and in the playground. There is the excitment of smoking, risk-taking or aggressive behaviour observed in

older brothers and sisters, television and newspapers. Not all of these influences may be significant and not all of them may be negative, but in many cases they do provide young children with an incomplete, misleading or occasionally false expectations and assumptions. They include health related behaviour such as food consumption, dental health, obesity and use of medicines and other drugs. These attitudes are transmitted to young children whether we like it or not.

It would be unwise to leave health education solely to parents, as only a proportion of parents acknowledge the importance of this and provide the stimuli, discussion, information and support required. Understandably there are some areas which might be difficult for parents to cover even if they wish to: they may not have the appropriate information or the necessary skills and in fact, attitudes and practices may unintentionally lead to the long-term ill-health of children, e.g. smoking habits in the home (Johnson, 1981).

Primary school teachers have an important role to play in supporting the broad aims of health education through their focus on personal, social and moral development throughout the whole curriculum. However, health education is important both as a subject in its own right as well as in relation to other aspects of the curriculum. Health education can help children's school work in many ways. Through concentration on self-awareness and relationships, on personal responsibility, on concern for the needs and feeling of others as well as on physical health, the work increasingly undertaken in the field of health education can be seen to have an impact upon children's learning in other fields, by improving their attitudes toward school and learning generally and by

providing an interesting vehicle for the teaching of other subjects (Cowley, David and Williams 1981).

Rash and Pigg (1979) also point out that students in schools play a dual role in the health programme as recipients and participants. The benefits to students from good health education include the opportunity to take control of decision-making relating to their own behaviour. Other benefits may include first aid knowledge, teamwork, effective use of community health services and the ability to communicate their needs to the appropriate authority.

3.4.1 Health Education in the UK

The 1988 *Education Reform Act* placed a legal responsibility on schools to provide a broad and balanced curriculum, which promotes the "spiritual, moral, cultural, mental and physical development of pupils" and prepares them for "the opportunities, responsibilities and experiences of adult life" (quoted in Qualifications and Curriculum Authority, 2000, p.2). This implies that schools have a responsibility to provide all pupils with accurate information about health matters, to help them clarify the attitudes and values which influence health choices, and to promote the acquisition of healthy patterns of behaviour. This requires health education to be considered as a part of the formal curriculum and something which permeates the ethos of a school.

However, in 1993, the National Foundation for Education Research (NFER) carried out a survey of health education policies in schools with the aim of evaluating the range and the quality of written health education policies in maintained primary, secondary and

special schools and in the independent sector. The results revealed the following issues:

Secondary schools were more likely to have developed a single comprehensive policy document for either health education or for personal social and health education (PSHE). The larger the school the more likely it was to have a comprehensive written policy. Thirty seven percent of primary, 25 % of secondary and 35 % of special schools were in the process of developing or writing a policy on health education, while 20 % of primary, and 11 % of secondary and special schools did not have a written policy at all. Maintained schools were more likely to have developed a health education policy than schools in the independent sector.

About 60 % of schools nationally were teaching sex education, informed by a specific sex education policy. More policies existed in secondary schools than in primary or independent schools. A few schools had a specific policy against the teaching of sex education (4 %) or were not planning to teach this subject (2 %), although this rose to 10 % in independent schools. The size of the school did not greatly influence the likelihod of their having a policy on sex education. The findings also suggested that the impact of religious and cultural influences may not be felt until the minority ethnic population in the school and locality has approached 10 %.

The absence of a policy did not necessarily indicate the lack of health education in the school, but the overall impression gained from schools with no policy was that delivery of health education was haphazard and largely left to individual teachers. The quality of health education provision and co-ordination in these schools depended on the

commitment of senior staff to this area (NFER, 1993).

Primary and special schools were much more likely to have included all members of staff in the development of a health education policy. The PSHE or Health Education co-ordinator was involved in writing the policy in just under half of the secondary schools, a third of special schools and less than one in ten primary schools. The policy had often been written by the headteacher in primary schools and by deputy heads and senior and middle managers in secondary schools.

In general, schools place a greater emphasis on written statements about the arrangements for teaching health education within the formal curriculum than on the non-curricular elements of health education, promotion and protection. Schools with a comprehensive health education policy were twice as likely to also have policy statement on healthy eating, sex education, drugs education, procedures if a pupil or member of staff is HIV positive, and instances of suspected child abuse (NFER, 1993).

Eighty seven percent of primary schools taught health education through cross-curricular themes, 75 % through science topics, 50 % through specific health education topics, 10 % through health education week, 45 % through extra-curricular activities and 4 % through other means (e.g. pastoral). Just 2 % taught health education exclusively through the formal science curriculum. Topics on self were most likely to be encountered at Key Stage 1 (ages 5 - 7) and sex education and use of illegal substances were most likely to feature in Key Stage 2 (ages 7 - 11). Teaching about healthy eating and hygiene was distributed throughout the age ranges. Fitness, health

and safety, diet and lifestyles, and the factual content of reproduction featured in the majority of schools in years 7 to 11 (ages 11 - 16). Teaching about contraception was concentrated in years 9, 10 and 11 (ages 14 - 16) (NFER, 1993).

Since the advent of the *Education Reform Act* in 1988, evidence shows that the implementation of the statutory requirements of the National Curriculum has left many schools without sufficient curriculum time, resources, funding, staff time and expertise to implement the health education policies they might otherwise have wanted (Jamison, 1993; Thomas, Benton, Keirle and Pearsall, 1999). In these cases, health education has been seen as another subject area to be fitted into the curriculum, rather than an issue to be promoted by a whole school ethos.

In 1990 the National Curriculum Council (Turner and DiMarco, 1998; Thomas and Keirle, 2000) identified nine components of health education. These components are:

- substance use and misuse
- sex education
- family life education
- safety
- health-related exercise
- food and nutrition
- personal hygiene
- environmental aspects of health
- psychological aspects of health

All of these topics feature in the new Personal Social and Health Education (PSHE) programmes (QCA, 2000). PSHE comprises all aspects of a school's planned provision to promote their pupils' personal and social development, including health and well-being. It is intended to benefit pupils, schools and society; it is a flexible provision, and offers a basis for continuity and progression. According to the Qualifications and Curriculum Authority (QCA), implementing the PSHE framework must be based on a whole-school approach. This approach is considered as an effective way of implementing health education, because pupils' personal and social development is influenced by many aspects of school life. The framework for PSHE should therefore play a central part in the cycle of whole-curriculum planning and development (QCA, 2000).

Provision for PSHE in the curriculum needs to be consistent with school policies on the guidance and care of pupils, behaviour and discipline and health and safety. Moreover, pupils need opportunities to learn PSHE through real situations and contexts outside school. Provision for PSHE is not confined to specific timetabled time. A variety of forms of provision are considered and used in combination at different times: discrete curriculum time, provision through teaching and learning in other subjects/curriculum areas, through PSHE activities and school events and through pastoral care and guidance (QCA, 2000).

A range of teaching strategies should be used to provide a breadth of effective learning opportunities for all pupils. These include an emphasis on active learning, inquiry and discussion. Pupils develop their knowledge, skills and understanding by working

together, making decisions, taking responsibility and reflecting on their experiences. Therefore, aspects of PSHE will promote and be promoted through key skills. Organisation and management in the classroom should allow the teacher the opportunity to establish effective working relationships with the pupils, particularly when potentially sensitive issues are addressed. Moreover, PSHE provides many different opportunities for visitors to come into schools. The expertise and skills offered by visitors should complement those of the teacher and provide added value to the school's work (QCA, 2000).

Only certain aspects of PSHE will be covered in science in the English and Welsh curriculum. However, health education is an intrinsic element of the work of all science teachers, through their contribution to pastoral work and/or PSHE programmes, in addition to the aspects of health education that form part of science. This means that the science curriculum integrates with the PSHE programme and health education forms only one part of it. Health education is included in the curriculum of a number of subject areas (Thomas and Keirle, 2000).

In PSHE there are two broad areas for assessment: pupils' knowledge and understanding of, for example, information on health and understanding of procedures including health and safety and secondly, how well pupils can use their knowledge and understanding in developing skills and attitudes, for example, through participating in discussions, group tasks and activities, resolving conflict, making decisions, and promoting positive relationships. Assessment in PSHE should not imply that pupils are failing as people or citizens. It should not be a judgment on the worth, personality or value of an individual

child or their family (QCA, 2000).

As for recognising achievement, schools are entitled to award their own certificates to recognise the achievement of pupils in PSHE. These could be linked with the schools systems of awards and commendation, and certificates may be presented by external organisations or individuals. However, if a externally awarded certificate seeks to give credit for pupils' learning or competence, it must be approved for use with pupils of statutory school age under section 400 of the Education Act 1996. Qualifications in PSHE and preparation for working life may be approved for use with young people of statutory school age, as they become available through awarding bodies (QCA, 2000).

In Scottish Schools, Devine (1993) presented a report entitled *Encouraging Healthy Living: Health Education in Scottish Schools.* The aim was to provide a description of the provision of health education in schools in Scotland and to review the support available to them. Guidance on health education at a regional level was seen to be important; seven out of twelve local authorities had a health education policy; secondary schools in particular were much more likely to have a health education policy if one existed at regional level; only 30 % of secondary schools in areas where there was no regional policy had developed their own policy. However, two thirds of all primary schools had a health policy whether or not one existed at regional level. In addition, the regional documents were the resource on which most schools depended in preparing their own health education policies (Devine, 1993).

The different structures of primary and secondary schools in Scottland were reflected in how health education was delivered. Almost all primary school used environmental studies as a medium for health education, but also made use of situations as they arose. At the secondary level there seemed to be widespread acceptance that Personal and Social Education (PSE) was an ideal medium for developing health education. However, health education forms only one part of PSE, which is included in the curriculum of a number of different subjects. Devine (1993) identified a need for discussion among subject teachers, guidance staff and the health education co-ordinators to ensure awareness of which aspects of health education were being delivered and by whom. Several schools mentioned that they were presently involved in carrying out an audit of health education to monitor provision and delivery.

Most schools seemed to be satisfied that they were meeting the health education needs of pupils, at least to some extent. Those schools which were not satisfied were asked to give examples of the constraints which limited provision. In the secondary sector in Scotland, as in England and Wales, time-tabling health education in an already overcrowded curriculum was the most common constraint. Senior pupils were considered to be less well served than any other group and almost one half of all secondary schools were not satisfied that the needs of these pupils were being met. Pupils at levels S5 and S6 (ages 11-12) spent less time on health education than any other group of pupils (Devine, 1993).

About one quarter of primary and secondary schools in Scotland indicated that they had prepared an explicit statement of the health education aims of the school for both

staff and pupils. However, certain health education topics such as bereavement, child abuse and education for parenthood were omitted by large numbers of schools. Sensitive areas were avoided by many schools for pupils at all stages. It may be that pupils' needs are greatest in these areas but they are where teachers feel least capable.

More than half of all the Scottish schools used health professionals and the police for guidance or support, especially drug agencies and family planning specialists. It is noteworthy that alcohol is the most commonly used and abused drug in the UK (Givens and Reiss, 1996). Priorities for the future needs of teachers included consultations with experts, more classroom resources, courses on teaching methods for health education, courses on health education topics and personal development programmes.

To some extent there was a mismatch between teachers and health board staff in the perceived role of the health board. Many teachers were looking for resources in the secondary school and classroom visits in the primary school. Health board staff agreed with the need to help teachers with resources which would make life easier in the classroom but resource production was not a priority for them (Devine, 1993).

3.4.2 Health Education in Europe

As long ago as 1987, Williams (1987) identified many of the issues that are still being discussed today:

- There was a widespread agreement amongst all European countries concerning the need for national and local policies related to health education in schools.

- Most European governments are very concerned about the rapid increase in drug abuse and are eager for schools to take part in preventative action.

- It is generally agreed that primary school children are more receptive to health education than are secondary school children.

- In some Mediterranean countries, policies link the system of primary health care in the community with health education and promotion in the school system and it was agreed that closer collaboration between education and health authorities would be of benefit to all countries.

- An important point to emerge from European countries is that most do not view health education in schools as a separate subject. There is a considerable need for teachers and others involved in school health education to become familiar with and experienced in methods more appropriate to health education such as: informal group work, discussion, simulation, role-play and decision-making processes and simulations.

- All European countries are aware of the importance of setting health education into the context of family life and the wider community.

- In some countries, such as France, Italy, Holland, the UK, Germany and Ireland, independent organisations such as health promotion units have been funded, whose

main purpose is to promote health education in the community.

- The reality of practice in Europe generally is that schools place great emphasis upon the academic and intellectual development of their pupils to the exclusion generally of matters related to their health and well-being.

- The major emphasis within Europe is still placed upon the content of the health education curriculum, whilst more emphasis needs to be placed upon the ways in which it is taught in the classroom through developing values and attitudes.

- Most countries are involved in some kind of curriculum development in health education involving the production of materials for schools.

- Although there are several interesting and exciting teacher training activities going on in several countries such as England and the Netherlands, nevertheless there is a need in all countries for large-scale and well-planned initiatives to redress what is generally agreed to be an unsatisfactory situation with regard to staff development for health education, especially in teaching methods and the use of resources.

3.4.3 Health Education in the U.S.A

Collins, Small, Kann, Pateman, Gold and Kolbe (1995) mentioned that, since 1918, the commission on the reorganisation of secondary school education named health as the first of seven cardinal principles of education. The role of school health education lies in assuring the full and productive lives of citizens as well as contributing to the

attainment of other education goals. The most important policy was that school health education should be planned by both school and community; sequence, progression, and continuity and should be planned for grades K-12 (ages 4 to 18). It should be:

- taught by teachers trained and prepared in health education.
- designed to develop critical thinking and individual responsibility for one's health.
- structured to incorporate current and emerging health problems.
- focused on the dynamic relationship between physical, mental, emotional, and social well-being.
- strengthened by integrating available community resources into classroom teaching.

The criteria for school health education are intended to promote maintenance of health and well-being and not merely the prevention of disease or disability. Activities are designed to develop decision-making competencies related to health education behaviour through a planned, sequential pre-kindergarden to level 12 curriculum based on students' needs using current and emerging health concepts and social issues. There should be opportunities for all students to develop and demonstrate health-related knowledge, attitudes, and practices and the integration of the physical, mental, emotional, and social dimensions of health (Collins et al, 1995).

The importance of school health education in promoting the health of young people and contributing to the overall public health mission is articulated in *Healthy People 2000* (Collins et al, 1995) - the national health objectives intended to be attained by the year 2000. These objectives are presented below:

- Increase to at least 75 % the proportion of the nation's schools that provide nutrition education from pre-school through 12th grade, preferably as part of a quality school health education.

- Establish tobacco-free environments and include prevention of tobacco use in the curricula of all elementary, middle, and secondary schools.

- Provide children in all school districts and private schools with school educational programmes of alcohol and other drug awareness.

- Increase to at least 85 % the number of students aged 10-18 who have discussed human sexuality, including values surrounding sexuality, with their parents and/or have received information through another parentally endorsed source, such as youth, school, or religious programmes.

- Increase to at least 50 % the proportion of elementary and secondary schools that teach non-violent conflict resolution skills.

- Provide academic instruction on injury prevention and control in at least 50 % of public school systems, kindergarten through 12th grade (K-12).

- Increase to at least 95 % the proportion of schools that have age-appropriate HIV

education curricula for students in grades 4-12.

- Include instruction in sexually transmitted disease prevention in the curricula of all middle and secondary schools.

The *School Health Education Policies and Programmes Study* (SHPPS) in 1994 (cited in Collins et al, 1995) assessed school health education at the state, district, school, and classroom levels. The findings are discussed below. Types of delivery include a separate course devoted almost entirely to health topics, a course split equally between health education and physical education, and lessons taught as part of the general school curriculum.

Every U.S state has a person responsible for directing school health education. Nearly all states require that schools provide health education at the elementary, middle/junior high, and senior high school levels, and most states provide written guidance in the form of health education curricula, guidelines, or frameworks. Nearly all states provide in-service training on a variety of important health topics. Only a few states include health education topics as a part of mandated academic testing.

The nation's districts are as likely as individual states to require that schools offer health education, and are more likely to specify how health education should be delivered and what topics should be taught. One-third of the districts have a district-wide school health advisory council consisting of parents, teachers, administrators, and community members, which demonstrates that joint planning approaches are in use.

However, only about half of all districts have a person responsible for directing health education. A lack of leadership for health education at the district level may result in less priority being placed on health education at the school level (Collins et al, 1995).

At the school level, most middle/junior high and senior high schools offer one or more courses composed primarily of health education topics. Within these courses, schools are most likely to include instruction on alcohol and other drug use and prevention and HIV prevention, both of which are supported by federal funds. Fewer schools include issues such as the prevention of pregnancy, injury and violence. In general, health topics were more likely to be taught in health education courses than in integrated courses.

Most teachers who provide health instruction teach risk reduction skills, such as communication and decision-making, that enable people to avoid dangerous and health threatening situations. Indeed, providing students with skills practice is the norm. The preparation of teachers who provide health instruction is of significant concern; one-third of health education teachers and one-third of other teachers majored in a field other than health or science.

3.5 Summary of the Key Findings of Health Education Delivery

This review of health education has highlighted the many international initiatives that have attempted to support and encourage the development of child health and the rights of the child. There appears to be a major gap between the policy of health promotion and the practice of health promotion and health education, and a great deal still needs to

be done. Schools have a very important role to play in this respect. The study of the delivery of health education in the UK, in Europe and the USA has revealed that these countries approach health education in different ways; however, there are many examples of good practice, and ideas that can be taken forward to inform this study.

These are summarised as follows:

- Where national or regional policies for the delivery of health education exist, schools are much more likely to have developed policies of their own.
- Specific sex education policies are of particular value in guiding teachers in this sensitive area.
- Where all school staff are involved in drafting the policies, more health education is taught in the school.
- Education ministries, non-governmental organisations, health professionals and the media all have an important role to play, particularly in the production of teaching materials.
- Close collaboration between schools and primary health care teams is beneficial.
- Some schools have a separate health education curriculum.
- Other schools treat health education as a 'cross-curricular theme'. This means that it is not taught within just one subject area, but appears in many areas such as science, PE, personal and social education and environmental studies.
- Time for health education delivery can be difficult in a curriculum that is seen to be already overcrowded.
- 'Whole school policies' which permeate the whole school, such as the provision of healthy food, clean surroundings and anti-litter schemes are likely to be more

effective overall, as they affect the overall ethos of the school in relation to health.

- Teachers must be able to develop effective working relationships with their students if they are going to be able to discuss sensitive issues frankly and openly. Teacher gender may be an issue here.
- Effective methods for health education delivery include active learning, enquiry methods, discussion, working together, making decisions, taking responsibility and reflecting on experience.
- Health education must be set in the context of family life and the wider community.
- Teachers may need further training in the effective use of such methods, and also in health education issues generally, especially as the majority of them are not specialists in health areas.
- 'Visiting speakers' such as health professionals and the police are a valuable resource.
- Recognising achievement in health education, either formally through certification or informally through awards and prize giving, emphasise the importance of the subject.
- There is insufficient emphasis on the evaluation of health education programmes, in terms of affecting student behaviour and health outcomes generally.

However, as can be seen from this chapter, most education systems treat health education as a cross-curricular theme, requiring a whole school approach to the subject. Although this may be the ideal, and perhaps the ultimate goal for the Jordanian education system, there are many reasons why it may not be possible to recommend such an approach for Jordan at the present time. This will be explored further in the final chapter.

Many of the experiences and new initiatives of other countries in health education can, however, be taken into account, and used to make recommendations for the future development of health education in Jordan. However, health education is likely to continue to be delivered within the science curriculum for the foreseeable future. Therefore the current study will concentrate on the most effective ways of doing this. One immediate problem to consider is that of delivery methods, with science traditionally being considered as largely factual and laboratory based, and health education, as we have seen, being about the development of attitudes and values through more open, student centred activities. How this might be reconciled is the subject of the next chapter.

Chapter Four: Health Education and Science Education

4.1 Introduction

This chapter seeks to explore the relationship between the purposes, content and teaching methods used for the delivery of science and those for health education. As has been discussed in Chapter 2, the most effective health education programmes emphasise changes in values and attitudes as well as the development of knowledge and information, in order to inform health choices. On the other hand, science has been associated with learning facts and the development of practical skills. Yet there is much overlap with content, especially in biology, and there is the potential to develop an integrated curriculum that meets the objectives for each subject. Therefore, in this chapter, the purposes of health education and science education will be compared, and the curriculum content examined, to identify common aspects. This will be related to the teaching and learning methods used in each area, and the background and further training needs of teachers, particularly science teachers who are required to teach health education.

4.2 The Purposes of Health Education versus the Purposes of Science Education

Health education is considered an important aspect of the upbringing and education of everybody. The following list of health education objectives has been developed as a consensus of views from several countries (Kelly and Lewis, 1987):

- Develop an ability to discriminate between fact and opinion in information related to health.
- Acquire knowledge of body systems and functions with an understanding that

growth and development of these systems follow a predictable pattern with many normal variations, producing unique individuals.

- Develop an understanding of the relationship between physical and emotional well-being.
- Develop an understanding of the need for proper nutrition.
- Develop the skills necessary for physical fitness.
- Develop an awareness of the relationship between human beings and the natural and social environments.
- Develop a body of knowledge about the causative agents and preventive measures relating to common communicable diseases, and develop positive behaviours and attitudes regarding the control of such diseases.
- Develop responsible behaviours and attitudes relating to sanitation in the home and community.
- Develop an ability to make responsible decisions about alcohol, tobacco and other drugs.
- Develop an understanding of the role of being an effective parent and the role of the family in contemporary society.
- Develop an ability to make informed decisions concerned with sexuality.
- Develop responsible attitudes towards family planning in consonance with a country's population programme.
- Acquire knowledge of the range of vocational opportunities in health and allied fields.

On the other hand, the purposes of science education as stated by Frost (1997) are:

- knowing and understanding facts, explanations and concepts, and asking questions;
- understanding experiments, interpreting data and developing technical know-how;
- understanding the relationship between science and everyday life, the nature of science and the cultural significance of science.

Ratcliffe (1998, p. 6-7) offers the following purposes of science education within the Science National Curriculum in the UK:

- understanding the key concepts of science to allow pupils to use them in unfamiliar situations;
- using scientific methods of investigation to help pupils to make successful, disciplined enquiries and use ideas to solve relevant problems;
- appreciating the contributions science makes to society, to encourage pupils to develop a sense of their responsibilities as members of society and the contributions they can make to it;
- learning in science to contribute to personal development;
- appreciating the powerful but provisional nature of scientific knowledge and explanation to bring pupils closer to the process by which scientific models are created, tested and modified;
- giving students access to careers in science and technology.

In Scotland, experiences and purposes of science education (Ratcliffe 1998, p. 7) for individual learners should:

- broaden understanding of themselves, human culture and societies and the natural and made worlds in which they live;
- help to sustain natural human curiosity, develop an enquiring mind and foster an interest in continuing to learn throughout life;
- help to engender a critical way of thinking about phenomena and issues;
- support other aspects of learning across the curriculum;
- develop the potential to contribute in an informed, thoughtful and sensitive way to the enhancement of people's lives and of the environment.

Harlen (2000) emphasised the purposes of science education in the UK and Scotland. In practice, these purposes mean that pupils are:

- able to function with confidence in relation to the scientific aspects of the world around them;
- able to look at something in a scientific way, seeing, for example, whether or not evidence has been taken into account in the explanation of the event or phenomenon, whether it makes sense in terms of related events;
- aware of the nature of (and limitations of) scientific knowledge and the role of values in its generation.

It can be seen from the discussion above that there are many areas of overlap between the aims of health education and those of science education. This is especially true of

the newer science curricula which are more concerned with the emphasis on everyday life, personal development and personal responsibilities. The development of critical thinking skills and the ability to solve problems are just as applicable to health education. On the other hand, effective health education also requires a knowledge of the functioning of body systems, growth and development. Thus it appears that a real, integrated approach to the two subjects is possible.

4.3 The Content of Health and Science Curricula

As we have seen in the previous section, the role of science education is no longer limited to providing scientific information that may contribute to improving material living standards but has been extended to influence values and attitudes (Bennett, 2001). In the same way, health education content overlaps with science education in many respects. In terms of values, science education aims to provide activities and life experiences that motivate students to think about the world in which they live, in order that they might develop a deep understanding of scientific and technological advances. In Jordan, these include information about projects in space and ocean exploration, communication technology, meteorology, and medical and agricultural technology. Science education emphasises the impact of developments in science and technology on students' lives, community and environment. Furthermore, it presents for discussion issues that may help develop students' values such as objectivity and "rejecting superstition" (MoE, 1998).

In terms of ethics, science education in Jordan informs students about weaponry, such as nuclear, chemical, and biological as well as traditional weapons. A student should develop an understanding of their effects on human life; other issues include changes to the environment, such as resource depletion, ozone layer deterioration, forest destruction, extinction of organisms, and environmental pollution. Also relevant, and related to health, are scientific experiments on animals and techniques such as artificial fertilisation and reproduction. Discussion may cover the ethical considerations of genetic engineering (Hill, Stanisstreet, O'Sullivan and Boyes, 1999). One significant problem for debate is the possibility that genetically engineered organisms may spread new but lethal diseases. In Arab culture, science education may emphasise that human cloning is unacceptable and should be prohibited legally, religiously, and morally. However, science education in Jordan has not ignored the positive aspects of genetic engineering in various fields of life. Among the distinctive achievements of genetic engineering are producing human insulin to help people with diabetes to deal with this disease, developing a protein for blood coagulation, and making cancer-resisting drugs. Other contributions may include providing anti-biotics, vaccines and hormones useful for heart, kidney and lung disease treatments and generally for human health.

Science education may also present examples about the contribution of biotechnology in agriculture, including producing animal embryos, organic fertilisers, pesticides, and forage; in chemical production such as acids and enzymes, in the area of natural energy such as producing alcohol and natural gas; in food such as the manufacture of dairy products and vitamins, and in industries such as purifying water and oil extraction.

As for the physiological aspects, science education should present an integrated picture - anatomical and functional - about the components of the human body (Cuthbert, 2000), which have a vital function in maintaining the body's health, development and survival. From these anatomical and functional aspects, further discussion could be lead into important health education areas such as sexual health, diet and nutrition and the importance of exercise. The process of teaching health topics through science education should allow children to relate what they learn to everyday life and in addition, this knowledge can be developed and applied throughout life (Adey, 2001). For example, the rules of safety on the road which are taught within science education in the lower grades of basic education in Jordan are applied directly outside school (Hawes et al, 1994).

Therefore, the science which children learn at school can provide a new vision for health education. This new vision implies that teaching scientific facts which are related to children's health encourages children to be active with regard to their health and that of other people (Hawes et al, 1994). Accordingly, the teaching in school should be linked to the requirements of the home and the community in a way that develops citizenship, responsibility and self-respect.

The importance of school science for personal health and for the future of young people is demonstrated by the following quotes, which relate to the dangers of illegal drugs and alcohol.

> "... what it's actually doing to their body and, if they can physically see that, it might make them think twice." (Collins and Osborne, 2000, p.100).

> "That they can fall back on and say, 'No, I'm not doing it because it does this to your brain, it does this to your heart. Have you any idea what you're doing to yourself?" (Collins and Osborne, 2000, p.101).

Therefore, teaching health education through science education helps students to think in a scientific way and to apply science through skills and activities which are associated with everyday life. This application can save life by preventing the occurrence of accidents as students learn how to behave safely, through familiarisation with possible dangers, anticipating accidents before they actually occur and thus developing responsibility for themselves and others (Hawes et al, 1994). All of this is dependent on teaching health education using effective practical methods such as those which enhance understanding or assist in communicating accurate health messages.

Just supplying correct information and understanding through science education may not be an effective basis for health education. Therefore, the teaching needs to be active so that children show interest in their health and are able to connect what they have learnt with their daily lives. They are then able to understand the basic ideas and are able to help their families and their friends to lead healthy lives (Hawes et al, 1994).

As scientific knowledge acquired by students will be reflected in their daily lives, and as increasing this knowledge will initiate changes in students' ways of life and communication with others, science education in Jordan should provide issues for discussion and research. It should pose serious questions that enable students to think critically, and develop the scientific and practical skills that make them capable of understanding and dealing with these issues. All of this can only serve to crystallise

current and future interests and attitudes in a way that supports science and health objectives and the aspirations of society (MoE, 1998).

In the context of Jordan, for the religious believer, science education contributes to the spiritual awareness of creatures, phenomena and features of this universe. This knowledge can make a person more aware of the spiritual aspects of the universe (Al-Hashimi, 1996). Also, science education presents the human body as a blessing to be maintained in a healthy and sound form. By this blessing man can walk, move, and be active in society and life (Al-Hashimi, 1996). It offers learners the knowledge that may lead them to control their instincts and sexual and non-sexual drives, and present some solutions to deal with these. A learner should not contemplate suicide or think of inflicting any kind of damage to his or her body. Science education presents religious and social arguments against this kind of action.

From an Islamic religious and social perspective, health and science education enhance the role of family and society in maintaining the health and safety of their children. This may include responsibility for choosing a spouse, child care, health and sex education, and the safety of the home environment. Individual responsibility towards oneself and that of the family towards their children also comes under the public responsibility of society or state (Mousa, 1995). In this regard, science education offers knowledge that spreads awareness among learners about the role of society in securing a good life for everybody, and this will include providing basic necessities such as food, medicine, shelter and dignity. Within this framework, economic, educational and moral

responsibility can be explained and discussed.

Science education spreads awareness among learners about the dignity of the human body as a whole by providing an awareness of morals and values that support this dignity. Examples would include some contemporary issues such as organ donation and transfer, and artificial fertility treatments. Also, science education provides the knowledge which helps understand the body's instinctive needs and seeks to put these needs in a balanced and moderate context that supports human control over instincts and emotions (Mousa, 1995).

Within the context of these aspects, health education taught within science education in Jordan seeks to build an understanding of biological, chemical and physical concepts, and teaches students the foundations of sound thinking and a logical and scientific approach when dealing with health issues. The objective is to build a generation that has a balanced health in mental, emotional, spiritual and physical aspects. By this knowledge, science education assigns to the learner responsibility for maintaining health and safety no matter what kind of responsibility this is – ethical, legal, or religious (MoE, 1998). In fact some might see a danger in delivering health education just as a part of science education because science education tends to be seen often as just memorising facts, theories and perhaps behaviour. While recognising this danger, it should be noted that this mechanistic view of science education is increasingly misplaced, in that effective science education relates topics to social and moral considerations.

Therefore, in general, there appears to be some consensus among writers in the fields of health education and science education in terms of the purposes and content of these fields, but there are differing views about methods of their delivery. The aims and objectives of science education and health education determine the methodologies to be used (Lewis and Kelly, 1987). These differences, conflicts and commonalties between the methods of teaching health education and science education are discussed in the next section.

4.4 Methods of Teaching Health Education versus Methods of Teaching Science Education

Based on the above discussion, whether one can distinguish between teaching methods for the delivery of health education and the delivery of science is debatable. As already discussed, health education and science education overlap in terms of their aims and content. The following discussion argues that the teacher should select the method which is the most appropriate for the delivery of specific concepts or skills. For example, using advice and guidance for the development of attitudes is more appropriate than 'telling' or issuing rules and regulations. Science teachers should carefully choose the most appropriate teaching methods for achieving the educational aims and objectives depending on whether they are science or health based.

4.4.1 Delivery Methods for Health Education

One of the major constraining influences on successful health education is the failure to develop and use a methodology appropriate to its needs (Cowley et al, 1981). Content

and process are both considered to be important in health education, and it has been suggested that in some circumstances, the process may in fact constitute the content (Ryder and Campbell, 1988). Thus, it is necessary to adopt 'progressive' styles of teaching, such as active and participatory learning and other pupil-centered explorations that differ from those ordinarily employed, which are usually the transmission of knowledge, instruction, didactic teacher-centered and content-focused (Harrison, 2000).

Teaching health education effectively requires the creation of an educational atmosphere which is conducive to the open discussion of health related issues (Brandes and Ginnis, 1990; Wilson, 1992). However, the most important single factor influencing learning is what the learner already knows (Ausubel, Novak and Hanesian, 1968). Before starting a health topic, teachers should explore children's existing knowledge (Monk and Osborne, 2000). It will be advantageous to utilise activities which catch the attention of the children, set the mood, focus the mind for the main aim of the session and offer the teacher the opportunity to discover the level of knowledge of the children. Activities such as brainstorming, value continuums, forming groups, ranking, role play, simulation, interviews, problem-solving, group discussions, case histories and surveys may be employed in the teaching of health education (Brandes and Ginnis, 1989).

Ewles and Simnett (1992) and Harrison (2000) have suggested some basic principles of effective teaching of health education whether to individuals or groups. These principles are:

- Working from the known to the unknown, to start with what students already know.

- Aiming for maximum involvement, because students learn best if they are actively involved in the learning process.

- Bringing variety into health teaching, which can be done in many ways. These include the following learning activities:

- *listen*: lectures, audiotapes;
- *read*: books, booklets, leaflets, handouts, posters, chalk/white board, flipcharts, overhead projector transparencies;
- *look*: photographs, drawings, paintings, posters, charts, materials from magazines (such as advertisements), flannelgraphs;
- *look and listen*: films, videotapes, tape-slide sets, slides with commentary, demonstrations;
- *listen and talk*: question-and-answer sessions, discussions, informal conversations, debates, brainstorming;
- *read, listen and talk*: case studies, discussion based on study question or handouts;
- *read, listen, talk and actively participate*: drama, role-play, games, simulations, quizzes, practising skills;
- *read and actively participate*: programmed learning, computer-assisted learning;
- *make and use*: models, charts, drawings;
- *action research*: gathering information, opinions, interviews and surveys;
- *projects*: making health education materials-videos, leaflets;
- *visits*: to health service premises, fire station, sewage works, play groups, voluntary organisations;
- *write*: articles, letters to the press, stories, poems.

- Ensuring the relevance of what is said to the needs, interests and circumstances of the students involved.

- Identifying realistic goals and objectives.
- Organising the material into a logical framework, and ensuring students understand what this is, both at the beginning, and during, the teaching session.

- Evaluating and giving feedback, to help assess learning and improve future performance.

4.4.2 Delivery Methods for Science Education

Educational literature and research on science teaching show that the teaching methods used by science teachers play a decisive role in meeting the objectives of the science curriculum. Selecting a teaching method will depend on several factors, including the education stage, the students' level of ability, the content and the teacher's philosophy and perspective on the teaching-learning process as a whole (Zaiton, 1994). A science teacher should have clear and specific teaching objectives, from which appropriate teaching methods or styles are selected (Attalla, 1984).

According to Lewis and Kelly (1987), science education should be practical, relevant and appropriate, and promote adaptability to change. Students should acquire a frame of mind associated with inquiry and discovery, rather than memorise facts whose value

may be transitory. There are various common methods in teaching science education such as inquiry and discovery, problem-solving, practical laboratory work, demonstrations, field trips, discussion and lectures (Pentley, 1989; Zaiton, 1994), which may also be used in teaching health education. These methods are discussed below:

Inquiry and discovery: this is one of the most vital methods in supporting student's scientific thinking (Ghabain, 1982). It offers students the opportunity for self-learning, building self-confidence, and the development more of scientific attitudes and creative trends (Shymansky, Kyle and Allport, 1983; Ajewole, 1991). The teacher's role in this method is that of a guide, inspirer and instigator. He or she should help students to search, inquire and discover through situations or questions that challenge thinking (Zaiton, 1994). Within this process, the teacher should encourage students not to look upon him or her as a source of information and answers. By virtue of this method, students should become capable of solving problems scientifically, not only in the laboratory but also in real life situations (Zaiton, 1994). However, literature indicates some limitations in this method. It takes up a lot of time and requires appropriate skill by the teacher. But despite this, Carin and Sund (1985), and Lawrence (1990) point out that this method contributes positively to improving scientific knowledge, developing scientific thinking, and acquiring scientific methods and skills.

Problem-solving: this is a significant method in teaching science as it encourages students to research and experiment by means of reading, developing ideas and investigating solutions to problems (Bill, 1986; Zaiton, 1989). To a great extent, this method is similar to that of inquiry and discovery.

Practical laboratory work: the laboratory is a basic requirement for science education at all educational stages. Advantages of practical laboratory work may include the opportunity to learn through practice, the development of scientific skills, practising basic science skills, developing scientific attitudes, and again, presenting opportunities for self-learning (Zaiton, 1994). But despite the significance of this method and its contributions to the teaching of science, relevant literature points out some limitations. These include the expense of providing laboratories, the hazards arising from some experiments, and the effort and time needed to prepare laboratory activities (Zaiton, 1988; Al-Showarib, 1991). Okebukola and Ogunniyi (1984) suggest two types of laboratory work - the 'explanatory laboratory' seeks to confirm, with the teacher's help, pre-learned scientific information whilst the 'exploratory laboratory' seeks to help students to explore scientific knowledge with limited help and guidance from the teacher. In the author's experience, laboratory work in Jordan has little relevance to health education.

Demonstration: this is one of the most common methods of teaching science in Jordan especially at the elementary grade (Zaiton, 1994) but is perhaps less widely used in the UK. Reasons for using this method may be traced to various factors including the limited financial resources of a school, shortage of laboratory sets and tools, economy of effort and time, and avoidance of hazards in students carrying out laboratory tests. But despite the advantages and wide use of this method in science teaching, relevant literature points out some limitations (Zaiton, 1994). Unless demonstrations and presentations are given in a way that makes them comprehensible to students, they will be ineffective. In addition, this method does not offer students opportunities to interact

with laboratory equipment and develop manual skills. This is especially the case with respect to the concept of measurement. There are limited uses for the demonstration in health education.

Field trips: this is a pre-planned and organised learning activity carried out outside the class, under the supervision of the teacher, to fulfil specific educational objectives, often to develop an awareness of the environment and developing positive attitudes towards environmental conservation (Lee and Myers, 1980; Klepper, 1990). This can be done by means of visits, excursions, expeditions and school camps. But despite all the advantages, there are some limitations which may include financial cost, technical and administrative problems, safety measures, and teachers' reluctance to bear the responsibility (Keown, 1986; Han, 1991; Easa, 1993). Depending on the type of visit, it can have relevance to both science and health education.

Discussion: this method relies on verbal dialogue between teacher and students. It is generally considered to be an effective method in encouraging contributions by students; a teacher will present a subject for discussion, and this will lead to understanding, explaining, analysing and evaluating of the topic. The discussion can be very effective, especially when and if it is thoroughly prepared, organised and directed by the teacher. Of course, this requires a teacher with a high level of knowledge, experience and flexibility to steer and discuss relevant materials and situations (Zaiton, 1994). This method may have many advantages, in that it helps students to acquire skills of interaction and communication. It may enable the teacher to identify students' prior knowledge and attitudes. Questions and answers will reveal students' level of

understanding of the topic, and the behaviour and attitude changes that students have acquired during the study of a topic may also be assessed (Zaiton, 1994). However, it requires mutual respect between teacher and students. Topics and ideas must be handled in a spirit of respect of others' views and appreciation. On the other hand, extended talk by the teacher or the over-use of authority may lead to a restriction of interaction and dialogue (Zaiton, 1994). Finally, the discussion method takes a great deal of time and may be difficult to manage with a large number of students. However, it is likely to be a very valuable method for health education topics.

Lecture: this is one of the oldest methods of teaching. It is based on direct presentation and explanation of the topic by the teacher. Within this method a teacher is expected to convey information and knowledge to the student, while students sit listening or taking notes (Zaiton, 1994). One great advantage of this method is economy. Other advantages may include: continuity and comprehensiveness (giving an 'over-view') as scientific content is presented in a coherent way. It is appropriate for introducing new topics. However, this method has been heavily criticised, as it makes a student a passive recipient, whose needs and interests and individual differences are not taken into account (Zaiton, 1994). There is likely to be a limited use of this method in health education, mainly for the introduction of facts e.g. in the structure of the human body (Harrison, 2000).

In conclusion, science education in general involves a number of teaching methods that, to varying extents, can also be used in health education. The strategies that are available to science teachers to enrich science lessons with health-related materials are numerous.

One practical example of applied science is the physics that explains the domestic water supply; this also has a health context. For older pupils newspaper articles can stimulate discussion on issues like overpopulation or test-tube babies. Role-play is a teaching method which can be used effectively to teach about moral or ethical issues arising from the curriculum (Johnson, 1999; McSharry and Jones, 2000).

Harrison and Edwards (1994) provide a useful summary of teaching and learning strategies to bring about successful health education within science lessons:

- health education co-ordinators in school should help plan the health education content;
- it is necessary to identify and use pupils' existing understanding (or misunderstandings) in order to develop new skills;
- teachers must be aware of the sort of language that is used to describe health concepts, medically, scientifically and in the everyday language used by pupils;
- teachers should allow discussion to develop, to explore attitudes and values, but should ensure that the required message 'comes through';
- a subject's principles and processes should always be related to everyday life.

Teachers who are involved with health education will become role models for the children, and they need to be prepared to take on this responsibility. Teaching styles may be of operational advantage, but the attitudes and personality of the teacher may also be crucial. Such personal qualities, together with the climate that is created when working with the class may all be vital contributors to successful health education. Therefore, the academic background and training of teachers is an important issue.

4.5 The Development of the 'Science' Teacher into a 'Health' Teacher

Findings at the national level on science teaching in the USA (Krajcik, 1993) point out that students at primary, intermediate and secondary grades do not have a deep understanding of basic scientific concepts, nor are they able to relate these concepts to universal phenomena. They tended to memorise the scientific terms without understanding them and do the same with procedures for solving problems. They held negative attitudes towards science and had a low motivation to learn science in the future. There was a decline in the students' liking for and interest in science as they matured. Finally, students were not learning about the nature of science and technology and integrating their knowledge with social issues and problems.

There is a wide agreement that intelligent, knowledgeable and engaging teachers, who are interested in children and know how to manage classrooms and teach creatively, are crucial for good education (Matthews, 1994). Furthermore, teachers have to do more than teach: they have to either develop local curricula, or to interpret national curricula for their use as well as taking part in school governance, and in policy-making that bears upon the subjects taught in their schools. Good, well-prepared teachers are necessary for these complex and important tasks. There has, however, been less agreement on how best to prepare such teachers (Matthews, 1994). Many people have argued that history and philosophy of science should be part of the education of science teachers. Teachers have a professional responsibility to society, to their profession, and to their students, both in helping them to understand science and to see science in its broad historical, philosophical and cultural contexts (Matthews, 1994).

The role of the health educator has been described as the three I's of methodology namely, Inspiration-motivating, Interpretation-clarifying and Information-informing (Rash and Pigg, 1979). In addition, the health teacher has the responsibility for promoting a favourable physical, social, and emotional climate in the classroom. There are at least three types of teachers sharing responsibility for health instruction in the classroom: the full time professional health educator, the elementary school teacher, and the teacher in related areas such as physical education and biology. Science teachers can be involved in health education in two ways: through the incorporation of health related topics within the science curriculum, and through the teaching of health education as a separate subject (Garrard, 1986).

On the other hand, Rash and Pigg (1979) and Smith and Jensen (1985) argue that although many people share in the health education process, not everyone who does can be classified as a health educator. The health educator is a special person, with a specialised background of education uniquely equipping him or her for the task of providing health instruction and of fostering the process of health education in all aspects of the school programme. Their background should include a major specialism in health education or health and safety education, with additional preparation in the life sciences, the behavioural and social sciences, and in educational methodology. They consider that the minimum preparation should be a minor specialism of at least 24 semester hours in health and safety education, with a good background in the other areas. Personal requirements should include a strong interest in health conservation through education, a genuine interest in and concern for others, a desire to keep up-to-date on professional matters, and the willingness and ability to change as knowledge

advances. Also the teacher must be able to communicate effectively in a manner that will motivate students to action (Smith and Jensen, 1985). This has implications for science teachers who are expected to teach health education.

Campbell (1985), emphasised that initial teacher education should provide:

- an understanding of health and contemporary and future health problems;
- an understanding of major issues in school health education practice;
- a values and belief clarification exercise about their own health;
- a programme to support life skills teaching designed to self-empower the students;
- skills in affective teaching, including individual and group teaching skills.

In some countries, the preparation of teachers in health education is given considerable emphasis. For example, in the U.S.A, the Texas Education Agency (1987) mentioned that teachers who wish to specialise in health education must enrol in twenty-four semester hours of health courses or those from related departments such as biology, nutrition, home economics or health and physical education. The following topics should be addressed: consumer health, sex education or family living, nutrition, human diseases, use and abuse of tobacco, alcohol, and drugs, and human anatomy and physiology.

Williams (1987) conducted research in England and Wales regarding health education in initial teacher education. The results of the survey were that over 90 % of schools strongly supported the view that health education should be a core element in initial

teacher education. However, less than 25 % of teacher education institutions include health education as a core element for students, although 63 % offered some kind of health education input, varying from as little as one hour to fifty hours or more. Over 90 % of student teachers believed that schools have a responsibility to health education in their curriculum and over 80 % would welcome the opportunity of contributing to it, but less than half of the student teachers considered their current preparation was adequate. Although now a dated study it was clear that at that time, few teacher education institutions appeared to be preparing student teachers effectively for such activities.

More recently, Anderson and Thorsen (1998) carried out a survey in Canada of pre-service preparation for almost 500 elementary school teachers. This was to determine the degree to which they had been taught the content and methods associated with effective school-based health education, and the student teachers' perceptions of their competency and comfort level in teaching specific health topics. More than one third of the respondents reported that they received no pre-service instruction devoted specifically to health education. About half indicated that their programme included one to six hours and the rest noted that seven or more hours were devoted to health education. The majority of the respondents indicated that they did not teach any health education during their practice teaching. Sutherland (1979) commented that teachers need not only knowledge of what they teach in health education, but also knowledge which enables them to protect children by drawing the attention of appropriate authorities to incipient physical and emotional problems, which they are in a good position to detect. In-service courses should aim to provide an opportunity to reassess issues and to provide mature and experienced teachers with the future specialist

knowledge and skills necessary to enable them to co-ordinate health and social education activities across the curriculum (Anderson and Thorsen, 1998). These are likely to be of particular importance to the non-health specialist, such as a science teacher.

In the context of Jordan, Hasna (1996) carried out a small scale study which showed that eleven out of the twelve teachers surveyed agreed they did not have a health education qualification or previous experience in teaching health, nor had they attended any in-service training.

4.6 Summary

This chapter has shown that there can be a real and integrated relationship between health education and science education in terms of content, aims, and teaching strategies. However, the discussion reveals that teaching health education is likely to involve other specific teaching methods, which deal with moral, cultural, and social dimensions of health education. These might include role-play, problem-solving and discussion. It should not be restricted to the teaching methods used in science education such as the lecture, discussion and conducting laboratory experiments. Therefore, the background and preparation of the science teacher who becomes a 'health' teacher should ideally include a specific qualification such as a major specialism in biology or health and safety education, with additional preparation in the behavioural and social sciences and health. General educational methodology should include student-centred approaches to learning that, although increasingly encouraged in science education, are even more applicable to health education.

Chapter Five: Methodology of the Research

5.1 Introduction

This chapter describes the population of the study and the three research methods used - questionnaire, interview and documentary analysis. This is followed by a description of the methods used for analysing the data.

5.2 Ethical Issues

Research is more than just a mechanical operation, it is also a social process involving theoretical and practical considerations (Burgess, 1984). The activities of researchers take place within particular social, political and cultural contexts (Hitchcock and Hughes, 1989). Therefore the concepts of both psychological and social harm should be considered (Richardson and Webber, 1995). Potential ethical problems can present themselves at any stage, originating from the methods used to obtain data, or from the kinds of problem being investigated (Cohen, Manion and Morrison, 2000).

This research is concerned with a study of sensitive issues relating to children. Health education is closely linked with personal, family and religious values. It is anticipated that ethical problems could arise relating to the following aspects of the research, unless the following issues are addressed:

(i) Issues related to the content of the study, e.g health education involves sex and family education, so the investigation must be carried out with sensitivity and respect for people's values.

(ii) Issues related to the methodology of the study. The researcher took account of ethical issues during the field work by adopting the following:

- **Seeking permission**: the researcher established contact with individuals from whom it was necessary to gain permission, through clarifying what activities were to be undertaken and documented.

- **Confidentiality and anonymity**: the information provided by participants was treated carefully to not reveal their identity. There was an obligation to treat data as confidential and conceal identities when reporting results (The British Psychological Society, 1978).

- **Privacy**: the researcher considered privacy from three different perspectives: the sensitivity of the information being given, the setting observed, and dissemination of information.

- **Respecting the participant's time**: the researcher is aware that participant's time is valuable and therefore did not waste people's time (Anderson and Arsenault, 1998).

This research handles a topic with a high sensitivity in Jordan. Therefore, this study employed a survey approach for collecting data from various parts of Jordan. The justification for collecting data from across Jordan was related to the following:

- It gave the research findings the capacity to generalise throughout Jordan and possibly to other countries with similar educational conditions.
- It gave the researcher a real opportunity to collect extensive information about the current levels of delivering and practising health education with coverage of the different geographical areas of Jordan.
- It enabled the researcher to obtained a representative sample of the basic stage science teachers in Jordan.
- It enabled the research to be strongly focussed in its content and methodology.

5.3 Methodological Rationale

Educational research can be described and classified in many ways according to how it is conducted and administered and according to the methods of data processing (Herbert, 1991). Based on such classification of research, the present study could be classed as including descriptive, exploratory and analytical study because it is aimed at surveying and analysing the key aspects of the official policy on health education and its delivery. Using such an approach can provide quantitative and qualitative data about the current educational conditions within which health education is implemented. To meet its purpose, the study has focused on six main areas of analysis. These areas are:

- The official policy on health education as laid down in the documents held by science teachers of the basic stage in Jordan.
- The emphasis placed on various health education topics by science teachers.
- The delivery of health education according to variables relating to the science teacher such as gender, region (area of Jordan where he or she teaches: north, centre or south), teaching subject (general science, biology, chemistry and physics at grades

7-10), qualification in science (diploma in science, B.Sc. and above), qualification in education (none, diploma and above), teaching experiences (5 years or less, 6-10 years, more than 10 years).

- The teaching methods in the delivery of health education used by the science teachers.
- The percentage of time spent on health education by science teachers compared to the total number of science lessons.
- The problems that face science teachers in the delivery of health education.

The intention was that exploring and analysing these areas individually and in combination would illuminate the reality of the delivery of health education by basic stage science teachers in Jordan.

5.4 Study Population

The population (science teachers) was determined through visits to all departments of the educational supervision in Jordan (25 departments) after receiving official permission by the Ministry of Education (see Appendix 1). Time-tables of all science teachers involved were collected with the aim of providing data on the number and names of these teachers. Job addresses were also collected (name of school and educational directorate). This strategy was used to control the process of distributing the questionnaires to the sample so that a science teacher would not receive more than one questionnaire even if he or she taught more than one subject and grade in his or her school. The researcher also used this strategy later to conduct interviews with some

subjects in the sample.

This procedure revealed that the size of the population (science teachers who were teaching science subjects for grades seven to ten) was 2694, (of these 1206 were males and 1488 females) working at 898 public schools comprising grades seven to ten as a single unit. This was based on statistics by the Ministry of Education for the school year 1996/ 1997. The following table presents this data.

Table 5.1: Distribution of the population of science teachers according to gender and region variables for the school year 1996/ 1997.

Region	Gender		Total
	Male	Female	
North	495	594	1089
Centre	492	615	1107
South	219	279	498
Total	1206	1488	2694

Only the basic stage science teachers in public schools were selected in order to obtain consistency in academic background, contents of science curriculum which they teach, and consistency in school conditions relating to finance, facilities and regulations.

The rationale for confining the study to the latter part of basic stage was as follows:

- The age range of students (13-16 years) within this stage represents the beginning of adolescence, and the transition between childhood and adulthood.

- The basic stage is the final compulsory stage (a few of the students may leave the

schools after this stage due to economic factors).

- Students at this stage are highly active and have an increasing range of social contacts, so they are in need of encouragement to resist peer group pressures and social problems.

- Poor behaviour by students may have serious consequences especially if they indulge in pre-marital sex, because this offends Jordanian society's moral code.

- Due to psychological factors, students in this stage are curious and looking for information, but it is better to seek to modify their behaviour through persuasion and not forcing them.

5.5 Study Sample

Educational literature indicates that there is no single procedure for all situations in selecting sample size. There are many factors that limit the researcher's choice of the size that fits his or her research capabilities. However, the general rule is that the bigger the sample is, the more representative it is of the study population and thus can lead to a more valid generalisation of study findings.

Nunnally (1978), Gay (1980) and Borg and Gall (1989) among others suggest that the minimum size of the sample for specific types of study should be as follows:

- Correlation studies: 30 subjects or variable of multiple correlation and regression.
- Empirical studies: 15 subjects for each group. It is recommended that the number of

subjects in these studies should be similar or closer to that of the actual range of conditions so that findings will be more valid.

- Descriptive studies: 20 % of a relatively small population (few hundreds); 10 % of a big population (some thousands); and 5 % of a very big population (ten thousands).
- Factorial analysis: 5-10 subjects for each item.

However, educational literature points out that it will necessary to exceed these limits in the following conditions (Audeh and Malkawi, 1992) when:

- variables are not controlled;
- there is an expectancy of small differences or correlation coefficients;
- there is an expectancy of arranging the total group into sub-groups in conformity with the number of independent variables;
- the study population is not homogenous;
- reliability of the dependent variable is low.

As the population was 2694 subjects, and as the study could be regarded as including descriptive data, the acceptable percentage of the sample size was 10 %. But the researcher had to consider the above mentioned conditions for extending the sample size, and accordingly, it was decided that the actual percentage should be 15 %. Hence the initial sample size representing the study population was 404 teachers (male and female) working at public schools comprising grades seven to ten in the three regions (North, Centre, South) of Jordan, and teaching various science subjects (general science, physics, chemistry, and biology).

5.5.1 The Procedure of Selecting the Sample

In order to meet the requirements for obtaining a random stratified cross-representational sample, account was taken of the following factors: the different geographical areas of Jordan, the gender composition of the science teachers, and the subjects at grades seven to ten which they are teaching (biology, chemistry, physics and general science).

To determine the subjects of the sample relating to gender and region, all teachers were given a serial number in each region. The selection was made by a simple random procedure to pick the required number in each region, which should correspond to 15 % of the total number of male teachers, and 15 % of the total number of female teachers. The following table represents this data.

Table 5.2: Distribution of the study sample with regard to the gender and region variables.

Region	Gender		Total
	Male	Female	
North	74	89	163
Centre	74	92	166
South	33	42	75
Total	181	223	404

To determine the subjects of the sample relating to science subject, the following strategy was employed.

- The science subjects being taught from grade seven to grade ten were categorised as

follows: general science-grade 7, general science-grade 8, physics-grade 9, chemistry and earth science-grade 9, biology-grade 9, physics-grade 10, chemistry and earth science-grade 10, and biology-grade 10. This means that eight subjects were being taught for students of grades 7-10.

- The number of science teachers in each region were equally assigned to the eight subjects in order to specify the numbers in each sub-sample for each subject separately. The objective was to avoid duplication of responses.

- In the case when there was a remaining number after the division process, the remaining amount was distributed in accordance with percentage of emergence of health education topics in those subjects. Based on the results of content analysis the priority and the order of distribution was as follows: Biology- grade 9, biology-grade 10, general science-grade 7, physics- grade 9, chemistry-grade 9, physics-grade 10, chemistry-grade 10, then general science-grade 8 (see Table 6.2, p. 153).

After specifying the numbers of the science teachers who were to answer one questionnaire for a single subject and one grade, the simple random method was used to select the sample of these teachers. This is illustrated by the following table:

Table 5.3: Distribution of the study sample according to variables of gender, region and science subject.

Region	Gender	Subject								Total
		Sc/7	Sc/8	Ph/9	Ch/9	Bo/9	Ph/10	Ch/10	Bo/10	
North	Male	9	9	9	9	10	9	9	10	74
	Female	11	11	11	11	12	11	11	11	89
Centre	Male	9	9	9	9	10	9	9	10	74
	Female	12	11	12	11	12	11	11	12	92
South	Male	4	4	4	4	5	4	4	4	33
	Female	5	5	5	5	6	5	5	6	42
Total		50	49	50	49	55	49	49	53	404

Sc= General Science, Ph= Physics, Ch= Chemistry, Bo= Biology

5.6 Instruments

For the purpose of this research a form of triangulated data collection was employed: questionnaire, interview and analysis of documents. The requirements of the research questions dictated these methods. Combining different methods in the same study can help the researcher to overcome deficiencies that may result from a single method (McNeill 1990; Vulliamy, Lewin and Stephens,1990 ; Cohen et al, 2000).

5.6.1 Documentary Analysis

Much official documentary material was accessed at an early stage from the Ministry of Education and from Jordanian schools. Other material was examined as it became available during the field work. Documents identified for study and analysis included

the official science curriculum and the science textbooks of grades seven to ten together with the teachers' books and other published and primary source material. These documents were used as a means of identifying the health education policies, and as sources of information for the content analysis related to delivery of health education by Jordanian basic schools.

A review of literature and documentary materials should be based, whenever possible, upon primary sources (Borg and Gall, 1989). Primary and secondary sources have been employed in this study. Primary sources generally refer to a direct description of an occurrence by a person who actually observed or witnessed the occurrence. In educational research this means description of the study qualitatively and quantitatively by the researcher who carried it out.

Secondary source materials in educational research include any publications written by an author who was not a direct observer or participant in the events described (Borg and Gall, 1989). This means that the author compiled the reports or results of experiences of others on the basis of his or her interpretation of the various research reports and articles.

Secondary sources are very useful in that they combine knowledge from many primary sources into a single publication. Moreover, they combine the work of many others thus providing a quick and relatively easy method of obtaining a good overall understanding of the field (Borg and Gall, 1989). Most secondary sources, such as textbooks, contain a bibliography listing the sources from which the material was obtained so that the

researcher can usually locate the primary sources (MoE, 1991). Among the secondary sources in this study were journal articles, newspaper reports and official documents. Primary sources included a research study carried out by the researcher in Jordan in 1994. One of the main disadvantages of using secondary sources is that in the process of simplifying and combining the results of many studies, the author of a textbook or other secondary source may slant his or her interpretation of the primary source to agree with his or her own views and will omit material that the person using the literature needs to know (Borg and Gall, 1989).

The analysis of these primary and secondary source documents provided the researcher with an opportunity to identify the major issues and to clarify official policy regarding health education in Jordanian basic schools and also to assist in designing the questionnaires and conducting the interviews. There were some difficulties related to tracing the documented policy and the accessibility of some local educational reports and documents.

5.6.2 Questionnaire

The questionnaire is an effective tool for gathering data in most educational research (Fowler 1993; Cohen et al, 2000). In addition, the well designed and organised questionnaire prompts the researcher to investigate the relationships which may be established between the different elements within the research (Roberts, 1992). For the present study both these points are relevant. First, it was important to guarantee the necessary breadth of data. Second, the use of the questionnaire made it possible to undertake comparisons between the country's different regions and other related

variables (Herbert, 1991).

5.6.2.1 Questionnaire for Teachers

The actual performance of the science teacher who plays a vital role in the implementation, delivery and continued development of health education is central to the study. One questionnaire was designed for the science teachers. This consisted of a list of 64 individual topics related to the following five areas in health education: personal health, nutritional health, environmental health, disease and prophylaxis and education for married life. These are the five areas identified within the Jordanian official documents (see Table 6.2, p. 153). This provides a realistic structure within which to undertake the study. Cohen et al (2000) emphasise that it is more appropriate to put sensitive areas, topics or questions later in the questionnaire in order to avoid creating a mental set in the mind of respondents; hence 'education for married life' was the final area in the questionnaire.

The cover page covered the gender, region of Jordan where the teacher worked, teaching subject, qualification in science, qualification in education, and teaching experience (see questionnaire in Appendix 2). The prime objective of the questionnaire was to investigate the emphasis placed on the different aspects of health education in Jordanian basic schools, also to assess the content which is actually covered (or not covered) in order to identify any issues which hinder the effective implementation of health education.

Researchers should benefit from the prior measurement efforts of others (Gray, Burden and Weigel, 1985). Likert type questionnaires, as used in previous similar studies, were adopted for the purpose of this research (Hunting, Zymelman and Godfery, 1986; Subbarini, 1989). The Likert scale, an ordinal scale, is the most convenient for this study, because it provides an opportunity to collect a wide range of responses, and allows compilation of a profile of the current level of the delivery of health education (Hunting, 1986). The advantages of the questionnaire are apparent; the following issues are considered common disadvantages (Mouly, 1978; Brown and Dowling, 1998):

- Non-returns decrease the size of the sample, but more importantly, can introduce a bias.
- The validity of the questionnaire data depends on the ability and willingness of the respondent to provide the information requested.
- It is possible for the respondent to be so uninterested in the topic under investigation that he will answer the questions more or less at random.
- It is possible to misinterpret questions especially if the questions are ambiguous.

A linear weighting was given to the points on the scale. The descriptors used for the five-point scale, the most common one in educational research (Zaiton, 1994), were as follows (see Appendix 2):

- Very High: the topic was given great emphasis by teachers, score 5.
- High: the topic was taught with some emphasis, score 4.
- Moderate: the topic was delivered but given limited emphasis, score 3.
- Low: the topic was mentioned only, score 2.
- Never delivered: the topic was not mentioned at all, score 1.

5.6.2.2 Procedure of Designing the Research Questionnaire

The design of the questionnaire took into account the following considerations:

- The instructions for the completion of the questionnaire should be clear and accurate.
- The language and the wording of the questionnaire should be clear, simple, and precise to avoid any ambiguities or misleading statements.
- Closed and open-ended questions should be used to obtain quantitative and qualitative data.
- Where necessary, simple explanations and definitions should be given (Richardson, 1992; Fowler, 1993; Cohen et al, 2000).

Step One: Literature Review

A comprehensive study was made of the related literature and Jordanian official documents, to assist in the identification of key topics and areas relating to health education (see Chapter 6). These were then selected on the basis of the following criteria (Shami, 1982):

- Appearing in the analysed documents explicitly as prominent themes.
- Significance for the purpose of the current study (relating to health education).

Step Two: Developing the First Draft

The first draft was developed using the following procedure:

- The selected key topics and areas were subjected to a further close review to ensure that they covered the aims of the study.
- Closely associated topics were gathered under one area.

- Topics within each area were examined and then arranged into a logical sequence, often related to the way they might be taught.

Step Three: Pilot Study

Powney and Watts (1987) state that questionnaires should be free from ambiguities, inappropriate wording or misleading questions. Oppenheim and Abraham (1992) emphasise that it is essential to ensure this by 'piloting' each question and question sequence. Thus, the questionnaire in this study was pre-tested and piloted through the following procedure: the initial format of the questionnaire was written and then presented to a group of science teachers who were chosen for the pilot sample. Pilot studies are carried out with fewer subjects than will be employed in the main study. For some pilot studies two or three subjects are sufficient, and they rarely need to include more than 20 subjects (Borg and Gall, 1989). To represent the original sample with regard to region, subject area and gender, a random stratified cross-representational sample was used as a pilot study. These were five males and five females chosen from the study population and not from the original study sample. Cohen et al (2000) emphasise that the researcher should pilot the questionnaire using a group of respondents who are drawn from the possible sample but who will not receive the final refined version. The idea behind the selection from the population and not from the original sample was to avoid repetition which may affect the respondents' views if they are replying twice to the same questions. The aim behind this procedure (piloting) was to have an initial assessment of the items' format and clarity of meaning so it would be possible to carry out necessary adjustments and changes in order to make the

questionnaire more effective.

Step Four: Validity of Questionnaire

Based on comments by participants in the pilot sample, the researcher made the required changes and produced the final version of the questionnaire. However, the questionnaire was referred to a specialist in Arabic language to review and make adjustments if necessary. This was particularly necessary in that the study instrument was translated into and delivered in the Arabic language, after initially being prepared in English. However, a form of back translation was undertaken before the data had been collected.

The questionnaire was then presented to a group of 'judges'. This group comprised 12 people selected by the researcher based on their specialisms and experiences. Their role was to check whether the items of the questionnaire were appropriate to measure the reality of delivery of health education by science teachers in Jordan. The group of judges were asked to provide comments as follows:

- Put the sign (✓) at the category you think appropriate.
- Point out the extent of linguistic clarity.
- Specify the degree to which each topic is appropriate to the area.
- Note the topics that need to be changed or adjusted.
- Present suggestions for adding or removing any topics.
- Specify the extent of comprehensiveness with regard to covering aspects of health education.

- Note any ethical issues relating to the content and the language of the topics involved.

It was confirmed that the content of the questionnaire was accurate from the language point of view and suitable for the cultural background of Jordan. This involved, for instance, checking whether the same topics or statements could be used for both females and males, or whether any of questionnaire's statements might conflict with the local culture.

The initial number of items was 89. But when the items were presented to the group of judges, some items were changed, adjusted or combined. The final total was 64 topics. Agreement of the majority of judges was considered as an indication of the instrument's validity.

Step Five: Reliability of Questionnaire

The Cronbach-Alpha Test was used to measure the reliability of the final instrument (Audeh, 1993). The Coefficient of internal consistency of the five areas together was 98.21 %, while consistency of the areas separately was as follows:

- Personal health, 91.18 %
- Nutritional health, 94.71 %
- Environmental health; 93.28 %
- Disease and prophylaxis, 95.57 %
- Education for married life, 97.07 %

These are considered as very high consistency coefficients, thus confirming the reliablity of the questionnaire in meeting the objectives of this study.

Step Six: The Final Form of the Questionnaire

The final presentation of the questionnaire (see Appendix 2) followed the general pattern:

- A brief introduction about the study's general purpose and the purpose of the questionnaire was provided at the beginning, coupled with the request for co-operation and for answering all questions honestly.
- General instructions were given at the beginning of questionnaire.
- A five-point scale was employed in the questionnaire, ranging from very high to never delivered.
- A consistent, standard verbal explanation, at the time of administering the questionnaire to participants was provided.

5.6.3 Interviews

A semi-structured interview with a high proportion of open-ended questions was adopted to complement the questionnaire data and to allow probing for further information as necessary (Drever, 1995). This approach provides the freedom to adapt a sequence of questions and the opportunity to add other questions and explain them (Richardson, 1992; Cohen et al, 2000). The interviews were held with a sub-sample of selected science teachers who teach grades seven to ten in Jordanian basic schools.

These interviews aimed at investigating further the emphasis placed on various health education topics by science teachers. The interviews focused on the following themes:

- The teaching methods used by science teachers when delivering topics of health education.
- Suggestions for the teaching methods that may have an influence on changing students' health behaviour.
- The percentage of time spent on health education compared to the total number of science lessons.
- Any problems or issues that face science teachers when delivering health education.

For the interview schedule see Appendix 7.

Sixty participants were involved in the interviews (15 % of the original sample of 404 science teachers). The science teachers interviewed were selected and distributed based on the same procedure used to select the questionnaire sample. The following table clarifies this:

Table 5.4: Distribution of science teachers interviewed

Region	Gender	Subject								Total
		Sc/7	Sc/8	Ph/9	Ch/9	Bo/9	Ph/10	Ch/10	Bo/10	
North	Male	2	1	1	1	2	1	1	2	11
	Female	2	1	2	2	2	1	1	2	13
Centre	Male	2	1	1	1	2	1	1	2	11
	Female	2	1	2	2	2	2	1	2	14
South	Male	1	-	1	1	1	-	-	1	5
	Female	1	-	1	1	1	1	-	1	6
Total		10	4	8	8	10	6	4	10	60

Sc= General Science, Ph= Physics, Ch= Chemistry, Bo= Biology

5.7 Data Collection

The research instruments were applied and the data collected in-country between September 1999 and January 2000. Written permission from the MoE was obtained for access to schools and to background documentary information (see Appendix 1). The previous experience of the researcher as a science teacher and as a supervisor in the same field in different areas in Jordan (north, centre and south) for about ten years helped to inform and direct the study in its all stages.

5.7.1 The Administration of the Questionnaire

The administration of the questionnaire adopted the following pattern:

- The researcher obtained the head teacher's permission to meet the science teachers.
- In the introductory section, the aims of the study and of the questionnaire were

explained. The sample group were assured that the questionnaire formed part of an academic research project, and that their answers would be treated as confidential, and no information identifying the respondent would be disclosed.

- The participants were asked to determine how much emphasis they placed on the health education topics listed in the questionnaire.
- The participants were asked to inquire if they felt that a statement was unclear or ambiguous (Haroun, 1997; Sa'di, 1997).

The researcher conducted personal visits to the schools involved. All the respondents filled in the questionnaire at the same time, and it was possible to collect the completed questionnaire immediately at the end of each visit. The intention in adopting this approach was not only to elicit responses from the participants, but also to provide the participants with adequate time and an appropriate atmosphere within which they could respond freely in a way that reflected thoroughly their perceptions of, and points of view about the issues (Haroun, 1997). Therefore, the percentage of questionnaire return was 100 %.

5.7.2 The Administration of the interviews

The interviews were held with a sub-sample of selected science teachers who teach grades seven to ten in Jordanian basic schools according to the following strategy:

- **Before Interview Sessions:** due to the large numbers of participants (sixty) and not wishing to waste people's time, these sessions were arranged individually during the period of delivering the questionnaires; a set of questions was prepared; however

their sequence or order was altered slightly according to the nature of each individual interview (Merriam, 1988; Haroun, 1997). The interview questions are presented in Appendix 7.

- **Within the Interview Sessions:** It was important to select a convenient place in each school to hold interviews so as to avoid any outside influences on the participant's responses. A briefing about the research was given, and an informal preliminary talk related to their role and perceptions of the delivery of health education held, so as to accomplish 'relaxing' of the interviewee. Each open-ended question related to delivery of health education was delivered on a separate sheet of paper (especially for most of the females and some of males based on a desire expressed by them) to obtain the required information regarding the content of this question. These interviewees wrote their answers directly by hand. The justifications behind this are that religious and social factors limit and prevent continuous looking face-to-face between males and females and the sensitivity of health education itself especially where information related to sex issues and family life preparation are involved. Moreover, the tape recording process in general is not commonly in use in Jordanian schools and itself puts the interviewees under psychological pressure; some fear that this may threaten their social and professional position especially in the case of using formal language and giving correct (scientific) information; and in general and from the researcher's experience, most teachers in Jordan can be described as 'talk and chalk' teachers. This may be the reason why they expressed their desire beforehand to write directly.

However, this situation was in itself useful in giving the interviewee a full opportunity and adequate time to answer the questions and to summarise his or her thoughts through adding, modifying and deleting information (Jarman and McAleese, 1996). This opportunity does not occur in the case of tape recording. Also, this situation compensates by giving more information and avoiding very short answers.

For the researcher, it was useful in avoiding extra unrelated information and avoiding wasting time in translating and categorising data, especially as each response was written on a separate sheet. But in spite of these advantages, there were some limitations to this situation, such as less opportunity to observe and record the respondent's impressions and feelings, and less opportunity to control immediately the respondent especially should they go too far from the main subject. However, there was a considerable talking around the content of the questions during this session, especially if the participants needed clarification about something.

After finishing their answers on each question and before going to another question, a quick revision of these answers by the researcher was made so as to inquire deeply and to get clarifications about any unclear issue or incomplete information. In case of getting further information, the researcher immediately wrote this down by hand on the same answer sheet. Considerable information relating to the content of the questions was collected by this manner. The responses of other participants (about one third of the sample) were written directly by the researcher as it was their preference.

- **After the Interview Sessions:** The collected responses were put in a special file for analysis. These answers were analysed individually and in combination to illuminate the delivery of health education. Then the results of the interviews were compared with the results of the documentary analysis and the questionnaire data.

5.8 The Approach to Analysis

Brannen (1992) emphasises that quantitative and qualitative data should be used interactively. Both Hunting et al (1986) and Brannen (1992) report that quantitative methods describe rather than explain, whereas, qualitative methods examine the 'hows' and 'whys'.

To obtain a comprehensive picture of the delivery of health education by basic stage science teachers in Jordan, it was necessary to combine and integrate the qualitative with the quantitative data. Integrating qualitative and quantitative results provides an enhanced depth and insight into various aspects of the study (Davies, 1995). In this research, the data (questionnaires, interviews and documents) have been generally exposed to three processes; data reduction, data display, and conclusion drawing (Miles and Huberman, 1984).

5.8.1 Quantitative Approach

The main source of quantitative data in this study was the questionnaire results. The participants' responses were handled by the following strategy: the collected data were manipulated, tabulated, and computed for analysis through a numerical coding system to handle and subsequently interpret the data collected. This strategy comprises the

following steps:

- The collected data were recorded on separate sheets where every response was given the serial number of the questionnaire from which it came. The study sample was 404 science teachers. This means that for instance, the sheets comprised of 404 rows and 73 columns as follows: columns 1-3 stands for the serial number, gender variable, column column 4 stands for 5 stands for region variable, column 6 stands for subject variable, column 7 stands for qualification in education variable, column 8 stands for qualification in science variable and column 9 stands for teaching experience variable. Columns 10-73 are the scores given by teachers to the topics taught, which are 64 topics under five main areas of health education; personal health comprises 10 topics, nutritional health comprises 11 topics, environmental health comprises 12 topics, disease and prophylaxis comprises 13 topics and education for married life comprises 18 topics.

The Likert five point scale was as follows: very high, 5; high, 4; moderate, 3; low, 2; never delivered, 1 (see section 5.6.2.1).

Descriptor variables were scored as follows:

Gender: 1 for the male and 2 for the female.

Region: 1 for the northern region, 2 for the central region and 3 for the southern region.

Subject: 1 for general science at grade seven, 2 for general science at grade eight, 3 for physics at grade nine, 4 for chemistry at grade nine, 5 for biology at grade nine, 6 for physics at grade ten, 7 for chemistry at grade ten, and 8 for biology at grade ten.

Qualification in science: 1 for diploma in science and 2 for B.Sc. and above.

Qualification in education: 1 for no qualification and 2 for diploma and above.

Teaching experience: 1 for teaching experience of 5 years and less, 2 for teaching experience of 6-10 years, and 3 for teaching experience of more than 10 years.

- These data were computed and subjected to statistical analysis to determine relationships between them. This allowed comparisons to be made between the different variables (Burroughs, 1971).

The Statistical Package for Social Sciences (SPSS) was used for the analysis. Data were analysed and expressed through means, standard deviations (S.D), frequencies and percentages so as to be more easily understood and interpreted. The percentages were calculated by dividing the number of responses in each category of the Likert five-point scale by the overall number of respondents, which is 404, and then multiplied by 100. The mathematical mean score for each topic was calculated by dividing the sum of the scores given to that topic by each respondent, by the number of respondents, which was 404. The standard deviation of each topic was calculated by the standard formula, subtracting each score from the mean of the topic, the resulting deviation scores then squared and divided by the sample size which is 404 in this study, then the square root of the result calculated. The overall means and standard deviations for each area were calculated in the same way.

- **Two-way ANOVA** with **Scheffe** post-hoc techniques were used to examine any differences related to the variables (gender, region, subject, qualification in science, qualification in education and teaching experience) and the interaction between them. It was considered that the data approximated normality sufficiently to justify

the use of parametric statistics. The reason for using two-way ANOVA was that the analysis of variance offers three advantages over the Z or T type of significance test:

- It can compare the effects of more than two categories of independent variables.
- It can compare the simultaneous but separate effects of two or more variables.
- It can assess the interaction effects of two or more variables (Phillips, 1996).

Therefore a Two-way ANOVA was considered as the most convenient technique for the purposes of the study using the raw data as described earlier in this section.

The rationale for examining the effects of these variables and the interaction between them was that, due to the sensitive nature of health education and the social and cultural background of people in Jordan, it was expected that there will be different views and practices between males and females in the three regions (north, central and south regions). On the other hand, the qualification in education, in Jordan, is concerned with training teachers on various teaching methods appropriate for implementing the national curriculum and its content. Thus, there could be a link between this and the topic taught. It was expected that qualifications in science and the length of teaching experience would also have an effect.

- **The F-value** used in this study indicates whether there are significant differences between variables. The significance level $\alpha < 0.05$ is most commonly used in educational research (Audeh and Malkawi, 1992).

- If the **F-value** (ratio) was statistically significant, the researcher carried out t-tests to determine which group means differ significantly from each another; there are

several t-tests for multiple comparisons, including Duncan's multiple-range test and techniques developed by Newman-Keuls, Tukey and Scheffe. In this study, the Scheffe method for making post hoc comparisons was used. The rationale for using this method was that the Scheffe method is characterised by its flexibility and robustness. It can be applied even when the groups being compared have different sizes and is less sensitive to departures from normality and any assumptions of equal population variances than other tests. Scheffe's test determines the critical difference between any two sample means which makes it necessary to reject the null hypothesis that their corresponding population means are equal (Sirkin, 1995).

- To interpret the questionnaire findings in terms of actual scores (percentages and frequencies), means and standard deviations, the researcher adopted the following strategy: the topics involved were ranked in a descending order within each area according to their means. To judge the emphasis placed on any health topic, whether it is very high, high, moderate, low or never delivered, account was taken for both mean and actual scores of that topic. For example, if the mathematical mean of a health topic was 2.87, then this means that the topic was between 'moderate' and 'low' delivery.

5.8.2 Qualitative Approach

All the techniques used in this study were a source of qualitative data. Although the questionnaire is generally considered a quantitative research tool, in this case it included 'open-ended' questions suitable for qualitative analysis.

The model employed in the qualitative analysis was derived from one developed by Mason and Finch (1994). The main features of this model are: it is possible to start with broad themes that can be, in subsequent stages, refined and sub-divided into categories, allowing the researcher to compare the thematical material from the responses of each group of participants and allowing comparisons between different themes. This approach enabled the researcher to measure the levels of agreement between the responses of participants, documentary results and interview data (Brayman and Burgess, 1994). Upon these levels of agreement, a general picture of the current situation regarding health education in Jordan has been drawn.

Content anlysis can be used to turn qualitative evidence into quantitative data.

In the analysis of the contents of the science textbooks, the researcher has used the Apparent Health Content and not the implicit content (see Section 6.4, p. 151). The researcher has analysed the texts of these lessons or chapters carefully and identified the health concepts that appear in each in order to specify and classify these topics. Moreover, the proportion of the lessons containing health topics in the science textbook prescribed for each grade has been calculated in order to compare the content of the health education with the actual delivery by science teachers. This comparison is discussed in Chapter 9 (see Table 9.1 and 9.2, p. 242).

The procedure for calculating the proportion of lessons that contain health education topics within the science textbooks of the basic stage was as follows: if the science textbook for the seventh basic grade contained twenty five different lessons (assuming that all lessons are equivalent in terms of time), and if any six lessons involved topics of

health education related to the body and its systems, then the number of the lessons that contained health topics in the field of the body and its systems in the total number of the lessons of the textbook is 6/25; that is to say 24 % of the lessons of this textbook focus on the health of the body. This methodology has been adopted in all of the science textbooks for the grades from seven to ten. Although a fairly crude measure, it does begin to quantify the amount of health education contained in the science curriculum.

As for the interviews findings, the researcher has grouped themes according to the following strategy: For each theme, a general overview has been provided through grouping by common features. An analysis and discussion has been conducted for these features using quotations and statements made by respondents. These are support by evidence from the questionnaire and documentary analysis.

5.8.3 Integrating Qualitative and Quantitative Findings

Brannen (1992) argued that although qualitative and quantitative data give results of a different nature, they may contain similar themes. This is true in the case of this study. The themes and sub-themes that emerge from the qualitative analysis (interviews and documentary data) formed part of the context for the discussion of the quantitative findings (questionnaire data). Brayman and Burgess (1994) recognised that the integration of data enhances the validity of the overall analysis. This supported the intention of the research, that the findings from the interviews and documents were used to increase the validity of the quantitative data.

5.9 Summary

Due to the sensitivity of Jordanian culture to some health education topics, such as sex education, the researcher was aware of issues that may conflict with moral, cultural, religious considerations during the fieldwork. The researcher has sought to obtain rich data, qualitatively and quantitatively, regarding health education delivery in Jordan. The documentary analysis was one of the three parts of the study, and the findings from this are discussed in the next chapter.

Chapter Six: Health Education Policy and Curriculum in Jordan - A Documentary Analysis

6.1 Introduction

This chapter presents the results of the documentary analysis which was carried out with key policy documents relating to health education in Jordan. As mentioned in Section 1.7, p. 17, health education was first emphasised in the First National Conference on Education Development held in Amman in 1987. It was introduced into the science curriculum in the early 1990s. The obvious aims of the introduction of health education were to promote aspects of health and to encourage healthy behaviour by 'following health habits' through providing students with appropriate health knowledge. The science curriculum was considered to be the most effective vehicle for this.

To discover the official policy with regard to health education, official documents issued by the Ministry of Education in Jordan such as the curriculum, science textbooks and the Teachers' Guide provided for schools have been analysed. The explicit indications related to aspects of health education were analysed to find out what has been emphasised and what appears to have been neglected or ignored by the Ministry of Education in Jordan regarding the age category 13 to 16 years old.

Having revealed the content of such documents, this study will go on to analyse any differences between the policy and its implementation by science teachers in the upper basic schools in various regions of Jordan. The health education topics mentioned within the science curriculum and textbooks were used to prepare the questionnaire administered to teachers, to form a picture of the emphasis placed on each topic. Other

aspects such as methods of delivery, the time spent on health education and the obstacles to delivery were investigated through individual interviews. These are discussed in Chapters 7 and 8 respectively.

The research question for this part of the study was: 'What aspects of health education are reflected by educational policy within official Jordanian policy documents?' For the purpose of analysis, this was further divided into a number of categories, which were the official policy regarding:

- the areas of health education that are included.
- the topics omitted from the curriculum.
- the methods of delivery.
- the teaching of the moral aspects of health education.
- any recommended textbooks.
- any other recommended support materials (e.g. videos, films).
- the time to be spent on health education.
- the assessment of students' learning in health education.
- the relationship between health education and other subjects in the school curriculum.
- the ages at which different aspects of health education should be taught.

These categories are discussed within the analysis of the following official documents.

6.2 Guidelines for the Science Curriculum in the Basic Education stage

This document was issued by the Jordanian Ministry of Education in 1991. It forms the first part of the official document called *Science Curriculum and its Guidelines in the Basic Education Stage*. The second part is discussed in Section 6.3. This part was approved by the Education Council in its resolution number 34/88 which was made on 24/8/1988, and has eight sections:

(i) *The Basis of Science Curricula in the Basic Education Stage*. This section highlights the philosophical, psychological, social and cognitive basis which forms the main foundation for the science curriculum in the basic education stage (MoE, 1991, p.18-19). The philosophical basis encourages the enhancement of the relationship between science, technology and society.

The psychological basis confirms that science education should:

- satisfy the basic needs of the learner;
- contribute to health education;
- organise the learner's experiences in a way that suits their potential;
- achieve the participation of learners in guided scientific activity;
- enable them to reach their full potential along with respecting individual differences between the learners.

The social basis emphasises that scientific and technological advancement is a basic social need that is associated with the scientific and technological education of society, and that the science curriculum is devised to satisfy the needs of Jordanian society and

enhance the potential for cultural development and progress.

The cognitive basis emphasises that science has a significant structure of facts and concepts, and a methodology built on research and investigation. Therefore, the nature of science, its structure, and its methodology must be taken into consideration in building the curriculum.

Thus the educational policy confirms that the science curriculum must focus on introducing science at the basic education stages through an integrated approach that associates science concepts with technical applications, and develops an understanding of environmental, health and population problems in order to ensure the integrated growth of the child. Health education is mentioned specifically as it is taught within science topics.

(ii) *The Objectives of Teaching Science in the Basic Education Stage.* This section lists certain fundamental objectives which should be achieved in teaching science at the basic education stage. Among these is just one statement dealing with health education: "The assimilation of the proper scientific values and attitudes in a functional way such as following the health habits" (MoE, 1991, p. 20).

(iii) The *Structure of the Curriculum and its Components.* This section lists the main cores on which the science curriculum in Jordan is built. These are: *The Human Body and its Health; Science and Technology; Creatures and their Environment; Our Planet the Earth; The Atmosphere and the Atmospheric Conditions; Substance and Energy;*

The Solar System and the Universe (MoE, 1991, p. 21-22). Mention is only made of health education in the first core: *The Human Body and its Health.*

(iv) *Special Objectives and Competencies.* This section highlights what is expected to be achieved by students after studying science in the basic education stage. The specific objectives focus on scientific facts and concepts in very general terms such as *The Human Body and its Health* as listed above, and scientific process competencies such as experimentation and the building of scientific patterns. However they also concentrate on acquiring performance, behaviour, and social skills such as reading, listening, co-operation, partnership, discipline and order (MoE, 1991, p. 23). These general social skills have relevance to health education.

(v) *The Tutorial Plan.* This section provides a plan of the distribution of weekly science lessons for basic stage students from the seventh to the tenth basic grades. This section emphasises that the practical aspects of science should be integrated, and that the science lessons for the ninth and the tenth grades should be distributed equally between physics, chemistry and biology with two lessons per week for each of these subjects at these two grades (MoE, 1991, p. 24). All schools and teachers are required to follow this plan. Again, health education is not mentioned specifically although it is taught within the science topics.

Table 6.1: Distribution of science weekly lessons to the basic stage students from the seventh to the tenth basic grades (ages 13 to 16). One lesson lasts 45 minutes

Grade	Seven	Eight	Nine			Ten		
Subject name	Sc	Sc	Ph	Ch	Bio	Ph	Ch	Bio
Weekly lessons	4	5	2	2	2	2	2	2
Total	4	5	6			6		

Sc= Science Ph= Physics Ch= Chemistry Bio= Biology

(vi) *Science Textbooks and their Specifications.* This guideline stipulates that the presentation of the teaching content in the textbook should focus on encouraging inductive thinking among students, and encourage a variety of teaching styles appropriate to the nature of the scientific content and intellectual maturity of the students. Textbooks must be accurate and up to date. New terms must be presented within a meaningful context and clearly defined, so that they become familiar. A balance should be struck between resorting to complex scientific knowledge or simplifying in a way that destroys the essential meaning (MoE, 1991, p. 25).

(vii) *Teaching styles, Teaching aids and Activities.* This guideline focuses on the recognition of individual differences among students, by varying teaching styles and scientific activities in a way that is appropriate to the physical and mental capabilities of students. It talks about maintaining a suitable classroom atmosphere to help students to acquire skills and develop desired scientific attitudes, such as interest in the cleanliness and safety of apparatus, to view the environment as an extension of science classes, and to employ environmental resources effectively (MoE, 1991, p. 26-27). The latter point

has indirect links with health education.

(viii) *Assessment and Development of the Curriculum.* This section indicates that assessment procedures must be planned to involve the assessment of all objectives. It emphasises that the assessment procedure should include students' contributions to scientific activities such as a science magazine and a science club (MoE, 1991, p. 28).

It is clear that the *Guidelines for the Science Curriculum in the Basic Education Stage* recognise the importance of making connections between the concepts of science and technological progress on one hand and the understanding of environmental and health problems on the other. Thereby it seeks to achieve the integrated growth of the child in both academic and health aspects through the science curriculum. On the other hand, analysing the content of the guidelines reveal that there are deficiencies and a clear discrepancy between the concepts of pure sciences and the other topics included in the curriculum such as health education. The evidence for these discrepancies are discussed below.

The general objectives of teaching science at the basic stage includes only one statement which stipulates adhering to good healthy habits. This is a very general statement that requires further explanation and expansion.

The cores around which the science curricula are built included *The Human Body and its Health.* The other cores of the curriculum (*Creatures and their Environment, Our Planet the Earth, The Atmosphere and the Atmospheric Conditions, Substance and*

Energy, The Solar System and the Universe) did not give any specific indication relating to, for example, healthy food, environmental health and disease and prophylaxis in order to integrate with the core of *The Human Body and its Health.* It appears that there is little integration between the cores on which the science curriculum is built.

Furthermore, an imbalance appears in the tutorial plan (the fifth guideline). Four lessons weekly have been assigned for the seventh grade and five lessons weekly for the eighth grade, while the ninth grade and tenth grade receive six lessons weekly to cover all three sciences. Also, it emphasises the theoretical and practical aspects of science without assigning specific time for teaching health education within the curriculum. Thus it can be said that despite the fact that the MoE states that health education should be included within the science curriculum, the pure scientific concepts continue to dominate the curriculum plan and the general objectives.

6.3 Science Curriculum for the Basic Education Stage

The *Science Curricula for the Basic Education Stage* document was approved by the Education Council in its resolution number 3/91 which was made on 9/1/1991. It forms the second part of official document called *Science Curriculum and its Guidelines in the Basic Education Stage*. This document was prepared as a result of the recommendations of the First National Conference on Education (MoE, 1988) as discussed in Section 1.7, p. 17 of this thesis, and further developed in 1991. This document was built on the basis of the guidelines discussed in the previous section. However, in its analysis the researcher was unable to gain much information from this document as it is mainly guidance, instructions and directions for authors who will write the science textbooks

for each basic education grade. More importantly all topics for all grades were presented in tables and included very little detail on the topics themselves, just the names and the numbers of units, chapters and the method of designing lesson content through suggested specific aims for these lessons. It was not possible to identify health education topics just through reading the titles of lessons or units. For example, just reading a title such as *The relations between the creatures* which is mentioned in the curriculum will not give any indication for studying any health topic. Yet studying the content in this topic in the textbook gives some indications for healthy food. Science teachers rely on the science textbooks to identify relevant health education topics.

To illustrate the science curriculum for grades 7 to 10, and demonstrate how it is composed of topic titles only, it has been translated in its entirety below. For each grade, more detail on the health education component has been added from the relevant textbook writer's guide.

The grade seven science curriculum consists of the following teaching units or topics:

- the characteristics of living creatures;
- from the cell to the system;
- patterns of reproduction;
- the power and the pressure;
- other characteristics for the substance;
- the chemical reactions;
- the relationship between the sun and the earth;
- the atmospheric pressure and the winds;
- the heat for our life.

Regarding health education, the researcher found just the following statements in the textbook guide: growth and reproduction, food and water, the importance of sunlight for life, the central heating at home and non-inflammable clothing.

The grade eight science curriculum consists of the following teaching units or topics:

- classification of living creatures;
- organisation in the body of living creatures;
- powers and movement;
- some forms of energy in our life;
- energy resources;
- behaviour of elements and compounds;
- important reactions between oxygen and substances;
- chemical industries.

Regarding health education, the researcher found the following statements in the textbook guide: the digestion, breathing, organisation and circulatory systems of tiny creatures, the importance of fuel, natural gas and electricity and its effects on the environment.

In grades nine and ten, the science curriculum consists of three separate subjects: biology, physics and chemistry. The content of the biology curriculum consists of the following teaching units:

- the environment and adaptation;
- the cell and tissues;

- the human body systems;
- disease and the body's health.

Regarding health education, the researcher just found the following statements in the textbook guide: the groups of food, dealing with the environment, studying the importance and problems of the body systems such as digestion, breathing, circulation and reproduction systems, the balance of food and athletic exercises, teeth health, vaccination and Aids.

The content of the physics curriculum consists of the following teaching units:

- the mechanical energy in our life;
- the heat in our life;
- the electricity in our life.

There was only one statement in the textbook guide: the consumption of electricity at home.

The content of the chemistry curriculum consists of the following teaching units:

- water at home;
- the activity of metals;
- electo-chemistry;
- the conductivity of solutions and compounds for electricity;
- bases, acids and salts;
- some atmospheric phenomena;

- metals, rocks and other natural resources;
- formation of the ground's surface.

Regarding health education, the following statements were identified: the pollution of air, soil and water, the effects of acid rain on the environment, the effects of industries on the environment, giving instructions regarding First-Aid.

In grade ten, the biology curriculum consists of the following teaching units:

- the environment: resources and problems;
- the human body's systems;
- heredity;
- humans and medication;
- seed plants.

Regarding health education, the following statements in the textbook guide were identified: the pollution of air, soil and water, the effects of acid rain and petroleum on the environment, maintaining the forests and agricultural lands, maintaining the body's systems, drugs and health, dealing with medicine, hereditary engineering, hereditary disease, family planning, pregnancy, abortion, delivery of twins, natural feeding, pre-medical test, nourishment of the child in the womb, the social and lawful dimensions of medical technology, and transmission of disease.

The content of the physics curriculum consists of the following teaching units:

- the electrical power in our life;

- the light power in our life.

Applied technology such as the washing machine and vacuum cleaner are of indirect relevance.

The content of the chemistry curriculum consists of the following teaching units:

- chemical calculations based on chemical reactions;
- power in chemical changes;
- chemical bonds and formulating molecules;
- order in the behaviour of elements and compounds;
- hydrocarbons as important organic compounds;
- prediction of atmospheric conditions;
- prediction of ground's components;
- solar system and the universe.

Regarding health education, the following statements in the textbook guide were found: the consumption of electricity, atmospheric conditions, safety, and the possibility of life on other planets.

In conclusion, very little information regarding health education could be deduced from the content of the science curriculum, except from that of biology. This is much as expected, with even these topics appearing to be more related to scientific aspects than health and attitudinal ones.

Regarding the suggested teaching methods, the teaching methods suggested for all grades are:

- using pictures, posters, films and simple apparatus and measures;
- observation, examining, measurement and classification;
- preparing lists, reports and slides;
- studying ready made models or slides;
- doing simple experiments and making simple models or drawings;
- field trips;
- discussion;
- collecting species;
- invited speakers and specialists.

This reveals that in the Jordanian curriculum documents, science topics received much more attention and emphasis than health topics. Furthermore, the proposed teaching methods in the curriculum tend to confirm the cognitive aspect more than attitudes, values and emotional aspects. On the other hand, the above suggested teaching styles could be seen, by policy-makers, as the most appropriate ones for the Jordanian school setting.

6.4 The Science textbooks for the Basic Stage Students

The textbook can be considered as the functional translation of the prescribed curriculum in Jordan. It provides the medium, the objectives and the content on which the teaching-learning process depends. It is considered one of the most important documents which the teachers and the students have. It is the main source of reference

for teachers, students, supervisors and parents of students because it shows what is to be presented to students by teachers, what the students have to learn at each stage, and what the educational supervisors must follow-up.

The researcher has analysed the contents of the textbooks used in Jordan for the seventh to the tenth basic grades in order to provide an actual picture of the content of health education within the science curriculum. In the analysis the researcher has used the Apparent Health Content and not the implicit content. In other words, the obvious text that concerns any health topic or concept has been used, not what could be interpreted as the content of the lesson, in order to make it easier to control the analysis process and to classify the health education concepts. The results of this analysis will be compared, later on, with the health education policy in general, and with its actual delivery by science teachers.

The procedure for working out the proportion of lessons that contain health education topics within the science textbooks of the basic stage was as follows: if the science textbook for the seventh basic grade contained twenty five different lessons (assuming that all lessons are equivalent in terms of time), and if say, six lessons included health education topics related to personal health then the proportion of lessons that contained health topics in the area of the personal health in the total number of the lessons of the textbook is 6/25; that is to say 24 % of the lessons of this textbook involved personal health. This methodology has been adopted in all of the science textbooks for the grades from seven to ten. It is recognised that this can only be a broad estimate of the amount of health education that should be taught within the science curriculum, as the whole of

the lesson may not be devoted to this area; however it represents a first attempt to quantify this information.

Based on this methodology, the following results were found:

The health education in the science textbooks was centred on five main areas: personal health, nutritional health, environmental health, protection from disease, and education for married life. These areas were distributed within science textbooks at all grades, seven to ten, as shown in Table 6.2.

Table 6.2: The results of the analysis of the science textbooks' contents for grades 7-10.

Subject/grade	Percentage of lessons including each health area						
Health areas	personal health	nutritional health	disease and prophylaxis	environmental health	education for married life	overall percentage of health topics in the science curriculum for each grade	
science / 7	24 %	12 %	16 %	28 %	27 %	20 %	
science / 8	12 %	12 %	4 %	8 %	-	7 %	
physics / 9	17 %	-	17 %	33 %	-	13 %	22 %
chemistry / 9	22 %	-	6 %	33 %	-	12 %	
biology / 9	56 %	21 %	56 %	33 %	33 %	40 %	
physics / 10	50 %	-	-	-	-	10 %	19 %
chemistry/ 10	6 %	6 %	-	31 %	-	9 %	
biology / 10	67 %	13 %	67 %	27 %	13 %	37 %	
overall percentage of health topics in the science curriculum for the whole stage	32 %	8 %	21 %	24 %	9 %	19 %	

Over the four grades, an average of 19 % of science lessons contained health education

topics with a range of 4 % to 67 %. As expected, the main subject area for health education in grades 9 and 10 is biology. The overall percentages at each grade are as follows: 20 % at grade seven, 7% at grade eight, 22 % at grade nine and 19 % at grade ten. These percentages are relatively close to each other except at grade eight, which has only 7 %. This low overall percentage may come as a result of the difference between the committees which compiled the science textbooks; they began by compiling the textbooks for the first grade, third grade, fifth grade, seventh grade, ninth grade; then in the second phase they produced those for the second grade, fourth grade, sixth grade, eighth grade, tenth grade (MoE, 1994). This could have led to a lack of co-ordination and progression in health-related topics.

Although the health education topics taught at each grade will depend on the nature of the science topics and their relevance to a health education area, Table 6.2 shows that there is an imbalance between the delivery of the five health education areas at the different grades. It is also be seen that some textbooks contain no reference to health topic areas, as is the case of the science textbook for the eighth grade in terms of 'Education for married life' and the physics and chemistry textbooks for the ninth and tenth grades.

These results suggest a neglect of health education compared with topics in pure science. This can be deduced, in addition to the percentages in Table 6.2, from the number of lessons assigned per week at each grade (see Table 6.1). There was no specific time set aside for any health education topic; without the identification of specific times and topics in health education, it is likely that the information provided

will be simple and shallow.

With regard to health education areas, the overall percentages at the whole stage did vary in these areas, from 8 % to 32 % (nutritional health and personal health respectively). The lowest percentages were for nutritional health, 8 %, and education for married life, 9 %. With regard to education for married life, the low overall percentage, 9 %, may come as a result of not wishing to tackle this sensitive topic in more depth at this age due to psychological, cultural and political issues. This finding is supported by the interview data in Section 8.6, p. 231 - 234. It could be that the official policy considers that tackling these topics in an early age stage (less than 16 years old) is arousing the emotions and feelings of adolescents which may direct their attention towards inappropriate behaviour (Reiss, 1998). This topic, education for married life, and its relationship with social and cultural factors will be discussed in Chapters 7 and 8.

As for the area of nutritional health, 8 %, it can only be speculated that this low overall percentage comes from the belief that acquiring good habits in nutrition should occur at home; that the students eat whatever they like or is available for them at home, rather than practise what they have learnt at school. The neglect of the area of nutritional health in the educational policy may be due to social, economical and cultural factors govering food choice and availability (Alison, 1992). This is also emphasised in Section 1.3 in this thesis, in that there is a big gap between Jordanian groups in terms of social, economical and cultural factors which may affect their life styles and eating habits.

A detailed breakdown of the five health areas and the health education topics within

these areas across all four basic grades are presented below.

Personal health

- Maintaining the health and safety of body organs.
- Social health in dealing with others.
- Cleanliness and purity of the body during adulthood.
- Self dependence in solving private problems.
- Healthy habits and the proofs of good behaviour in daily life.
- Suitable athletic exercises for health and potential of body organs.
- Health of the mouth, teeth and gums and their relationships with tastes prevailing in the society.
- Attending school actively and confidently.
- Common problem among companions such as smoking, drugs.
- Comprehensiveness of knowledge about children's rights such as education, health, work.

Nutritional health

- Healthy habits in taking food and drink.
- Diet and prevention of disease.
- Eating snacks between main meals.
- Keeping foods from decomposition.
- Balanced food and general appearance of the body.
- Taking sweets and confections between meals.
- Weight control through nutrition.
- Good nutrition and improving school performance.
- Balanced diet and its effect on psychological and emotional condition.

- Choosing food as means of preventing disease.
- Feelings about accepting or refusing some kinds of food.

Environmental health

- Sanitary measures to dispose of household refuse and waste.
- Protecting the stocks of the natural environment from abuse and destruction.
- Participating with society in activities which fight local sicknesses and disease.
- Inspecting water and sanitary facilities at home and school.
- Fires and suitable extinguishers.
- Technology hazards in the environment.
- Reducing the causes of pollution of air, water and soil.
- Public safety precautions at home, school and in the environment.
- Rationalisation of the consumption of water, electricity and telephone services.
- Maintaining the safety of machines when using them.
- Micro-organisms and their effects on the environment.
- Familiarisation with laws of healthy environment.

Disease and prophylaxis

- Transmission of infection.
- Medical herbs and treating some daily problems.
- Rules of dealing with drugs in relation to taking and storage.
- Health problems caused by obesity and thinness.
- Prevention of infection of disease caused by micro-organisms.
- Completion of vaccination at appropriate times and in correct places.

- Indication of some diseases and recognising them.
- Chemical materials and their effects on health and food.
- Consulting the doctor in abnormal circumstances.
- Hereditary factors in disease.
- AIDS prevention and containment.
- Familiarisation with first aid principles to deal with common minor injuries and illness.
- Use of mineral waters in prevention of some diseases.

Education for married life

- Reproduction and survival.
- Male and female sexual organs.
- Psychological and physical preparation of females to perform maternity roles and preparing males as fathers.
- Adulthood in both sexes: time, stages, duration, general body appearance.
- Feelings between the two sexes and controlling them.
- Physiological and psychological behaviours in adulthood: day dreams, menstruation.
- Illegal sexual practices before marriage.
- Dealing with health and family information in the media.
- Family planning means.
- Having a pre-marriage medical test.
- Dangers of early marriage.
- Pregnancy: duration, stages, psychological preparation.
- Abortion: conditions, dangers.

- The social, lawful dimensions of medical technology such as artificial fertility.
- Care of the pregnant woman (safe maternity).
- Nourishment of child in the womb.
- Delivery of twins.
- Natural feeding and health of the mother and her child.

The results of the analysis of the contents of the science textbooks for the basic stage (grade seven to grade ten) in Jordan show that there are areas in health education which are not mentioned or discussed by the official science textbooks for the basic stage. The following aspects derived from the literature are the most important ones: child abuse, smoking and personal health, drugs misuse, chemical solvents misuse, and violence.

6.5 The Teacher's Guide

The *Teacher's Guide* is a copy of the student's textbook which also includes guidance, directives and instructions to the teacher about how to teach the contents of the book. Special copies of the student's textbook are prepared with guidance for the teacher typed in the margins.

The researcher has analysed the content of *The Teacher's Guide* for the grades seven to ten in order to reveal the directives and guidance on teaching the health education content. It was found that the guidance notes focused on recommended teaching activities related to pure science rather than applied science or health education, and suggested teaching aids and activities emphasise the theoretical side more than the practical side. These notes are presented in a scattered and incomplete way which is

difficult for the teacher to follow in delivering the content of the lessons with simplicity and ease.

6.6 Other Evidence of a Whole School Approach to Health Education

The School Certificate. This is an official document issued by the Ministry of Education to students at the end of each semester (twice a year), to show the student's academic progress in the different subjects which are part of the obligatory curriculum. There is the mark achieved for each subject, and a column for the teacher to show if the student has succeeded or failed. The mark is distributed between physics, chemistry, and biology in the ninth and the tenth grades. At all these grades there is no specific mention of health education.

A section is assigned for the class educator's remarks. In Jordan, the 'class educator' is the teacher who has pastoral responsibility for the class. This part contains entries on: cleanliness and tidiness; behaviour and number of days of absence, and is hence related to health education. This is a positive step; as shown in Section 3.5, p. 78, recognising achievement in health education, either formally through certification or informally through awards and prize giving, emphasises the importance of the subject.

School Visits' Register. This official document is issued by the Ministry of Education and includes any general remarks that may be written by visitors to the school, such as educational supervisors, doctors from the Ministry of Health officially co-operating with the school, or doctors and other people who are invited or volunteer to deliver lectures on health, or other topics related to the students, the school and the teachers.

Upon analysing the contents of these registers available at the schools within the sample of the study (approximately 100 schools), it was found that the remarks relating to the supervisory visits to teachers did not show anything relating to health education with regard to spreading health awareness, providing different health topics, or follow-up of students in matters related to their health and behaviour. The official visits paid by the doctors of the Ministry of Health to these schools were restricted to performing an annual routine medical check-up of students. Those visits included the students of the lower basic stage; grades one to six (ages of 6-12), in relation to the student's height, weight and eyesight. But these visits did not usually include the students of the higher basic stage; grades seven to ten (ages of 13-16).

The School Visits' Register showed no visit or invitation to doctors or other people to spread health knowledge, not even on important occasions such as World Health Day, World Environment Day, World Traffic Day or Family Planning Day. This was the case in all schools in the sample.

In this respect, and as recommended in Section 3.5, p. 78, it can be said that collaboration between schools and 'visiting speakers' such as health professionals and the police would be a valuable resources for delivery of health education topics, but this is currently not being utilised regularly.

The Students' Health Register. This contains Students' Health Forms which are kept by each class educator. This form, which is distributed by the Ministry of Education and

designed in co-operation with the Ministry of Health, contains information about the student and his or her health such as height, weight, eyesight, hereditary disease and any medication. This register is kept at school to be completed by the physician upon his or her visit to the school.

Posters and Wall Charts. School posters and charts prepared by students or distributed to schools appeared to be related to pure science; very few dealt with health topics related to disease, infections, pollution, personal health, or safety on the road. Despite being issued under the supervision of teachers, the observation showed that health posters, where they did exist, often contained health errors; for example, 'AIDS could transfer through shaking hands'. Again, and as mentioned in Section 3.5, p. 78, it can be said that Education ministries, non-governmental organisations, health professionals and the media all have an important role to play, particularly in the production of accurate, informative health materials. However there was little evidence of involvement in terms of the production of charts and posters by the Ministry of Health or documentary films issued by the MoE in co-operation with the media.

The School Cafeteria. The researcher visited every cafeteria in the schools which came within the sample of the study. These cafeteria lacked any information about healthy food or balanced diet or how to dispose of refuse. Also, the researcher noticed a failure to adhere to hygiene standards such as wearing coveralls or gloves to prevent the spreading of infection. As mentioned in Section 3.5, p.78, it can be said that 'Whole school policies' which permeate the whole school, such as the provision of healthy food, clean surroundings and anti-litter schemes are likely to be more effective overall, as they

affect the overall ethos of the school in relation to health.

The Library. The researcher visited all of the school libraries which came within the sample of the study, and checked their books related to health education and school health in general. It appeared that very few of the books dealt with health topics. Furthermore, many were treating health topics in a complex and advanced way which did not suit the level of the students of the basic stage and their academic ability. These reference books and documents did not deal with health topics and issues specifically concerning the Jordanian environment or which might arise in the future in certain areas in Jordan. Among these issues are cholera, phthiriasis at school or nuclear pollution, especially as Jordan is located between warring countries.

The School Broadcasting File. The researcher examined the school broadcasting file in each of the sample schools and found out that this file was usually supervised by the Arabic Language teacher. It appeared that all the contents of the messages that the school addressed to students every morning were prepared by students. Few of them dealt with health topics; most of them were restricted to copying information from daily newspapers issued in Jordan. Some issues which were related to school activities such as World Environment Day, and the content of these messages concentrated on indicating the importance and the size of the problem without addressing ways of reducing its effects.

In the light of studying the above mentioned documents, drawing on the analysis of their contents with regard to the policies and the reality of health education delivery in Jordanian schools, the researcher has reached the following conclusion. Analysis of the

content of all the documents showed that the health education policy in these documents appeared as 'flashes of light' that appear at one moment and disappear at the next. So they are clear in one document or section of a document, but do not appear in another document or section and so on. They are present in some official documents issued by the Ministry of Education, such as the curriculum and the textbook; they are not present in the teacher guide issued by the same Ministry; then they appear in documents such as school certificates, but are not present in other records such as the school visits' documents. On the other hand, there appears to be no health education policy in school cafeterias; occasional health messages appear in out-of-class activities such as producing magazines and posters. This indicated a lack of clear 'whole school policies' on health education. As mentioned in Section 3.5, p. 78, it can be said that where national or regional policies for the delivery of health education exist, schools are much more likely to have developed policies of their own.

This lack of overall health education policy may be due to the continuous succession of education officials, arising from frequent changes of Ministers. This leads to differences in the strategies, interests and plans of these officials in managing the educational issues in the curricula; the actual situation in Jordan proves that individuals leave their stamp on policy (see Section 1.5 and 1.6, p. 13 and 15 respectively). The vagueness of the official policy will reflect on the teacher's role in delivering the curriculum; Jordanian teachers are generally known for their adherence to what is laid down in the official school curricula.

In summary, the educational curriculum in Jordan focuses on five main areas of health

education - personal health, nutritional health, environmental health, disease and prophylaxis and education for married life. It omits other important areas such as child abuse, smoking, drugs and chemical solvents misuse. It does not provide a suggested time allocation for different health education topics or areas, with no specified time to be spent on health education as separate lessons or as topics within science lessons. There appear to be few additional textbooks or references that may help teachers to provide health education topics, nor are any other supporting health materials recommended. There is no guidance relating to the relationship between health education and other subjects in the school curriculum, nor to the background and training of people who teach health education or others who can help with the delivery of health education within the school setting, such as teachers of religious education, physical education and social education.

Although the suggested teaching methods within the science curriculum can be used for the delivery of pure science or health education topics, there is no policy relating to the teaching of the moral aspects of health education. These aspects need appropriate methods of delivery such as guidance, direction, counselling, role-play and group work. Moreover, there are no specific methods recommended for the assessment of students' learning in health education.

Although educational policy allows for an entry for the recording of students' general behaviour on the school certificate, in reality these entries were completed by the class educator and not by a health education teacher, who could follow-up the outcomes of health education and assess the progress of students' health related behaviour

accordingly. Moreover, the reality was that these entries were completed without being based on official standards: whatever the students' behaviour the majority obtained a 'Good' or 'Very Good', perhaps to avoid any conflict or objection from students' parents. Therefore, there is no major difference between 'good' behaviour and 'bad' behaviour, leading to some feeling discouraged and demotivated while others continue their poor behaviour patterns.

Finally, it is clear that the general educational policy seeks to provide health education topics for all students at all grades. But this study has shown that there is little guidance with respect to the delivery of some health education topics such as sex education, especially at the lower grades. Most of these topics were delivered at the age of 16, the tenth grade which represents the end of the basic education stage. This means that there is an indirect admission by policy-makers that sex education should only be delivered in the later stages of education. Based on his experience in Jordanian schools, and current thinking in other countries the researcher observed that it would be more appropriate to deliver sex education at an earlier stage. A more appropriate age for the delivery of such topics is around 12 years of age, the beginning of maturity for both sexes. However, the ages at which different aspects of health education should be taught are now one of the debatable issues in Jordan, and it is hoped that this study can contribute to this debate.

6.7 Summary

The findings of this chapter reveal that the official policy relating to health education in Jordan has some positive features. These include the fact that the policy seeks to link health education with science education, and attempts to find a balance between the

theoretical and the practical aspects. On the other hand, there are many negative features including a lack of aims and guidance from policy-makers which will certainly affect the implementation of these policies by teachers. These include the inability to challenge students' behaviours, the lack of relevant teaching materials, and the lack of sufficient time for delivering health education topics, which usually need more time than teaching basic scientific concepts.

To provide a clearer picture of the reality of health education in Jordan, it is necessary to analyse the implementation of the official policy. It is necessary to explore the factors that affect the implementation of these policies, and to highlight the weaknesses and strengths of the actual delivery of health education. This will be discussed in Chapter 7.

Chapter Seven: The Implementation of Health Education Policy by Science Teachers - Questionnaire Analysis

7.1 Introduction

This chapter discusses the answers to four of the questions listed in the first chapter. These questions are:

- •What is the reality of the delivery of health education by upper basic stage science teachers in Jordan, as measured by the perceptions of emphasis placed on various health education topics?
- •Does the delivery of health education differ according to the teacher's gender, the region of the country in which he or she teaches, or the interaction between these two variables?
- •Does the delivery of health education differ according to the qualification in education, the science subject taught, or the interaction between these two variables?
- •Does the delivery of health education differ according to the qualification in science, the teaching experience of the teacher, or the interaction between these two variables?

This chapter is concerned with analysing the science teachers' responses regarding the delivery of health education in Jordanian schools, and seeks to highlight the emphasis in the delivery of health education as obtained from the quantitative and qualitative data. These two types of data are important for the following reasons:

- They reveal that science teachers' responses are richer and more complex than figures, tables and statistics; they reflect their views, feelings, beliefs, perspectives, performance, efforts, time used, methods and content involved i.e. they reflect the social and the human face of the delivery of health education.

- They illustrate the factors (hidden and explicit) which are important in affecting the delivery of health education such as social, cultural, political and religious issues. In addition to this, the effects of gender, qualification, region and teaching experience of the science teachers have been studied.

- They reflect how much emphasis is placed on various health education topics and the reasons for different aspects being given different 'weighting' by science teachers. This gives a partial picture of the emphasis in the delivery of health education by science teachers in Jordan. To give a clearer picture, other aspects such as the teaching methods used, the time spent on health education and issues which affect the delivery of health education will be discussed within the content of the next chapter.

7.2 The 'Reality' of Delivery of Health Education by Science Teachers

To investigate the emphasis placed on various health education topics in Jordan, a questionnaire was developed and distributed to all subjects in the sample (science teachers teaching courses for students of the 7-10th grades in the three regions of Jordan (i.e. north, central and south). Science teachers were asked to determine how much emphasis they place on health education topics listed in the questionnaire, and also to tick boxes which give information on their gender, region and teaching subject. Other information included their qualification in education (diploma in education or above, no qualification), qualification in science (diploma in science, B.Sc. and above) and teaching experience (5 years and less, 6-10 years, more than 10 years) (see Section

5.8.1, p. 130). An analysis of the statistical data has been made to explore which of these factors are particularly important in affecting the delivery of health education. The data collected were analysed and expressed through means, frequencies and percentages, as these are more easily understood and interpreted. The standard deviation indicates the extent to which data is spread or clustered among scores. Consequently, a high standard deviation indicates that data is widely spread.

The results have been presented, in a descending order of topics according to their means within each health education area, in tabular form. At the end of each health education area, the overall mean, standard deviation and the percentage scores are shown. However, to judge whether any topic or area included in the questionnaire is given emphasis by science teachers to a degree of very high (VH, score 5), high (H, score 4), moderate (M, score 3), low (L, score 2) or not delivered (N, score 1), account was taken of both the mathematical mean and the frequency scores. The qualitative data is supplemented by the responses from the open-ended questions on the questionnaire.

7.2.1 Results and Discussion

Table 7.1: Personal health (Area 1)

no.	Topic	Mean	S. D	Frequencies and Percentages of each topic				
				VH	H	M	L	N
1	Maintaining the health and safety of different body organs	3.50	1.15	85 21.0 %	133 32.9 %	117 29.0 %	38 9.4 %	31 7.7 %
2	Cleanliness and purity of the body during adulthood	3.37	1.33	46 11.4 %	131 32.4 %	117 29.0 %	54 13.4 %	56 13.9 %
3	Healthy habits and the proofs of good behaviour in daily life	3.36	1.06	90 22.3 %	130 32.2 %	83 20.5 %	43 10.6 %	58 14.4 %
4	Self dependence in solving private problems	3.23	1.20	57 14.1 %	130 32.2 %	109 27.0 %	63 15.6 %	45 11.1 %
5	Social health in dealing with others	3.14	1.20	41 10.1 %	172 42.6 %	110 27.2 %	53 13.1 %	28 6.9 %
6	Attending school actively and confidently	3.12	1.22	41 10.1 %	99 24.5 %	136 33.7 %	66 16.3 %	62 15.3 %
7	Suitable athletic exercises for health and potential of different body organs	2.98	1.20	43 10.6 %	100 24.8 %	130 32.2 %	58 14.4 %	73 18.1 %
8	Health of the mouth, teeth and gums and their relationships with tastes prevailing in the society	2.96	1.24	50 12.4 %	123 30.4 %	113 28.0 %	63 15.6 %	55 13.6 %
9	Comprehensiveness of knowledge about children's rights such as education, health, work	2.83	1.30	50 12.4 %	82 20.3 %	72 17.8 %	86 21.3 %	114 28.2 %
10	Common problem among companions such as smoking, drugs	2.67	1.39	40 9.9 %	100 24.8 %	107 26.5 %	67 16.4 %	90 22.3 %
Overall for the area		**3.12**	**0.92**	**13.43 %**	**29.71 %**	**27.09 %**	**14.61 %**	**15.15 %**

VH= Very High, H= High, M= moderate, L= Low, N= Never delivered

As can be seen from Table 7.1, topic no. 1 which refers to maintaining the health and safety of different body organs, obtained the highest mean score, 3.5, while topic no. 10, which was about common problems among companions such as smoking and drug-taking, obtained the lowest mean score, 2.67. The overall mean score of this area was 3.12 and this means that the delivery of this area overall was between high and moderate.

Not only the elementary grade syllabus but also higher ones (grades seven to ten) tend to stress the significance of care of various parts of the human body. Teaching science is strongly connected to the maintainance of the human body by studying different body systems. It is common practice among teachers to urge students to take care of their health and inform them about health risks that may affect their bodies. However, most of this comes in a theoretical form rather than applied.

> "....the teachers usually discussing issues related to physical health.... the lack of teachers' training make them unable to practice First-Aid skills within their schools" (male teacher, south region).

Smoking and drug-taking are not urgent problems in Jordanian society and accordingly they have not received much attention. Drugs are still very rarely abused among students in a Muslim society which considers drug-taking as something to be avoided. Teachers do not need to tackle this issue as students are supposedly in a good position to resist due to their upbringing. However increasing Western influence may result in drug abuse being a problem in the near future in Jordan. Smoking is not allowed in schools though some students may smoke just outside the school walls. In the author's experience, it is

not a widespread problem among students in these age categories, but it is more common among secondary students, particularly males. Evidence could be deduced from the socio-economic background of students, many of whom could not afford to buy cigarettes for regular consumption owing to their cost in Jordan. For such reasons, teachers may have a tendency to not concentrate on these problems and instead choose to deal with more serious, welcomed and 'safe' ones in terms of the social and cultural aspects such as keeping a healthy body. This is supported by the interview data in Section 8.6, p. 231 - 234.

The standard deviation was calculated as a measure of variablity around the mean. The standard deviation of the means of the results in the area of personal health was .092, that is just under one Likert point. However standard deviations for each individual topic did vary in this area, from 1.06 to 1.39. The highest standard deviations (1.33 and 1.39) were for topics 2 and 10 (cleanliness and purity of the body during adulthood, and common problems among companions such as smoking and drugs respectively). Common problems among companions is a topic which is likely to create debate and even controversy, so the relatively high standard deviation for this topic may reflect its contentious nature. The other high standard deviation was the topic concerning cleanliness and purity of the body during adulthood. This is hardly a contentious issue, but the data may be explained because not all teachers would see the need to teach this topic and there may well be much variation from school to school according to the dignity and privacy aspects of the students. This suggests that there was a wider spread of response for these topics, when compared with less contentious topics. Again, the interview data supports this (see Section 8.6).

Table 7.2: Nutritional health (Area 2)

no.	Topic	Mean	S. D	Frequencies and Percentages of each topic				
				VH	H	M	L	N
11	Balanced food and general appearance of the body	3.30	1.25	48 11.9 %	144 35.6 %	128 31.7 %	29 7.2 %	55 13.6 %
12	Keeping foods from decomposition	3.27	1.31	48 11.9 %	117 29.0 %	127 31.4 %	55 13.6 %	57 14.1 %
13	Healthy habits in taking food and drink	3.25	1.18	17 4.2 %	81 20.0 %	121 30.0 %	77 19.1 %	108 26.7 %
14	Diet and prevention of diseases	3.11	1.21	72 17.8 %	136 33.7 %	88 21.8 %	44 10.9 %	64 15.8 %
15	Good nutrition and improving school performance	3.07	1.22	69 17.1 %	130 32.2 %	116 28.7 %	33 8.2 %	56 13.9 %
16	Choosing food as means of preventing disease	3.07	1.26	24 5.9 %	104 25.7 %	117 29.0 %	68 16.8 %	91 22.5 %
17	Balanced diet and its effect on psychological and emotional condition	2.97	1.28	24 5.9 %	89 22.0 %	122 30.2 %	73 18.1 %	96 23.8 %
18	Taking sweets and confections between meals	2.76	1.23	41 10.1 %	129 31.9 %	116 28.7 %	55 13.6 %	63 15.6 %
19	Weight control through nutrition	2.68	1.22	43 10.6 %	117 29.0 %	108 26.7 %	56 13.9 %	80 19.8 %
20	Feelings about accepting or refusing some kinds of food	2.58	1.22	49 12.1 %	124 30.7 %	103 25.5 %	64 15.8 %	64 15.8 %
21	Eating snacks between the main meals	2.56	1.20	25 6.2 %	71 17.6 %	122 30.2 %	83 20.5 %	103 25.5 %
Overall for the area		**2.97**	**1.00**	**10.33 %**	**27.94 %**	**28.53 %**	**14.33 %**	**18.82 %**

VH= Very High, H= High, M= moderate, L= Low, N= Never delivered

As can be seen from Table 7.2, topic no. 11 which was about balanced food and general appearance of the body, obtained the highest mean score for delivery, 3.30. On the other hand topic no. 21, which was about eating snacks between meals, obtained the lowest mean score, 2.56. The overall mean scores of this area was 2.97 and this means that the delivery of this area overall was between low and moderate, lower than that for the personal health area. This is suprising, as the topics included in this section are largely science based and fairly uncontenious.

As mentioned above, balanced food and its relation with the general appearance of the body, had the highest mean score. In practice, with the emphasis on maintaining a healthy body, science teachers are likely to concentrate on a balanced diet as one way to achieve this, by demonstrating the benefits of various types of food. Examples may include the significance of food containing calcium in building bone structure, proteins in supporting muscles, and vitamins in improving activity of the circulatory and respiratory systems. Science teachers place much emphasis on a balanced diet because the content of science textbooks give this much space, and it is generally seen as a 'science' topic. Food preservation is also given much emphasis.

Eating additional snacks between main meals (mean 2.56) does not receive much attention. Considering students' economic and social conditions, teachers usually do not interfere in the types of food students take. It is up to students to eat whatever they want to eat. This implies that there is no clear policy in schools regarding the relationship between light meals and improving students' learning. Educational policy has not given this issue much emphasis and accordingly it is difficult for students to get information

about it. The school day is rather short (8 a.m. to 2 p.m. as maximum) and students have only a short time (20 minutes at the most) to buy snacks from the school or eat something they bring from home. However, advising against unhealthy snacks such as salty or sugary food could contribute to a whole-school health education policy.

The standard deviation of the means of the results in the area of nutritional health was 1.00, that is just equal to one Likert point. However standard deviations for each individual topic did vary in this area, from 1.18 to 1.31. The highest standard deviations (1.31 and 1.28) were for topics 12 and 17 (keeping foods from decomposition, and balanced diet and its effect on psychological and emotional condition respectively). Keeping foods from decomposition is a topic which, from the author's experience, may create debate and even controversy, so the relatively high standard deviation for this topic may reflect some socio-cultural and economic factors, such as many families eating up their food at each meal with no chance of storage and decomposition. Others through daily experience do not see teaching this topic as important, especially as most foodstuffs are uncovered in shops. Some teachers may see this topic as related directly to the housewife and not relevant for men. On the other hand, the relatively high standard deviation for balanced diet and its effect on psychological and emotional condition may result from the wide disparity between teachers' experiences regarding the effects of food on body systems. There was a wider spread of response for these topics, when compared with less contentious topics, such as those to do with choosing food as means of preventing disease, with a standard deviation of 1.26. This topic has many common practices in Jordanian daily life such as eating garlic with yoghurt for treating dizziness.

Table 7.3: Environmental health (Area 3)

no.	Topic	Mean	S. D	frequencies and percentages of each topic				
				VH	H	M	L	N
22	Rationalisation of the consumption of water, electricity and telephone services	3.52	1.25	64 15.8 %	153 37.9 %	98 24.3 %	50 12.4 %	39 9.7 %
23	Protecting the stocks of the natural and cultural environments from abuse and destruction	3.47	1.15	81 20.0 %	137 33.9 %	105 26.0 %	54 13.4 %	27 6.7 %
24	Reducing the causes of pollution of air, water and soil	3.41	1.15	29 7.2 %	109 27.0 %	129 31.9 %	74 18.3 %	63 15.6 %
25	Sanitary measures to dispose of household refuse and waste	3.38	1.18	62 15.3 %	121 30.0 %	117 29.0 %	54 13.4 %	50 12.4 %
26	Maintaining the safety of machines when using them	3.31	1.19	43 10.6 %	106 26.2 %	110 27.2 %	70 17.3 %	75 18.6 %
27	Public safety precautions at home, school and environment	3.27	1.17	45 11.1 %	116 28.7 %	132 32.7 %	60 14.9 %	51 12.6 %
28	Inspecting lipial water and sanitary facilities at home and school	3.23	1.22	72 17.8 %	134 33.2 %	119 29.5 %	45 11.1 %	34 8.4 %
29	Tiny creatures and their effects on the health of environment	3.22	1.24	55 13.6 %	137 33.9 %	115 28.5 %	56 13.9 %	41 10.1 %
30	Familiarisation with laws of healthy environment	3.20	1.19	101 25.0 %	130 32.2 %	95 23.5 %	36 8.9 %	42 10.4 %
31	Technology Hazards in the environment	3.11	1.17	63 15.6 %	138 34.2 %	110 27.2 %	49 12.1 %	44 10.9 %
32	Fires and suitable extinguishers	2.93	1.27	65 16.1 %	119 29.5 %	110 27.2 %	60 14.9 %	50 12.4 %
33	Participating with society in activities which fight local sicknesses and diseases	2.92	1.17	46 11.4 %	149 36.9 %	97 24.0 %	64 15.8 %	48 11.9 %
Overall for the area		**3.25**	**0.91**	**14.96 %**	**31.96 %**	**27.58 %**	**13.86 %**	**11.64 %**

VH= Very High, H= High, M= moderate, L= Low, N= Never delivered

As can be seen from Table 7.3, topic no. 22, which was about rationalisation of the consumption of water, electricity and telephone services, obtained the highest mean score, 3.52, while topic 33, which was about participating with society in activities which fight local sickness and disease, obtained the lowest mean score, 2.92. The overall mean scores of this area was 3.25 and this means that the delivery of this area overall was between high and moderate, the highest of the five areas.

There is much concentration, in the textbooks, on consumption of water, electricity and telephone services. This might be related to economic conditions in Jordan, for these services consume huge amounts of the state's treasury and energy resources. It is interesting that many of these topics will be covered in chemistry and physics lessons, rather than biology, and raises the question of whether these subjects use more examples from everyday life.

Despite the significance of social participation in the combating of local disease and epidemics, this topic did not receive much attention by teachers, within this health area. Perhaps this topic is considered to be the role of the Ministry of Health and Municipalities who are better equipped to handle it. Other evidence is deduced from the educational policy documents, which have not given this topic much emphasis, and accordingly it is difficult for teachers and students to obtain information about it. An allocation of one day per year is given for dealing with this topic. It is called the Day of School Activity and involve various activities that may include a cleaning of the school yard, the neighbouring community or mosque. At any rate, in the author's experience, combating disease voluntarily is not a popular exercise in Jordanian society in general,

let alone by school children. Observation of the real life practices in Jordan would provide evidence for this assertion. This is clearly a topic which requires more attention, from policy makers, teachers and pupils.

The standard deviation of the means of the results in the area of environmental health was 0.91, that is just under one Likert point. However standard deviations for each individual topic did vary in this area, from 1.15 to 1.27. The highest standard deviations (1.25 and 1.27) were for topics 22 and 32 (rationalisation of the consumption of water, electricity and telephone services, and fires and suitable extinguishers respectively). The relatively high standard deviation for rationalisation of the consumption of water, electricity and telephone services may reflect the relative degree of importance of this topic for people at home, with use usually connected with the income of the family. It may also be related to geographical area. On the other hand, the relatively high standard deviation for fires and suitable extinguishers may result from the teachers' doubt about students' capabilities in these areas or from teachers themselves lacking the required skills although there is no firm evidence for this. Less contentious topics include those to do with laws of healthy environment, which had a standard deviation of 1.19. This topic could perhaps be described as more 'safe' for teachers to discuss compared with other topics in this health education area.

Table 7.4: Disease and prophylaxis (Area 4)

no.	Topic	Mean	S. D	frequencies and percentages of each topic				
				VH	H	M	L	N
34	Consulting the doctor in abnormal circumstances	3.29	1.35	79 19.6 %	121 30.0 %	101 25.0 %	40 9.9 %	63 15.6 %
35	Transmission of infection	3.28	1.32	43 10.6 %	117 29.0 %	110 27.2 %	56 13.9 %	78 19.3 %
36	Completion of vaccination at appropriate times and in correct places	3.25	1.39	52 12.9 %	123 30.4 %	102 25.2 %	45 11.1 %	82 20.3 %
37	Prevention of infection of diseases caused by tiny creatures	3.14	1.28	37 9.2 %	100 24.8 %	100 24.8 %	67 16.6 %	100 24.8 %
38	Rules of dealing with drugs in relation to taking and storage	3.04	1.32	57 14.1 %	125 30.9 %	108 26.7 %	46 11.4 %	68 16.8 %
39	AIDS prevention and containment	3.02	1.44	78 19.3 %	135 33.4 %	79 19.6 %	32 7.9 %	80 19.8 %
40	Chemical materials and their effects on health and food	3.01	1.26	35 8.7 %	119 29.5 %	115 28.5 %	47 11.6 %	88 21.8 %
41	Medical herbs and treating some daily problems	2.98	1.28	48 11.9 %	111 27.5 %	108 26.7 %	72 17.8 %	65 16.1 %
42	Hereditary factors in disease	2.97	1.34	84 20.8 %	126 31.2 %	81 20.0 %	48 11.9 %	65 16.1 %
43	Familiarisation with first aid principles to deal with common minor injuries and illness	2.96	1.33	46 11.4 %	126 31.2 %	92 22.8 %	49 12.1 %	91 22.5 %
44	Use of mineral waters in prevention of some diseases	2.96	1.26	66 16.3 %	122 30.2 %	68 16.8 %	49 12.1 %	99 24.5 %
45	Distinguishing between the indication of some diseases and recognising them	2.92	1.28	50 12.4 %	114 28.2 %	91 22.5 %	66 16.3 %	83 20.5 %
46	Health problems caused by obesity and thinness	2.77	1.31	38 9.4 %	121 30.0 %	112 27.7 %	54 13.4 %	79 19.6 %
Overall for the area		**3.04**	**1.07**	**13.58 %**	**29.71 %**	**24.11 %**	**12.76 %**	**19.82 %**

VH= Very High, H= High, M= moderate, L= Low, N= Never delivered

As can be seen from Table 7.4, topic no. 34, which was about consulting the doctor in abnormal circumstances, obtained the highest mean score, 3.29. On the other hand, topic 46, which was about health problems caused by obesity and thinness, obtained the lowest mean score, 2.77. The overall mean of this area was 3.04 and this means that the delivery of this area overall was between high and moderate, below personal health and environmental health but above nutritional health.

When feeling unwell students are usually urged by their teachers to contact a physician; this may result from the teacher's role as counsellor and also as an observer of anything that is not quite normal in students' behaviour and health. Concentrating on contacting a physician when necessary can be presented as one way of maintaining a healthy body. The evidence could be deduced from this quotation:

> "...in our daily practices within school, we usually urged our students who feel unwell to contact a physician especially if we observed cases required urgent treatment. That is to avoid complications and to avoid questioning in case something happened to the student concerned" (male teacher, north region).

Problems of obesity and thinness have not received much attention due to the fact that these problems are not very common in Jordanian society, especially among school students. Evidence could be deduced from the weighting given by teachers (2.77) in addition to the author's observation of the reality in Jordanian schools. Through the interview sessions, teachers highlighted 'abnormal behaviour' as a problem. However, discussing this topic may lead a teacher to contradict the prevailing views of society. Some would differentiate between fullness of figure and obesity and tend to consider obesity as an indicator of good health and social condition and thinness as indicator of

bad health and poverty. Discussion of this problem can be taken as a criticism of those of a particular body shape, and this is particularly the case when we realise that students at this age are sensitive about their bodies (Bani Khalaf, 1994). A student who is unsure of his or her social position may experience acute feelings of shame and shyness, especially when other students develop nicknames for those who are regarded as too fat or thin. The researcher's experience in Jordanian schools as a teacher and trainer supports this fact.

The standard deviation of the means of the results in the area of disease and prophylaxis was 1.07, that is just above one Likert point. However standard deviations for each individual topic did vary in this area, from 1.26 to 1.44. The highest standard deviations (1.44 and 1.39) were for topics 39 and 36 (Aids prevention and containment, and completion of vaccination at appropriate times and in correct places respectively). The relatively high standard deviation for Aids prevention and containment may result from the close link with sex issues which may conflict with the local culture, and because of a lack of documented cases of Aids in Jordan. On the other hand, the relatively high standard deviation for completion of vaccination at appropriate times may result from teachers' doubts about involvement in aspects than they consider to be the proper role of health professionals. This compares with less contentious topics, such as those to do with the effect of chemicals on health and food. In this case the standard deviation was 1.26. This topic is closer to pure science, so there was less spread of response than for other topics.

Table 7.5: Education for married life (Area 5)

no.	Topic	Mean	S. D	frequencies and percentages of each topic				
				VH	H	M	L	N
47	Reproduction and survival	2.89	1.31	35 8.7 %	125 30.9 %	101 25.0 %	48 11.9 %	95 23.5 %
48	Adulthood in both sexes: Time, stages, duration, general body appearance	2.57	1.36	21 5.2 %	98 24.3 %	93 23.0 %	61 15.1 %	131 32.4 %
49	Male and female sexual organs	2.55	1.30	20 5.0 %	84 20.8 %	101 25.0 %	58 14.4 %	141 34.9 %
50	Natural feeding and health of the mother and her child	2.51	1.43	38 9.4 %	76 18.8 %	98 24.3 %	57 14.1 %	135 33.4 %
51	Psychological and physical preparation of females to perform maternity roles and preparing males as fathers	2.47	1.29	16 4.0 %	72 17.8 %	76 18.8 %	65 16.1 %	175 43.3 %
52	Dealing with health and family information in the media	2.42	1.26	18 4.5 %	77 19.1 %	71 17.6 %	73 18.1 %	165 40.9 %
53	Nourishment of child in the womb	2.34	1.29	18 4.5 %	38 9.4 %	65 16.1 %	67 16.6 %	216 53.5 %
54	Physiological and psychological behaviours in adulthood: day dreams, menstruation	2.29	1.29	23 5.7 %	72 17.8 %	90 22.3 %	87 21.5 %	132 32.7 %
55	Feelings between the two sexes and controlling them	2.23	1.28	10 2.5 %	69 17.1 %	84 20.8 %	67 16.6 %	174 43.1 %
56	Care of the pregnant woman (safe maternity)	2.20	1.28	17 4.2 %	59 14. 6 %	63 15.6 %	80 19.8 %	185 45.8 %
57	Family planning means	2.19	1.23	12 3.0 %	56 13.9 %	64 15.8 %	76 18.8 %	196 48.5 %
58	Pregnancy: duration, stages, psychological reparation	2.15	1.25	20 5.0 %	50 12.4 %	83 20.5 %	70 17.3 %	181 44.8 %
59	Delivery of twins	2.14	1.22	9 2.2 %	51 12.6 %	57 14.1 %	75 18.6 %	212 52.5 %
60	Having a pre-marriage medical test	2.12	1.25	10 2.5 %	52 12.9 %	83 20.5 %	75 18.6 %	184 45.5 %
61	The social, lawful dimensions of medical technology such as artificial fertility	2.08	1.18	18 4.5 %	63 15.6 %	81 20.0 %	63 15.6 %	179 44.3 %
62	Dangers of early marriage	2.04	1.21	17 4.2 %	76 18.9 %	93 23.1 %	57 14.1 %	161 39.8 %
63	Illegal sexual practices before marriage	1.95	1.21	15 3.7 %	54 13.4 %	82 2 0.3 %	74 18.3 %	179 44.3 %
64	Abortion: conditions, dangers	1.94	1.17	36 8.9 %	97 24.0 %	63 15.6 %	51 12.6 %	157 38.9 %
Overall for the area		**2.28**	**1.04**	**4.87 %**	**17.46 %**	**19.91 %**	**6.56 %**	**41.20 %**
Overall for all the areas		**2.87**	**0.86**	**10.80 %**	**26.38 %**	**24.80 %**	**14.59 %**	**23.40 %**

VH= Very High, H= High, M= moderate, L= Low, N= Never delivered

As can be seen from Table 7.5, topic no. 47, which was about reproduction and survival, obtained the highest mean score, 2.89, while topic no. 64, which was about abortion, obtained the lowest mean score, 1.94. The overall mean scores of this area was 2.28 and this means that the delivery of this area overall was between low and moderate; it was the area given the least attention by teachers in the study.

Teachers might have concentrated on the topic of survival and reproduction with the aim of continuity and survival. However, the emphasis tends to be on animals and plants rather than humans, a 'safe' science topic. Evidence for this is available from the documentary analysis of science textbooks, which put a much greater emphasis on the reproduction of plants and animals and avoid discussing human reproduction directly. Sensitivity related to topics concerning human reproduction, pregnancy, birth control and early marriage may put a teacher in an awkward position. The evidence could be deduced from this quotation:

> "human reproduction for example, discussing such topic may be result in a lack of control students' behaviour.....may be interpreted to be outside the framework of the lesson and lead to a deterioration of students' thoughts" (male teacher, south region).

He or she may have to explain the functions of male and female reproductive systems, and this might lead him or her to encounter religious or social issues that are difficult to handle, particularly in more rural areas. Also, introducing these topics constitutes quite a 'thrill' for students at this critical age when they are either shy or indulge in sexual fantasies. This concern was expressed by the majority of subjects in the interview sample (55 teachers from a total of 60).

Among all items of the questionnaire, the topic of abortion received the lowest mean score (1.94). Teachers cannot discuss it because it is of no occurrence among students. The Jordanian society is a conservative Muslim one that prohibits sexual encounters before marriage. Moreover, educational policy does not allow married students, particularly females, to join ordinary schools, and they have to join special schools as a preventive measure that seeks to avoid cases of illegitimate pregnancy and having young students' minds confused by the knowledge and ideas of married students. Moreover there are so many considerations - religious, emotional and medical - related to this topic that teachers may not be able or feel able to address such a critical issue and present it in the right perspective for students who still rather young (13-16 years) (see also Section 8.6, p. 231 - 234). At this early age students are not concerned with this issue even if it is presented in relation to married people.

The standard deviation of the means of the results in the area of education for married life was 1.04, that is just above one Likert point. However standard deviations for each individual topic did vary in this area, from 1.17 to 1.43. The highest standard deviations (1.43 and 1.36) were for topics 50 and 48 (natural feeding and health of the mother and her child, and adulthood in both sexes respectively). The relatively high standard deviation for natural feeding and health of the mother and her child may result from the nature of this topic as it is related directly to women and not men. On the other hand, the relatively high standard deviation for adulthood in both sexes may result from the sensitivity of this topic from three perspectives: shyness, controlling students' behaviour and feelings of embarrassment among some students (see also Section 8.6, p. 231 - 234), and this suggests that there was a wider spread of response for these topics, when

compared with less contentious topics, such as those to do with reproduction and survival, with a standard deviation of 1.31, as this topic discusses human reproduction indirectly with the main focus on aminals and plants.

Table 7.6 shows the overall means and the standard deviation of each of the five health education areas in the questionnaire. They are presented in descending order of their mean 'level of emphasis placed'.

Table 7.6: Mean and standard deviation values for the five main health areas

Health Education areas	**Mean**	**Standard Deviation**
Environmental health	3.25	0.91
Personal health	3.12	0.92
Disease and prophylaxis	3.04	1.07
Nutritional health	2.97	1.00
Education for married life	2.28	1.04
Overall areas	**2.87**	**0.86**

The perceived emphasis placed on the five main health areas varied both within and between areas. Within topics, it ranged from a mean of 3.52 to 1.94. Item 22, 'rationalisation of the consumption of water, electricity and telephone services' was included in the area of environmental health, and represented the highest emphasis placed by science teachers. Item 64, 'Abortion' was included in the area of education for married life and represented the lowest emphasis placed by science teachers. Between areas, means ranged from 3.25 to 2.28. The environmental health area represented the

highest emphasis placed by teachers whereas education for married life area represented the lowest emphasis placed by teachers (see Table 7.6).

The standard deviation of the mean of the results in the health areas overall was 0.86, that is just under one Likert point. However standard deviations for each area did vary, from 0.91 to 1.07. The highest standard deviations (1.07 and 1.04) were for areas disease and prophylaxis and education for married life respectively. The relatively high standard deviation for disease and prophylaxis may result from the fact that some people, for cultural reasons, see disease as shame for the person which might affect his or her future life. On the other hand, the relatively high standard deviation for education for married life may result from the fact that some people, for cultural reasons, consider this a private topic for both men and women (see quote from interview on page 233). Less contentious areas were those to do with nutritional health, with a standard deviation of 1.00, as this topic is more 'safe' for teachers than other areas, but also personal health and environmental health which had standard deviations of 0.92 and 0.91 respectively.

However, within this broader picture, there is considerable variation in the delivery of health education, and the questionnaire revealed some interesting differences in what was being taught in various schools. One of the wider aims of this thesis is to make a convincing case, grounded in empirical evidence, for an increase in the level of delivery of health education in Jordanian schools, and to raise the profile of this crucially important, but all too often neglected subject. To further interpret these results we may outline some factors that generally contribute to this rather moderate level of delivery of

health education at the present time in Jordan.

Health education in Jordan is still a relatively new topic with no previous roots in either teachers' or students' general behaviour, as shown by teachers' responses to the questionnaires and interviews. This topic is still not clearly formulated in the curriculum, an assertion supported by the analysis of the previously mentioned documents (see Chapter 6). Despite the fact that health education was introduced into the curriculum ten years ago, it is still ambiguous as a concept for both teachers and students. The idea of school health, which is related to delivery of health services, has tended to obscure the concept of health education which is about teaching health topics. These terms are similar, yet their exact definitions and application to teaching and learning are unclear for teachers. Many interviewees asked for clarification on this issue, using words such as:

> "has health education is the same meaning as school health?.....Is it run by Ministry of Health?" (male teacher, south region).

Perhaps this confusion between the two areas has made teachers believe that health education is the responsibility of the Ministry of Health, as in the case of school health. This widespread belief can only negatively affect the introduction of health education topics in terms of both quantity and quality.

Reviewing laws and regulations applied by the Ministry of Education the researcher has not found any guidance on the distinction between acceptable and non-acceptable teacher's performance with regard to health education delivery. This can be exacerbated

in instances where headteachers are not able to guide the work of their staff effectively. This lack of focus on what constitutes good quality teaching in health education may well lead to a breakdown in discipline in these lessons, and an examination of student behaviour and academic achievement might show these factors to be closely related (see page 232).

Moreover, these laws and regulations do not designate any official authority as responsible for specifying conditions for teaching health education or for ensuring that teachers have appropriate qualifications. If there were such an authority, they would work to improve the level of teachers' performance in teaching health education topics, and develop standards of performance to be adopted by teachers which could serve as an evaluation and feedback tool to be used for teacher training and development. Together, the lack of guidance and the relative novelty of the subject, have made health education a subject which is supported by all, but is nobody's responsibility.

Delivering health education is closely related to the general obstacles and difficulties that teachers face. Results of the interviews have revealed that there are five major factors affecting the delivery of health education in general, which contribute largely to the poor level of health education in terms of quantity, quality and relevance to students' needs. These are student-related problems, curriculum and textbook-related problems and community and concerned agencies. These and other problems are discussed in the next chapter.

As for the areas of health education included in the questionnaire, the results indicate that the area of environmental health was given most emphasis, followed by personal health, disease and prophylaxis, nutritional health, and finally education for married life.

To interpret these findings, we may say that this result relates to shortcomings in both educational policy and the beliefs of the local community. Teachers are the means of implementing national educational policy but are also members of the local community, and thus they may attempt to meet the needs or norms of both. Most teachers in Jordan teach to 'complete the textbook' so that no one may question their performance. This is accepted practice, observed by the researcher as a teacher and trainer in Jordan. They would not tackle any topic external to the official curriculum such as sex concepts because they think that topics such as these may endanger their social and academic reputation. No one wants to be accused of violating public decency, an act punishable by Jordanian law. The evidence could be deduced from this quotation:

> "....the teachers can't ignore discussing these issues, but there are other issues, due to the social and the cultural factors, I cannot discuss; human reproduction for example" (female teacher, south region).

Putting these findings and discussions within the context of the official policy, several key observations can be made. The major emphasis in the official curriculum is placed on the areas of environmental health and personal health (see Table 6.2, p. 153). The general aims of the MoE focus on personal health including physical, mental, spiritual, emotional and social aspects (see Section 1.4, p. 9). However, these areas were not found to be delivered to a high or very high degree in practice. This may be due to lack of follow up of the implementation of the curriculum and due to rapid changes of policy-

makers in the MoE (see Section 1.5, p. 13). Less emphasis is placed on nutritional health and sex education as well as on the religious, moral, ethical, personal and social dimensions of health education. Without clear guidance on expectations of delivery in areas such as sex education, teachers may feel at risk in their local communities if they attempt to teach these topics.

7.3 Gender and Regional Differences

One of the main questions of this study was: 'Does the delivery of health education differ according to the teacher's gender, the region of the country in which he or she teaches, or the interaction between these two variables?' To answer this question, covariance analysis (2 × 3) was used to examine effect of these variables and the interaction between them. This was done with the raw data from the questionnaire, on two levels; the first was at each separate area and the second was at all five areas together (see Appendix 3). The means for the sample subjects according to gender, region and interaction between the two are presented in Table 7.7.

Table 7.7 shows that the total mean score for health education areas overall was 2.87. Environmental health, personal health, disease and prophylaxis and nutritional health all obtained scores above the mean (3.25, 3.12, 3.04 and 2.97 respectively), while education for married life received a low mean score of 2.28.

Table 7.7: Means for the sample subjects according to the variables of gender, region and interaction between the two.

health areas	Gender	Region			
		Northern	Central	Southern	Total
personal health	Male	3.22	3.19	3.11	3.19
	Female	3.12	3.05	2.94	3.06
	Total	3.17	3.11	3.01	3.12
nutritional health	Male	3.09	3.01	2.91	3.02
	Female	3.10	2.82	2.78	2.92
	Total	3.09	2.90	2.84	2.97
environmental health	Male	3.34	3.33	3.20	3.31
	Female	3.27	3.16	3.12	3.20
	Total	3.30	3.24	3.16	3.25
disease and prophylaxis	Male	3.16	3.15	3.11	3.15
	Female	3.19	2.81	2.81	2.96
	Total	3.17	2.96	2.94	3.04
education for married life	Male	2.44	2.51	2.31	2.44 *
	Female	2.41	1.97	2.02	2.15 *
	Total	2.42	2.21	2.15	2.28
overall areas involved	Male	2.99	2.98	2.87	2.96 *
	Female	2.96	2.68	2.66	2.79 *
	Total	2.97	2.81	2.75	2.87

* = significant difference according to covariance analysis (see Appendix 3)

The analysis indicates no significant difference could be attributed to the variables of gender and region or the combined effect of the two in the following areas: personal health, nutritional health, environmental health and disease and prophylaxis (see Appendix 3). As for education for married life, there was a significant difference that could be traced to the gender variable. The f-value was 8.21 at a significance level of 0.004, and this was significant at $\alpha < 0.05$. The mean of delivering education for married life by male teachers overall regions was 2.44, and that of the female teachers was 2.15 (see Table 7.7). These differences were significance in favour of male teachers. It shows that male teachers place more emphasis on education for married life compared with female teachers. But there was no significant difference that could be traced to the region variable or the combined effect of gender and region in this area (see Appendix 3).

At the level of the five areas together, the results indicate that there was a significant difference that could be attributed to the gender variable. The f-value was 4.37 at the significance level 0.037, and this value is statistically significant at $\alpha < 0.05$. The mean for delivery of health education overall for male teachers was 2.96, and for female teachers, 2.79 (see Table 7.7). These differences were significant in favour of male teachers. It shows that male teachers place more emphasis on the overall health education areas compared with female teachers. But there was no significant difference that could be traced to region variable or the combined effect of gender and region in the overall health education areas (see Appendix 3).

Differences in total means ranging from 2.15 to 3.20 for health education overall and 1.97 to 2.41 for the area, 'education for married life', across the three regions (see Table 7.7). Although not significant, the significance level = 0.084 indicates a trend here. The greatest disparity for this area is between males and females in the Central region, again with females teaching less. The people who live in the Central region are a mix of urban and bedouin groups and these tend to have disparity in their own culture regarding health education.

7.3.1 Effect of gender

A previous study conducted in Jordan (Bani Khalaf, 1994), showed that the way female teachers interact with their students is characterised by concern for better behaviour and health. It is interesting to note, therefore, that female teachers tend to teach less health education, especially in the area of education for married life.

This difference can probably be explained by the fact that most teachers in Jordan are from the middle class and from rural areas, which tend to give the male a greater freedom than females. Hence male teachers are perhaps more willing to tackle sexual issues with their students (see Section 1.3, p. 4). This could be related to the increased cultural openness that Jordan started to experience in the nineties. Political pluralism, freedom of the press, and the role of cultural institutions have enabled Jordanian teachers, or male teachers at least, to be more innovative in teaching delivery and content.

However this social transition has not affected women in the same way. They tend to be still constrained by social traditions and customs, which if violated may result in social rejection and lose of position and respect. Hence a female teacher who addresses sexual issues could put herself in a precarious position socially. For this reason female teachers may attempt some sort of balance between the requirements of the topic and the norms of society, and so avoid addressing sexual and health topics that society considers taboo.

An outside observer of the Jordan society and education might think that it is not difficult for a female teacher to deliver health and sexual information to female students in elementary education. But even the Jordanian Parliament, the highest constitutional authority in the country, has experienced objections by some members against circulation of a questionnaire that was developed by the Ministry of Education and contained items on health and sexual information. The questionnaire was subsequently withdrawn (Al-Ra'i Newspaper, Jordan, 1999). The difficulties involved in asking such questions show that all parties involved in education in Jordan are constrained by

cultural factors. Given the still subordinate status of women in Jordan, it is not surprising that many of them find the delivery of health education a problem area.

7.3.2 Effect of the regions

Administratively, Jordan is divided into three regions, the north, the centre, and the south. The purpose of such a division is to facilitate the delivery of educational, health and other services to citizens in a fair way. These regions tackle health problems in different ways. The southern region is desert-like in nature and has several factories for cement and potash which can only have a negative impact on human health and the environment. The central region includes big cities such as Amman and Zarqa and their suburbs and is characterised by being overcrowded, with people more prone to disease. The northern region such as Irbid city and its suburbs is a mixture of rural and urban features. Because of these regional variations, it could be hypothesised that the delivery of health education would vary according to the region. However, this was not a significant finding in this study, and can perhaps be attributed to two reasons. First, Jordan's total area is relatively small even though it is divided into regions. People are mainly concentrated in big cities and rural areas with the rest, 90 % of Jordan, being desert land that is uninhabited.

The second reason is related to the curriculum. All public schools employ the same curriculum whether at the elementary or secondary grade (see Section 1.4, p. 9). Interviewees expressed a high level of commitment to the textbook, and there were no clear variations in the delivery of health education from one region to another.

7.3.3 Interaction between gender and region

In general, the social, political, cultural and traditional situations of Jordanian families still control the general behaviour of their members (see Section 1.3, p. 4). They have more influence than the effect of geographical regions, though there is some variation between regions, as described in Section 1.3, p. 4. The family tradition is more pronounced in rural areas, in enforcing the general behaviour of its members (see Section 1.3, p. 4). The delivery of health education may be not affected by the region in a statistically significant way, but the reality of Jordanian family life may result in a variation between different regions in terms of the actual outcomes, in terms of health problems and the general behaviour of students in these regions.

7.4 Effect of Qualifications in Education and Science Subjects

The effect of the qualifications in education and science subjects taught by teachers was investigated, based on this question: 'Does the delivery of health education differ according to the qualifications in education, the science subject taught, or the interaction between these two variables?'

To answer this question, covariance analysis (8 × 2) was used to examine the influence of these variables and the interaction between them on two levels; first in each of the five health areas and secondly, across all five areas (see Appendix 4). The means of the study sample according to the variables of subject and qualification in education are presented in the following table:

Table 7.8: Means of the study sample according to the variables of subject and qualification in education.

health areas	Subject		Sc /7	Sc /8	Ph /9	Ch /9	Bio /9	Ph /10	Ch /10	Bio /10	Total
personal health	qul.	no	3.17	3.32	2.96	3.04	3.44	3.09	2.77	3.19	3.13
		yes	3.40	3.73	3.13	2.25	3.07	3.26	2.63	3.20	3.04
	Total		3.19	3.35	2.99	2.91	3.38 *	3.12	2.74	3.19	3.12
nutritional health	qul.	no	3.14	3.27	2.64	2.93	3.48	2.85	2.57	2.92	2.99
		yes	3.25	3.77	2.46	2.25	3.33	2.78	2.35	3.02	2.84
	Total		3.15	3.31	2.61	2.82	3.46 *	2.84	2.53	2.95	2.97
environmental health	qul.	no	3.16	3.54	3.04	3.35	3.37	3.14	3.13	3.36	3.27
		yes	3.23	4.10	2.76	3.18	3.19	3.19	2.92	3.20	3.15
	Total		3.17	3.59 *	2.99	3.32	3.34	3.15	3.09	3.32	3.25
disease and prophylaxis	qul.	no	2.92	3.20	2.74	3.04	3.60	2.91	2.63	3.27	3.05
		yes	3.43	3.85	2.30	2.63	3.38	3.10	2.40	3.41	3.01
	Total		2.98	3.25	2.66	2.97	3.56 *	2.95	2.59	3.31	3.04
education for married life	qul.	no	2.11	2.15	2.32	2.06	2.32	2.19	1.92	3.07	2.26
		yes	3.01	3.14	1.80	1.83	2.36	2.46	1.79	2.97	2.38
	Total		2.20	2.23	2.23	2.02	2.32	2.24	1.90	3.05 *	2.28
overall areas involved	qul.	no	2.82	3.00	2.70	2.80	3.15	2.77	2.54	3.16	2.78
		yes	3.24	3.66	2.40	2.38	3.00	2.91	2.35	3.15	2.83
	Total		2.86	3.05	2.64	2.73	3.13	2.79	2.50	3.16 *	2.87

Sc= science, Ph= physics, Ch= chemistry, Bio= biology, qul= qualification, * = significant difference according to covariance analysis (see Appendix 4)

At the level of each separate area, the following observations can be made:

Personal health: results indicate that there was a significant difference that could be traced to the subject taught. The f-value was 2.96 at a significance level of 0.005, and this was significant at $\alpha < 0.05$. Regardless of whether the teacher held a qualification in education, the mean value for the delivery of health education by teachers of biology at the ninth grade was 3.38 and this is higher than all other subjects (see Table 7.8). Based on the Scheffe post-hoc test, the results showed there is no significant difference between these subjects and this means that these subjects showed similar effects (see Appendix 6). There was only a significant difference in terms of biology. But there was no significant difference in terms of qualification in education or interaction between the subject taught and the qualification in education.

Nutritional health: results indicate that there was a significant difference that could be attributed to the subject taught. The f-value was 5.98 at a significance level of 0.045, and this was significant at $\alpha < 0.05$. Regardless of whether the teacher held a qualification in education, the mean value for the delivery of health education by teachers of biology at the ninth grade was 3.46 which is higher than those of other subjects. Based on the Scheffe post-hoc tests, results show there is a significant difference between:

- science at grade 8 and chemistry at grade 10 with a significance of 0.026.
- physics at grade 9 and biology at grade 9 with a significance of 0.005.
- biology at grade 9 and chemistry at grade 10 with a significance of 0.001.

Based on the mean values of these subjects, the amount of nutritional health taught was in favour of science at grade 8, biology at grade 9, chemistry at grade 10 then physics at grade 9. The other subjects showed a similar effect (see Appendix 4 and 6). There was no significant difference that could be attributed to qualification in education held or to the interaction between the subject and qualification in education in this area.

Environmental health: results indicate that there was a significant difference that could be attributed to the subject taught. The f-value was 2.08 at a significance level of 0.045, and this was significant at $\alpha < 0.05$. Regardless of whether the teacher held a qualification in education, the mean value for the delivery of health education by teachers of science at eighth grade was 3.59 which is higher than those for other subjects. Based on Scheffe post-hoc tests, the results show that these subjects showed similar effects (see Appendix 4 and 6). The only significant difference that could be

attributed to the subject taught was in favour of science at grade eight. There was no significant difference between the qualification in education held or to the interaction between subject and qualification in education.

Disease and prophylaxis: results indicate that there was a significant difference that could be attributed to the subject taught. The f-value was 5.29 at a significance level of 0.000, and this was significant at $\alpha < 0.05$. Regardless of whether the teacher held a qualification in education, the mean value for the delivery of health education by teachers who were teaching biology at ninth grade was 3.56 which was higher than those of other subjects. Based on Scheffe post-hoc tests, results show there is significant difference between:

- physics at grade 9 and biology at grade 9 with a significance of 0.006.
- biology at grade 9 and chemistry at grade 10 with a significance of 0.002.

Based on the mean values of these subjects, the amount of 'disease and prophylaxis' taught was in favour of biology at grade 9, physics at grade 9 then chemistry at grade 10. There was no significant difference that could be attributed to any qualification held in education or the interaction between subject and qualification in education in this area (see Appendix 4 and 6).

Education for married life: results indicate that there was a significant difference that could be attributed the subject taught. The f-value was 6.17 at a significance level of 0.000, and this was significant at $\alpha < 0.05$. Regardless of whether the teacher held a qualification in education, the mean value for the delivery of health education by

teachers of biology at the tenth grade was 3.05 which was higher than those of other subjects. Based on the Scheffe Post-Hoc tests, the results show the following significant difference between the subjects:

- science at grade seven and biology at grade ten; significance 0.010
- science at grade eight and biology at grade ten; significance 0.017
- physics at grade nine and biology at grade ten; significance 0.015
- chemistry at grade nine and biology at grade ten; significance 0.000
- biology at grade nine and biology at grade ten; significance 0.046
- physics at grade ten and biology at grade ten; significance 0.020
- chemistry at grade ten and biology at grade ten; significance 0.000

Based on their mean values, the amount of 'education for married life' taught was in favour of subjects (in descending order) as follows:

- biology at grade 10
- biology at grade 9
- physics at grade 10
- science at grade 8 and physics at grade 9
- science at grade 7
- chemistry at grade 9

However, there was no significant difference that could be attributed to qualification in education or interaction between the subject and qualification in education (see Appendix 4 and 6).

General findings regarding health education overall indicate that there was a significant difference which was attributed to the subject taught. The f-value was 4.07 at a significance level of 0.000, and this value was significant at $\alpha < 0.05$. Regardless of whether teacher held a qualification in education, the mean for teachers who were teaching the biology at tenth grade was 3.16. This is higher than those for other science subjects. Based on Scheffe post-hoc tests, there is a significant difference between:

- biology at grade 9 and chemistry at grade 10 with a significance of 0.046.
- biology at grade 10 and chemistry at grade 10 with a significance of 0.032.

Based on the mean values, the amount of health education taught was in favour of biology at grade 10, biology at grade 9 and then chemistry at grade 10. The other subjects showed similar effects (see Appendix 4 and 6).

7.4.1 Effect of Qualifications in Education

An education qualification is likely to affect the choice of methods of teaching and the use of textbooks in general. Teachers with a qualification in education are expected to be more capable of applying strategies for conveying scientific knowledge for students at various grades (Zaiton, 1994). However, in this study there was no effect that could be attributed to qualification (diploma in education and above) or no qualification in delivering health education. This could be attributed to limited number of individuals in the sample with a qualification in education (67 teachers) as opposed to the greater number with no qualifications in education (337 teachers).

On the other hand, teachers' teaching experience and qualifications in education may result in the over use of teaching methods used for pure science concepts.

> "I'm not sure if there are teaching methods related to health education in particular. Anyway, my teaching experience is in pure science and not related to health education..... in my teaching I usually use dialogue and discussion methods" (male teacher with no qualification in education).

As discussed in Section 4.4.1, p. 92, the delivery of health concepts should be supported by methods of spreading awareness by guidance, direction, advice, and follow-up as the next quote illustrates:

> "I think that delivery of health education needs some specific teaching methods. However, I used to use advice, guidance, and directions and sometimes real examples" (female teacher with a qualification in education).

This suggestion is supported by Al-Arafeen's study (1985) which was concerned with strategies of teaching scientific concepts at the elementary grade in Jordan, and how these were affected by science teachers' understanding of the nature of science. It appeared that the amount of teaching experience did not necessarily reflect positively on the teaching methods. In theory, a teacher may repeat himself or herself for 30 years without any change of teaching methods used. To counter a situation such as this, teachers should be helped to develop professionally and scientifically by training and refresher courses or by academic courses that involve educational units on the nature of health education, research methods, inquiry, and scientific skills that may reflect positively on the teaching strategies used for presenting both science and health topics.

7.4.2 Effect of the subject

At the general and specific level of the questionnaire, the science subject being taught had a significant effect on the amount of delivery of health education. As would be expected, biology teachers taught a higher percentage of health education topics regardless of grade. After biology came general science, then physics and chemistry. To a great extent, these results corresponded with the analysis of the content of these subjects (see Table 6.2, p. 153). As already discussed, science teachers follow the content of the textbook very closely. Hence, the more health education topics the textbooks include, the greater the chances of their being taught by teachers.

7.5 Effect of Qualifications in Science and Teaching Experience

These variables was investigated based on the question: 'Does the delivery of health education differ according to the qualifications in science, the teaching experience of the teacher, or the interaction between these two variables?'

To answer this question, covariance analysis (2×3) was used to examine the influence of these variables and interaction between them at two levels. This was carried out at the level of each separate health education area and on health education as a whole (see Appendix 5). The means for the sample subjects according to the variables of teaching experience, qualification in science and interaction between the two are presented in the following table:

Table 7.9: Means for the sample subjects according to the variables of teaching experience, qualification in science and interaction between the two.

health areas	qualification in science	Teaching experience			
		5 years and less	6-10 years	more than 10 years	Total
personal health	science diploma	3.92	2.90	3.14	3.17
	B. Sc. and above	3.14	3.06	3.15	3.11
	Total	3.18	3.05	3.15	3.12
nutritional health	science diploma	3.75	3.17	3.08	3.15
	B. Sc. and above	2.93	2.85	3.05	2.94
	Total	2.98	2.87	3.05	2.97
environmental health	science diploma	3.85	3.41	3.32	3.38
	B. Sc. and above	3.21	3.24	3.22	3.23
	Total	3.25	3.25	3.25	3.25
disease and prophylaxis	science diploma	3.68	2.91	3.05	3.09
	B. Sc. and above	2.97	3.01	3.12	3.04
	Total	3.01	3.00	3.10	3.04
education for married life	science diploma	2.19	2.25	2.34	2.31
	B. Sc. and above	2.23	2.25	2.35	2.28
	Total	2.23	2.25	2.34	2.28
overall areas involved	science diploma	3.34	2.86	2.92	2.95
	B.Sc. and above	2.83	2.82	2.91	2.85
	Total	2.86	2.82	2.91	2.87

At the level of each health education area, results indicate that there was no significant difference that could be attributed to the variables of qualification in science and teaching experience or the combined effect of the two in any of the five areas. For health education overall, the analysis also indicates that there was no significant difference that could be attributed to qualification in science, teaching experience, or the combined effect of the two (see Appendix 5).

7.5.1 Effect of Qualifications in Science

The qualification in science means the specialised scientific courses (theoretical and applied) a science teacher is supposed to study within the specialisation he or she is going to teach. Relevant literature (see Section 4.5, p. 101) attests to the fact that

success in science teaching depends on a teacher being well-prepared before and during service. The teacher should have sufficient scientific, professional and general knowledge and skills to enable him or her to lead the teaching-learning process effectively. Despite the importance of relevant qualifications for teaching science, this research has found that it has no specific effect on the delivery of health education by science teachers in Jordan. This could be attributed to the fact that the training courses undertaken do not include health education, as they are about pure scientific concepts (see quotes from interviews, p. 230). Therefore, there was no significant difference in delivering health education by teachers who had a science diploma or a B.Sc. or higher science degree.

7.5.2 Effect of Teaching Experience

It was expected that teaching experience would play an important role in health education delivery, but this was found not to be the case. A teacher with little experience (five years and less) was no different from that of a teacher with medium or high experience (6-10 years, 10 years and above respectively). It seems that a science teacher's teaching experience does not necessarily develop effectiveness in introducing health education topics. It appears that if a teacher does not develop an understanding of the nature of health education during their years of university study or from in-service programmes, years of teaching experience and other life experience would not grant him or her that understanding.

This is supported by the findings of a study by Za'ror and Ba'arah (1981) on the extent of science teacher trainees' comprehension of certain science topics in Amman, Jordan. It

showed that length of teaching experience had no effect on teachers' understanding of science. The teaching experience of the teachers in the study was very much biased towards teaching pure science rather than health education, but there are parallels with this study in that teaching experience in general had no effect on the delivery of health education.

7.6 Summary

The analysis of teachers' responses revealed that there was no significant effect relating to the region of Jordan, qualification in science, qualification in education, or length of teaching experience on the delivery of health education. The effect of gender appeared significant in one health education area, that of education for married life, where male teachers, because of their position within Jordanian society, were found to be more confident teaching this sensitive topic than female teachers. This appeared to be the case especially in the central region. There was a clearly significant effect of the teaching subject in all health education areas studied, with biology having the greatest input followed by general science, physics and chemistry in that order. It was expected that biology would be the subject most closely aligned to health education, but surprising that physics had more health content than chemistry. This could be related to the emphasis placed on the environmental health area in the textbook. This suggests that the more frequent the inclusion of health education topics in the science textbooks, the greater the chance of health education being delivered by the teachers.

Social, cultural, and political considerations (see Section 1.3, p. 4) play a vital role in the delivery of health education and in the weightings given to different topics. Also, the

teachers' identification of problems among students, and the extent to which teachers are capable of controlling students' behaviour played a crucial role in the delivery of health education topics. One particular teacher noted the adverse effects of the mass-media, and the possibility of contradiction between these messages and those delivered in health education lessons:

> ".... parents often do not supervise what their children watch on video or satellite and so they come into contact with the bad habits of society...these contradict what we teach....." (female teacher, central region).

Finally, the findings reveal the necessity of studying the ways of teaching health education topics, and highlighting the problems and constraints that affect its delivery. Moreover, information on the methods of delivery of health education will support and integrate with the findings of the documentary analysis and with the other empirical work undertaken in this study. These data together will serve to provide a much clearer picture of the actual delivery of health education in Jordanian schools. In the next chapter, the interviews undertaken for this study will be further analysed to allow a greater insight into these aspects.

Chapter Eight: The Methods Used for the Delivery of Health Education by Science Teachers - Interview Analysis

8.1 Introduction

This chapter discusses and analyses the third theme in this study, the teaching methods used in delivering health education topics. It provides information about the teaching methods used and considers suggestions by science teachers for more effective curriculum delivery. Moreover, it highlights the pressures of time in implementing the curriculum and the ways in which a lack of time can make delivering health education difficult. The chapter also contains reflection about the methods used to inculcate healthy habits and values in students and the nature of problems that affect the delivery of health education. The role of the Ministry of Education in supporting health education is also reported here.

As stated above, the findings of the interviews represent the third dimension of this study. The first one addresses health education as expressed by Jordanian educational policy in the documents that have been analysed (see Chapter 6). The second discusses actual amount of teaching of health education topics as declared by science teachers through their answers to the questionnaire (see Chapter 7). The third dimension is concerned with how health education topics are delivered by science teachers. The findings are important because they reflect the science teachers' abilities to affect the attitudes and the general health behaviour of students, and to some extent, their attitudes towards delivering certain health education topics.

Semi-structured interviews with the random stratified cross-representational sample (60 respondents distributed across the three regions, teaching science for grades 7 to 10) were conducted (see Section 5.6.3, p. 124). The interviews stressed four basic themes:

- What teaching methods are usually used by science teachers in the delivery of health education?

- What teaching methods may have a stronger influence on changing students' health behaviour?

- What percentage of time does the science teacher spend on health education compared to the total number of science lessons?

- What problems, if any, face science teachers in the delivery of health education?

At the end of the interview, teachers were given the opportunity to discuss general issues related to health education and other concerns they might have.

After conducting the interviews, the researcher subjected the responses to content analysis and recorded the frequencies of the themes identified. The final theme, which related to the problems faced by the teacher, is discussed qualitatively only, because these problems were seen to be very common amongst respondents and represent a serious constraint to the delivery of health education. It was found that some aspects were common to each region, but other aspects were peculiar to a particular region. It emerged that there were a few effects that could be attributed to region and science subject, but there were no significant differences between teachers that could be attributed to their gender, teaching experience or qualifications in science and education. The following is a review of these findings.

8.2 Teaching Methods Used for the Delivery of Health Education

One of the main aims of this study is to investigate the teaching methods used by science teachers in Jordan for the delivery of health education. To meet this aim, the researcher conducted interviews with a sample of science teachers in the three regions: north, central and south, and asked the following question: 'What teaching methods are usually used by science teachers in delivery of health education?' A content analysis was carried out on the responses. The teaching methods commonly used among science teachers in Jordan overall were as follows:

Table 8.1: The teaching methods commonly used among science teachers in Jordan

no.	Teaching methods used in health education	North N= 24		Centre N= 25		South N= 11		Total N= 60	
		F	%	F	%	F	%	F	%
1	dialogue and discussion	21	87.5	23	92	9	81.8	53	83.3
2	presenting examples from real life	21	87.5	23	92	9	81.8	53	83.3
3	using brochures	21	87.5	23	92	9	81.8	53	83.3
4	boards and illustrations	21	87.5	23	92	9	81.8	53	83.3
5	using documentary films	21	87.5	23	92	9	81.8	53	83.3
6	advice, guidance, and direction	18	75	16	64	5	45.5	39	65
7	reports and research	18	75	16	64	5	45.5	39	65
8	laboratory tests	18	75	16	64	5	45.5	39	65
9	group work	5	20.8	19	76	8	72.7	32	53.3
10	visits by specialists	8	33.3	11	44	4	36.4	23	38.3
11	good example (role model)	6	25	4	16	2	18.2	12	20
12	using students' experiences	6	25	4	16	2	18.2	12	20
13	problem solving	6	25	4	16	2	18.2	12	20

F= frequency

The other teaching methods were peculiar to each region and are presented in the following table:

Table 8.2: The teaching methods used that were peculiar to each region

no.	teaching methods used in health education	North N= 24		Centre N= 25		South N= 11		Total N= 60	
		F	%	F	%	F	%	F	%
1	dictation	20	83.3	-	-	-	-	20	33.3
2	story telling	-	-	19	76	-	-	19	31.6
3	using the textbook	14	58.3	-	-	3	27.3	17	28.3
4	school radio	9	37.5	7	28	-	-	16	26.6
5	field trips	-	-	7	28	5	45.5	12	20
6	dramatisation	-	-	7	28	3	27.3	10	16.6
7	using science and health references	-	-	7	28	-	-	7	11.6
8	using school library	-	-	7	28	-	-	7	11.6
9	inquiry and inference	-	-	7	28	-	-	7	11.6
10	incorporating the religious dimension	-	-	-	-	5	45.5	5	8.3
11	co-operation with the school health teacher	-	--	-	-	3	27.3	3	5
12	brainstorming	-	-	-	-	3	27.3	3	5

F= frequency

The findings of the interviews revealed that there were only a limited number of teaching methods used frequently by science teachers in Jordan. These consisted of: dialogue and discussion; introducing examples from real life; use of health brochures; use of boards and illustrations; and use of documentary films. The reasons for this can perhaps be traced to the fact that science teachers tended to use methods that were, to a great extent, similar to those which they experienced as students (see p. 214). Other reasons could be choices about the compatibility of teaching methods versus the volume of health content in science textbooks, the time devoted for teaching science overall, and

the teaching aids and educational technology available to teachers. The evidence for this could be deduced from the respondents who expressed their reasons for using these methods as follows:

The size of the science curriculum is so large that some teachers find it difficult to complete it without making extensive use of the methods of lecturing and dictation, accompanied by some dialogue and discussion. This is particularly the case when we realise that education officials would often inquire about curriculum coverage and measure teachers' performance by the students' ability to recall information:

> "The size of the science curriculum generally is very large compared with number of lessons per week; two lessons for biology, chemistry and physics is not enough to cover the concepts presented within the textbooks" (female teacher, north region).

> "In the classroom visits, education officials often inquire about the amount of curriculum that had been taught and the amount of curriculum remaining whatever the level of the information given" (male teacher, south region).

Some schools lack materials and technical facilities such as a laboratory or a demonstration room. Many teachers were working at schools with reasonable materials and facilities and this is reflected in the use of documentary film, health brochures and illustrations as teaching aids:

> "In my school like other schools as I know, there are many documentary films especially for biology concepts....I usually used them but the others 'the other science teachers in the school' depend on health brochures because it may be easy for them to use" (male teacher, north region).

These methods were relatively easy to implement compared with other teaching

methods:

> "These methods and other methods such as discussion and demonistration are more easy to use than compared with other teaching methods such as inquiry ..... I don't think it works effectively in Jordanian schools" (male teacher, south region).

Science teachers often carry heavy teaching loads with most teaching more than 20 hours science per week:

> "I have a heavy schedule... about 22 lessons (45 minute per lesson) per week for different grades.....in addition to shortage of material capabilities" (male teacher, north region).

Some of the science teachers were lacking educational and professional qualifications. This made them unaware of a range of other teaching methods:

> "we did not have in-service training courses on methods of delivery of health education.....the other training courses lacked seriousness and good planning" (male teacher, central region).

The study revealed that within the questionnaire sample, only 67 out of a total of 404 teachers had educational qualifications.

Classrooms were often overcrowded, which tends to make the teacher concentrate on teaching methods that were economical in terms of time, effort and space requirements. Thus methods tend to be didactic. The researcher observed that some schools within the sample had almost 3000 students. This was especially the case in big cities such as Zarqa. A single classroom would have to accommodate more than 55 students.
These didactic methods were common among science teachers in Jordan, especially those who had been taught by the same methods as students in school or university.

> "these teaching methods are common for us..... we learned through these methods in schools and in the university..... to be honest with you, we are not familiar with and not experts in implementing other teaching methods" (female teacher, south region).

This is confirmed by Al-Arafeen's study (1985) on the strategies used to teach science at the elementary grade. Al-Arafeen found that teachers tend to use the same teaching methods year after year without any change. Science teachers were using two main strategies: demonstration, which is characterised by being teacher-led, where it is the teacher who selects the information and organises it to develop the concepts to be learnt. The other strategy is that of problem-solving, in which the teacher presents students with illustrations or diagrams in order for them to deduce the relationship between concepts. The present study shows that very little has changed in the teaching of science in Jordan since Al-Arafeen's study 15 years ago. The demonstration method has very little application to health education, whereas problem-solving techniques can be appropriate, if allowed to be more 'open-ended' than in the above example.

However, further investigation shows that there is a great variation in the delivery of health education topics:

> "I'm not sure if there are teaching methods related to health education in particular. Anyway, my teaching experience is in pure science and not related to health education..... in my teaching I usually use dialogue and discussion methods" (male teacher, central region).

> "I'm doing what they (students) want me to do.... presenting the content of lessons by using dictation method and using black board" (male teacher, south region).

> "I think if you are a 'good' teacher, you should use student thoughts for further discussions, link these thoughts with real life, and explain for them why some people behave in a different manner.... students then will like you and enjoy the lesson even if the lesson is considered hard to understood" (male teacher, north region).

> "Your teaching should help students acquire the scientific and social skills by using group work and if you share them as a good example you will be in the right way and then you can provide them a lot of information without hearing complaining. I think students like such a teaching approach and respect the teacher who does so" (female teacher, north region).

> "I think that delivery of health education needs some specific teaching methods. However, I use advice, guidance, and directions and sometimes real examples" (female teacher, central region).

These statements reveal that there are two types of teacher. One type are the more traditional teachers who tend to repeat themselves year after year, and do not develop their abilities to use more effective teaching methods that may result in a change in students' health behaviour, attitudes and values. They perhaps do not realise that different concepts require different teaching methods, but maintain the view that whatever the content is, the teaching methods remain the same. This means that a teacher could teach the concepts of weather, muscle, marriage, the verb 'to be', and the angles of a triangle, by using one teaching method. However, fortunately very few teachers (5 out of 60 interviewed) advocating the use of one method only. These five teachers were those with long teaching experience.

The second type of teacher is able to use different teaching methods for teaching different concepts, often in an effective manner. These teachers often use a variety of

approaches. The use of any teaching method will affect and reflect the nature of the interpersonal relationships between students and their teacher. As can be seen from the quotes on p. 214 and 215, the methods used will often reflect a more positive relationship between students and teacher, which encourages students to more readily accept the teacher's advice and instructions if presented in a less didactic way. As a result of such teaching methods, students will be better able to develop positive attitudes and strengthen their own value systems (see Section 4.2, p. 82). Unfortunately, the findings of this study reveal that this type of teacher is not commonly found. The findings of the interviews revealed that there were only a limited number of teaching methods used frequently by science teachers in Jordan. These consisted of dialogue and discussion; introducing examples from real life; use of health brochures; use of boards and illustrations; and use of documentary films (see Table 8.1).

However, many respondents recognised the characteristics of the 'effective' science teacher who is concerned with teaching health education:

> ".... the science teacher should use teaching aids, tools and apparatus, illustrations in an extensive manner to make the concepts very clear and meaningful for students" (female teacher, 4 years experience).
>
> "the good teacher should reveal balance, quiet and confidence through providing science lessons, these make students trust him or her" (male teacher, 7 years experience).
>
> "the teacher should show enthusiasm for teaching his or her subject, encourage students to raise questions and participate in discussion" (female teacher, 3 years experience).
>
> "despite the complex and depth of the concepts or the wide knowledge of the teachers, they should use simple, easy and understandable language" (female teacher, 9 years experience).

However, the effectiveness of the teacher may, to some extent be limited by the amount of teaching and learning resources available, as illustrated by the following quote:

> "most Jordanian schools, including my school, are poor in scientific apparatus and technical tools" (female teacher, 9 years experience).

Another factor which affects the ability of the teacher to use more 'modern' student-centred methods is the lack of in-service teacher training:

> "we did not have in-service training courses on methods of delivery of health education.....the other training courses lacked seriousness and good planning" (male teacher, 10 years experience).

As already discussed, only 67 out of 404 (16.6 %) of teachers in the study had received initial teacher training. This, along with a limited in-service provision, results in the use of traditional teaching methods, experienced by the teachers being students in school and in university, then being used by themselves as teachers. This situation could be described as inflexible; as new generations of Jordanian teachers arrive, they perpetuate this teacher-driven approach to health education which ignores the possibility of changing practices to make health education more dynamic and more effective. This study suggests that there is currently a state of inertia in the teaching of health education in Jordan, and this mitigates against innovation in this area.

The choice of teaching methods reflects to a great extent attitudes towards the teaching-learning process. The classroom is still the traditional place for teaching science and health topics. The study has not revealed any use of the surrounding environment or

visiting speakers for extending health knowledge. This may be related to the fact that teachers are under pressure to complete the curriculum 'at any cost'. They feel obliged to do so to avoid questioning by the school principal:

> "headteachers are always warning and enquiring about finishing the content, they said: don't put us in awkward position with parents and the Ministry" (male teacher, 12 years experience).

As a result of this pressure to finish a potentially overcrowded curriculum, it can be expected that the teaching methods selected reflect time constraints more than their ability to develop appropriate attitudes to health. The main activities are closed ones, often based on whole class discussion where teachers tend to consider, perhaps wrongly, that all students work at the same cognitive level. The documentary analysis supports these findings; many of the activities suggested by the textbooks are closed, teacher-centred ones. These methods are considered by the researcher and by the literature to be less suitable for teaching health education topics (see Section 6.3 and 6.4, p. 145 and 151 respectively).

8.3 Teaching Methods that Influence Student Behaviour

This section discusses the responses to the second interview question: 'What teaching methods may have a stronger influence on changing students' health behaviour?'

The teaching methods generally suggested by science teachers in Jordan overall are presented in the following table and are based on a content analysis of responses.

Table 8.3: Teaching methods suggested by science teachers that may have a stronger influence on changing students' health behaviour

no.	Teaching methods suggested in science education and health education	North N= 24		Centre N= 25		South N= 11		Total N= 60	
		F	%	F	%	F	%	F	%
1	using documentary films	22	91.7	23	92	10	90.9	55	91.7
2	laboratory work	22	91.7	23	92	10	90.9	55	91.7
3	dialogue and discussion	22	91.7	23	92	10	90.9	55	91.7
4	learning by example	19	79.2	18	72	7	63.6	44	73.3
5	co-operation with specialists	19	79.2	18	72	7	63.6	44	73.3
6	persuasion and guidance	22	91.7	15	60	2	18.2	39	65
7	field trips	16	66.7	10	40	9	81.8	35	58.3
8	reports and research	9	37.5	10	40	6	54.5	25	41.7
9	competitions	9	37.5	10	40	6	54.5	25	41.7
10	using health brochures	9	37.5	10	40	6	54.5	25	41.7
11	student participation	9	37.5	10	40	6	54.5	25	41.7
12	group work	8	33.3	10	40	5	45.5	23	38.3
13	co-operating with the counsellor at school	7	29.1	9	36	2	18.1	18	30
14	using simple language and sensible manner	7	29.1	7	28	4	36.3	18	30
15	following up student behaviour	6	25	8	32	4	36.3	18	30
16	inquiry	5	20.8	5	20	4	36.4	14	23.3
17	dramatisation	5	20.8	5	20	4	36.4	14	23.3
18	studying health condition of students and their families	5	20.8	5	20	4	36.4	14	23.3
19	co-operating with the family	3	12.5	8	32	3	27.2	14	23.3
20	co-operating with school staff	4	16.6	4	16	6	54.5	14	23.3
21	using audio-visual tutorial	5	20.8	4	16	5	45.4	14	23.3
22	held seminars at school by students	4	16.6	2	8	5	45.4	11	18.3
23	individual learning	6	25	2	8	3	27.2	11	18.3
24	self-learning	4	16.6	3	12	4	36.3	11	18.3
25	using enhancement and rewards	5	20.8	3	12	2	18.1	10	16.6

F= frequency

The other aspects were peculiar to each region regarding the suggested teaching methods and are presented in the following table:

Table 8.4: The teaching methods suggested that were peculiar to each region

no.	teaching methods	North N= 24		Centre N= 25		South N= 11		Total N= 60	
		F	%	F	%	F	%	F	%
1	radio and television programmes	-	-	21	84	2	18.2	23	38.3
2	using examples from real life	-	-	21	84	-	-	21	35
3	story telling	8	33.3	-	-	-	-	8	13.3
4	designing health education slogans	-	-	8	32	-	-	8	13.3
5	magazines	-	-	-	-	2	18.2	2	3.3

F= frequency

Looking at the findings of the methods actually used by teachers for health education, and comparing these with the methods that teachers think would be most effective, it is clear that there are many differences between the two. Teachers in Jordan are obviously aware of the existence of a wider range of teaching methods than the ones they actually employ, and even that these may be more effective (see Tables 8.1 to 8.4). This raises the question of why they do not use a wider range of methods? This may be due to factors such as a fear of controversy or lack of clarity about the optimal methods to tackle various topics of health education (see p. 217), or by strict adherence to the methods that may help them to cover the content of science textbooks (see Table 8.3 and see p. 218).

The findings of the interviews also revealed that the teaching methods suggested for effective health education were not affected by gender, teaching experience or qualifications in science and education. All respondents from the three regions gave a similar response. On the other hand, the science subject taught only had a limited effect on the range of suggested teaching methods. This may be traced to the nature of the subject content. Some regional variation in teaching methods suggested (see Tables 8.2 and 8.4), may be caused by training courses organised by the directorate of education of a region involving methods that differ from those used in other regions. The author's experience in Jordanian schools as a teacher supports this finding.

To provide a more in-depth picture, a representative statements from interviews in the regions are discussed below:

> "I used learning by examples, advice and guiding..... teachers' behaviour has the most influence" (male teacher, north region).

> "I used dramatisation, studying the health conditions of the student and his or her family" (female teacher, south region).

> "I used group teaching, field trips, and support of principals and the media" (female teacher, central region).

These statements show that these are the teaching methods used as opposed to those suggested (see Table 8.2). They reflect that teachers are aware of themselves as role models for their students. They understand that a range of factors can be effective in modifying student behaviour, such as the teacher's personality, the family and social environment of the student and messages from the media. Teachers need school

principals, the media, and one would suppose, the policy makers at the Ministry of Education to support them in this wider role.

8.4 The Time Devoted to the Delivery of Health Education

Analysis of the key policy documents gave no clear indication regarding the proportion of time that should be spent on health education topics. The discussion of health education topics usually takes more time than pure science topics, especially if student-centred learning is to take place. Health education is concerned with developing the behaviour, attitudes and values of students. This section discusses the responses to the following question: 'What percentage of time does the science teacher spend on health education compared to the total number of science lessons?'

An analysis of the responses revealed that it was particularly difficult for teachers to determine how much time they spend on health education as opposed to 'pure' science. Teachers pointed out that no time was specified in the curriculum. However, this would also depend on the relevance of health education to specific science lessons. Teachers found that sometimes weeks passed without any health education topic being taught. At best, the time devoted for health topics, within general science, physics and chemistry appeared to total that of one to two lessons, 45-90 minutes in a single school semester (see Table 6.1, p. 143). This means that less than 1% of total teaching time; the total time for general science, physics, and chemistry is 192 lessons per single school semester which is 4 months. It was often the case that health topics would be casually presented as a result of students inquiring about a certain health issue or because of real

world events such as the emergence of some disease among students or in response to a news item. This was indicated by teachers of all sciences at the various grades.

The greatest percentage of time spent on health topics was in biology lessons, where between 40-80 % of time in the ninth and tenth grades is related to health content. The total time for biology at grade 9 and 10 is 32 lessons for each per semester (see Table 6.1, p. 143). Interviews revealed that a great part of this time was devoted to topics on environmental health, followed by personal health; the remaining time was used for discussing other health topics according to their emergence in lessons or from casual questions by students. These findings are supported by the results of the documentary analysis.

For further investigation and analysis, statements from interviews are discussed below:

> "there is no specified time for health education.....I think not more than ten minutes" (chemistry teacher).

> "as a biology teacher, I can say about 70 % of weekly lessons, most topics in biology are related to health education in some way" (biology teacher).

> "It is hard to guess..... health education topics mostly discussed in casual events whether in school or in the local community ..... and as it appears in the textbooks" (general science teacher).

It is apparent that neither the documents or the responses from teachers have been able to establish, with any certainly, an overall picture of the health education being taught

within the science curriculum. This is because the curriculum gives broad topic areas only, and it is left to the teacher to 'fill in' details which may or may not include reference to health matters.

The interviews show that teachers themselves have a similar difficulty, with estimates between 1 % (of overall sciences, physics and chemistry) and 13 % (of biology overall in grades 9 and 10) of the science curriculum time being put forward. This would of course depend on the science subject being taught, and to some extent, the grade; however there appears to be much variation between individual teachers.

The other issue is that, in general, the time allocation reflects how much emphasis is placed on various health education topics, but it does not reflect the use of this time in making a deep impact on students' behaviour, i.e. it reflects the quantity but not necessarily the quality of health education. Unfortunately, the findings of this study suggest shortages in both quantity and quality.

The variation in time devoted to health education also reflects to a great extent the lack of clear policy of the MoE regarding health education and whether it is a priority or not. Within Jordanian schools there is no recognised mechanism for the co-ordination of the delivery of health education between and across the various science subjects. This lack of planning and co-ordination makes an already bad situation worse, as what little time there is for health education may well not be used to the best advantage in a whole school context.

At present, it depends on teachers' attitudes towards health education. If these attitudes are positive then health education will be given emphasis within science lessons and it will be developed within science concepts. i.e. the teacher will present the role of health education in science and not the role of science in health education. A typical example might be starting with a discussion on smoking cigarettes, and following this with work on the effect of smoking on the respiratory system and its functions, and how the components of cigarette smoke interact with the respiratory organs.

8.5 Problems Facing Teachers in the Delivery of Health Education

One of the main aims of this chapter is to investigate the hidden and the explicit factors that affect the delivery of health education in Jordan. To meet this aim the following question was raised: 'What problems, if any, face science teachers in the delivery of health education?'

After conducting the interviews, responses to this theme were assigned to the following five areas:

- Student-related problems
- Curriculum and textbook-related problems
- School-related problems
- Science teacher-related problems
- The local community and other agencies

These will be discussed in turn in the following sub-sections.

8.5.1 Student-related problems: in this area the respondents mentioned the following problems they faced in delivering health education topics:

- Previous negative experiences of attempting to teach health topics.
- Students' lack of linguistic abilities which makes it difficult for them to use correct terminology and develop understanding.
- The majority of students reveal a spirit of rebellion and desire for greater freedom which makes them ignore the advice about good health behaviour given to them by teachers.
- Feelings of embarrassment among some students to discuss publicly diseases which they are suffering from.
- Feelings of shyness to discuss some sensitive issue such as sex and birth control.
- Students' lack of sufficient background health knowledge.
- Students' tendency to use materials and equipment inappropriately (they may play with the equipment and lose sight of the aims of the lesson).

8.5.2 Curriculum and textbook-related problems: in this area the respondents mentioned the following problems they faced in delivering health education topics:

- The science textbook focuses on various disciplines such as physics, chemistry and biology which makes it difficult to develop the teaching of health education.
- The lack of sufficient coverage of health education in the textbooks.
- The textbook emphasis on quantity of the material to be learnt rather than quality.

- The textbook's method of presentation makes the topic of health education lose its value and interest.
- The textbook does not present health activities that could readily be applied.
- The lack of a specific textbook on health education that could be integrated with other disciplines.
- The science textbooks are not related to the student's reality and environment.

8.5.3 School-related problems: in this area the respondents mentioned the following problems they faced in delivering health education topics:

- There is not enough time for teachers to explore fully important issues due to heavy schedules.
- There is a lack of any specified class time for health education within the time-table.
- There is a shortage of materials and resources such as audio and video tapes, health brochures.
- There is a lack of healthy conditions at school, including overcrowded classrooms, poor ventilation, inappropriate locations.
- There is a lack of any school statements on teaching health education.
- There is a shortage of educational counsellors at most of the schools.
- There is poor practice in some schools with regard to cleanliness which may make students believe that this issue is not of great significance.

8.5.4 Science teacher-related problems: in this area the respondents mentioned the following problems they faced in delivering health education topics:

- There is a lack of teachers with specialist health education background.
- Science teachers do not have sufficient knowledge to teach certain topics in health education.
- Teachers are often burdened with many heavy administrative tasks that do not leave much time for preparing for health topics additional to those in the textbooks.
- Teachers are committed to completing the entire textbook on time despite the fact that the amount of content leaves most teachers unable to elaborate on some topics.
- The health behaviour of some teachers may not present a good example for their students e.g. in smoking.
- Lack of any periodicals on health education that could be used in supporting teachers professionally and providing them with accurate and up-to-date information.

8.5.5 The local community and other agencies: in this area the respondents mentioned the following problems they faced in delivering health education topics:

- Bad habits of society, such as smoking, may affect a student's behaviour, and this represents a contradiction between what is taught and social reality.
- The local community does not often co-operate with the school in areas such as health. This is represented by the lack of specialist visits to schools.

- There is a lack of co-operation and communication between school and students' families.
- There are some negative attitudes and superstitions prevailing in Jordanian society against teaching some health topics such as the pre-marriage medical examination and birth control.
- There is a lack of firm control of health matters in schools or regular medical examination of students.
- Student's social and economic environments may affect their ability to follow good health practices, such as healthy diet.
- There is a lack of health education with the family as most parents are ignorant about health topics.
- There is the failure of the official health authorities to practise what they preach (for example, doctors who smoke but lecture other people about the harmful effects of smoking).
- Health education topics are not frequently found in the media.
- Satellite television and video tapes used without any parental control may result in misleading information about health matters.

The identification of the five main themes has helped to categorise the data. The following quotes provide illustration of the issues:

> "the lack of linguistic abilities of students.....spirit of rebellion and openness (such as using verbal sex terms between them and behaving rudely) among majority of students in my school

especially as most students are coming from different social and economic levels" (male teacher, central region).

"the textbook is not related to student's reality and his or her environment, also, textbook emphasises quantity rather than quality.....texts provide mixed topics such as physics, chemistry and biology" (female teacher, north region).

"I have a heavy schedule... about 22 lessons per week for different grades.....shortage of material capabilities" (male teacher, north region).

".....I'm not qualified to teach health education, I didn't learn about such topics in the university and I didn't have in-service training course during my teaching experience which is about nine years" (male teacher, central region).

".... parents often do not supervise what their children watch on video or satellite and so they come into contact with the bad habits of society...these contradict what we teach....." (female teacher, central region).

The results indicated a wide range of problems and obstacles affecting teachers in their attempt to deliver health education, and they constitute great challenges for the educational system of Jordan. The magnitude and variety of these problems may be attributed to educational strategies being incapable of dealing with the real problems of the educational system and developing proper solutions. These problems may become acute if this situation continues to be accompanied by lack of support and clear guidance from the MoE. This parallels Mutter's study (1986), when he highlighted some of the

problems confronting school health education in Canada. Results there indicated a lack of formal recognition for health compared with subjects such as physical education or home economics. In addition, health teachers lacked specialised or supplementary training, and a haphazard use of materials and resources was noted.

An earlier study by Hasna (1996) in Jordan, showed that the major limitations of implementing school health programmes included financial constraints, administrative constraints, unsuitable buildings, lack of co-operation by some school personnel, overcrowding of schools, shortage of housekeeping personnel and shortage of water supply at times, lack of co-operation of parents with schools, and lack of understanding of parents' roles in following up health issues. Results emerging from this study suggest that little has changed.

8.6 General Issues Related to Health Education

At the end of the formal interview questions, teachers were given the opportunity to raise other general concens they might have. During the field work, some teachers asked for clarification of the difference between health education and school health.

One respondent said:

> "Does *health education* have the same meaning as *school health*?.....Is it run by Ministry of Health?..... schools nowadays are becoming a store of violence and other abnormal behaviours.....everybody blames the teacher and no body co-operates with him" (male teacher, north region).

This statement reveals the confusion between health education as managed by the Ministry of Education and school health as managed by the Ministry of Health. It also reflects the dissatisfaction of teachers about the general health behaviour of students. It also reflects a concern that Jordanian people are dissatisfied with teachers' performance and their ability to modify student behaviour, which has an increasing tendency to violate Jordanian culture, norms and traditions (MoE, 1988) (see Section 1.8, p. 21). Teachers cannot be expected to manage unacceptable behaviour alone; they need the co-operation and support of families and other agencies. Without this, we can expect that science teachers will experience difficulty in fulfiling their role as health educators.

Another interviewee elaborated on the type of unacceptable behaviour experienced:

> "yes, some students attack each other and sometimes teachers.... some students circulate sex posters secretly....of course these are forbidden in schools.....others tend to destroy their desks, windows, doors, and steal other pupils' equipment" (male teacher, central region).

This statement highlights a most important but unexpected problem, that of attacks on the teacher (physically and verabally). Yet if he or she administers any physical punishment, the community will not respect him or her; teachers have no right to use any form of physical punishment in any circumstances; if they do so they run the risk of being punished themselves by the MoE.

Also, this statement highlights a problem of students secretly circulating sex posters from magazines and other sources. Such behaviour does not just break school

regulations but also contradicts social, cultural and religious traditions in Jordan, as an Arab and Muslim country. On the other hand, such behaviour reflects the physical and emotional characteristics of this age group. It reflects a typical adolescent curiosity about sex, and it reflects the negative relationships than can develop between students and their school at this stage. These students see school life as a list of constraints and a list of taboos: *No...., don't...., do....*This makes students wish to challenge these constraints. They may do this by challenging the authority of teachers or the 'system' as shown by the last quote. Peer pressure can be very strong in this process and students will encourage each other to 'break the rules'. Delivering health education 'messages' in this setting will require much skill on the part of the teacher.

Teachers specifically mentioned the problems they experience when attempting to teach topics related to sex and reproduction:

> "..... to be honest with you, the teachers can't ignore discussing these issues, but there are other issues I cannot discuss" (male teacher, south region).

'Could you please give an example?'

> "....human reproduction for example, discussing such topic may result in a lack of control of students' behaviour.....may be interpreted to be outside the framework of the lesson and lead to a deterioration of students' thoughts".

Science teachers cannot ignore their roles as teachers and as members of society. They have to assist in countering unhealthy behaviour, but see many limitations to their role and the extent to which they can assist. Some of these limitations are because of the

highly personal matters being considered or because of objections from families with regard to the subject matter. In Arabic culture, involving science teachers with these issues may affect his or her 'honour'.

8.7 Summary

The findings discussed in this chapter indicate that science teachers do play an important role in the delivery of health education, and there are various different aspects to this role. One aspect requires teachers to be more than a source of information; he or she may have to assist students in solving their health problems and act as an educational and social counsellor within the school setting. Teachers are also expected to act as facilitators of learning, monitors of students' health behaviours, organisers of teaching activities, good role models for the students, and co-operators with other health specialists. They are expected to carry out this role despite the lack of guidance provided by the MoE on the amount and specific content of health education they should teach, and often without support from the school and local community.

A substantial amount of information about the official policy with regard to health education and its implementation has now been gathered and discussed. To provide an integrated picture of the delivery of health education, this information has been analysed, discussed and integrated with relevant literature, leading to a number of recommendations which are the subject of chapter nine.

Chapter Nine: Overall Findings and Recommendations

9.1 Introduction

This chapter summarises the findings of this study, and relates these to relevant literature on the delivery of health education. The significance of the overall findings is in the fulfilment of the aims of the study, which were as follows:

- To explore the official policy on health education in Jordan as indicated in the official policy and curriculum documents provided for science teachers.

- To analyse the content and nature of health education topics delivered by science teachers in the upper basic education stage in Jordan.

- To investigate the teaching methods used by science teachers in the delivery of health education in Jordan.

The findings are discussed within the context of the main objectives and questions of the study with the aim of providing a picture of health education in Jordan as it exists at present, and developing an effective strategy for improving it. The strategy suggested in this chapter is based on the evidence documented in the literature and on the findings of this study.

9.2 The Health Education Context

The review of the literature showed that there are many models, definitions and philosophies about health education (see Section 2.2, 2.3 and 2.4, p. 30, 34 and 37 respectively). One of the first problems of this study was to select, from the range of definitions and models found in the literature, a working definition that would be used in this study. The one selected was that health education is:

> "any intentional activity which is designed to achieve health or illness related learning" (Tones and Tilford, 1994, p. 11).

This definition is a very broad one, but was considered the most applicable for current purposes as it includes all the 'intentional' aspects of health education. This relates to all the planned health education content which is designed and delivered within the science curriculum of the seventh to tenth grades in the Jordanian education system. The health aspects currently contained in the Jordanian science curriculum comprise five areas of health education: personal health, nutritional health, environmental health, disease and prophylaxis, and education for married life.

However, Pring's suggestions for a health education curriculum are broader than that currently offered in Jordan, and will be kept under consideration in this study. These are that the curriculum:

> "might cover such diverse skills, habits, bits of knowledge, attitudes and behaviours as 'living and working together amicably'. 'self-esteem and self-confidence', 'social competence' and even 'appropriate attitude toward sex, parenthood, smoking, drink and exercise" (Pring , 1985, p. 187).

This approach will include many other aspects of school life. This will be discussed later in this chapter.

At present in Jordan, health education, as delivered within the science curriculum, appears to be based on the Knowledge - Attitudes - Behaviour Model (Hendry et al, 1995). Yet this is considered to not be the most effective approach, as it tends to be content-based (Hendry et al, 1995). The Health Belief Model (Ghazizadeh, 1992; Pridmore, 1996) may also be of relevance in less developed areas of Jordan, where basic hygiene and clean water supplies are important issues. However, the Health Action Model, with its emphasis on values and attitude change as well as knowledge and action is likely to be the most effective in the long term (Baron and Brown, 1991). In the current study, the Health Action Model and the Health Belief Model will both be used as frameworks for the recommended delivery of health education.

Both models agree about the necessity of promoting the health of the individual, groups and the environment. The Health Belief Model is a wider concept and will require the co-ordinated support of concerned agencies such as the Ministry of Health, the Ministry of Social Development and non-governmental organisations (NGOs) and the mass media as well as the Ministry of Education (Campbell, 1985; Harrison and Edwards, 1994; Naidoo and Wills, 2000). Both models require clear policies and guidance from the relevant Ministries.

9.2.1 Health Education policy in Jordan

In general, the Jordanian government supports the idea of health education as a topic with distinctive status in the curriculum (see Section 3.3, p. 51). This was supported by Jordan's attendance at international conferences and by signing international treaties in relation to the development of the health of the population. However, this study has shown that at present many aspects of this commitment are theoretical rather than applied. Results of the documentary analysis (see Section 6.2 and 6.3, p. 140 and 145 respectively) indicate that the policy with regard to health education is not clearly structured and does not connect with the philosophical, psychological, social and cognitive bases of health education as is it understood world-wide. Thus the current policy is incapable of disseminating health awareness and fulfilling health education objectives.

There have been several proposed educational policies related to health education, but these have often remained at the proposal level. In the past there has been no effective planning that might transform them into reality. Plans, where they existed, tended to be of short duration, and expire when relevant officials left office or changed their positions in government (see Section 1.5, p. 13). The best example here is the 'project of health education in Jordan' (MoE, 1994) for grades one to six which did not last for more than one year.

To a great extent, health education policy in Jordan is not clarified by officials and so could not easily be communicated to others. This was indicated by the small number of visits by officials and decision makers - such as from the Ministry of Education - to

schools to see what was really taking place. There appears to be little review and evaluation, and no consistent support for teachers.

One very interesting finding in this study was that 'health education' as a concept has become, in many teachers' minds, linked with the concept of 'school health'. They tended to use the terms interchangeably (see Section 3.2, 7.2, and 8.6, p. 48, 169 and 231 respectively). This was evident from the interviews with science teachers and visits to schools. When the researcher was talking about health education and expressing a desire to meet with science teachers involved with this, school administrators tended to call the teacher who was in charge of health services in the school, regardless of his or her specialisation. There is no job title as 'School Health Teacher' in the Jordanian educational system.

The integration of health education in the Jordanian school science curriculum is rather spasmodic. Because the formal curriculum documents are composed of short topic titles only, it is difficult for teachers to identify the specific health education content. Although health education concepts have been introduced in all grades (7 to 10) of the science curriculum in Jordan, they are in the form of concepts or lessons that are not supported by activities that could affect students' values and attitudes (see Section 6.2, 6.3 and 6.4, p. 140, 145 and 151 respectively). This is not peculiar to Jordan, however; the findings are supported by Burrage's (1990) findings in UK, revealing that not all health education areas are commonly addressed in the school curriculum; this is despite a more detailed presentation of health education topics within the UK curriculum. Therefore it appears that it will not be enough to 'spell out' the health education content

clearly in the curriculum; other factors such as resource support and teacher development will also need to be addressed. This will be discussed later in this chapter.

9.2.2 Curriculum guidance

As already described, the formal curriculum document in Jordan does not provide teachers with detailed guidance on the content to be taught, being restricted to topic areas and lesson titles only. For details the teacher relies on the relevant grade textbook. This has both content and suggested teaching and learning methods, and in the case of the science curriculum, practical activities. Documentary analysis of the textbooks has revealed a lack of clear, relevant health education material. Where health topics are presented, they concentrate on facts and knowledge, not behavioural change. The health education content did not generally stimulate students' interest and did not present health concepts in a way that corresponded with students' age and stage of development. Several domains of health education were ignored, such as child abuse, violence and chemical solvents misuse (see Section 6.2, 6.3 and 6.4, p. 140, 145 and 151 respectively).

Objectives relating to health education in the science curriculum were not explicit in the most part (see Section 6.2, p. 140). They tended to focus on theoretical aspects, highlighting in the first instance the physiological aspects and the anatomical study of body parts. They did not stress values, attitudes and morals. Expression of these objectives came often in the 'imperative' form that did not reflect 'self-practice'. In helping students to acquire knowledge, skills and understanding, it is essential that they are given the opportunity to participate actively in their own learning, through debate

and discussion, through negotiation and investigation (Hendry et al, 1995). For example, a statement in the curriculum was 'following sound health habits' and not 'exercising sound health habits'. The word 'following' in Jordanian culture can only express an obligation to confirm with specific regulations, whereas the word 'exercise' implies a self-motivated action. It is worth noting that the statement 'following sound health habits' is the only statement related to health education which is mentioned in the overall objectives of the science curriculum.

The nature of educational practice in Jordan makes it imperative upon teachers to adopt certain teaching patterns, in order to complete each textbook in the time required (see Section 8.5.2, p. 226). Therefore, the methods of presentation tend to support dictation, discussion, learning by heart and information retrieval; not practical work or other student centred methods (see Section 8.2, 210). Occasionally, educational materials are suggested by the textbook, but they are not always available in schools (see Section 6.2, 6.3 and 6.4, p. 140, 145 and 151 respectively).

In practice, health education has remained related to school achievement rather than to behaviour and the achievement of positive health habits. Assessment of this topic is based on information retrieval and learning by heart. There are no methods for evaluating health attitudes or daily practice of them (see Section 6.2, 140).

9.2.3 Delivery of health education by science teachers

Analysis of the results indicates that health education delivery by science teachers was very variable; some areas receive a lot of attention, such as environmental health, and others, such as education for married life, receive little attention. There is also a difference between the weighting given to health education areas in the textbooks (as shown in Table 6.2, p. 153) and the emphasis placed on topics by science teachers (from the questionnaire analysis, Table7.1 to 7.5, p. 171). These findings are compared in Table 9.1.

Table 9.1: The emphasis placed on health education areas

Emphasis placed on health education areas in science textbooks (based on percentage occurrence)	Emphasis placed on delivery of health education areas by science teachers (based on mean values)
1- personal health (32 %)	1- environmental health (3.25)
2- disease and prophylaxis (24 %)	2- personal health (3.12)
3- environmental health (21 %)	3- disease and prophylaxis (3.04)
4- education for married life (9 %)	4- nutritional health (2.97)
5- nutritional health (8 %)	5- education for married life (2.28)
health education overall (19 %)	**health education overall (2.87)**

Table 9.2 compares the proportion of health education found within the science textbooks and its actual delivery by science teachers at various grades, based on evidence from documentary analysis (see Table 6.2, p. 153) and from questionnaire analysis (see Table 7.8, p. 197).

Table 9.2: Proportion of health education in science content and the mean of its delivery

A: Proportion of health education in the content of the science textbooks							B: Overall mean value of delivery of health education by science teachers					
subject	personal health		nutrition health		environment health		disease prevention		married life		overall	
	A	B	A	B	A	B	A	B	A	B	A	B
Sc/ 7	24	3.19	12	3.15	16	3.17	28	2.98	27	2.20	20	2.86
Sc/ 8	12	3.35	12	3.31	04	3.59	08	3.25	-	2.23	07	3.05
Ph/ 9	17	2.99	-	2.61	17	2.99	13	2.66	-	2.23	13	2.64
Chem/ 9	22	2.91	-	2.82	06	3.32	33	2.97	-	2.02	12	2.73
Bio/ 9	56	3.38	21	3.46	56	3.34	33	3.56	33	2.32	40	3.13
Ph/ 10	50	3.12	-	2.84	-	3.15	-	2.95	-	2.24	10	2.79
Chem/ 10	06	2.74	06	2.53	-	3.09	31	2.59	-	1.90	09	2.50
Bio/ 10	67	3.19	13	2.95	67	3.32	27	3.31	13	3.05	37	3.16
overall	32	3.12	08	2.97	21	3.25	24	3.04	09	2.28	19	2.87

Sc= science, Ph= physics, Chem= chemistry, Bio= biology

Topics which were actually presented were often within the range of 'low' and 'moderate' delivery according to the categories used in this study (see Table 7.1 to 7.5). On the other hand, science teachers' experiences, qualifications in education, qualifications in science and the region appeared to have little or no effect on the amount of delivery of health education. The teaching subject was relevant - in favour of biology. The major difference shown to affect health education delivery in this study was the gender of the teacher, with female staff being less likely to cover topics such as 'education for married life'. The religious and cultural reasons for this have been discussed in Sections 1.2, 1.3, and 7.3.1, p. 1, 4 and 193 respectively; however lack of clear policy and guidance are likely to also be of relevance here, in terms of providing female teachers with the 'security' to teach sensitive topics.

Findings show that the delivery of health education and the teaching methods used do not seem at present to be affecting students' behaviour or their value systems and health attitudes. This is discussed in Section 8.5 to 8.5.5, p. 225, where teachers are

complaining about students' behaviour and the teachers' inability to change these behaviours. Teachers' responses indicate that there is no allocated specific time for teaching health education. Teaching health concepts is often done casually or 'by accident', and as a result, a teacher would not have enough time to plan and adopt teaching methods that may help instil health concepts in students' minds.

The findings indicate that among the significant obstacles to the success of health education is a failure to develop and use teaching methods that are suitable for health education. Cowley et al (1981) stated that those involved in health education have long recognised the need to go beyond the mere passing on of facts and information if the aim of helping students to make choices and decisions relevant to their lives is to be achieved. A particular obstacle is the inability to shift the emphasis from cognitive to affective aspects. Tones (1979) stated that although health education has a very important cognitive base, it becomes problematical when it deals with values and attitudes. It proves difficult when it probes social problems, attempts to increase sensitivities, develops personal and social skills and attempts to change students' behaviour. Part of this problem derives from the fact that teachers are usually ill-prepared to deal with affective issues and are rarely equipped with the teaching methods necessary to handle them. This study has shown that teachers in Jordan use a fairly limited range of teaching and learning methods. However, what is very interesting is that they are aware of the existence of a greater range of teaching methods than those they use. Table 9.3 summarises the findings from Sections 8. 2 and 8.3 and illustrates this very well.

Table 9.3: The suggested and used teaching methods

The teaching methods suggested in the science curriculum	The teaching methods used by science teachers	The teaching methods suggested by science teachers	The effective teaching methods suggested in literature
using pictures, posters and films	dialogue and discussion	using documentary films	working together
using simple apparatus and measures	presenting examples from real life	laboratory work	enquiry methods
observation, examining, measurement and classification	using brochures	dialogue and discussion	discussion
preparing lists, reports and slides	boards and illustrations	learning by examples	making decisions
studying ready models or slides	using documentary films	co-operation with specialists	taking responsibility and reflecting on experience
doing simple experiments and simple models or drawings	advice, guidance, and direction	Persuasion and guidance	dramatisation
field trips	reports and research	field trips	using pictures, posters and films
discussion	group work	reports and research	role-play, games and quizzes
collecting species	visits by specialists	competitions	studying ready models or slides
invited speakers and specialists	good example (role model)	using health brochures	problem solving
	using students' experiences	student participation	case studies
	problem solving	group work	visits and field trips
		co-operating with the counsellor at school	brainstorming
		using simple language and sensible manner	programmed learning
		following up student behaviour	interviews and surveys
		inquiry	lectures
		dramatisation	informal conversations
		studying health condition of students and their families	
		co-operating with the family	
		co-operating with school staff	
		using audio-visual tutorial	
		held seminars at school by students	
		individual learning	
		self-learning	
		using enhancement and rewards	

Although science teachers in the study sample are aware of a considerable number of teaching methods, they are currently unable to implement them, due to time constraints (see Section 8.5.3, p. 227) and lack of confidence in using these methods (see p. 228). According to the literature, this aspect is one the most significant reasons for not delivering health education effectively (Section 4.4.1, p. 92). Teachers need to identify teaching methods specific to health education. Some health education topics will require more advanced teaching methods that are able to deal in depth with students' behaviour, attitudes, emotions, feelings, and thinking rather than focusing just on implementing the curriculum as may happen in science lessons. These methods should go beyond illustrations, demonstration, testing and experimenting to focus on following up students' behaviour by guiding, directing, and advising them. Also, these teaching methods should go beyond verbal exposition, to use suitable teaching aids which involve students in activities in order to help them build up their own decision-making skills and enhance their social and communication skills. Health can be regarded as a practical aspect of science and is therefore a desirable aspect of science.

9.2.4 The whole school context

The schools in this study did not appear to have any individual policies for the delivery of health education. It was considered to be part of the science curriculum and treated as such. Emphasis was placed on 'covering the curriculum', with teachers and principals being questioned by the MoE if this was not done. As the science curriculum is considered to be already over full, there was no time to develop or use 'student centred' methods which tend to take more time and create more classroom noise. Teachers can still be judged on the basis of how they manage their class in a quiet fashion.

Sometimes resources that were recommended by the textbooks were not available in school. School staff, and the surroundings of the school did not necessarily reflect an overall healthy 'message', for example with the provision of facilities to ensure cleanliness and healthy food in the refectory. No 'whole school policies' were observed, and there was no one person identified as responsible for health education. There was little involvement of other health care professionals, such as doctors and health workers.

The findings of this study confirm the challenges facing the Jordanian educational system with regard to the effective delivery of health education. At the same time they highlight the need for an effective health education programme, for clear guidance for teachers on how to manage controversial issues such as the nature of the health topics, the most effective methods to handle these topics, and how to manage some of the 'health' behaviours currently shown by students. These issues create great controversies among teachers in terms of acceptance or rejection. There is also one particularly major controversy concerning the right age for delivering some health concepts such as the ones related to sexual health and development (see Section 3.3, p. 61). These issues in particular need very careful thinking due to the social and cultural constraints in Jordan. Another aspect is the shortage of appropriate qualified health education teachers, and provision of in-service teaching training (see Sub- Section 8.5.4, p. 228).

However, recognition of these problems is not to deny the positive aspects of the development of health education provision in Jordan. These aspects include the following:

- The fact of that health education topics have been introduced into the school curriculum especially within basic stage science education.
- The MoE plans to introduce health education topics into other educational stages such as the secondary level (MoE, 1994).
- There are plans to develop teaching aids in general and health education and science education in particular (MoE, 1994).
- Co-operation between the MoE and the Ministry of Health to provide effective health services and materials for teaching health topics.
- Co-operation between the MoE and the Ministry of Information to include health education in its policies.

With respect to health education in general, the educational policy of Jordan is similar to that of other Arab countries (The Arab State Union, *c.f* 1990). The reality of health education in Arab countries, including Jordan, is very different from that of developed countries (see Section 3.3 and 3.4.1, p.51 and 64 respectively). Differences include ways of integrating health education in the curriculum, the inclusion of health topics in the curriculum and whether this should be done within a specific health curriculum or as a 'cross-curricular theme'. Whatever methods are adopted, time factors, shortage of qualified teachers and availability of teaching materials and other aids will act as constraints.

The study of the delivery of health education in the UK, in Europe and the USA has revealed that these countries approach health education in many different ways;

however, there are many examples of good practice, and ideas that can be taken into consideration for developing the teaching of health education in Jordan. However, as can be seen from the literature review, most education systems treat health education as a cross-curricular theme, requiring a whole school approach to the subject. This is accepted as the ideal and ultimate goal for the Jordanian education system. However it may not be possible to implement this in a short timescale. Therefore, health education will continue to be delivered within the science curriculum for the foreseeable future, and the recommendations that follow concentrate on the most effective ways of doing this. In the longer term, the 'ideal' of a separate health education curriculum is also discussed.

There are many reasons why it may not be possible to recommend such an approach for Jordan at the present time. The most important reasons are:

- The lack of guidance and the relative novelty of the subject has made health education a subject which may be supported by all, but is nobody's responsibility (see Section 7.2, p. 169). This will make accountability and evaluation difficult to implement.

- Within Jordanian schools there is no recognised mechanism for the co-ordination of the delivery of health education between and across the various subjects. This lack of planning and co-ordination makes the recommendation of teaching health education as a cross-curricular theme not possible at present.

- There is a shortage of qualified and experienced health education teachers at present. The MoE needs to provide comprehensive training programmes before and during service for teachers in order to prepare them to teach health education effectively. This will cost the Ministry a lot of money. The teacher's desire and his or her attitude towards teaching this subject is also an important factor in this respect.

As discussed in Section 1.11, p. 28, it seems that educational development in Jordan, as in many other countries focuses on change from the perspective of policy-makers and planners, rather than from the perspective of the teacher who has to deliver and handle change. The findings of this study showed that teachers consider that the most appropriate way to influence students' health behaviour, in the long term, is to deliver health education within a separate curriculum. There is much evidence of teachers' preference to deliver health education in this way. This includes:

- The findings of the documentary analysis (see Section 6.2, 6.3 and 6.4, p 140, 145 and 151 respectively), revealed that there is currently a lack of a well-planned integrated curriculum which meets the objectives of both health education and science education as recommended by the literature in Section 4.2, p. 82.

- Teaching health education topics usually takes more time than pure science topics, especially if student-centred learning is to take place. According to the educational circumstances in Jordan with the time constraints, delivering health education within any school subject will not allow sufficient time for extensive discussion of health education topics.

9.3 Recommendations

Society's progress and development cannot be judged by scientific achievements or great inventions alone. It is measured by the prevalence of human values such as peace, compassion, integrity, philanthropy and good behaviour. As individuals are the foundations of society and the pillars on which a social revival may be built, it is the duty of all societies to support elements of good behaviour and reduce inclinations to bad behaviour among individuals. The objective is to make good citizens, for a strong, healthy and progressive society can only consist of these citizens (Al-Hashmi, 1996).

Reviewing the relevant literature - Jordanian, Arab, and international it is clear that health education has many definitions and philosophies. Each concept or philosophy stresses different aspects and includes many dimensions that should be addressed in any project or programme of health education. But the most significant questions for Jordan are: 'What is the nature of health education in Jordan at present?' and 'What type of health education do we need?' The findings of this study represent the response to the first question, and these have been discussed in Section 9.2.

In an attempt to answer the second question, the researcher presents the following recommendations that he considers will constitute a foundation for health education in Jordan.

9.3.1 Recommendations Concerning Health Education Policy in Jordan

First and foremost it is necessary for the Jordanian Ministry of Education to develop a well-defined and documented official policy for health education in its schools. The MoE first emphasised the importance of health education in its 1988 Reform, and again in 1991, identified health education as an important factor for children's health and an insurance of future growth (MoE, 1991). To ensure that the policy is fully implemented, it must reflect the needs of schools across Jordan, and should involve consultation with a wide range of teachers and health professionals. It would be more meaningful if this consultation was carried out with the support of political leaders in the context of politics, society and the mass media. Moreover, this policy should propose a structure for the delivery of health education in Jordanian schools, public and private, and should be supplemented by long term and contingency plans. Evaluation of its implementation should take place at each stage. The objective is to attain a 'healthy generation' that is guided by appropriate values and which enjoys appropriate and coherent health attitudes (see Section 3.3, p. 51). The policy should take into consideration that health education involves 'content and method' and the interaction between the two. The policy should be guided by the following:

- In the context of supporting the international movement of providing health for all people, we should co-operate with concerned agencies such as the WHO, UNICEF and UNESCO, who have already published much support material, in order to prepare a curriculum for health education, and develop a procedural plan to implement the project. In developing this plan the MoE should be the main participant joined by other active parties such as the Ministry of Health, the Queen

Alia Fund, and the Ministry of Information.

- The philosophy of health education that underpins the project should be based on the Health Action and Health Belief Models, with the belief that health education is an activity which aims at educating students, family and society and enabling all of them to achieve optimum health. Health education is not just a matter of facts and theories but rather is concerned with attitudes, behaviours and value systems that include a positive spirit, self-dependency, co-operation with others and active participation. Within this approach one basic attribute of health education is that it is an educational process directed in the first instance to students as both recipients and participants. They would learn and also be able to influence their families and local communities because they are the 'school messengers' to the family and local community and are in a position to emphasise the role of the school in serving the community (Pridmore, 1996).

- The general objective of health education is to provide comprehensive health education for everybody. Such health education can lead to an improvement in the quality of life by fulfilling the needs of the individual, family and society in all areas of health - physical, psychological, spiritual, economic, political, and cultural - providing students with positive attitudes and good health practices and helping to develop a value system in a way that achieves an internal and external balance with himself or herself, with the family, society and environment. The objective is to achieve a 'healthy generation' that enjoys comprehensive health, peace and security

in all aspects of life.

Once the national philosophy and aims of health education have been clearly stated, it may be necessary to develop more specific regional policies based on the national one. This would enable the particular development aims of the three regions of Jordan to be considered.

If health education is to be effective, then it must receive the recognition it deserves, especially from Arab governments. They must designate budgets and provide experienced practitioners who can translate the concerns into tangible resolutions. These resolutions must seek to deepen the intellectual, educational and moral attitudes with which the child must be armed in order to face his or her future (Zaki, 1989).

9.3.2 Recommendations Concerning Curriculum Guidance

Once the official policy is in place, then the science curriculum can be reviewed with the aim of identifying and strengthening the health education content within it. Theoretical concepts can be followed with the applied health aspects - for example, the biology of micro-organisms would be followed by methods taken to reduce the spread of infection. Reviewers of the curriculum should therefore include both science and health experts. The curriculum would therefore need to include more specific detail to ensure that all teachers understood what they were expected to cover under each topic, and textbook writers would then be able to include relevant content and activities. Again, it is

recommended that science and health experts collaborate on the production of the science textbooks.

It is important that health education is taught within the wider context. The various contexts may include the following: political, economic, religious, social, legal, morals and values, geographical, occupational, psychological, physiological, human, chemical, medical and technological (Kelly and Lewis, 1987). Teachers, curriculum developers and textbook writers must consider the appropriate contexts for discussing health topics, relevant to the age or stage of the students. By setting each health topic in context, and if the student were given accurate and true information about, say, the reproductive system, he or she would acquire a wide and comprehensive knowledge about not just the anatomy and physiology of the body systems, but knowledge that may constitute a deterrent against practices that may expose him or her to health hazards, whether at the personal level such as sexual disease or at the societal level such as punishment or reduced status. This strategy may be applied to other health concepts at different educational grades and stages.

This study has shown that there are five health areas that are currently taught within the science curriculum of the basic education grades. These are: personal health; nutritional health; environmental health; disease and prophylaxis; and education for married life. As discussed above, and in Section 6.4, p. 151, any effective study of health education leads to broader considerations. There are other areas that are either ignored or have received little attention. Among these are child abuse, violence and the abuse of chemical solvents. Accordingly, while some areas originally included in the curriculum

need updating in their content and supplementing with additional health activities, additional areas should also be incorporated into the curriculum, in order to prepare a generation that is capable of handling future health problems. These areas may include education about political and economic justice, cultural harmony, and education for death and the after-life.

Areas covered by health education should not be limited to those suggested by the definition of health as 'a state of physical, mental and social competency' (MoE, 1991), but should stress the human role in both health and sickness and should seek to improve the quality of life in terms of housing, food, freedom, security, the right to learn, and the right to work, an approach that may encompass citizenship.

Teachers will require much more detailed guidance on the approach they should adopt in the delivery of health education. This research has shown that the current annotated copy of the *Teachers' Guide* is not enough and leads to widespread variations in practice. It is recommended that a separate guide, perhaps entitled *A Teacher's Guide to Health Education* would help the teacher to select the most appropriate methods of presentation and the mechanism of implementation for each topic. This guide should encourage teachers to adopt the following recommendations:

- Selection of a health lesson in line with the type of health problem, seasons and school semesters. For example, problems of the respiratory system may be addressed during the winter.

- Ensuring that various local, national and international 'days' or occasions are recognised by the selection of an appropriate health education lesson: such as the international health day, international traffic day, international environment day, international food day, labour day, and other related events.

- Selection of health topics in response to the occurrence of disease and epidemics in the local and national environment such as diarrhoea, cholera, and the spread of locusts and rats.

- Selection of a health lesson relating to health problems the teacher may notice in the school such as dental plaque, and the spread of lice.

- Co-ordinating health education and activities with other school activities such as sport, religious practices, applied science, and community service.

- Integrating and participating with other institutions within the local community such as the directorate of agriculture, civil defence, and birth control organisations.

In conjunction with this, a school textbook, perhaps entitled *School Health Education*, should be developed for the use of the student. This textbook should include health topics that emphasise the broader context of health education. This would also 'prepare the way' for a separate health education curriculum, should this be desired in the future.

9.3.3 Recommendations Concerning the Delivery of Health Education

These recommendations are about the delivery of health education by science teachers in respect of the health content, the teaching methods used and the obstacles faced by teachers, as identified in this study. The science teacher's role, from the perspective of health education, is to help students learn by effective preparation of lessons, co-ordination of learning activities and organising links with the local community (Frost, 1997). This role also involves leading and directing students and helping them to learn how to think and not just to memorise (Zaiton, 1994). Moreover, the teacher's role is like a 'guardian' over children's rights; he or she is responsible educationally, socially and legally, for protecting these rights. A teacher has to seek to achieve this objective and bear this responsibility with honesty; he or she has to adopt teaching methods and strategies that go beyond those traditional patterns which have been used for decades (Krajcik, 1993). Also, a teacher has to substitute for parents in the school, and the school has to be a substitute for the home (Rash and Pigg, 1979).

In this regard, we should differentiate between 'teaching methods', 'teaching styles' and 'teaching strategies' which all have a positive influence in developing an effective learning environment inside the classroom (Suleiman, 1988). A teaching method is that method used by the teacher throughout the education process to covey the content of the curriculum; the teacher must select the methods that are suitable to the nature of the content. A teaching style is specific to a teacher, and is therefore closely connected to the teacher's personal attributes. A teaching strategy is a set of procedures that are carried out consistently and systematically by the teacher in order to achieve pre-planned

teaching objectives. This means that a teacher is adopting his or her own style of teaching in using a particular teaching method and that he or she is employing a well-defined strategy to achieve the lesson objectives. Based on this discussion, the researcher recommends the following in relation to health education:

- A teacher should be well prepared, both theoretically and practically. A teacher must be able to prepare effective health activities that involve student participation, interaction with family and local community if appropriate, and in response to a particular health need. A range of teaching and learning aids such as video and audio tapes, posters, health brochures, school radio and exhibitions should be used for this purpose.

- Stressing the concept of 'association' in health issues and avoiding over-emphasis of 'cause and effect' in health and sickness. For example, should a teacher connect diarrhoea to dirty hands, a student may wonder why there are persons with dirty hands who do not get diarrhoea. However, the teacher should stress the concept of the correlation between cleanliness and health, and that cleanliness would raise the general level of health in the community.

- The health content should be presented in an approach that is based on a range of methods, styles, and strategies. The health topic is presented by emphasising the various dimensions of health education in an integrated, interactive, consistent and interesting way. The objective is to broaden students' perceptions, develop their

ideas, and emphasis the concept of exercising health practices, as well as the positive or negative effects produced by health practices at the level of the individual and the community.

- For the assessment of health topics, a teacher should present questions and other evaluative activities in a simple and clear way, emphasising questions and activities which stimulate students' interest and promote positive attitudes. These activities should be evaluated by observing health outcomes in the student and school.

9.3.4 The Role of the School

Schools should be encouraged to develop their own health education policies, in response to those produced at the national level. This is particularly true of sex education policies, which research has shown, are of particular value in guiding teachers in terms of what they should teach and how (UNESCO, 1998). All school staff, and preferably representatives from the local community, should be involved. Research has shown that this result will in more health education being taught (Al-Sarayreh, 1995). If local community leaders are involved, this will give more security to teachers in the teaching of sensitive areas, as they will know they have local support. Tying the local (school) policy into the national policy and curriculum guidelines will ensure a greater consistency in approach and coverage of health topics and issues.

Whole school policies will incorporate all areas of the school's activity, not just the

formal health education curriculum. For example, it will include expected standards of behaviour and interaction with staff and fellow students, and policies with regard to the dropping of litter and standards of cleanliness. Attractive posters will display health 'messages', and provide information and guidance about where further advice can be obtained. The school canteen would provide healthy eating options. However, this does place certain expectations on the school itself, in terms of the provision of hygienic facilities and healthy food. These may have resource implications.

In some instances, particularly in rural areas, it might be possible to develop a pilot health role for the school. This could be effected by working with local child health co-ordinators and medical staff. Such staff could attend school for the purposes of delivering specific health topics and advice. Both school and health professionals could work together to provide a framework of basic health information which may enable teachers and students to understand the health problems affecting their local environment (Campbell, 1985).

As for the students, the researcher recommends that an academic and behavioural record is kept for each student, just as is the situation now in the case of artistic or athletic excellence. A student with a certificate of such excellence is given an increase of 10 % to his or her average of GSEE. If the academic and behaviour record were given the same status, the student would be motivated to show good conduct and to do his or her best to have a certificate of 'health excellence' which may serve him or her in various stages of life. Recognising achievement in health education has been shown to emphasise the importance of healthy activities to students (QCA, 2000).

Teachers' behaviour and approach to their students is likely to have a strong influence, whether in positive or negative terms. A teacher may be of authoritarian character and unaware of students' tendencies and attitudes. As a result, students may be driven away from the learning process. On the other hand, a teacher may be of democratic character, treating students with respect, acknowledging their needs, attitudes and tendencies, and taking account of their development stage and personality. By this means he or she may attain a high level of positive interaction with the students so that he or she will be able to achieve the planned objectives (Bani Khalaf, 1994). Teachers must be able to develop effective working relationships with their students in order to be able to discuss sensitive issues in an open, non-judgmental way (Harrison, 2000.). Health education is the responsibility of all teachers, but it should only be formally taught by qualified teachers, such as health education teachers or science teachers with additional training (Rash and Pigg, 1979; Smith and Jensen, 1985; Garrard, 1986). It is recommended that one teacher in each school is trained as a 'health education co-ordinator' who then provides leadership in this area and guides other staff in their health teaching. They would also co-ordinate the whole-school approach to health.

9.3.5 Teacher training

Preparing effective teachers capable of achieving health objectives, developing the health curriculum, and co-ordinating the activities recommended above will be a challenge for the higher education system in Jordan. This could be done by initial academic qualification (at Universities and Colleges), advanced in-service training courses, and participation in health conferences and local and overseas (health)

scholarships. In-service training would be organised by the health education co-ordinator placed within each school. Placing a co-ordinator in each school will in itself result in an initial heavy demand for such training; this may therefore need to be introduced gradually on a school area basis.

Because health education is a relatively new area, and requires much skill on the part of the teacher, it may be necessary to develop a system for evaluating a teacher's performance in health education. This should be done in line with standards set by the MoE. Among these standards would be students' results and progress in health education, health activities in which the teacher has participated, annual school reports on health education, and the extent of attaining the objectives of health education. Based on these standards, a decision must be taken to keep this teacher working in this area or to move him or her to another area. Those reluctant to engage in the teaching-learning process of health education will not produce effective outcomes.

9.3.6 Collaboration with Other Agencies/Community

There are many ways that the school can collaborate with other agencies in the promotion of health education. These include emphasising students' and teachers' contributions, and encouraging individual and collective initiatives in serving the environment and the local community, and by holding symposia, exhibitions and providing support for local projects. Developing responsible behaviour in areas such housing, care for the environment, litter, cleanliness, traffic and other fields will all affect the quality of life.

The revised detailed curriculum could help in this respect, by the establishment of clearer guidelines for principals, teachers and educational supervisors so that they can achieve a better health awareness amongst their students. It could also help teachers to develop health inputs within various lessons that can direct the students towards self-learning and independence. Such lessons would form a general conceptual framework of health information so as to help students to understand the health problems in their environment and those which affect humanity in general. This illuminates the role of the school in its interaction with the local and national environment, as an active unit for promoting positive health. As far as students are concerned, it is intended that this strategy should help to develop awareness of health, nutrition, the home, the environment, transportation and other domains which impact on lifestyles.

9.3.7 Recommendations for Further Research

Examining educational literature in general and that on health education in particular, and considering the findings of this study, the researcher has found out that there are other areas of health education that remain ambiguous or neglected, and need to be examined and addressed. One of the limitations of this study is that, although the review of the literature was undertaken on a world-wide basis, and therefore represents a fully international perspective, all the fieldwork was conducted in Jordan. Accordingly, the researcher recommends that further work could be carried out in countries such as the UK and USA, which have a separate health education curriculum or treat health education as a cross-curricular theme, to obtain the views of teachers and pupils

regarding the effectiveness of this provision.

Another unexpected limitation was actually due to the nature of the documents used for analysis and became a finding in itself; it was impossible to provide more than an estimate of the proportion of health education within the science curriculum, or the amount of time that teachers actually spend teaching health topics, because of the lack of clarity of the syllabus and therefore the amount of variation in delivery. Once the curriculum has been reviewed and made more explicit, it would be worthwhile to repeat the analysis to determine whether the new clarity has reduced the amount of variation in delivery.

Other possible future research topics have scientific and social significance. These topics are:

- What are the teaching and learning methods that students prefer for health education?
- What are the sources of health knowledge which are currently used by school students within the age category (13-16 years)? What is the extent of each source's influence on students' behaviours, attitudes, and value system?
- Once the new system of health education has been implemented, and health education co-ordinators are in place in each school, there will be the opportunity to evaluate the specifications and qualifications (personal, professional, academic) of the teacher or individual who teaches health education effectively, to result in recommendations for further training.

9.4 Conclusion

It is clear that people who work in the field of child health or health education must prepare children for the coming era by making them aware of health and moral values in order to effectively prepare them to face the challenges of the future. These values will be effectively reflected in development plans, which will go beyond providing basic needs such as food, medicine and education, to take care of mental, cultural and moral growth (Zaki, 1989). The findings in this study and the recommendations arising from it have attempted to contribute to this development planning, by suggesting a framework for health education which will promote the health of the next generation. This study is also in accord with the recommendations of the Educational Development Conference conducted in Amman (1987) for curriculum and textbook development in 'nutrition and scholastic health', and with the aims of the 'Charter of the Rights of the Arab Child' (The Arab States Union, *c./* 1990). The latter recommended studies such as this, in order to evaluate the reality of the child in domains such as education and health, and to form a base for planning in child care and health. These links emphasise the importance and significance of this study, which is the first in this particular field conducted for Jordan.

It is hoped that this study has been able to shed some light on the important and sensitive topic of health education, especially in Jordan. Health education is important for individuals, groups and communities and for all stages of human life, in health and sickness and in war and peace. The study has shown that there are many positive aspects of health education in Jordan, but that much more can still be done, particularly in terms

of the formulation of policy, clarification of curriculum aims, resourcing and teacher support. As well as identifying the health education content, and demonstrating how it can be delivered within the science curriculum, this study has served to emphasise the importance of the social, cultural, moral, ethical and political considerations relating to health education. It has shown that it is possible to continue to deliver health education within the science curriculum, given further guidance and support. However, in the longer term, it recommends that 'whole school approaches' to health education are adopted, with a view, ultimately to have a separate health education curriculum with suitably trained teachers to deliver it. This is a longer term goal.

Also, it is hoped that this study has been able to form a solid base for the delivery of health education in Jordan, so that however it is delivered, its rightful place within the school curriculum is recognised. Finally, this study has suggested other areas of health education which need further research. It is hoped that together, the study will contribute to the achievement of an effective health education which will serve the needs of Jordan and humanity in general.

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Appendix 1

The official permission by the Ministry of Education In Jordan

In the name of God

The Ministry of Education

The Hashemite Kingdon of Jordan

No. 3/10 Date: Sep. 21, 1999

Mr. The general head of educational directorate of.....

Subject: Educational Research

Hello,

Mr Bani Khalf is doing a research on 'An analysis of the reality of the delivery of health education by upper basic stage science teachers in Jordan'. This work is in part fulfilment of requirements for the degree of Doctor of Philosophy at Huddersfield University in the UK. Please would you give him permission to enter schools in your area and to administer questionnaires and conduct interviews. Please could he also be allowed access to Ministry documents and reports. Thank You.

/ The Minister of Education

Signature

Dr. Fwas Jaradat

Appendix 2

Health Education Questionnaire for Science Teachers

Dear science teacher;

This is a questionnaire which aims to analyse the reality of the delivery of health education by upper basic stage science teachers in Jordanian schools which involve grades 7 to 10, age 13-16. This questionnaire consists of many health education topics categorised under the areas below:

1- personal health 2- nutritional health

3- environmental health 4- diseases and prophylaxis

5- Education for married life

At the end there is an open question to enable you to raise any further issues. Because of your important role in improving the teaching-learning process, your close experience of the science curriculum and its contents, your knowledge about students' learning and direct interaction with these issues, I will be very grateful if you describe what actually happens in the field of practice without bias. Please tick the most appropriate box. Your answers will be taken very seriously and individual responses will be regarded as confidential.

Gender	Male				Female			
Region	North			Middle		South		
Teaching subject	sc /7	sc /8	phy /9	chem /9	bio /9	phy /10	chem /10	bio /10
qualification in science	science diploma			B.Sc. and more				
qualification in education	none			diploma and more				
Teaching experience	5 years and Less			6-10 years		More than 10 years		

Sc= Science, Phy= Physics, Chem= Chemistry, Bio= Biology

Thank you The researcher: BANI KHALAF,

Personal health

Please indicate the emphasis placed on the following health education topics.

no.	Topic	Very high	High	Moderate	Low	Never delivered
1	Maintaining the health and safety of different body organs					
2	Social health in dealing with others					
3	Cleanliness and purity of the body during the adulthood					
4	Self dependence in solving private problems					
5	Healthy habits and the proofs of good behaviour in daily life					
6	Suitable athletic exercises for health and potential of different body organs					
7	Health of the mouth, teeth and gums and their relationships with tastes prevailing in the society					
8	Attending school actively and confidently					
9	Common problems among companions such as smoking, drugs					
10	Comprehensiveness of knowledge about children's rights such as education, health, work					

Are there any other topics which come under this headings? Please indicate the emphasis placed on them.

Nutritional health

Please indicate the emphasis placed on the following health education topics.

no.	Topic	Very high	High	Moderate	Low	Never delivered
11	Healthy habits in taking food and drink					
12	Diet and prevention of diseases					
13	Eating snacks between the main meals					
14	Keeping foods from decomposition					
15	Balanced food and general appearance of the body					
16	Taking sweets and confections between meals					
17	Weight control through nutrition					
18	Good nutrition and improving school performance					
19	Balanced diet and its effect on psychological and emotional condition					
20	Choosing food as a means of preventing disease					
21	Feelings about accepting or refusing some kinds of food					

Are there any other topics which come under this headings? Please indicate the emphasis placed on them.

Environmental health

Please indicate the emphasis placed on the following health education topics.

no.	Topic	Very high	High	Moderate	Low	Never delivered
22	Sanitary measures to dispose of household refuse and waste					
23	protecting the stocks of the natural and cultural environments from abuse and destruction					
24	Participating with society in activities which fight local sicknesses and diseases					
25	Inspecting lipial water and sanitary facilities at home and school					
26	Fires and suitable extinguishers					
27	Technology Hazards in the environment					
28	Reducing the causes of pollution of air, water and soil					
29	Public safety precautions at home, school and environment					
30	Rationalisation of the consumption of water, electricity and telephone services					
31	Maintaining the safety of machines when using them					
32	Tiny creatures and their effects on the health of environment					
33	Familiarisation with laws of healthy environment					

Are there any other topics which come under this headings? Please indicate the emphasis placed on them.

Diseases and prophylaxis

Please indicate the emphasis placed on the following health education topics.

no.	Topic	Very high	High	Moderate	Low	Never delivered
34	Transmission of infection					
35	Medical herbs and treating some daily problems					
36	Rules of dealing with drugs in relation to taking and storage					
37	Health problems caused by obesity and thinness					
38	Prevention of infection of diseases caused by tiny creatures					
39	Completion of vaccination at appropriate times and in correct places					
40	Distinguishing between the indication of some diseases and recognising them					
41	Chemical materials and their effects on health and food					
42	Consulting the doctor in abnormal circumstances					
43	Hereditary factors in disease					
44	AIDS prevention and containment					
45	Familiarisation with first aid principles to face common minor injuries and illness					
46	Use of mineral waters in prevention of some diseases					

Are there any other topics which come under this headings? Please indicate the emphasis placed on them.

Education for married life

Please indicate the emphasis placed on the following health education topics.

no.	Topic	Very high	High	Moderate	Low	Never delivered
47	Reproduction and survival					
48	Male and female sexual organs					
49	Psychological and physical preparation of females to perform maternity roles and preparing males as fathers					
50	Adulthood in both sexes: Time, stages, duration, general body appearance					
51	Feelings among the two sexes and controlling them					
52	Physiological and psychological behaviours in adulthood: day dreams, menstruation					
53	Illegal sexual practices before married					
54	Dealing with health and family information in the media					
55	Family planning means					
56	Having a pre-marriage medical test					
57	Dangers of early marriage					
58	Pregnancy: duration, stages, psychological reparation					
59	Abortion: conditions, dangers					
60	The social, lawful dimensions of medical technology such as artificial fertility					
61	Care of the pregnant woman (safe maternity)					
62	Nourishment of child in the womb					
63	Delivery of twins					
64	Natural feeding and health of the mother and her child					

Are there any other topics which come under this headings? Please indicate the emphasis placed on them.

Appendix 3

Results of covariance analysis (2 × 3) according to the variables of gender, region and interaction between the two

Appendix 3

Results of covariance analysis (2 × 3) according to the variables of gender, region and interaction between the two.

health areas	source of variance	sum of squares	degree of freedom	mean square	F value	significance
personal health	Gender	1.691	1	1.691	1.993	0.159
	Region	1.216	2	0.608	0.717	0.489
	Gender × Region	0.072	2	0.036	0.043	0.958
	Random error	337.659	398	0.848		
	Total	340.639	403	0.845		
nutritional health	Gender	1.033	1	1.033	1.041	0.308
	Region	4.519	2	2.260	2.276	0.104
	Gender × Region	0.883	2	0.444	0.447	0.640
	Random error	395.081	398	0.993		
	Total	401.521	403	0.996		
environmental health	Gender	1.265	1	1.265	1.531	0.217
	Region	1.094	2	0.547	0.662	0.517
	Gender × Region	0.205	2	0.103	0.124	0.883
	Random error	329.010	398	0.827		
	Total	331.574	403	0.823		
disease and prophylaxis	Gender	3.372	1	3.372	3.000	0.084
	Region	4.512	2	2.256	2.007	0.136
	Gender × Region	3.131	2	1.565	1.393	0.250
	Random error	447.308	398	1.124		
	Total	485.323	403			
education for married life	Gender	8.535	1	8.535	8.210	0.004 *
	Region	5.266	2	2.633	2.533	0.081
	Gender × Region	5.180	2	2.590	2.492	0.084
	Random error	413.757	398	1.040		
	Total	432.740	403	1.074		
overall areas involved	Gender	3.18	1	3.18	4.37	0.037 *
	Region	3.15	2	1.57	2.17	0.116
	Gender × Region	1.57	2	0.79	1.08	0.341
	Random error	289.34	398	0.73		
	Total	297.24	403	0.74		

Appendix 4

Results of covariance analysis according to the variables of subject, qualification in education and interaction between the two

Appendix 4

Results of covariance analysis according to the variables of subject, qualification in education and interaction between the two.

health areas	source of variance	sum of squares	degree of freedom	mean square	F value	significance
personal health	Subject	16.939	7	2.420	2.961	0.005 *
	Ed.qual	0.292	1	0.292	0.357	0.551
	Subject × Ed.qual	6.311	7	0.902	1.103	0.360
	Random error	317.097	388	0.817		
	Total	340.639	403	0.845		
nutritional health	Subject	38.638	7	5.520	5.984	0.000 *
	Ed.qual	0.599	1	0.599	0.649	0.421
	Subject × Ed.qual	4.387	7	0.627	0.679	0.690
	Random error	357.897	388	0.922		
	Total	401.521	403	0.996		
environmental health	Subject	11.895	7	1.699	2.081	0.045 *
	Ed.qual	0.469	1	0.469	0.574	0.449
	Subject × Ed.qual	2.345	7	0.335	0.410	0.896
	Random error	316.865	388	0.817		
	Total	331.574	403	0.823		
disease and prophylaxis	Subject	39.390	7	5.627	5.294	0.000 *
	Ed.qual	0.06461	1	0.06461	0.061	0.805
	Subject × Ed.qual	6.448	7	0.921	0.867	0.533
	Random error	412.421	388	1.063		
	Total	458.323	403	1.137		
education for married life	Subject	42.322	7	6.046	6.174	0.000 *
	Ed.qual	0.117	1	0.117	0.119	0.730
	Subject × Ed.qual	10.344	7	1.478	1.509	0.163
	Random error	379.957	388	0.979		
	Total	432.740	403	1.074		
overall areas involved	Subject	20.005	7	2.858	4.071	0.000 *
	Ed.qual	0.09117	1	0.09117	0.130	0.719
	Subject × Ed.qual	4.737	7	0.677	0.964	0.457
	Random error	272.406	388	0.702		
	Total	297.239	403	0.738		

Appendix 5

Results of covariance analysis according to the variables of teaching experience, qualification in science and interaction between the two

Appendix 5

Results of covariance analysis according to the variables of teaching experience, qualification in science and interaction between the two.

health areas	source of variance	sum of squares	degree of freedom	mean square	F value	significance
personal health	T. exp.	0.176	1	0.176	0.208	0.649
	qual. in science	1.206	2	0.603	0.714	0.491
	T.exp × Sc.qual	2.996	2	1.498	1.773	0.171
	Random error	336.262	398	0.845		
	Total	340.639	403	0.845		
nutritional health	T. exp.	2.193	1	2.193	2.211	0.138
	qual. in science	1.783	2	0.892	0.899	0.408
	T.exp × Sc.qual	2.767	2	1.384	1.395	0.249
	Random error	394.777	398	0.992		
	Total	401.521	403	0.996		
environmental health	T. exp.	1.094	1	1.094	1.322	0.251
	qual. in science	0.09387	2	0.04693	0.057	0.945
	T.exp × Sc.qual	1.232	2	0.616	0.745	0.475
	Random error	329.154	398	0.827		
	Total	331.574	403	0.823		
disease and prophylaxis	T. exp.	0.114	1	0.114	0.100	0.752
	qual. in science	0.791	2	0.396	0.346	0.708
	T.exp × Sc.qual	2.534	2	1.267	1.108	0.331
	Random error	454.884	398	1.143		
	Total	458.323	403	1.137		
education for married life	T. exp.	0.04715	1	0.04715	0.043	0.835
	qual. in science	0.973	2	0.486	0.448	0.639
	T.exp × Sc.qual	0.005634	2	0.002817	0.003	0.997
	Random error	431.714	398	1.085		
	Total	432.740	403	1.074		
overall areas involved	T. exp.	0.416	1	0.416	0.561	0.454
	qual. in science	0.482	2	0.241	0.325	0.723
	T.exp × Sc.qual	1.062	2	0.531	0.716	0.489
	Random error	295.278	398	0.742		
	Total	297.239	403	0.738		

Appendix 6

Results of Scheffe post-hoc tests

Multiple Comparisons
Dependent Variable: R1 (Personal Health)
Scheffe

		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
(I) SUBJECT	(J) SUBJECT				Lower Bound	Upper Bound
1	2	-.1611	.182	.998	-.8466	.5245
	3	.1980	.181	.991	-.4841	.8801
	4	.2857	.183	.930	-.4034	.9749
	5	-.1901	.176	.992	-.8537	.4734
	6	7.363E-02	.182	1.000	-.6119	.7592
	7	.4471	.182	.535	-.2385	1.1327
	8	-2.3396E-03	.178	1.000	-.6747	.6700
2	1	.1611	.182	.998	-.5245	.8466
	3	.3591	.182	.790	-.3265	1.0446
	4	.4468	.184	.550	-.2458	1.1394
	5	-2.9082E-02	.177	1.000	-.6962	.6381
	6	.2347	.183	.976	-.4543	.9237
	7	.6082	.183	.139	-8.0863E-02	1.2972
	8	.1587	.179	.998	-.5172	.8346
3	1	-.1980	.181	.991	-.8801	.4841
	2	-.3591	.182	.790	-1.0446	.3265
	4	8.775E-02	.183	1.000	-.6014	.7769
	5	-.3881	.176	.676	-1.0517	.2754
	6	-.1244	.182	1.000	-.8099	.5612
	7	.2491	.182	.966	-.4365	.9347
	8	-.2003	.178	.989	-.8727	.4720
4	1	-.2857	.183	.930	-.9749	.4034
	2	-.4468	.184	.550	-1.1394	.2458
	3	-8.7750E-02	.183	1.000	-.7769	.6014
	5	-.4759	.178	.414	-1.1467	.1949
	6	-.2121	.184	.987	-.9047	.4805
	7	.1614	.184	.998	-.5313	.8540
	8	-.2881	.180	.922	-.9676	.3915
5	1	.1901	.176	.992	-.4734	.8537
	2	2.908E-02	.177	1.000	-.6381	.6962
	3	.3881	.176	.676	-.2754	1.0517
	4	.4759	.178	.414	-.1949	1.1467
	6	.2638	.177	.946	-.4034	.9309
	7	.6372	.177	.076	-2.9902E-02	1.3044
	8	.1878	.173	.991	-.4658	.8414
6	1	-7.3633E-02	.182	1.000	-.7592	.6119
	2	-.2347	.183	.976	-.9237	.4543
	3	.1244	.182	1.000	-.5612	.8099

	4	.2121	.184	.987	-.4805	.9047
	5	-.2638	.177	.946	-.9309	.4034
	7	.3735	.183	.758	-.3156	1.0625
	8	-7.5972E-02	.179	1.000	-.7519	.5999
7	1	-.4471	.182	.535	-1.1327	.2385
	2	-.6082	.183	.139	-1.2972	8.086E-02
	3	-.2491	.182	.966	-.9347	.4365
	4	-.1614	.184	.998	-.8540	.5313
	5	-.6372	.177	.076	-1.3044	2.990E-02
	6	-.3735	.183	.758	-1.0625	.3156
	8	-.4494	.179	.507	-1.1253	.2265
8	1	2.340E-03	.178	1.000	-.6700	.6747
	2	-.1587	.179	.998	-.8346	.5172
	3	.2003	.178	.989	-.4720	.8727
	4	.2881	.180	.922	-.3915	.9676
	5	-.1878	.173	.991	-.8414	.4658
	6	7.597E-02	.179	1.000	-.5999	.7519
	7	.4494	.179	.507	-.2265	1.1253

Based on observed means. The error term is Error.

1 = science at grade 7, 2 = science at grade 8, 3 = physics at grade 9, 4 = chemistry at grade 9, 5 = biology at grade 9, 6 = physics at grade 10, 7 = chemistry at grade 10, 8 = biology at grade 10

Multiple Comparisons
Dependent Variable: R2 (Nutritional Health)
Scheffe

(I) SUBJECT	(J) SUBJECT	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	-.1589	.193	.998	-.8873	.5694
	3	.5418	.192	.339	-.1828	1.2665
	4	.3327	.194	.890	-.3994	1.0649
	5	-.3085	.187	.909	-1.0135	.3965
	6	.3105	.193	.920	-.4179	1.0388
	7	.6203	.193	.175	-.1080	1.3486
	8	.2058	.189	.991	-.5085	.9201
2	1	.1589	.193	.998	-.5694	.8873
	3	.7007	.193	.071	-2.7601E-02	1.4291
	4	.4917	.195	.500	-.2442	1.2275
	5	-.1496	.188	.999	-.8584	.5592
	6	.4694	.194	.558	-.2626	1.2014
	7	.7792 *	.194	.026	4.721E-02	1.5112
	8	.3647	.190	.816	-.3533	1.0828
3	1	-.5418	.192	.339	-1.2665	.1828
	2	-.7007	.193	.071	-1.4291	2.760E-02
	4	-.2091	.194	.992	-.9413	.5231
	5	-.8503 *	.187	.005	-1.5553	-.1453
	6	-.2314	.193	.984	-.9597	.4970
	7	7.848E-02	.193	1.000	-.6499	.8068
	8	-.3360	.189	.870	-1.0503	.3783
4	1	-.3327	.194	.890	-1.0649	.3994
	2	-.4917	.195	.500	-1.2275	.2442
	3	.2091	.194	.992	-.5231	.9413
	5	-.6412	.189	.121	-1.3539	7.146E-02
	6	-2.2263E-02	.195	1.000	-.7581	.7136
	7	.2876	.195	.949	-.4482	1.0234
	8	-.1269	.191	1.000	-.8489	.5950
5	1	.3085	.187	.909	-.3965	1.0135
	2	.1496	.188	.999	-.5592	.8584
	3	.8503 *	.187	.005	.1453	1.5553
	4	.6412	.189	.121	-7.1461E-02	1.3539
	6	.6190	.188	.149	-8.9797E-02	1.3277
	7	.9288 *	.188	.001	.2200	1.6376
	8	.5143	.184	.352	-.1801	1.2087
6	1	-.3105	.193	.920	-1.0388	.4179
	2	-.4694	.194	.558	-1.2014	.2626
	3	.2314	.193	.984	-.4970	.9597
	4	2.226E-02	.195	1.000	-.7136	.7581

	5	-.6190	.188	.149	-1.3277	8.980E-02
	7	.3098	.194	.923	-.4222	1.0418
	8	-.1047	.190	1.000	-.8227	.6134
7	1	-.6203	.193	.175	-1.3486	.1080
	2	-.7792 *	.194	.026	-1.5112	-4.7209E-02
	3	-7.8479E-02	.193	1.000	-.8068	.6499
	4	-.2876	.195	.949	-1.0234	.4482
	5	-.9288 *	.188	.001	-1.6376	-.2200
	6	-.3098	.194	.923	-1.0418	.4222
	8	-.4145	.190	.691	-1.1326	.3036
8	1	-.2058	.189	.991	-.9201	.5085
	2	-.3647	.190	.816	-1.0828	.3533
	3	.3360	.189	.870	-.3783	1.0503
	4	.1269	.191	1.000	-.5950	.8489
	5	-.5143	.184	.352	-1.2087	.1801
	6	.1047	.190	1.000	-.6134	.8227
	7	.4145	.190	.691	-.3036	1.1326

Based on observed means. The error term is Error.

* The mean difference is significant at the .05 level.

1 = science at grade 7, 2 = science at grade 8, 3 = physics at grade 9, 4 = chemistry at grade 9, 5 = biology at grade 9, 6 = physics at grade 10, 7 = chemistry at grade 10, 8 = biology at grade 10

Multiple Comparisons
Dependent Variable: R3 (Environmental Health)
Scheffe

		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
(I) SUBJECT	(J) SUBJECT				Lower Bound	Upper Bound
1	2	-.4167	.182	.628	-1.1021	.2686
	3	.1783	.181	.995	-.5035	.8602
	4	-.1529	.183	.998	-.8418	.5360
	5	-.1693	.176	.996	-.8326	.4940
	6	1.864E-02	.182	1.000	-.6667	.7040
	7	7.986E-02	.182	1.000	-.6055	.7652
	8	-.1492	.178	.998	-.8213	.5230
2	1	.4167	.182	.628	-.2686	1.1021
	3	.5951	.182	.154	-9.0253E-02	1.2804
	4	.2638	.184	.956	-.4285	.9562
	5	.2474	.177	.962	-.4195	.9144
	6	.4354	.183	.577	-.2534	1.1241
	7	.4966	.183	.391	-.1922	1.1854
	8	.2676	.179	.945	-.4081	.9432
3	1	-.1783	.181	.995	-.8602	.5035
	2	-.5951	.182	.154	-1.2804	9.025E-02
	4	-.3312	.183	.856	-1.0202	.3577
	5	-.3476	.176	.790	-1.0110	.3157
	6	-.1597	.182	.998	-.8450	.5256
	7	-9.8469E-02	.182	1.000	-.7838	.5869
	8	-.3275	.178	.847	-.9996	.3446
4	1	.1529	.183	.998	-.5360	.8418
	2	-.2638	.184	.956	-.9562	.4285
	3	.3312	.183	.856	-.3577	1.0202
	5	-1.6369E-02	.178	1.000	-.6870	.6542
	6	.1716	.184	.997	-.5208	.8639
	7	.2328	.184	.978	-.4596	.9251
	8	3.734E-03	.180	1.000	-.6756	.6830
5	1	.1693	.176	.996	-.4940	.8326
	2	-.2474	.177	.962	-.9144	.4195
	3	.3476	.176	.790	-.3157	1.0110
	4	1.637E-02	.178	1.000	-.6542	.6870
	6	.1879	.177	.992	-.4790	.8548
	7	.2491	.177	.960	-.4178	.9161
	8	2.010E-02	.173	1.000	-.6332	.6734
6	1	-1.8639E-02	.182	1.000	-.7040	.6667
	2	-.4354	.183	.577	-1.1241	.2534
	3	.1597	.182	.998	-.5256	.8450
	4	-.1716	.184	.997	-.8639	.5208

	5	-.1879	.177	.992	-.8548	.4790
	7	6.122E-02	.183	1.000	-.6275	.7500
	8	-.1678	.179	.997	-.8435	.5078
7	1	-7.9864E-02	.182	1.000	-.7652	.6055
	2	-.4966	.183	.391	-1.1854	.1922
	3	9.847E-02	.182	1.000	-.5869	.7838
	4	-.2328	.184	.978	-.9251	.4596
	5	-.2491	.177	.960	-.9161	.4178
	6	-6.1224E-02	.183	1.000	-.7500	.6275
	8	-.2290	.179	.977	-.9047	.4466
8	1	.1492	.178	.998	-.5230	.8213
	2	-.2676	.179	.945	-.9432	.4081
	3	.3275	.178	.847	-.3446	.9996
	4	-3.7343E-03	.180	1.000	-.6830	.6756
	5	-2.0103E-02	.173	1.000	-.6734	.6332
	6	.1678	.179	.997	-.5078	.8435
	7	.2290	.179	.977	-.4466	.9047

Based on observed means. The error term is Error.

1 = science at grade 7, 2 = science at grade 8, 3 = physics at grade 9, 4 = chemistry at grade 9, 5 = biology at grade 9, 6 = physics at grade 10, 7 = chemistry at grade 10, 8 = biology at grade 10

Multiple Comparisons
Dependent Variable: R4 (Disease and Prophylaxis)
Scheffe

		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
(I) SUBJECT	(J) SUBJECT				Lower Bound	Upper Bound
1	2	-.2774	.207	.970	-1.0592	.5045
	3	.3154	.206	.938	-.4625	1.0933
	4	2.628E-03	.208	1.000	-.7833	.7886
	5	-.5878	.201	.287	-1.3446	.1690
	6	2.876E-02	.207	1.000	-.7531	.8106
	7	.3867	.207	.836	-.3952	1.1685
	8	-.3323	.203	.913	-1.0991	.4345
2	1	.2774	.207	.970	-.5045	1.0592
	3	.5927	.207	.320	-.1891	1.3746
	4	.2800	.209	.970	-.5099	1.0699
	5	-.3104	.202	.936	-1.0713	.4504
	6	.3061	.208	.950	-.4797	1.0919
	7	.6641	.208	.183	-.1217	1.4498
	8	-5.4945E-02	.204	1.000	-.8258	.7159
3	1	-.3154	.206	.938	-1.0933	.4625
	2	-.5927	.207	.320	-1.3746	.1891
	4	-.3128	.208	.944	-1.0987	.4732
	5	-.9032 *	.201	.006	-1.6600	-.1464
	6	-.2866	.207	.964	-1.0685	.4952
	7	7.130E-02	.207	1.000	-.7106	.8532
	8	-.6477	.203	.184	-1.4145	.1191
4	1	-2.6282E-03	.208	1.000	-.7886	.7833
	2	-.2800	.209	.970	-1.0699	.5099
	3	.3128	.208	.944	-.4732	1.0987
	5	-.5904	.203	.295	-1.3555	.1746
	6	2.613E-02	.209	1.000	-.7637	.8160
	7	.3841	.209	.849	-.4058	1.1739
	8	-.3349	.205	.914	-1.1099	.4401
5	1	.5878	.201	.287	-.1690	1.3446
	2	.3104	.202	.936	-.4504	1.0713
	3	.9032 *	.201	.006	.1464	1.6600
	4	.5904	.203	.295	-.1746	1.3555
	6	.6166	.202	.232	-.1443	1.3774
	7	.9745 *	.202	.002	.2136	1.7353
	8	.2555	.198	.975	-.4899	1.0009
6	1	-2.8760E-02	.207	1.000	-.8106	.7531
	2	-.3061	.208	.950	-1.0919	.4797
	3	.2866	.207	.964	-.4952	1.0685
	4	-2.6132E-02	.209	1.000	-.8160	.7637

	5	-.6166	.202	.232	-1.3774	.1443
	7	.3579	.208	.889	-.4279	1.1437
	8	-.3611	.204	.873	-1.1319	.4098
7	1	-.3867	.207	.836	-1.1685	.3952
	2	-.6641	.208	.183	-1.4498	.1217
	3	-7.1303E-02	.207	1.000	-.8532	.7106
	4	-.3841	.209	.849	-1.1739	.4058
	5	-.9745 *	.202	.002	-1.7353	-.2136
	6	-.3579	.208	.889	-1.1437	.4279
	8	-.7190	.204	.092	-1.4898	5.183E-02
8	1	.3323	.203	.913	-.4345	1.0991
	2	5.495E-02	.204	1.000	-.7159	.8258
	3	.6477	.203	.184	-.1191	1.4145
	4	.3349	.205	.914	-.4401	1.1099
	5	-.2555	.198	.975	-1.0009	.4899
	6	.3611	.204	.873	-.4098	1.1319
	7	.7190	.204	.092	-5.1832E-02	1.4898

Based on observed means. The error term is Error.

* The mean difference is significant at the .05 level.

1 = science at grade 7, 2 = science at grade 8, 3 = physics at grade 9, 4 = chemistry at grade 9, 5 = biology at grade 9, 6 = physics at grade 10, 7 = chemistry at grade 10, 8 = biology at grade 10

Multiple Comparisons
Dependent Variable: R5 (Education for Married Life)
Scheffe

(I) SUBJECT	(J) SUBJECT	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	-2.7914E-02	.199	1.000	-.7784	.7226
	3	-2.4444E-02	.198	1.000	-.7712	.7223
	4	.1814	.200	.997	-.5730	.9359
	5	-.1233	.193	1.000	-.8497	.6031
	6	-3.8118E-02	.199	1.000	-.7886	.7124
	7	.3043	.199	.938	-.4462	1.0548
	8	-.8450 *	.195	.010	-1.5811	-.1089
2	1	2.791E-02	.199	1.000	-.7226	.7784
	3	3.469E-03	.199	1.000	-.7470	.7540
	4	.2093	.201	.993	-.5489	.9676
	5	-9.5380E-02	.194	1.000	-.8257	.6350
	6	-1.0204E-02	.200	1.000	-.7645	.7441
	7	.3322	.200	.906	-.4221	1.0865
	8	-.8171 *	.196	.017	-1.5570	-7.7167E-02
3	1	2.444E-02	.198	1.000	-.7223	.7712
	2	-3.4694E-03	.199	1.000	-.7540	.7470
	4	.2059	.200	.994	-.5486	.9603
	5	-9.8849E-02	.193	1.000	-.8253	.6276
	6	-1.3673E-02	.199	1.000	-.7642	.7368
	7	.3287	.199	.908	-.4218	1.0792
	8	-.8206 *	.195	.015	-1.5566	-8.4492E-02
4	1	-.1814	.200	.997	-.9359	.5730
	2	-.2093	.201	.993	-.9676	.5489
	3	-.2059	.200	.994	-.9603	.5486
	5	-.3047	.195	.930	-1.0391	.4297
	6	-.2196	.201	.991	-.9778	.5387
	7	.1229	.201	1.000	-.6354	.8811
	8	-1.0264 *	.197	.000	-1.7704	-.2825
5	1	.1233	.193	1.000	-.6031	.8497
	2	9.538E-02	.194	1.000	-.6350	.8257
	3	9.885E-02	.193	1.000	-.6276	.8253
	4	.3047	.195	.930	-.4297	1.0391
	6	8.518E-02	.194	1.000	-.6452	.8155
	7	.4276	.194	.675	-.3028	1.1579
	8	-.7217 *	.190	.046	-1.4372	-6.2206E-03
6	1	3.812E-02	.199	1.000	-.7124	.7886
	2	1.020E-02	.200	1.000	-.7441	.7645
	3	1.367E-02	.199	1.000	-.7368	.7642
	4	.2196	.201	.991	-.5387	.9778

	5	-8.5176E-02	.194	1.000	-.8155	.6452
	7	.3424	.200	.890	-.4119	1.0967
	8	-.8069 *	.196	.020	-1.5468	-6.6963E-02
7	1	-.3043	.199	.938	-1.0548	.4462
	2	-.3322	.200	.906	-1.0865	.4221
	3	-.3287	.199	.908	-1.0792	.4218
	4	-.1229	.201	1.000	-.8811	.6354
	5	-.4276	.194	.675	-1.1579	.3028
	6	-.3424	.200	.890	-1.0967	.4119
	8	-1.1493 *	.196	.000	-1.8892	-.4094
8	1	.8450 *	.195	.010	.1089	1.5811
	2	.8171 *	.196	.017	7.717E-02	1.5570
	3	.8206 *	.195	.015	8.449E-02	1.5566
	4	1.0264 *	.197	.000	.2825	1.7704
	5	.7217 *	.190	.046	6.221E-03	1.4372
	6	.8069 *	.196	.020	6.696E-02	1.5468
	7	1.1493 *	.196	.000	.4094	1.8892

Based on observed means. The error term is Error.

* The mean difference is significant at the .05 level.

1 = science at grade 7, 2 = science at grade 8, 3 = physics at grade 9, 4 = chemistry at grade 9, 5 = biology at grade 9, 6 = physics at grade 10, 7 = chemistry at grade 10, 8 = biology at grade 10

Multiple Comparisons
Dependent Variable: TOTAL (Overall Areas Involved)
Scheffe

		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
(I) SUBJECT	(J) SUBJECT				Lower Bound	Upper Bound
1	2	-.1948	.168	.987	-.8302	.4406
	3	.2147	.168	.977	-.4175	.8469
	4	.1247	.169	.999	-.5140	.7635
	5	-.2685	.163	.910	-.8836	.3465
	6	6.348E-02	.168	1.000	-.5719	.6989
	7	.3556	.168	.726	-.2799	.9910
	8	-.2981	.165	.860	-.9213	.3251
2	1	.1948	.168	.987	-.4406	.8302
	3	.4095	.168	.551	-.2259	1.0449
	4	.3195	.170	.832	-.3224	.9615
	5	-7.3740E-02	.164	1.000	-.6921	.5446
	6	.2583	.169	.939	-.3803	.8969
	7	.5504	.169	.162	-8.8244E-02	1.1890
	8	-.1033	.166	1.000	-.7298	.5231
3	1	-.2147	.168	.977	-.8469	.4175
	2	-.4095	.168	.551	-1.0449	.2259
	4	-8.9961E-02	.169	1.000	-.7287	.5488
	5	-.4832	.163	.272	-1.0983	.1318
	6	-.1512	.168	.997	-.7866	.4842
	7	.1409	.168	.998	-.4945	.7763
	8	-.5128	.165	.214	-1.1360	.1104
4	1	-.1247	.169	.999	-.7635	.5140
	2	-.3195	.170	.832	-.9615	.3224
	3	8.996E-02	.169	1.000	-.5488	.7287
	5	-.3933	.165	.577	-1.0150	.2285
	6	-6.1244E-02	.170	1.000	-.7032	.5807
	7	.2308	.170	.968	-.4111	.8728
	8	-.4229	.167	.494	-1.0527	.2070
5	1	.2685	.163	.910	-.3465	.8836
	2	7.374E-02	.164	1.000	-.5446	.6921
	3	.4832	.163	.272	-.1318	1.0983
	4	.3933	.165	.577	-.2285	1.0150
	6	.3320	.164	.767	-.2863	.9504
	7	.6241	.164	.046	5.775E-03	1.2425
	8	-2.9576E-02	.161	1.000	-.6354	.5762
6	1	-6.3482E-02	.168	1.000	-.6989	.5719
	2	-.2583	.169	.939	-.8969	.3803
	3	.1512	.168	.997	-.4842	.7866
	4	6.124E-02	.170	1.000	-.5807	.7032

	5	-.3320	.164	.767	-.9504	.2863
	7	.2921	.169	.886	-.3465	.9307
	8	-.3616	.166	.691	-.9881	.2649
7	1	-.3556	.168	.726	-.9910	.2799
	2	-.5504	.169	.162	-1.1890	8.824E-02
	3	-.1409	.168	.998	-.7763	.4945
	4	-.2308	.170	.968	-.8728	.4111
	5	-.6241 *	.164	.046	-1.2425	-5.7753E-03
	6	-.2921	.169	.886	-.9307	.3465
	8	-.6537 *	.166	.032	-1.2802	-2.7238E-02
8	1	.2981	.165	.860	-.3251	.9213
	2	.1033	.166	1.000	-.5231	.7298
	3	.5128	.165	.214	-.1104	1.1360
	4	.4229	.167	.494	-.2070	1.0527
	5	2.958E-02	.161	1.000	-.5762	.6354
	6	.3616	.166	.691	-.2649	.9881
	7	.6537 *	.166	.032	2.724E-02	1.2802

Based on observed means. The error term is Error.

* The mean difference is significant at the .05 level.

1 = science at grade 7, 2 = science at grade 8, 3 = physics at grade 9, 4 = chemistry at grade 9, 5 = biology at grade 9, 6 = physics at grade 10, 7 = chemistry at grade 10, 8 = biology at grade 10

Appendix 7

List of the questions raised within the interview sessions

- What teaching methods usually used by science teachers in delivery of health education?

- What teaching methods may have a stronger influence on changing students' health behaviour?

- What percentage of time does the science teachers spend on health education compared to the total number of science lessons?

- What problems, if any, face science teachers in the delivery of health education?