

**THE UNIVERSITY OF HULL**

**A REVIEW OF THE ROLE OF PROBLEM SOLVING AND OTHER  
CRITICAL THINKING SKILLS IN THE SECONDARY HOME ECONOMICS  
CURRICULUM OF THE SUDAN WITH AN EMPIRICAL STUDY OF THE  
IN-SERVICE TRAINING OF TEACHERS**

**being A Thesis Submitted for the Degree of  
Doctor of Philosophy  
in the University of Hull**

**By**

**Mahasin Ibrahim Shommo, Bsc (Hons) (Khartoum), Msc  
(Nebraska)**

**July, 1993.**

## Summary

Chapter 1 summarises the development of the Critical Thinking (CT) movement and previous studies of developing Critical Thinking Skills (CTSs), with particular focus on the methods used in teaching them in the Home Economics (HE) context. One method, Problem-Solving (PS), was chosen to teach CTSs in Sudanese secondary schools for girls. A four-day in-service training course in teaching PS was conducted with all the HE teachers of Omdurman.

To investigate the effect of teaching PS on students' learning in HE lessons, achievement tests were developed on 3 HE topics and were conducted on 234 students. Tests on the first two topics were conducted before and after the in-service course. T-test analysis was conducted on the mean scores of the results obtained, to compare students' learning of HE on the two occasions. It was found that the differences between the mean scores of the tests conducted prior to the in-service course and those carried out after it, were very highly significant, in favour of teaching PS-style lessons. A test on the third topic was conducted on all groups of students to investigate differences between classes.

To show how trained teachers implemented the PS techniques acquired during the in-service course, a diary study was conducted on the three topics taught.

Questionnaires were developed and administered to the teachers who participated in the in-service course to find out their opinions about the experience of teaching PS, both in the in-service course and in their own classes. Teachers' views were also obtained by means of semi-structured interviews.

The findings of the study support the use of PS method in teaching HE. Some implications of the findings for the development of initial and in-service teacher training, as well as curriculum modification in Sudanese secondary HE education are highlighted, and suggestions made for further research.

### Acknowledgments

Firstly, I am deeply indebted to Allah for giving me the health, help and patience to complete this study.

Special gratitude is extended to Dr. Costello, who supervised the theoretical part of this study before he left the University of Hull, for the inspiration needed to begin this study and for the knowledge which he continuously imparted.

I would particularly like to express personal thanks to Dr. Moore, who continued the supervision of the study, for his endless help and encouragement throughout this investigation. His continuous support and the time he spent with me in designing the study and preparing for the field work before he officially took over the supervision, are remembered with deepest appreciation. Without such assistance, this study would not have been completed.

Acknowledgement is also extended to the people of the University of Hull and the University of Khartoum, who were consulted in developing the instruments used for collecting data, particularly to Dr. Muzamil of the Faculty of Education at the University of Khartoum. To all individuals with whom I worked and whom came to know in the University of Hull, I wish to convey sincere thanks.

Thanks are also extended to all secondary HE teachers of Omdurman for their genuine co-operation, and to the headteachers for their continuous help during the conduct of the field work.

Special thanks are offered to the Sudan government for its generous sponsorship, and to the University of Khartoum for providing the opportunity to pursue my graduate studies abroad.



Last but not least, I am deeply grateful to my family, especially my husband, Dr. Ali, who gave up most of his time to teach and take care of our children, while studying for his Master degree in Obstetrics and Gynaecology. His continuous assistance has undoubtedly facilitated the carrying out and timely completion of this study. I would also like to thank my lovely children, Mohamed and Nasra, who made our stay away from home delightful, and I also wish to apologize to them for being busy most of the time. Gratitude is also extended to my family in the Sudan for their encouragement, affection and sympathy, particularly to my sister, Asma for her continual calls.

## CONTENTS

<u>Introduction</u>	1
<u>Chapter One</u>	
Literature Review	11
<u>Chapter Two</u>	
Educational Development in the Sudan	53
<u>Chapter Three</u>	
The Home Economics Curriculum for Girls' Secondary Schools in the Sudan	93
<u>Chapter Four</u>	
Design and Methodology of the Empirical Study	134
<u>Chapter Five</u>	
The In-Service Training Course on Teaching Problem-Solving in Home Economics	162
<u>Chapter Six</u>	
Analysis of the Achievement Tests	180
<u>Chapter Seven</u>	
The Diary Study	208
<u>Chapter Eight</u>	
Teachers' Opinions about the In-Service Course and the Teaching of Problem-Solving in Home Economics	227
<u>Part One: Analysis of the Interviews</u>	227
<u>Part Two: Analysis of the Questionnaire</u>	242
<u>Chapter Nine</u>	
Summary, Discussion, Implications and Suggestions for Further Research	261
Bibliography	270
Appendices	279

## List of Tables

<u>6.1</u>	Summary of results on the mean scores of test C by teacher.	183
<u>6.2</u>	Summary of results of the mean scores and the t-tests of pre- and post-test on topics A and B by teacher.	185
<u>6.3</u>	Summary of the results of the t-test on the mean scores of the first 3 questions on the basic HE of pre- and post-tests A and B.	190
<u>6.4</u>	Summary of the results of the t-test on the mean scores of second 3 questions on PS of pre- and Post-tests A and B.	193
<u>7.1</u>	Summary of the teachers' choice of lesson-type arranged by number and percentage.	212
<u>7.2</u>	Summary of the resources used by the teachers and the students.	214
<u>7.3</u>	Summary of homework assignment set by teacher.	216
<u>7.4</u>	Summary of teachers' level of satisfaction.	217
<u>7.5</u>	Summary of students' level of satisfaction as estimated by their teachers.	218
<u>7.6</u>	Summary of the teachers' use of the teaching/ learning activities.	220
<u>8.1</u>	Instructional responsibility of the teachers' sample.	243
<u>8.2</u>	Home economics teaching experience.	244
<u>8.3</u>	Teachers' academic qualification in HE.	245
<u>8.4</u>	(A) Description of the responses, with means and standard deviations, of the questionnaire items of scales (TR) and (LS).	247
<u>8.4</u>	(B) Description of the responses with means and standard deviations, of the items of scales (PR) and (TT).	248
<u>8.5</u>	Summary of the results of the means and reliabilities.	253
<u>8.6</u>	Summary of the results of the scale-scale correlation test.	254

## Figures

<u>2.1</u> Map of Sudan	55
<u>2.2</u> Educational system in Sudan	78

## Diagrams

<u>4.1</u>	Quasi-experimental design	139
<u>6.1</u>	Summary of the design of the study based on the time factor	196



## Abbreviations

HE = Home Economics

CT = Critical Thinking

CTSS = Critical Thinking Skills

PS = Problem-Solving

## Introduction

In a survey conducted in 1984 in America, 90% of professional educators agreed that enhancing Critical Thinking Skills (CTSs) "should be a major priority in educational planning for the coming years."<sup>1</sup> Indeed, the development of CTSs has become a major aim of primary and secondary education. In this regard, Nickerson argues that "Surely in one sense , all of us know how to think without being taught. The problem is to get us to do so with some consistency."<sup>2</sup>

Over the past decade, much research has been conducted with a view to improving and supporting schools' teaching of CTSs. Most of the studies reviewed concluded that our failure to think through to the solution of a problem is not always due to the lack of effort; sometimes, the motivation is there, but not the ability. Thus, if schools are entrusted with development of CTSs, the question arises, is "How do schools teach students to develop their ability to think?" More specifically, "What do teachers do to enable their students to become more perceptive, more insightful, and more reflective when facing a problem"? According to the Critical Thinking (CT) movement, many American educators believe that all the principles that guided traditional education were obsolete. In a general comment on the CT movement, Costa recently reports that "Teaching for thinking was the great discovery of the eighties."<sup>3</sup> Thus, the burden that put on educators and teachers is to provide a wide variety of approaches of teaching CTSs, taking into account that the difficulties and, perhaps, the risks that they take now, will be positively resolved in the

future. It is on this conceptual framework, that the inspiration for teaching CTSs was born.

### 1. Background to the Teaching of CTSs in HE

In the context of Home Economics (HE), stimulating students to develop CTSs has become a new target and a universal goal in American secondary education.<sup>4</sup> Experimental studies conducted in many American States, including Arizona, Nebraska, Wisconsin, Ohio, Maryland, Pennsylvania and Minnesota, have proven the success of CTSs teaching in relation to the learning of HE. One common aim of these studies was to develop methods of teaching CTSs, and the common ground for this success seemed to be the suitability of the HE curriculum as a diverse subject that seeks to promote the well-being of families and individuals.<sup>5</sup> Training teachers to be able to implement methods of teaching critical thinking skills then became the centre of interest for many studies.

In Britain, the National Curriculum has emphasised the teaching of CTSs in Technology, within which HE has been categorised. For example, a statement of attainment for level 10 is that pupils should be able "to make reasoned judgements about what is a subject for design and technological activities and what is better dealt with in other ways."<sup>6</sup> An objective for level 8 is to "show evidence of knowledge of making processes and devise and implement procedures for quality assurance."<sup>7</sup> In these two examples, making reasoned judgement and showing evidence involve the use of CTSs.

In Sudan, advanced methods of teaching CTSs have been implemented in teaching some subjects, namely mathematics, language and science. The Sudanese curriculum producers, however, have

ignored the teaching of CTSs in the context of HE, evidenced by two major facts: first, not even one method of teaching CTSs has been included in the HE curriculum; second, not even one teacher training programme in teaching CTSs has been provided, so far, for training HE teachers. Although several objectives included in the curriculum require development of CTSs, no attention has been paid to how these objectives can be achieved. For example, the "development of students' creative skills"<sup>8</sup> is stated as a major general objective in the secondary HE curriculum. In this particular example, rote-learning frequently used for teaching HE in Sudan, is not an appropriate method to achieve this goal.

Since the mid eighties, the researcher has been reading about teaching for developing thinking. In doing so, she has been greatly concerned about the lack of association between the need for CTSs in Sudanese society and what is actually taught in our schools in relation to fostering these skills. This is because we are teaching our children to think about problems in contexts which in many respects do not confront them in their daily life and perhaps will not do so in the future. However, in the teaching of subjects such as HE, the curriculum of which has been designed specifically to improve the well-being of individuals and families, the teaching of CTSs has been consistently excluded. Indeed, these issues provided the stimulus to conduct the present research, in an attempt to demonstrate that teachers can be trained in teaching CTSs. This is necessary because currently in Sudan life is very complex. The majority of individuals and families live in sub-standard conditions with poor general sanitation and water supply. The prevalence of diseases such as malaria, tetanus, kwashiorkor and marasmus, together with economic



conflicts and political turmoil and so on, have contributed to a low life expectancy and deterioration of families. In the face of this general bombardment with varying stimuli and the sometimes overwhelming difficulties which families face as a result, steps need to be taken to help people solve their problems. In these circumstances, it is ironic that the Sudanese curriculum designers attach no importance to CTs in the subject, which aims to improve family-welfare, HE continues to be taught only by traditional methods that concentrate on imparting basic knowledge. These methods lack any CT input that involves students in participating, discussing, and reflecting in the teaching/learning process. The teachers of HE have then been discharged from teaching CTs although in view of its diversity, teachers need to be equipped with a variety of teaching methods. Indeed, if we take into consideration the mission of HE education in relation to the whole life process of the society, the demands of HE teachers might be as broad as the needs of the society. At this point emerges the current deficiency of the Sudanese teacher training system, and the lack of attention paid to the training of HE teachers as compared to that of their colleagues. Arising from these ideas, the present research has been conducted with a view to improving educational practice.

The American literature reveals that methods of teaching CTs are numerous, for example, questioning, teaching for transfer, problem-solving and so on. In the present study, it was found impractical in terms of time, effort and economics to conduct an empirical study involving all the available methods. Accordingly, the researcher decided to use PS as an example of methods of teaching CTs.



## 2. Importance of Using PS Approaches in Teaching HE in the Present Study

The importance of using PS method in the present study is twofold. Firstly, the strong connection between teaching PS and the development of other CTs; and secondly, the need of Sudanese children for PS skills. This section clarifies the reasons for choosing PS approach in teaching HE in the present study. Throughout the history of education, PS has been consistently advocated by many educators as a method of promoting thinking. For example, John Dewey argued that using a problem-solving approach in public schools is the best method of inquiry in all fields.<sup>9</sup> In a recent article entitled "Thinking in Context: Teaching for Open-Mindedness and Critical Understanding," Berman has argued the merits of teaching PS in nurturing CTs.<sup>10</sup> In this respect, he states that the best means for teaching CT is the engagement of the students with real and meaningful problems.<sup>11</sup>

In the field of HE, PS has been proven by experimentation and research to be one of the most effective ways of teaching CTs. This is manifested by the approach to teaching PS developed by two HE experts, Dewald-Link and Wallace. Indeed, their format provided encouraging stimulus for the conduct of the present empirical study for three reasons. First, the format has been explicitly stated in terms of process, implementation and the role of the teacher. Thus, the lessons of this study were designed within a structured outline. Second, the format of teaching PS suggests that the method contains other elements of CT, for example, discussion, debate, questioning, making decisions, among others. This indicates that in applying the PS methods, students would in fact, be engaged in developing a range of CTs, rather than a single one. In other words, learning CT

via a PS approach would provide a good opportunity for learning a wide variety of CTSSs, rather than a single one. Third, new researchers are recommended to use instruments that have been tried before, if available, rather than to develop their own. The use of a method that has already been employed can often enhance the internal validity of an experimental study. Comparisons with other studies can add to the information about the validity of the study.

Moreover, with regard to the relationship between PS and HE, it could be said that in the HE context the opportunity of fostering CTSSs via PS already exists, because HE is entrusted with the aim of solving family problems, which indicates that HE is (or can be) a direct path for developing CTSSs. The basic approach will then be to develop pupils' thinking in solving problems that touch their real lives or, perhaps, the lives of others with whom they are concerned.

In this regard, Kownslar reports that:

Just as important as the attributes of the critical thinking skills we seek to teach is the subject matter we choose to have the youngsters exercise these skills. Research indicates that students are more highly motivated to learn skills and retain them more thoroughly and longer if such instruction is provided using content personally and socially relevant to them, as well as when the skills are clearly needed to achieve content-related goals. The use of such content to introduce skills also help to generalise these skills and to promote transfer.<sup>12</sup>

Similar ideas and attitudes are shared by Berman, who argues:

Thinking is more than developing a collection of isolated skills; it is an integrative process that happens when one is confronted with a real problem. Building isolated skills does not necessarily mean that one will be able to think well in the context of a real situation.<sup>13</sup>

These arguments confirm that teaching CT in a context relevant to the learner, will facilitate the development of CTSSs. I believe that

the selection of the appropriate subject within which to teach CTSs, provides an excellent chance for the pupils to use their thinking in a meaningful way. It also enables them to evaluate the consequences of their solutions and decisions purposefully. Thus, as PS is central to the learning of CTSs in the HE context, it should be a central method to the teaching of this subject.

Concerning the need to teach PS in the present study, this method is highly desirable because developing PS skill in the Sudan, where people have been threatened and overwhelmed with a wide variety of problems, would be very rewarding. Solutions to the significant problems facing this country nowadays require qualitative change or even improvement in its people's way of thinking. The country faces numerous challenges relating to economy, starvation, health, homelessness, education, environment, employment, religion, agriculture and politics. The increasing pressures imposed on the Sudanese society by these problems necessitate that Sudanese educators find appropriate ways to alleviate this social agony. One way to do so, is to nurture CTSs in future generations. Since CT is associated with PS, the teaching of this skill should be incorporated into the Sudanese HE curriculum where there is a special need for it.

### 3. Overview of the Study, Samples, Procedures and Methods

Two different samples were involved in this study: 16 secondary HE teachers and 234 students of their classes.

A four-day in-service training course in teaching PS in HE, was conducted for secondary HE teachers of Omdurman in Khartoum State. The major objective of the course was to demonstrate that teachers of HE can be trained in methods of teaching CTSs. More



specifically, it was hoped to demonstrate that teachers can learn to teach PS in their HE classes as a result of participating in a short in-service training course and the teaching of PS will not cause any loss in students' learning of basic HE.

The study was based on the achievement tests conducted with students. These tests were carried out before and after the teaching of PS with different groups of students to compare their learning of HE lessons taught according to the PS-style with those taught by traditional methods.

To demonstrate how far the lessons planned in the in-service course were taught, data were collected from classrooms, using the teachers' diaries. The variables studied in these diaries included: lesson duration and type; resources used by teachers and by students; teachers' satisfaction with the lessons and their estimation to students' satisfaction, homework assignments; and the use of lesson activities.

The study also made use of written questionnaires and interviews conducted with the teachers. From these, data were collected regarding teachers' opinions about teaching PS, based on their participation in the in-service training course and on their experience of teaching PS lessons in their own classes.

#### 4. Limitations of the Study

- a) This study is confined to the teaching of PS.
- b) The study is limited to the HE curriculum of girls' secondary schools in Northern Sudan.
- c) The study is limited to State schools only, both academic and technical.

d) The sizes of the samples, the number of topics assessed and the duration of the in-service programme were limited to what could be achieved by a single researcher working unaided during a single period of field study.



## References

1. Beyer, B. 'Improving Thinking Skills- Practical Approaches', Phi Delta Kappan, Vol. 65, April 1984, pp. 556-560.
2. Nickerson, R. 'Kinds of Thinking Taught in Current Programmes', Educational Leadership, Vol. 42, Sept 1984, pp. 26-36.
3. Costa, A. 'Mediating the Metacognitive' , in Costa, A. Developing Minds: A Resource Book for Teaching Thinking, Vol. 1, ASCD, 1991, pp. 211-214.
4. Copa, P., Hultgren, F. and Wilkosz, J. 'Critical Thinking as a Lived Activity', in Costa, A. Developing Minds: A Resource Book for Teaching Thinking, Vol. 1, ASCD, 1991. pp. 188-192.
5. Ibid.
6. Department of Educational Science and the Welsh Office. Technology in the National Curriculum, 1990, p. 6.
7. Ibid., p. 14.
8. Ministry of Education, Bukht er Ruda Institute of Education, The Home Economics Curriculum for Secondary Schools, El Delwaim, 1987, p. 1.
9. Dewey, J. Educational Thinkers Series, Collier-Macmillan, 1970.
10. Berman, S. 'Thinking in Context: Teaching for Openmindedness and Critical Understanding' , in Costa, A. Developing Minds: A Resource Book for Teaching Thinking, Vol. 1, ASCD 1991, pp. 10-16.
11. Ibid., p. 10.
12. Kwonslar, A. 'What Worth Having Students Think Critically About? a Democratic Lesson', Social Education, 1985, p. 304. | ?
13. Berman, S. op.cit., p. 10.

## Chapter One

### Literature Review

This chapter presents first the literature reviewed on CT education and the definition of CTSs and next, it examines the arguments provided for the methods of teaching such skills in HE. These methods include: questioning, discussion, problem-solving, decision-making, simulations, reasoning, writing, reading, laboratory work, informal debates and teaching for transfer.

#### 1.1 What is CT and What are CTSs?

The American literature reviewed on thinking education confirms that there is no universal definition for the term 'Critical Thinking.' Indeed, CT is variously defined based on the context in which it stands. According to Ennis, "Critical thinking is reasonable, reflective thinking that is focused on deciding what to believe or do."<sup>1</sup> In describing the advent of CT education in the context of social science, Beyer reports that this type of education is intended to achieve "an understanding of the relationship of language to logic, leading to the ability to analyse, and advocate ideas, reasons inductively and deductively and to reach factual or judgemental conclusions based on sound inferences drawn from unambiguous statement."<sup>2</sup> Paul, defines CTSs as below:

in a weak sense, critical thinking skills are understood as a set of discrete micro-logical skills ultimately intrinsic to the character of the person, skills that can be tacked onto other learning. In the strong sense, critical thinking skills are understood as a set of integrated macro-logical skills ultimately intrinsic to the character of the person and to insight into one's own cognitive and effective processes.<sup>3</sup>

In the context of HE, the subject-field of this thesis, Brown and Paolucci defined the term by reporting that: "critical thinking is

a critical spirit or attitude, the disposition to compare claims or arguments against each other, weigh evidence and form conclusions based on sound reasons rather than authority, expediency, whimsy, tradition, or irrational compulsion."<sup>4</sup> Another definition which is also provided by HE educators is that: "critical thinking is the ability to solve problem by using logical methods."<sup>5</sup> According to this definition, CTSs are: the skills that are involved in the process of problem solving which includes: identifying and defining the central issues, recognising the underlying assumptions and forming hypotheses, selecting and organising relevant facts, evaluating the evidence and drawing warranted conclusions.<sup>6</sup> The last definition will be used in this study as the PS format of teaching CTSs has been chosen to be implemented in the empirical research.

## 1.2 The Movement of CT Education

Probably never before in the American history of education practices has there been a greater emphasis on teaching children to think critically. Indeed, in America the signs are everywhere: multiple alternative programmes to teach CT at a variety of ages, tomes that review in some detail the numerous programmes available, workshops for teachers and administrators sponsored by such prestigious organisations such as the Association for Supervision and Curriculum Development (ASCD), an outpouring of articles on teaching CT in such journals as Educational Leadership, Educational Research, Social Education, Illinois Teacher and Phi Delta Kappan in which a large amount of the present literature has been reviewed. It would be difficult to read anything at all in the contemporary American literature without becoming aware of this new interest in teaching



CTSs. Indeed, during recent years, specifically in the 1980s, a number of educational movements have affected American instructional practice. Each of these instructional approaches has responded to identified educational needs and has provided a specific pedagogical prescription for addressing these needs, particularly the need for students to develop their thinking skills. In this regard, Blair argues that: "Most everyday thinking about pressing real-life problems crosses disciplinary categories and domains and involves opposing points of view and contradictory lines of reasoning."<sup>7</sup> In highlighting the need for CT education, Paul offers the following argument:

we need to ensure therefore, that students receive a substantial amount of practice in reasoning dialogically or dialectically, so that they become comfortable with and skilled in weighing, reconciling, and assessing contradictory points of view through rational dialogue, discussion and debate.<sup>8</sup>

The author then concludes his argument by reporting that "to properly design critical thinking instruction, we must cast our nets widely when we define research and scholarly work relevant to it. We must focus our attention on the kinds of problems and thinking that are most common and vexing in our everyday life."<sup>9</sup> In Britain, Robinson asserts that the current movement of CT education in America as well as some other countries "has many roots sharing the perception that traditional education was not producing judicious thinkers."<sup>10</sup> In his view of this movement the author considers "critical thinking as an educational ideal"<sup>11</sup> and that "a central facet of being an ideal critical thinker is to be fairminded and a central principle of teaching critical thinking is corresponding that of fostering reciprocity."<sup>12</sup>

Let us now examine the reasons for the movement or perhaps, the reconciliation between education and the teaching of CT in America. The literature reviewed in this area reveals that the surge of interest in teaching CTs is due to the following reasons which were quoted from Sternberg:<sup>13</sup>

- a) The declining scores on tests of scholastic aptitude have called attention to the apparently declining levels of critical thinking among high school students.
- b) A number of national reports have laid at least some of the blame for our educational ills at the door of the school-house, where students are somehow not learning to think as well as they should.
- c) Psycho-educational knowledge has reached the point at which programmes for teaching critical thinking look more promising than ever before, and peddlers of such programmes for teaching critical thinking have not been hiding their light under a bushel.
- d) A now-defunct Ministry of the Development of Intelligence in Venezuela showed that the teaching of critical thinking can be implemented on a massive scale with some success.
- e) There is a feeling among educators that, in trying to make students better thinkers, we have tried pretty much everything else to no avail, so that the time to teach critical thinking directly is surely at hand.

These reasons elucidate that the point behind the current endeavour to introduce CTs to American education is in fact an attempt to include CT as a formal part in a formal education. Although CT has been experienced by Americans, it has been abandoned in their formal systems of education.

Regarding the aim of CT education, McTighe and Clemson argue that the aim of developing CTs is certainly not new in education. However, renewed attention to this goal has been stimulated by a number of factors. These factors are: "analyses of local, State, and national test results reveal that students have improved their performance in basic skill items but continue to experience difficulty



in such areas as interpretive reading, persuasive writing and multistep problem solving."<sup>14</sup> This aim is also shared with Robinson who reported that:

programmes of teaching thinking seem to have in common the aim of helping students to discover and identify their own thinking skills, in ways that will enable them to recognise their customary successful use of those skills, enable them to adapt the skills to new problems and also cultivate the necessary dispositions and attitudes.<sup>15</sup>

The review of the aim of CT education indicated in these arguments suggests that similar attitudes among educators towards the incorporation of this area in the curriculum seems evident.

Nearly all the literature on CT education since the 1980s indicates that the current movement of CT education is anchored in a number of fundamental assumptions regarding the nature of thinking and its development. As identified by McTighe and Clemson these assumptions include the following:<sup>16</sup>

- a) The thinking abilities of all students can be developed through instruction.
- b) The improvement of thinking should be addressed throughout the grades and should begin in primary classrooms.
- c) Thinking is fundamental to all subject areas and should be emphasised within each content area.
- d) Teaching for thinking promotes deeper understanding of content material.
- e) Cooperative learning exchanges enhance the quality of student thinking and comprehension.
- f) Current standardised tests do not adequately assess student thinking.

In examining this list of assumptions, it could be suggested that CTs are teachable to students at various levels of schooling. The teaching/learning of CTs will improve the understanding of students and thus, should begin at the early stages of education. The

existing tests used in assessing students performance do not cover all kinds of students thinking skills.

Any approach to the introduction of critical thinking education must involve development of the curriculum in which it will be incorporated. This is particularly important since the implementation of teaching CTSS cannot take place in a vacuum. Critical thinking education must also lead to the development of teacher education. In this regard, Munro and Slater argue that:

The development of critical thinking education requires a long term commitment by curriculum developers and teachers. The curriculum must specify when to begin teaching various critical thinking skills as well as when and how to review, reinforce, and enrich these skills. A well-planned in-service training programme for teachers to ensure both commitment and consistency in classroom instruction is also essential.<sup>17</sup>

In explaining their argument the authors report that: "An individual teacher cannot ensure that all students will develop the 'know how' to think critically. Both curriculum and instruction must be sequential and developmental in a long-term basis if we are to improve student performance in critical thinking."<sup>18</sup> This argument suggests that although the agreement among the advocates of CT on the importance of its incorporation in the curriculum is high, the implementation of this idea is still questionable. This is evident by an argument offered by Paul that: "Everyone with any claim to knowledge of critical thinking seems to agree, however, that most school systems are not well prepared for this transformation of emphasis."<sup>19</sup>

Curriculum development through teaching CTSS is also a popular theme in contemporary American secondary HE education. In this regard, the following questions have recently been raised by



Copa and Wilcosz. The first is: why is being able to think critically something we value for HE students? The second question is: what is it that students should be able to do better because of CT? In answering these questions the authors argue that:

In home economics classes, programmes designed specifically to improve the well-being of individuals and families, the answers to these questions are not mere academic exercises but are, instead, the very core of teaching and learning. In home economics, thinking must translate into action. We value critical thinking specifically because it helps people take action to solve practical problems.<sup>20</sup>

Bearing in mind that the implementation of teaching CTSs has not yet been fully developed, the following question should be raised in examining the above mentioned argument. How can we teach CTSs in HE if current approaches to teaching this subject do not deal adequately with the demands of these skills in everyday problems? In the next section some of the methods that have been identified and proposed for teaching CTSs in HE will be presented.

### 1.3 Arguments about the Methods of Teaching CTSs in HE

In this section, a review will be given of some studies on methods of teaching CTSs in HE since the 1970s. The review is concentrated on the work done in the 1980s and up to 1991, the time when the trend for teaching these skills reached its peak and information became available in the American educational media. The review emphasises the methods that have been tried and discussed for teaching CTSs in HE classrooms. Before examining these methods, we note that in this thesis 'method' refers to any technique, instruction, approach, format or strategy of teaching.

The literature reviewed on the methods of teaching CTSs reveals that the spectrum of such approaches and strategies is very wide, depending upon the subject in which CTSs need to be nurtured. In this concern, McTighe and Clemson argue that :

teaching for thinking includes those teaching strategies that stimulate students to think, including a number of classroom activities that teachers have used for years, such as discussion, problem solving, debate experimentation, simulations, interpretive reading and writing. Strategies such as these provide opportunities for students to exercise their thinking abilities. They do not actually teach thinking however.<sup>21</sup>

Another argument that has been offered by the same authors which is considered as an important one to this study states that: "there is no single best method for developing student critical thinking, rather a number of complementary approaches should be used."<sup>22</sup> This indicates that in presenting methods of teaching CTSs in this section, an overlap between some methods will inevitably occur. Some CTSs such as problem-solving include more than one teaching method; in the same way some teaching methods may be used with more than one CTS; this emphasises the overlap between methods (of teaching) and the skills.

### 1.3.1 Posing Questions

Posing questions to stimulate further thinking is a strategy that has been used as a means for developing thinking in the HE classroom. Grubb argues that questioning can effectively serve as a tool to develop thinking abilities. She states that posing questions as a teaching strategy is "highly interesting, reactive, stimulating, exciting and fun for home economics students".<sup>23</sup> In regard to questioning, Rielly argues that from "the first step in becoming a

critical thinker one must be sceptical". In this argument the author suggests that "teachers can promote this attitude by presenting a convincing argument about something that students are inclined to believe and then showing weaknesses in the argument."<sup>24</sup> In a study entitled 'Developing Critical Thinkers Through the Art of Questioning', DeYoung and his colleague argue that among the general purposes of using questions in the classroom are: "to stimulate discussion. Questions that are thought-provoking can get the group to state reactions."<sup>25</sup> Also, "to channel the thinking. By skilful questioning the teacher can guide the group to the objective he/she has established. The group can be helped to move from the known to the unknown by a series of well-prepared questions."<sup>26</sup> These statements suggest that skilful questioning is a technique that enables the teacher to encourage the pursuit of thinking. In other words, questioning makes the learning environment in the classroom more stimulating and thought-provoking.

Handling the students' responses also constitutes an integral teaching skill for developing CTSS via questioning approaches. It was suggested that:

All responses should be acknowledged. If the answer is a good one, the teacher should praise the individual by commenting favourably on it. If the answer is not clear or incorrect, some additional questions may be needed. By skilful questioning a teacher can get a student to elaborate on an answer or lead a person to the discovery that there may be a flaw in his or her reasoning. The main purpose should be to help the student with thinking, not to embarrass or make the student feel foolish.<sup>27</sup>

As the role of the teacher is essential to the advancement of the students' thinking process, it has also been argued that:



The instructor should not become upset or impatient. What may seem to be an inappropriate or ill-timed question may be an indication of a need the teacher overlooked. The manner in which the teachers handle questions can be an important influence in their effectiveness as instructors. Asking appropriate questions is a skill which needs to be appreciated and practised. Recognising the different types of questions and techniques can enable a teacher to tailor a question to the situation. Developing this skill is one of the best methods of facilitating critical thinking.<sup>28</sup>

Gall argues that there are several other worthwhile question types for developing CTSS, which are introduced in Bloom's Taxonomy. This group as quoted includes the following:<sup>29</sup>

- a) Questions which cue students to improve an initially weak response to a question. ('Can you tell me a little more?').
- b) Questions which create a discussion atmosphere ('Billy, do you agree with Sue's position?').
- c) Questions which stimulate students' sense of curiosity and inquiry. ('What would you like to know about this manuscript?').
- d) Questions which guide students' learning of a problem-solving, behavioural or effective skill. ('What do you think we do next to solve this problem?').

At this stage it is necessary to make some comments about questioning for developing CTSS. My first comment is that as documented by research studies, researchers have emphasised the formal characteristics of a 'good' question, rather than the educational processes which good questions serve. However, it seems evident that it is not enough to learn about the merits of good questions; it is important to identify questions which are effective for a specific curriculum and classroom setting, rather than to search for general question types or even for good questions. To me, identifying specific questions would be more useful in providing a more precise and possibly clearer description of what constitutes effective questioning in a particular teaching situation. Question identification

is also important in training teachers to improve their classroom instruction. My second comment is that the systems of question categorisation reviewed suggest that categorisation is based almost entirely on the type of cognitive process required to answer a specific question. This is particularly true with Bloom's categorisation just presented. However, in Sudanese HE education, no consideration has been given, so far, to this cognitive identification. Indeed, questions provided usually concentrate on memorization and recitation of facts and information rather than on thinking.

### 1.3.2 Discussion

As a teaching technique, discussion has received considerable recognition in education for stimulating students' thinking in classrooms. A study by Sigel developed and validated the thesis that "thinking is regarded as an active process involving a number of denotable mental operations such as induction, deduction, reasoning, sequencing, classification and definition of relationships".<sup>30</sup> The author argues that discussion is an essential method for teaching such mental operations. Sigel also points out that for the advancement of discussion for developing thinking, teachers should consider the time factor. Indeed, he urges teachers to manage time satisfactorily in order to enrich students' thinking. Sigel holds that this is particularly important "since every teacher is concerned with keeping order in the classroom, eliciting maximum participation of the pupils and ensuring that all students gain from the classroom experience".<sup>31</sup> Many educators argue that group discussion is among the foremost methods of teaching CTSS in HE. For example, Hall and Paolucci argue that "discussions are good means of demonstrating



how to think through a problem."<sup>32</sup> This suggests that discussion is an appropriate framework for implementing other approaches, such as PS in teaching CTSs in HE classes. Sigel is also in agreement with Dewald-Link and Wallace that discussion is of primary importance in the development of thinking abilities in classrooms. The latter authors advance an important argument advocating that group discussion "assists students in comprehending their own perception as well as others' view points". The authors also argue that discussion is "one of the exciting tools to promote thinking and to provide a climate for divergence and expression of thoughts."<sup>33</sup> A similar argument has been recently provided by Costello, a pioneer in introducing philosophy into British primary education. In his argument, the author points out a new dimension that has perhaps been ignored by other advocates of discussion for teaching thinking in classrooms. He indicates that discussion is particularly important for those who "are poor readers, but whose reasoning ability may be as good as, or even better than, that of their peers".<sup>34</sup>

As a method of teaching, "group discussion methods involve an interchange of questions, thoughts and ideas, without attempting to reach a decision. On the other hand, the discussion-decision method goes a step further and determines definite goals for action."<sup>35</sup> In describing the approach of teaching discussion for developing CTSs in HE, it has been reported that:

During the discussion, either a teacher or a student may serve as a leader. The leader is responsible for guiding the discussion but not dominating it. Opportunity and encouragement should be provided for each member to make a contribution. Periodic summary are helpful a final summary should highlight the conclusions that have been reached. It is at this point that generalisation, applicable to other situations, can be formulated.<sup>36</sup>

In describing the role of the teacher in the implementation of discussion in the classroom, Hall and Paolucci state that the teacher might contribute in a variety of ways:

clarify the problem, suggest other aspects to be considered, define the meaning of terms, emphasise important ideas, correct mistakes or misinterpretations, bring quiet students into discussion, redirect the discussion that is being monopolised by a few students, help students to organise or express their ideas, stimulate students to reason out problems and develop good judgement in evaluating what they hear, maintain interest in group participation, or suggest possible class activities as outgrowths of the discussion.<sup>37</sup>

### 1.3.3 Problem Solving (PS)

Although the literature confirms that PS is only one technique among many, it has been suggested that this approach should be used widely in teaching CTSs in the classroom. Raths, Anold and Wasserman argue that PS is widely welcomed because it contains several thinking operations. "As students collect data, they may observe, compare and analyse. As they organise data, students may summarize, classify, interpret and evaluate."<sup>38</sup> This suggests that each of these elements involves thinking in order to be performed or operated. Thinking aloud is a teaching technique for CTSs usually espoused by advocates of PS. This technique builds on students' verbal expression of the steps that they go through to arrive at solutions. Perhaps Paul explains it clearly when he reports the following:

When I state my thoughts aloud, I think again about what I am saying, realise perhaps that my thinking is not clear. I am thinking of a new example. I may put a point in a slightly better way, or a different way, and thus come to see new sense in it. When I have to convince



others such as classmates, I have to try to give convincing reasons for thinking as I do.<sup>39</sup>

This suggests that the process of thinking aloud provides students with an opportunity to tell their thoughts through a chain of steps that finally bring them to a solution. McPeck specifically advocates this method by providing the following argument: "One of the most important implications of the analyses of critical thinking is that its scope is sufficiently broad to include processes involved in general problem-solving."<sup>40</sup> In this statement McPeck indicates that the strong relationship between CTSS and PS is based on the following argument:

Purporting to teach critical thinking in the abstract, in isolation from specific fields or areas, is muddled nonsense, thinking of any kind is thinking about an 'X'. Critical thinking cannot be a distinct subject. Critical thinking does not merely refer to the assessment of statement, but includes the thought process involved in problem-solving and active engagement in certain activities.<sup>41</sup>

In the field of HE, educators have perceived PS as a means to promote the process of reflective inquiry and CTSS. Recently, a course of study, 'Practical Problem Framework for the Home Economics Curriculum' has been developed and introduced into Minnesota secondary schools.<sup>42</sup> In this model, the curriculum was directed toward the practical perennial problems of the family. The emphasis was put on encouraging PS that focuses on practical reasoning, sound judgement and undertaking action. The result of this curriculum effort is supposed to be the following: "As they gain experience in using these problem-focused and reasoning skills, students become more active participants and appear to enjoy their involvement. They also develop greater respect and empathy for the views of others."<sup>43</sup> It was also found that a curriculum and

instructional climate that emphasised reasoned dialogue focused on addressing problems, using judgement and considering seriously the best courses of action, help students to learn to: "Identify and clarify their goals, defend their goals, identify and weigh means or alternatives for achieving their goals, make sound decisions, take action and weigh the action."<sup>44</sup> Finally, the authors confirm that "if such an instructional process were part of the school's core curriculum, students would soon learn to use critical thinking and reasoning in all of their problem-focusing and decision-making activities."<sup>45</sup> In the study conducted by Dewald-Link and Wallace mentioned earlier, the approach of teaching PS has been tested and validated for teaching CTSs in secondary HE classrooms. The authors argue that:

Developing reflective inquiry or critical thinking ability serves several purposes. These purposes include helping students to discover principles, nurturing student creativity, developing student independence and teaching students how to think. Critical thinking has as its basis the exploration of problems.<sup>46</sup>

The authors also identify the teaching strategies that lead to the development of PS as simulation, values clarification, case studies, games, panels, debates, projects and brain storming. The study then subsumes the stages of solving problems into the following:<sup>47</sup>

1. Identifying the problem
2. Interpreting the problem.
3. Listing the alternative choices.
4. Selecting the best solution.
5. Implementing the decision.
6. Evaluating the consequences.

In examining these steps the authors confess that PS as a means to promote thinking tells us little about how people actually go about solving problems. The emphasis is on the processes of solving problems rather than on the end products that can be achieved

through PS.<sup>48</sup> This idea is also noted by Sternberg, who argues that the steps enlisted above are key steps but they cannot guarantee to solve any given problem. Indeed, the author argues that "ill-structured problems are those that resist such specification of the steps to the solution. Well-structured problems, however, are those in which a set of steps leading to a solution can be explicitly and clearly laid out."<sup>49</sup> Based on this argument, it could be suggested that in order to get the maximum benefit from implementing PS approaches aimed at developing CTSs, teachers should behave as follows : They should view, or perhaps handle, PS as a means to encourage the students' thinking, rather than as a vehicle to arrive at a viable set of solutions. As PS is of special interest in the present thesis, viewing its approaches this way is particularly important if we recognize that many Sudanese 'problems' are ill-structured. Thus, emphasis should be put on training students' minds, rather than developing solutions. It could also be suggested that teachers should be given full training opportunities in using the approaches of PS. The suggested programmes should be focused on the shaping of the students' CTSs. It is also important that teachers should be trained in viewing PS as a means to an end for producing desired changes in students' behaviour. In this regard, we should emphasise the need for effective teacher-training to implement intended CTSs strategies in the classrooms. A similar call has been introduced currently by Costello, who argues that "in order to produce reflective critical pupils who are striving toward autonomy, it is necessary that teachers themselves should demonstrate these qualities." In his argument, the author suggests that "the role of educational theory within initial teacher training (and in-service)



courses is crucial in developing teachers who are both desirous and capable of promoting rational thinking in children."<sup>50</sup> This call is considered to be very important for Sudanese HE teachers who have never been trained in using CTSs methods in their teaching.

#### 1.3.4 Decision-Making

Decision-Making is considered to be one of the important methods of teaching CTSs in the HE classes. This method has sometimes been associated with PS approaches. Beyer has given special consideration to decision-making methods for developing thinking in the classroom. Taking into account that he views PS as a major complementary approach for teaching CTSs, the author considers decision-making as the ultimate goal or the integral part of the PS process. Nevertheless, in explaining decision-making as an individual approach for teaching CTSs, Beyer argues that:

In making a decision, students given two or more alternatives and a set of proposed conditions or criteria, state their choice of the best alternative under the proposed conditions or to meet the proposed criteria. CTSs are involved when students state the basis for their choice and explain how they see the selected item as the best choice. What happens is that students identify the characteristics of each alternative, and then identify those needed under the proposed conditions or to meet the criteria decided. Based on these characteristics, students select the best alternative which meets the requirements of the conditions or criteria. Consequently, students identify the reasons for their choices and the basis for choosing the best decision.<sup>51</sup>

Thus, according to this analysis, Beyer strongly advocates decision-making as an approach to teaching CTSs. Since the PS method of teaching CTSs has been chosen for use in the present study, this points to the integration of PS and decision-making as a means for teaching secondary HE students. This commendation is



based on the fact that, during my teaching experience it was observed that many of these students lacked adequate skills and dispositions for sound decision-making and responsible PS. This was of special concern because the conversation with students has shown that many of them did not plan to pursue any formal post-high-school education. The lack of these skills could have implications for the quality of their future homes and family lives. Indeed, as a result of these findings it was decided to pursue PS approaches for teaching CTSs in Sudanese HE classrooms.

### 1.3.5 Simulations

Simulations are techniques that have been given much consideration for teaching CTSs in HE. The purpose of using simulation is to enable HE students to confront situations and experiences before facing them in real life.<sup>52</sup> Simulation techniques are often associated with PS. Indeed, in some simulation activities, "students create their own problem situations that embody the principles they enact and analyse them to find out possible alternatives."<sup>53</sup> To explain the relationship between simulation and PS, Bogniard and her colleague reported the following: "the purposes for simulated activities are to allow a boy or a girl to act through situations before such situations must be faced in real life and to see the indirect and long-range consequences of choices made before the consequences must also be faced in real life."<sup>54</sup> This suggests that a simulation technique is simply an attempt to create life-like situations or incidents which permit students to apply theoretical analysis to these situations by placing and systematizing devised experiences in a realistic setting. In the same study it was found that simulation

encourages HE students to organise the sequences of the alternatives before they happen. It was also found that students' ability to understand and assess a problem was improved.<sup>55</sup> I think these findings can be applied in teaching CTSs in the Sudanese HE curriculum. The reason is that Sudanese people are overwhelmed with crises such as floods, famines and inflation which return from time to time. With simulated problems, many of these crises could be tackled imaginatively before they take place. Another impressive finding of this study was that simulation is very effective when incorporated in schools with limited resources.<sup>56</sup> This suggests that simulation can be another viable method of teaching CTSs in the Sudanese HE classes where teaching/learning materials are in short supply.

Before examining one type of simulation activities, a comment must be made about the embodiment of PS in simulation techniques. These techniques are used in the context of solving an anticipated problem. This suggests that the medium of PS permits problem solvers to take part in solving a problem prior to its confrontation. This in turn gives credit to the PS teaching approaches as they encourage precise educational orientation, namely a CT one. As a type of simulation activity, role playing has been tested and proven successful in teaching CTSs in HE classrooms. A study conducted by Johnson pointed out that "appropriate goals for role playing models of teaching will help the teacher to select role playing situations that stimulate learning."<sup>57</sup> The same argument is also shared with Hall and Paolucci who state that:

role playing is a technique in which the self is viewed as a totality of roles that an individual plays in his interpersonal contacts. To achieve good human relations, he must be able to understand his own roles and those of others and to respond appropriately to counterroles.



Role playing enables students to explore their thoughts and behavioural problems through interaction with others. It is directed toward self-integration, reduction of conflict and the development of insight about self and others.<sup>58</sup>

With regard to simulation as a means for future planning, Horn and East argue that HE education is charged "to involve everyone in future forecasting activities to compare the possible long-range of a variety of decisions and the choices that we might make today or within the next five to ten years."<sup>59</sup> It may sound confusing to propose how HE should approach the future. This is because many people might agree that knowledge of the past is important. However, these authors strongly recommend planning for the future or what could be called 'anticipatory thinking'. In contrast to this argument, Brown believes that future planning which is incorporated in the concept of simulated activities, is "irrational and ahistorical" The author argues that "futurism will only serve to reinforce existing trends and projections while ignoring important questions of meaning and value."<sup>60</sup> In her view, one cannot practise planning for the future of the profession while at the same time engaging in reflective, rational thought concerning fundamental beliefs, concepts or choices. Brown states that:

We must first resolve certain moral and ethical questions regarding the process of intervention, in whose lives we intend to intervene, and for what purpose, before we charge ahead toward programme and policy development. If we wish to further the development of society and families we must ask, toward what kind of society and what type of family systems? <sup>61</sup>

One objection to Brown's argument is that there are a number of possible future incidents that are largely built on past and present experiences. This does not necessarily imply that actions of the past or present will be transferred into the future; instead, it

indicates that the outcome of previous experiences can be used as a safeguard for building a secure future. For example, the consequences of the 1980s famine that had swept Sudanese people could be used as a means of protection from similar crises that could occur in the future. Therefore, we must learn from the lessons of history, and seek to comprehend the facts of current situations and the social realities of individuals and families. By doing so, we simply think ahead to maintain a safe way for the progress of the family in the future. This is because if HE applies itself merely to the social trends, or beliefs about what the future will inevitably be like, it will never be a family-centred subject. The point is that HE is in a unique position to help to shape and re-shape those trends and incidents, to help people to be creators of destiny, to be reactors rather than inert, and to be active rather than passive in confronting the inevitable problems. To accomplish this goal, the HE curriculum should engage students in a careful and reflective analysis of problems that will be inevitably encountered. This suggests that prediction which involves CT is an important element in planning the future of families and individuals.

### 1.3.6 Reasoning

Paul, a prominent American educationist who calls for CT-centred education, argues that reasoning is essential for teaching CTSs in classrooms. Indeed, the author recommends that "educators and teachers need to be sure that students receive a substantial amount of practice in reasoning so that they become skilled in weighing, recording and assessing contradictory points of view through a rational dialogue, discussion and debate."<sup>62</sup> In teaching



reasoning directly, Govier provided an approach known as 'discipline-specific logic and critical thinking'. In his opinion, critical teaching CTSs should be embedded in a specific subject. In his approach the author argues that:

Any teacher who is doing a decent job will teach students how to evaluate claims and arguments in whatever subject he or she is teaching. The criteria for evaluating statements and in fact, even arguments, are internal to the various special disciplines. When these disciplines are correctly taught, students will learn critical thinking as an inevitable product of that teaching. If they are not being well taught, so that students are incapable of appreciating and properly responding to arguments, then the solution is to have them taught more adequately, not to set up a special subject of thinking or critical thinking and teach that.<sup>63</sup>

### 1.3.7 Writing

Apart from improving spelling, punctuation, arranging words in grammatically acceptable ways and ordering sentence structure, writing is considered as an activity for developing thinking ability. Indeed, several educators have agreed with this idea. For example, Beyer views writing as a process rather than a single skill. He argues that writing which generates and expresses one's idea, in a clear, accurate, and understandable manner "involves synthesizing ideas, choosing evidence related to the ideas, sequencing the evidence in a reasonable order and explicitly stating perceived relationships among the evidence and/or between the evidence and a thesis or point we wish to make. Thus, writing is an act of thinking."<sup>64</sup>

According to Nickerson, writing is viewed "not only as a medium of thought but also as a vehicle for developing it. Hence, the major advantage of writing as a means of thinking is that it yields a

tangible product that can be evaluated."<sup>65</sup> Olson points out that "writing is a learning tool for heightening and refining thinking." He also proclaims that thinking and writing are examples of a "recursive process; one often has to go back to go forward."<sup>66</sup> The author then argues that using writing as a tool to foster thinking in classrooms requires all the levels of thinking skills in Bloom's Taxonomy, no matter what is the area or the purpose of writing. In adopting Bloom's Taxonomy, Olson developed a model of teaching designed primarily to help students to move from conception to completion via critical thinking. The model he proposed consists of the following seven parts:<sup>67</sup>

- a) Pre-writing- Pre-writing activities generate ideas for writing. These activities take a wide range of forms, e.g. class discussion, brain-storming, visualizing, free writing and so on. Pre-writing aims to stimulate the free flow of thoughts. Pre-writing usually precedes the introduction of a writing assignment and may set the stage for thinking and writing about a given topic without specifically addressing it.
- b) Pre-composition- Helping students to generate ideas for writing is often not enough to enable them to organize and express their thoughts. Pre-composition activities help students to focus on the specific requirements of the writing assignment as well as to formulate a writing plan.
- c) Writing- Writing is the stage in which thought is transformed into print. But more than that, it is an act of discovery. Often it is only as we write about what we think (and vice versa) that we grasp what we truly want to communicate. Pre-composition activities should be designed to facilitate and not to inhibit the growth of thought that occurs during writing. The goal of the first draft should be fluency and not refinement of ideas or expression.
- d) Sharing- To help students to review writing as a real means of communication, teachers should provide their students with opportunities to share writing, to give and receive feedback on work in progress. Sharing enables students to discover in what ways words affect other readers. Responses assist students in internalising the criteria for good writing.



- e) Revising- Revision is involved as thoughts are formulated, verbalized internally and organized. Once the writer has put pen to paper, generated a draft and received feedback, the revising stage allows time to reflect upon what has been written: to re-think, re-view and re-shape words and ideas. Using the skills used in sharing and responding, the student becomes his or her audience and assesses the quality of the written work to enhance communication.
- f) Editing- For some writers, editing is a process that happens when one composes. For others editing is proof-reading for minor errors in grammar, punctuation, spelling and so on. For students who have not acquired the conventions of written language, editing requires increased conscious attention to correctness.
- g) Evaluation- Although any revision is an act of self-evaluation, the evaluation stage of the writing process involves assessment of the final written product. The rating may come in the form of a letter grade, holistic score or analytic comment. The criteria upon which the writing will finally be judged should be clearly delineated and communicated early in the writing process.

As a conclusion to this study, Olson acknowledged that the model just described may not explain exactly the teaching process.

However, it provides teachers with:

a tool for talking about thinking and writing that enables students to perceive writing as something that can be crafted and that builds in time for thought and expression to evolve. This tool provides students with a ladder of activities that leads them to increasingly complex levels of thinking.<sup>68</sup>

Teaching through writing has been tested and has proven its practicality for teaching CTSS in HE classrooms. One of the fundamental objectives of a study conducted in this regard at Virginia State University, was to increase and improve writing skills of HE participants. The writing plan developed was utilized in diet therapy, meal management, principles and analysis of food, nutrition and consumer economics. An assignment on creative writing centred around classroom discussion was included in the study. In evaluating the assignment, it was found that the top students were those who



gave evidence and sufficient thought to the topic about which they were writing. It was also found that creative writing that focused on the students' discussion and students' own writing were highly encouraged by the teachers.<sup>69</sup>

In examining the commonly used activities in secondary HE classrooms in Lincoln, Nebraska, it was found that: among a total of 123 writing activities, the following have been identified as the ones that incorporated a CT input:

Writing analysis for projects; expressing own and other's opinions; self feelings; reactions about topics before and after discussing them; process of problem solving; reactions and feelings to new concepts to see the degree of relevancy or irrelevancy to known information. In addition, explaining questions that involves students' reflective and critical thinking, appreciation for readings and procedures, personal plan, and writing for expressing individual thoughts in the line of problem-solving and decision-making.<sup>70</sup>

This suggests that writing is a common device among many other CT activities. In other words, it seems that writing is a multiapproach that can be utilised to foster various CTs.

### 1.3.8 Reading

From reviews of the literature on teaching CTs, it appears that reading is generally considered as an important cognitive process. Lipman states: "We recognize reading and writing are fundamental to education, and we know that these skills should be utilizable within each and every discipline."<sup>71</sup> Indeed, it is also argued that reading is a:

collection of skills because it involves thought-making as well as thought getting. It is a process that consists of determining what the source says literally (translation), what its author means by what he he/she says (interpretation), and what the source means to the reader

(extrapolation, application, synthesis or evaluation). This complex processing of information and ideas in fact is thinking.<sup>72</sup>

The advocates of reading for developing thinking suggest that in teaching reading, teachers can provide instruction that helps students to develop CTSs. Beyer for example, identifies three areas in which teachers can introduce such a reading instruction. These areas are: when giving reading assignments, while students are doing their reading, and in a follow up discussion.<sup>73</sup> The author points out that teachers can also help students to improve their reading comprehension:

by alerting them to the vocabulary and organisation cues commonly used by texts, filmstrips, or oral presentation to call their attention to what the authors consider important, by helping students deal with unfamiliar or new technical terms that appear in teaching reading, and by helping students to develop specific purposes for reading.<sup>74</sup>

In offering this argument, Beyer asserts that reading instruction facilitates the learning of thinking skills as well. He reiterates that the most productive teaching guidance for developing CTSs through reading is the one "which helps students to distinguish carefully between what a source says literally, what the author of the source appears to mean, what the source means to the reader given what the reader already knows or wants to know about the content or subject of the course."<sup>75</sup>

Beyer also offers a strategy that can be used by teachers to help to develop the skills just stated, by having their students answer questions that require them to:<sup>76</sup>

- a) Employ the skills of translation [paraphrasing], of putting communications into other forms without changing the meaning.
- b) Reflect on the skills they have been using.



- c) Examine several pieces of information, even at just the literal level that can enhance their familiarity with this information before they move on to establish meaning.
- d) Determine what certain data mean, and classify and interpret data.
- e) Determine the reasons behind their responses to questions.
- f) Use their skills of analysis and synthesis.
- g) Determine relation of segment of data to a given ones.
- h) Develop a generalisation that explains or relates to the data.

To conclude his major argument, Beyer declares that the techniques mentioned above for developing thinking while teaching reading can be applicable to any classroom, regardless of the subject area of training. "The reading approach can also be applied while keeping focus on the content of the course."<sup>77</sup> This declaration is an open invitation for teachers to search for advanced reading strategies to foster CTSs in their students. This is particularly valid since we have noted earlier that reading cannot be divorced from any system of instruction. Indeed, Beyer's recommendation for teaching CTSs through reading impelled a critical review of what has been done about reading for developing thinking in HE classrooms. Consequently, it was found that in America, reading strategies have been developed and implemented successfully for teaching CTSs in HE. For example, in an experimental study carried out by Harbour it was found that:

Reading techniques can be used to teach HE basic skills effectively. Increased student participation, greater self-confidence, positive attitude toward reading, increased vocabulary, improvement in study skills, increased comprehension and improved organisational and question skills were observed in students after content reading techniques were integrated into home economics classrooms.<sup>78</sup>



Based on her experimental results, Harbour confirms that reading activities are very flexible and adaptable to all HE subjects and at all levels. She also indicates that reading as an approach for teaching CTSs can guide students to overcome difficulties.<sup>79</sup> Reading has been tried and validated as a medium for developing CTSs. Freire for instance endorses it for developing thinking. He urges all readers of his book, The Politics of Education, to be thinkers, advising them to "Be open to the world; be ready to think; each day be ready not to accept what is said; be predisposed to reread; each day investigate, question and doubt." The author then concludes "I think it is most necessary not to be sure, that is not to be overly sure of certainties."<sup>80</sup> One interpretation of Freire's view of reading as a method for teaching CTSs is that scepticism is the path-way to nurturing such skills. In the survey conducted in Nebraska cited earlier, the teachers were asked to describe the way they used reading in their classrooms. The responses were grouped according to the similarity of content. It was found that there was a total of 126 statements provided by 78 teachers that pertained to activities related to thinking. The activities identified for developing CTSs included reading for the following purposes:

Searching for relevant or irrelevant information for conducting projects; being prepared for discussion; getting main insights of different issues; understanding what and how others think; making decisions and understanding others' decisions. In addition, the activities included reading data from computer data products problems and reading about thinking to develop CTSs.<sup>81</sup>

This indicates that reading is an approach that strengthens other CTSs such as discussion, decision-making and PS. It also

suggests that in implementing critical reading activities, other CTSs will be enhanced.

### 1.3.9 Laboratory Work

As a teaching technique for developing CTSs laboratory work is highly valued by educators. It is usually associated with laboratories that are equipped with computers which motivate students to think deeply about ideas and which provide feedback. Those laboratories are referred to as the 'thinking labs'.<sup>82</sup> Viewing laboratory work this way, the teaching techniques employed in the thinking laboratories are defined as 'hi-tech'. It was argued that the group of hi-tech teaching methods is essentially designed to teach a "higher-order thinking skills (HOTS) [to teach] students to develop, articulate, test, and compare the results of different strategies in various situations."<sup>83</sup> This suggests that HOTS include the elements of thinking just stated. Pogrow and Buchanan indicated in their argument that there is only a fine line between the questioning and teaching techniques appropriate for providing higher-order thinking skills and those for learning basic skills. Nevertheless, the investigators classified the following teaching techniques for developing HOTS:<sup>84</sup>

- a) The use of drama to heighten interest, curiosity and thinking sessions before and sometimes after students use the computers.
- b) Teachers step back from the role of judge and expert and help students examine the consequences of their ideas.
- c) Asking questions about the sophisticated concepts being illustrated by computers, rather than about the mechanics of using the technology.

Although HE professionals have been working with computers for several years, it seems that the widespread adoption of computers



as a means for teaching has not yet been achieved. In this regard, Kliver and Kedall state that: "Home economics teachers have been told that they need to use computers in their classrooms, but few have considered using them with their students."<sup>85</sup> In criticising the lack of computer use in teaching HE, the authors have commented that "while home economists are becoming computer literate, most are still not sure when it comes to actually using the computer in their classrooms."<sup>86</sup> Although at the present time this position is probably changed, Wesswick advances a major argument in favour of the lack of computer involvement in teaching HE. As computers are currently entrusted with teaching CTSS, the author states that "now the microcomputers offer new challenges." She emphasises that "home economists will choose those functions of the microcomputers most appropriate to their individual purposes. Home economics educators need to decide what information should be stored, accessed and then deleted in all areas of home economics."<sup>87</sup> The author argues the need for computers, for the "vast storage capacity of microcomputers and the easy access to that information will make the management task of home economics educators easier." Wesswick confirms that home economists are ambitious and "are likely to see themselves grow in creativity as they discover and develop applications in their own areas of interest."<sup>88</sup>

In discussing the possibility of introducing computers for developing CTSS and other learning skills into HE classrooms, Wesswick argues that computers have largely been associated with statistics, accounting and business procedures, mathematical calculations and analysis of research data. Nevertheless, "it is also possible to use them for drill and tutorial purposes, problem-solving,



simulation and testing."<sup>89</sup> In conclusion, the author offers two arguments. The first one is that HE educators "need to be willing to seek out and evaluate new frontiers in the search for knowledge including the use of microcomputers."<sup>90</sup> The second argument is concerned with the relationship between the current lack of computer approaches for teaching HE and the future needs for the advancement of computer instruction. In this regard, the author repeats that "the electronic age is challenging home economics educators to decide how, when, where and why the computer, especially the microcomputer fits into their professional life."<sup>91</sup>

In examining the arguments provided regarding the approaches of laboratory work, it could be concluded that these arguments suggest that the idea of teaching CTSs through the use of computers has not been fully developed in the HE classroom compared to other approaches. It appears that this is thought to be due to teachers' lack of skill and knowledge of how to use computers to teach CTSs. It could also be attributed to the lack of consensus attitudes of HE educators toward the use of computers. Notwithstanding this, some optimistic educators such as Wesswick are both desirous and ambitious to develop computer approaches for teaching CTSs in HE.

#### 1.3.10. Informal Debates

Rossmann argues for informal debates as means for enhancing learning, particularly the learning of CTSs in secondary HE classroom. She distinguishes informal from formal debates by stating that in the former, "emphasis is on partner cooperation rather than competition."<sup>92</sup> The author describes the technique she proposes in her study as being easily adopted to all HE areas and suitable for

incorporation into classroom uses for all ages. Indeed, "the technique calls for a list of debatable issues with two students assigned for each. The issues which are the most successful are written in the positive form and clearly have two sides, such as 'All beverages should be marketed in returnable-for-deposit bottles'."<sup>93</sup> In carrying out informal debates about this issue, the author offers the following directions for the technique:<sup>94</sup>

- a) The teacher assigns partners, gives them issues and identifies which partner is number one and which is number two.
- b) The partners are given a short time (5-10 minutes) to help each other examine the issue and to prepare a given number of arguments for each side of the issue. Some topics may require more time to prepare answers, but in general, the technique is not intended to be a research project.
- c) A brief presentation is given to the entire class with partner number one speaking 1 to 2 minutes for the issue and partner number two speaking for a similar amount of time against it.

In examining this approach, we observe that informal debates focus on exchanging view points and ideas that support the issue on one hand and oppose it on the other hand. This process encourages students to generate their own ideas and to be open in appreciating other people's thoughts.

Based on the results of her study, Rossmann lists the advantages of informal debates in a way which describes the process of thinking involved to include the following:

The technique encourages students to learn cooperatively. The thought process of examining both sides of a particular issue is transferable to other settings, and many results in better future decisions for the individuals involved. The important topics in an area are presented in an interesting manner involving the students in their own learning. Students are given valuable experience in verbal expression without the

pressure of a formal report or the fear of failure. Everyone in the class speaks, if only briefly, giving the teacher an opportunity to hear from each student. The timing for use of the informal debate is flexible. It may be used as a pre-session device to determine student's knowledge level, or as a post-test. Evaluation could be based on the quality and the quantity of the arguments as well as the oral presentation. The entire class could contribute additional considerations for each issue. The listeners could also analyse the arguments to determine whether each is of equal importance or whether some are of overriding importance.<sup>95</sup>

Rossmann also indicates the disadvantage of informal debates as "the students' uncertainty of how to begin." To overcome this obstacle she argues that "the teacher could give an example of an issue and illustrate two sides of the topic, to assist students in getting started."<sup>96</sup> It is also suggested that the teacher could present the following topic. 'Persons should be encouraged to purchase enough clothes to reduce the need for frequent laundering'. Argument 1 in favour would be: "Water may be a scarce resource and should be conserved by washing full machine load". Argument 2 against would be: "Clothes are made of scarce resources, too, and we should use as few as possible."<sup>97</sup>

Hall and Paolucci also argue that: "debate is an effective technique for teaching students to think critically. They learn to admit when their evidence is only a probability. They learn to expose the fallacies in the thinking of members on the opposing team."<sup>98</sup> This argument in particular suggests that in teaching CTSs through debates, the aim is to teach students 'how' to think rather than 'what' to think. The point is obviously to communicate with students the desire to think critically.



### 1.3.11. Teaching for Transfer

Teaching for transfer has also been emphasised for developing CTSs in the HE context. This emphasis is based on the philosophy of this subject to understand the relationships and various community forces between and among family members. Also, to integrate learning process within the family and community.<sup>99</sup> Perkins and Salomon currently argue that transfer is demonstrated when "something learned in one context has helped in another. Transfer goes beyond ordinary learning in that the skill of knowledge in question has to travel to a new context"<sup>100</sup> In their argument, the authors report that: "transfer plays a key role in an aspiration of education that lately has attained great prominence, the teaching of critical thinking skills."<sup>101</sup> The authors then describe a process of teaching for transfer that can be pursued by "designing instruction to meet the conditions needed to foster transfer, perhaps we can achieve it."<sup>102</sup> They reported that: "in broad terms one might speak of two techniques for teaching transfer, 'hugging' and 'bridging'."<sup>103</sup> In explaining the meaning of these terms, Perkins and Salomon state that: 'Hugging' means teaching so as to meet the resemblance conditions for low road transfer."<sup>104</sup> The example provided in this regard is that: "Teachers who would like the students to use their knowledge of biology in thinking about current ecological problems might include that knowledge in the first place in the context of such problems."<sup>105</sup> On the other hand, the authors explained that 'bridging' means teaching so as to better meet the conditions of developing the skills of transfer rather than expecting students to achieve them spontaneously, one mediates the needed processes of abstraction and connection making."<sup>106</sup>

The message with regard to teaching for transfer is twofold. Firstly, the aim that any educational curriculum hopes to achieve discloses that transfer is integral to the expectations and aspiration for that curriculum. This concept of transfer plays a central role in an aspiration that has currently attained great prominence, the teaching of CTSs. Secondly, by teaching CTSs via transfer approaches students would improve such skills in many contexts that involve thoughtful input. Teaching for transfer in HE is particularly important since this subject is entrusted with serving individuals, families and communities outside the school.

#### 1.4 Summary

Based on the literature reviewed on the definition of CTSs, it has been found that there is no single universally accepted definition of this term. The definition varies according to the subject it represents. In HE, however, CT is defined as the ability to solve problems and the CTSs are those skills which are involved in PS.

The current global movement of CT education, mainly in America, aims to incorporate the teaching of CTSs as a formal part in formal systems of education. The reason behind such an endeavour is basically the lack of CTSs among students. Indeed, American educators have confirmed that most often teaching for developing thinking is being done irregularly, unsystematically and without sufficient personal or material resources. Thus, pioneers of CT education have been involved in heavy research and investigation to provide means of improving teaching practices to nurture CTSs. Fortunately, these central ideas have become part of the HE education. Indeed, HE educators are convinced that teaching to think

critically and act in better ways involve more than loading students with new facts, ideas or techniques. It demands giving up the familiar, traditional and comfortable ways of approaching ideas and clarifying meanings. Educators have decided that teaching HE should involve students in developing skills such as PS and decision-making to help them to shape and gain control over their lives. Consequently, approaches for teaching CTSs have been developed and implemented in teaching HE. The methods reviewed in this chapter emphasise that although each method stands for itself, when it comes to teaching in the classroom, the methods are inter dependent and complementary to each other. This is very clear with questioning and PS as well as with decision-making and PS. The methods discussed indicate that in many cases the approach to teaching CTSs in HE is addressed through solving a specific problem. This suggests that PS is a lively medium for teaching CTSs in the context of HE.

Based on the findings of the literature reviewed on the methods of teaching CTSs in HE, the arguments and discussion provided indicate that these skills are teachable. The different methods reviewed revealed a degree of consistency which is remarkable and applicable in teaching CTSs in the Sudanese secondary HE curriculum.



## References

1. Ennis, R. 'Rational Thinking and Educational Practices' in Robinson, W. 'What is Critical Thinking', Curriculum, Vol. 10, No. 2, 1989, pp. 87-93.
2. Beyer, B. 'Improving Thinking Skills: Defining the Problem', Phi Delta Kappan March 1984, pp. 22-24.
3. Paul, R. 'Critical Thinking: Fundamental to Education for a Free Society', Educational Leadership Vol. 42, No. 1, ASCD, Sept 1984, pp. 4-14.
4. Brown, M. and Paolucci, B. Home Economics: A Definition, Washington D.C., American Home Economics Association, 1979, p. 4.
5. Hall, O. and Paolucci, B. Teaching Home Economics, John Wiley & Sons, 1970, p. 200.
6. Ibid., pp. 200-202.
7. Blair, J. Dialectical Thinking: Richard Paul's New Criteria, A Paper Delivered at the Second International Conference on Critical Thinking and Educational Reform, Sonoma State University, California, July 1984, p. 2.
8. Paul, R. op.cit., Sept 1984, p. 5.
9. Ibid.
10. Robinson, W. 'What is Critical Thinking?', Curriculum, Vol. 10, No. 2, 1989, pp. 87-93.
11. Ibid. p. 87.
12. Ibid., p. 90.
13. Sternberg, R. 'Teaching Critical Thinking Part 1: Are We Making Critical Mistakes?', Phi Delta Kappan Vol. 2, 1985, pp. 194-198.
14. McTighe, J. and Clemson, R. 'Making Connections: Toward a Unifying Instructional Framework', In Costa, A. Developing Minds: A Resource Book for Teaching Thinking, Vol. 1, ASCD, pp. 304-311.
15. Robinson, W. op.cit., p. 89.
16. McTighe, J. and Clemson, R. op.cit., p. 305.

17. Munro, G. and Slater, A. 'The Know How of Teaching Critical Thinking', Social Education, April 1984, pp. 284-292.
18. Ibid. p. 292.
19. Paul, R. op.cit., Sept 1984. p. 5.
20. Copa, F. Hultgren, F and Wilkosz, J. 'Critical Thinking as a Lived Activity' In Costa, A. Developing Minds: A Resource Book for Teaching Thinking, Vol. 1, ASCD, 1991, pp. 188-192.
21. McTighe, J and Clemson, R. op.cit., p. 305.
22. Ibid., p. 306.
23. Grubb, B. 'Activities Can Surprise and Motivate', Illinois Teacher, XXV111, Jan/Feb 1984, pp. 135-137.
24. Rielly, K. 'Teaching Critical Thinking in High School US History', Social Education, No. 49, April 1985, pp. 281-284.
25. DeYoung, R. and Glenn, M. 'Developing Critical Thinkers Through the Art of Questioning', Journal of Business Education, Vol. 4, No. 51, Oct 1981, pp. 17-19.
26. Ibid.
27. Ibid.
28. Ibid., p. 19.
29. Gall, M. 'The Use of Questions in Teaching', Review of Educational Research, Vol. 40, No. 5, pp. 707-720.
30. Sigel, I. 'A Constructivist Perspective for Teaching Thinking', Educational Leadership, No. 42, Nov 1984, pp. 18-21.
31. Ibid., p. 19.
32. Hall, O. and Paolucci, B. op.cit., p. 203.
33. Dewald-Link, M. and Wallace, S. 'Help Students Face Tomorrow: Use Problem Solving Approaches in Your Classroom Today', Clearing House, Jan 1983, p. 216.
34. Costello, P. 'When Reason Sleeps: Arguments for the Introduction of Philosophy into Primary Schools', Irish Educational Studies, Vol. 8, No. 1, 1989, pp. 146-159.
35. Hall, O. and Paolucci, B. op.cit., p. 222.

36. Ibid., pp. 222-223.
37. Ibid., p. 223.
38. Raths, L. , Anold, R. and Wasserman, S. Teaching for Thinking-Theory and Application, Columbus, Ohio, Charles E. Merrill Books, 1979.
39. Paul, R , Binker, A., Jensen, K, and Krelau, Critical Thinking Handbook: 4th-6th Grades. A Guide for Remodelling Lesson Plans in Language Arts, Social Studies and Science, Rohnet Park, Sonoma State University, 1990, p. 5.
40. McPeck, J. Critical Thinking and Education. Oxford, Martin Robertson & Company, 1981.
41. Ibid., p. 10.
42. Copa, P., Hultgren, F. and Wilkosz, J., op cit., p. 188.
43. Ibid., p. 190.
44. Ibid., p. 191.
45. Ibid.
46. Dewald-Link, M. and Wallace, S., op.cit., p. 215.
47. Ibid., pp. 215-216.
48. Ibid., p. 216.
49. Sternberg, R., op.cit., p. 196.
50. Costello, P. Theory, Teacher Education and Thought Control, pp. 166-180 in Teacher Education in the Nineties: Towards a New Coherence, Vol. 1, Edited by: John Coolahan, Papers from the Annual Conference of the Association for Teacher Education in Europe (ATEE), Mary Immaculate College of education, Limerick, Ireland, 1990.
51. Beyer, B. Teaching Thinking in Social Studies, Columbus, Ohio, Bell and Howell, 1979.
52. Bogniard, J. and Dalrymple, J. 'The Use of Simulation Techniques', Journal of Home Economics, Vol. 62, No. 10, Dec 1979, pp. 729-732.
53. Ibid., p. 730.
54. Ibid.



55. Ibid., p. 731.
56. Ibid.
57. Johnson, J. 'Role Playing: Using Scenarios to Teach the Interrelationship of Work and the Family', Illinois Teacher, Vol. XXV111, March/April 1985, pp. 151-153.
58. Hall, O. and Paolucci, B. op.cit. p. 227.
59. Horn, M. and East, M. 'Hindsight and Foresight: Basis for Choice', Journal of Home Economics, Vol. 74, No. 7, Winter 1982, pp. 10-17.
60. Brown, M. , 'Point and Counterpoint: Response to Hindsight and Foresight: Basis for Choice', Journal of Home Economics, Vol. 75, No. 1, 1983, pp. 48-59.
61. Ibid., p. 58.
62. Paul, R. 'Critical Thinking: Fundamental to Education for a Free Society', Educational Leadership, Vol. 42, No. 3, Sept 1984, pp. 4-14.
63. Govier, T. 'Ways of Teaching Reasoning Directly', pp. 30-38, Critical Thinking, Proceedings of the First British Conference on Informal Logic and Critical Thinking, Edited by: Fisher, A., University of East Anglia, 1988.
64. Beyer, B., op.cit., 1979, p. 243.
65. Nickerson, R. 'Kinds of Thinking Taught in Current Programmes', Educational Leadership, Vol. 42, No. 8, May 1985, pp. 40-45.
66. Olson, C. 'Fostering Critical Thinking Skills Through Writing', Educational Leadership, Vol. 42, No. 7, Nov 1984, pp. 28-38.
67. Ibid., pp. 33-34.
68. Ibid., p. 34.
69. Bannister, D. and Mayo, C. 'Learning Through Writing in Home Economics Classes', Illinois Teacher , Vol. XXV11, No. 5, May/June 1984, pp. 187-188.
70. Shommo, M. Developing Thinking Skills in the Secondary Home Economics Classroom, M.Sc. Thesis, University of Nebraska, Lincoln, 1986, p. 102.

71. Lipman, M. Philosophy Goes to Schools, Temple University Press, 1988, p. 143.
72. Beyer, B. op.cit., p. 243.
73. Ibid., p. 244.
74. Ibid.
75. Ibid., 245.
76. Ibid.
77. Ibid., p. 246. .
78. Harbour, M. 'Back to Basics: Teaching Reading in Home Economics', Illinois Teacher, Vol. XXV111, No. 2, Nov/Dec 1984, pp. 56-57.
79. Ibid., p. 56.
80. Freire, P. The Politics of Education, Macmillian, London, 1985, p. 181. in Harbour, C. 'Education for Consciousness in African Social Studies', International Journal of Education Development, Vol. 10, No. 1, 1990, pp. 27-36.
81. Shommo, M. op.cit., p. 101.
82. Pogrow, S. and Buchanan, B. 'Higher-Order Thinking for Compensatory Students', Educational Leadership, Vol. 43, Sept 1985, pp. 40-43.
83. Ibid., p. 42.
84. Ibid.
85. Kluver, K. and Kendall, E. 'Integrating Microcomputers into Youth Group Activities', Illinois Teacher, Vol. XXV111, No. 1, Sept Oct 1984, pp. 18-19.
86. Ibid. p. 18.
87. Wesswick, L. 'Coping with Microcomputers-Byte by Byte', Illinois Teacher, Vol. XXX111, No. 1, Sept Oct 1984, pp. 17-18.
88. Ibid., p. 18.
89. Ibid.
90. Ibid.

91. Ibid.
92. Rossmann, M. 'Enhancing Learning in the Classroom: Using Informal Debates', Illinois Teacher, Vol. 26, No. 1, Sept Oct 1982, pp. 23-24.
93. Ibid., p. 23.
94. Ibid.
95. Ibid.
96. Ibid.
97. Ibid.
98. Hall, O and Paolucci, B. op.cit., 1970, p. 203.
99. Ibid., p. 41.
100. Perkins, D. and Salomon, G. 'Teaching for Transfer', in Costa, A. Developing Minds: Vol. 1 A Source Book for Teaching Thinking, pp. 215-223, ASCD, 1991.
101. Ibid., p. 216.
102. Ibid., p. 220.
103. Ibid.
104. Ibid.
105. Ibid.
106. Ibid.



## Chapter Two Educational Development In The Sudan

The purpose of this chapter is to give an outline picture of the Sudanese educational development alongside the development of home economics education. The chapter briefly examines Sudanese traditional education, its nature and purpose. It describes the development of the formal system of education in the Sudan in the colonial period (1889-1956), with particular emphasis on the obstacles experienced by the colonial administration regarding its educational policy. An account of the historical pattern of educational development in the post-independence period (1956-1969) and the modern period of the May Revolution (1969-1985) is also presented.

The chapter also comments briefly on the eras of the Transitional Government and the April Revolution. However, these were short and saw little activity in the field of educational development. Finally, the current educational efforts proposed by the National Salvation Revolution will be discussed. An account of HE educational development is given. We begin, however, with brief background information about the Sudan.

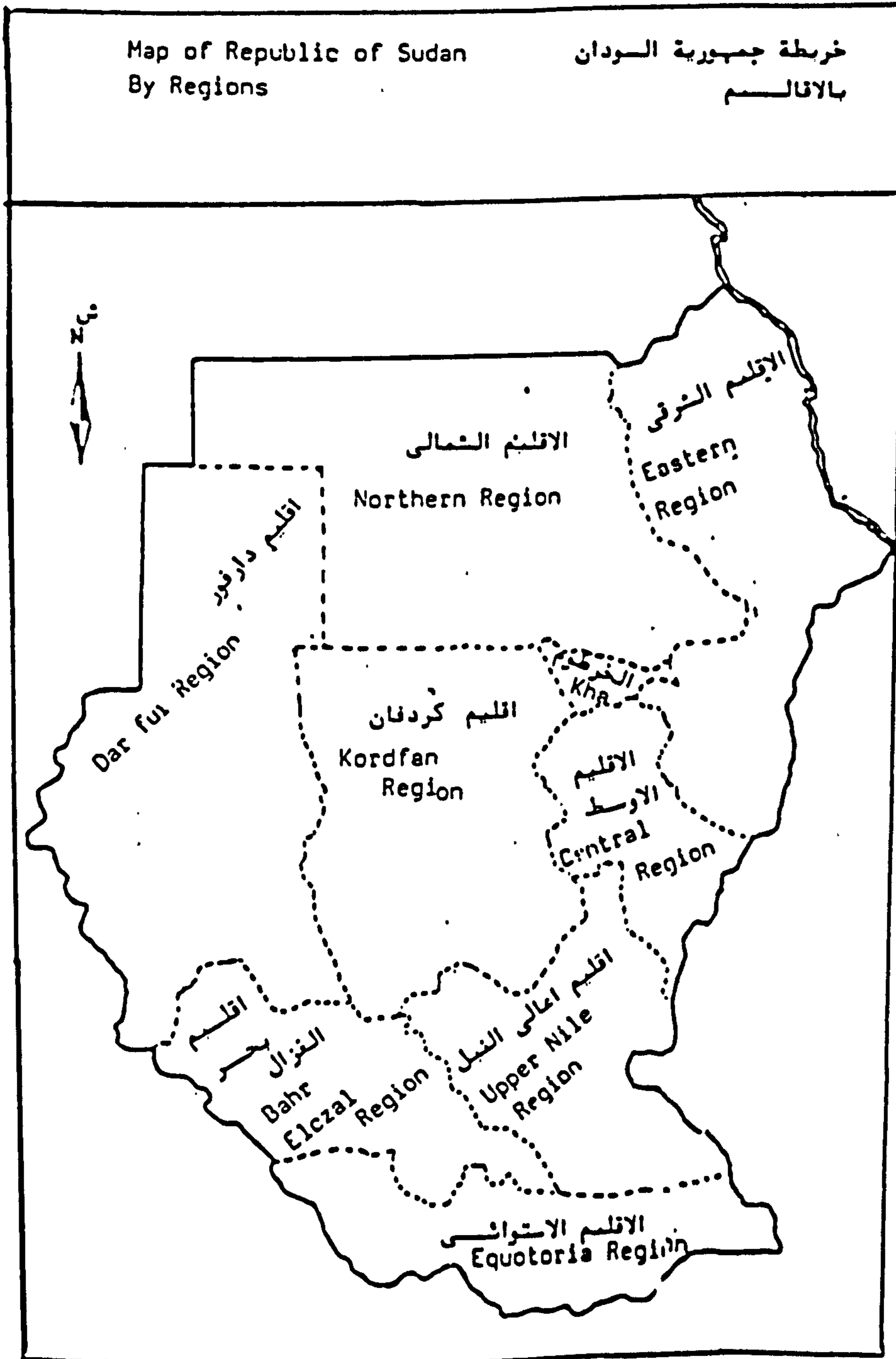
### 2.1 A Brief Note About the Sudan

The Sudan is the biggest country in the African continent, with an area of approximately 2.5 million square kilometres (approximately one million square miles). Consequently, Sudan is known among the African

and the Middle Eastern countries as 'the Land of the Million Miles.'<sup>1</sup>

Politically, the country is divided into two main regions, namely the northern, which consists of six States and the southern, which includes three States (fig. 2.1). Khartoum State constitutes the national capital and it consists of three cities, namely Khartoum, Khartoum North (Bahri) and Omdurman. The nine States are administered federally. In general, each region possesses its own system of education. In this thesis, reference will most frequently be made to the northern region.

Figure 1.1 : Map of Sudan



This map has been taken from: The Ministry of Education.  
Educational Statistics: Academic Year 1989/1990; Educational  
Planning - Section of Educational Statistics,  
Khartoum, April/1992, P.1.



The figures released by the National Statistics Department show that in the 1990 census, the population of the Sudan was 26 million.<sup>2</sup> The Sudan is therefore the least densely populated country in a continent noted for being sparsely populated. The distribution of the population is very uneven, with a very high population concentration in the area around the banks of the Nile. While the government has sought to implement a development policy that gives favourable treatment to underdeveloped regions, this plan has not been entirely successful. The already developed areas around the Nile continue to grow at a faster rate, both economically and educationally.<sup>3</sup>

The Sudan is an agricultural country with cotton as the main cash crop, and the basis of the Sudanese economy. Other plant resources such as gum Arabic, wheat, cereals and fruits also contribute to the national income. Animal resources, mainly cows and camels, constitute another part of the economy. The country is potentially rich in agriculture with cultivable land of nearly 200 million acres.<sup>4</sup> As agriculture depends to a great extent on rainfall, and there is a severe shortage of reservoirs, the weather constitutes the major limiting factor to the stability of the economy. Indeed, this is why, currently, the country is suffering from a disastrous shortage of food due to the 1990 famous drought. The discovery of oil is now being perceived as a possible solution to Sudan's economic problems. Recently,

light industry has been introduced by the government as well as by the private sector.

Regarding the administrative organisation of education in the Sudan, the Ministry of Education, which was established before independence in 1953, represents the highest educational authority in the country.

## 2.2 Traditional Education

Traditional education in the Sudan started hand in hand with the establishment of Sudanese society,<sup>5</sup> and the traditional roots of Sudanese education have been reflected in the process of educational development. Therefore, any discussion of Sudanese educational development would not be complete or meaningful without an adequate understanding of the structure of traditional education. Indeed, forms of traditional education in the Sudan were numerous and they varied from one area to another. Consequently, the aims of traditional education were also varied. Nevertheless, there was a major aim on which all systems were agreed. This aim was focused on the foundation of social and religious values.<sup>6</sup> The idea was to create a cohesive and stable society by fostering and preserving the values and history of the people. In this context, social and religious values constituted the common ground for all forms of education in the country. Thus, traditional education played a major role in maintaining the balance of Sudanese traditional society.

The curriculum of education at that time was completely informal. It involved people adapting themselves to cope with particular circumstance which faced their local communities and to comprehend the nature of their social structure.<sup>7</sup> The accomplishment of this task in turn, required a proper understanding of religious legislation, laws, beliefs, taboos and traditions inherited from previous generations. The ultimate goal of this type of education was the production of a Sudanese citizen who was honest, respectful, obedient, co-operative, sincere and who was proud of his/her society and cultural inheritance. Traditional education could be divided into two main types namely, religious and secular.

Religious education took place in a 'Khalwa' (a religious school) and at home where the Koran was taught. The core of the curriculum was based on fostering Islamic values such as good manners and behaviour; obedience, particularly towards elders; sincerity towards people and State; hospitality towards neighbours and friends; sympathy; dignity; honesty; solidarity and co-operation.<sup>8</sup> On the other hand, secular education in its traditional forms covered many areas which differed from one place to another. It was established prior to religious education, which began to strengthen with the settlement of Arabs in the country in the sixteenth century.<sup>9</sup> The theme of secular education included the training of children in the field to become skilled in agriculture, and



developing their knowledge of history, geography, science and politics.

Traditional education, however, tended to constrain the opportunities for girls. Almost all of the above-mentioned forms of education were open to boys, while girls were offered little freedom to choose what to learn. Indeed, girls were to be educated at home by their mothers and grandmothers in the skills of cooking, cleaning the home, washing clothes and dishes, bringing water, knitting, crafts, and pottery making and taking care of younger sisters and brothers.<sup>10</sup> The limitation of girls' education to domestic skills was attributed to the common belief among the Sudanese that home would be the natural place for girls in the future. Thus, women had to be equipped and familiarised with the skills of home life. It is interesting to note that processing skills in domestic matters was the most important criterion by which a man would choose a bride, because it was believed that a wife skilled in domestic affairs could guarantee the provision of a calm and enjoyable life for her family.

Subsequently, it could be debated that secular education in the Sudan was primarily vocational. To a large extent, it was a process of instruction that prepared young people to work in specific vocations. The traditional system indicated that a generally recognised fundamental aim of education was to prepare each generation for a productive life.<sup>11</sup> This indicates that

the forms of traditional education experienced in the Sudan were chosen and organised according to the needs of people.

### 2.3 Educational Development in the Colonial Period: 1898-1956

When the Sudan was defeated by the British forces in 1898, the Egyptian government claimed that the occupied region belonged technically to the Khedive of Egypt.<sup>23</sup> This conflict was solved by Lord Cromer, the British representative in Egypt, who proposed a joint government between Egypt and Britain known as the 'Condominium Agreement'.<sup>11</sup>

With the settlement of Arab Muslims, particularly Egyptians, in the Sudan, traditional education entered another stage of development. The type of education established at the time of reconquest was similar to that developed in Egypt, Hijaz and Northern Africa. Education was basically traditional, focusing on two major themes. The first was the emphasis on religious education, the study of the Koran. The second was 'Suffism', an Islamic system of mysticism which was brought to the Sudan by Arabs.<sup>13</sup>

As soon as they established their colony in the country, the British administrators showed an immediate interest in education, which became a vital instrument in maintaining a stable administration. Consequently, elementary education was established in the Sudan for the first time. The age of entry to the lowest school grade

was 7 years; and the first educational ladder established in the country was .4 years for each primary, intermediate and secondary schools.

To expand the condominium education in the Sudan, the idea of establishing a college in memory of General Gordon was initiated by Lord Kitchener in 1898. In 1902 the College was formally opened.<sup>14</sup> It was an educational centre around which the Sudanese educational system of the condominium rule evolved. Gradually, the Memorial College was expanded to form the University College of Khartoum in 1945, which finally became the University of Khartoum in 1956.<sup>15</sup>

With regard to the curricula, the colonial educational authority based its philosophy on borrowed British ideas, without giving consideration to the local needs or conditions.<sup>16</sup> Thus, Sudanese curricula at that time were quite similar to those in Britain. In the view of the colonizers, this approach to curriculum design would create a link between the local system and the English one.<sup>17</sup> The result of this policy was the transmission of British concepts and values to Sudanese children. However, the origin of such values and concepts was an urban industrial society, whilst Sudanese children were living in a predominantly rural agricultural society. This practice created a conflict between what children learned in schools and what they faced in real life.<sup>18</sup> An issue particularly worthy of note is the colonial system of examinations. In that system, exams



were used as filters to select the best percentage of students.<sup>19</sup> This indicates that the examination system was entirely competitive, similar to the old British grammar school entry. The Sudanese examinations focused on formal lessons and recitation. This particular trend has had a significant impact on the Sudanese system of examination which continues to focus on memorisation rather than on thinking and reflection.

The colonial educational authority strongly criticised the rote-learning offered by Khalwa education which trained children in the recitation of the Koran and obedience to their elders and teachers. The administrators based this criticism on their belief that, in the context of rote-learning, children's insights were limited. It was also reported that early training in obedience adversely affects intellectual development, especially the ability to solve new problems.<sup>20</sup> Nevertheless, it could be argued that colonial education made no attempt to foster an alternative to rote-learning. Indeed, the foreign educational policy experienced in the Sudan was merely an instruction prescribed by the administrators to satisfy their own desires.

In short, colonial policy not only failed to provide Sudanese people with a pertinent system of education, but was not intended to do so. Accordingly, Sudanese people feared that their beliefs, values and traditions were endangered, threatening the destruction of their whole

society. They resisted heavily any interference in their traditions and customs. Out of this awareness stemmed the demand for an educational system which contained elements of pure Sudanese culture. This finally led to the formation of a nationalistic revolutionary movement known as the 'Independent Revolution' which overthrew colonialism.<sup>21</sup> It should be emphasised that since then, Sudanese educational institutions have become a cultural arena in which political struggles take place.

#### 2.4 Educational Development in the Post-independence Period 1956-1969

When the Sudan achieved its independence in 1956, the leaders decided immediately that the educational system inherited from the British was inappropriate for the Sudanese. To nationalise the existing curricula in order to satisfy the needs of the Sudanese people, a re-evaluation of the whole system was undertaken. The new educational leaders launched a campaign against colonial elitism and the inappropriate system of education in the country.<sup>22</sup> They called for nationalism as a political ideology. The motto of this movement was cultural and social integration, implemented through the policy of centralization of power structures. To attain this goal, a new policy of Islamisation and Arabisation was proposed and implemented.<sup>23</sup> In this context education was organised to become a vehicle to enhance the concept of nationalism.

The idea behind renewing the system was to provide a form of education concerned with Sudanese ambition and intrinsic issues. In 1958, the Sudan government began to reform education by proposing a new experimental plan aiming at the production of a uniform formal system of education.<sup>24</sup> To conduct this experiment, the Ministry of Education appointed an Educational Planning Committee consisting of 11 Sudanese educationists.<sup>25</sup> The Committee was headed by a UNESCO expert, Matta Akrawi, and was known as the 'Akrawi Committee'.<sup>26</sup> The aim of establishing this Committee was to survey and evaluate the existing educational structure in order to develop a more practical one. As a result of this survey, the Committee of Educational Planning was created.<sup>27</sup> Based on the findings of its survey, the Akrawi Committee reported to the Ministry of Education a proposal for a five-year plan. This included expansion in educational services and the transition from the educational system created by the colonial administration to the proposed one.

To implement the proposed plan submitted by the Akrawi Committee, the Ministry of Education appointed another international expert in educational planning, Kazim of UNESCO, to revise this proposal.<sup>28</sup> As a result of his revision, another plan based on modern educational practices emerged. The new plan emphasised the need for new generations to be good and productive citizens, who could combine knowledge with good character and who would work for the development and unity of their country.



Many educational aims in the post-independent period were also drawn from the Addis Ababa Conference that was held in Ethiopia in 1961.<sup>29</sup> At this conference all the African Ministers took stock of educational development perspectives. The impression created in the Sudan as a result of the conference was that school-based vocational and technical education would lead to the economic independence of the country.<sup>30</sup> Thus, the educational plan turned to the vocationalization of the secondary school curriculum as a prelude to industrialisation. It was also stated in the educational plan that, as education is a major factor in economic development, universal primary education was to be achieved by 1980.<sup>31</sup>

As indicated earlier in this section, the post-independence educational policy was directed towards the achievement of nationalization. Nevertheless, the new educational system involved only the modification and adaptation of the colonial system that was in existence. For example, in 1962, the Minister of Education approved the establishment of a new educational ladder based on the structure of the grammar schools of Sudan's post colonial power, the United Kingdom.<sup>32</sup> This suggested that the post-independence educational strategy introduced minor changes into the existing system rather than radical reforms. This was also evidenced by the attempt to establish further links with the British educational system through continuous consultation and the importation of foreign educational practices.

Unfortunately, this situation perpetuated the inherited paradox which characterised the Sudanese educational system and laid the basis for continuing conflicts within the structure of Sudanese education. In short, after independence, the curriculum and the school practices of elite education continued to be the basis for educational development. The educational ladder remained 4 years for each primary, intermediate and secondary schools.

### 2.5 Educational Development in the Sudan During the May Revolution Period 1969-1985

In 1969, a new military government known as the May Revolution came to power in the Sudan. This government considered that human resources were the basic elements in the social and economical development of a socialist Sudan. Thus, education was perceived as the foundation for the Revolution which would change the social, economic, and political structure of the country. This perception implied that the concept of education had never previously been critically examined in relation to the demand for economic or social development before the May Revolution. Based on this ideology, calls were made to indigenise curricula; to make them more appropriate to national needs; to update old content; and to use education as a means for accelerating modernisation and development gained momentum.<sup>33</sup> The outcome of this ideology was that a National Commission on Education was established in 1969 and in the early 1970s a Comprehensive Education Sector Review was launched.<sup>34</sup>

Also, several committees were appointed to study the problems of technical manpower and higher education. Guided by the proposals of these bodies, the government declared an educational revolution known as the 'New Educational Plan' (NEP). In this plan the government dismissed all the attempts that had been made prior to the May Revolution, as they were perceived to be irrelevant and unsatisfactory. In his famous speech on the development of education, Dr. Mohi El Din Sabre, the Minister of Education, announced that :

The concept of public education in the Sudan has remained essentially irrelevant since the beginning of this century as far as structure, content and aims are concerned. Hitherto, the changes that have taken place have been trivial and formal rather than fundamental, and have always lagged behind the social movement of the Sudan. Education for instance, expanded quantitatively, but reflected the same old ideas, programmes and aims.<sup>35</sup>

The Minister also announced that the first step of the Revolution had to be an education which would rejuvenate Sudanese society as a socialist society. He indicated that by revolutionizing the educational system, the NEP would improve the Sudanese economy.<sup>36</sup>

Hence, education was centred on two elements namely, political ideology and the economic needs of development. As the major concern of the May Revolution was to renovate education by introducing radical changes to bring about a new system, an ambitious plan of reforms was attempted. The basic targets set for education in this endeavour covered the following aspects:<sup>37</sup>



- a) introduction of compulsory elementary education all over the country, with a special emphasis on nomadic areas;
- b) establishment of sufficient educational facilities at school level in every region of the Sudan;
- c) diversification of education for the production of various specialisations;
- d) promotion of technical education to cover the acute shortage of Sudanese technicians;
- e) expansion of girls' education as the result of the awareness that women were the driving force behind the establishment of a modern socialist society;
- f) development of education to become a basic human right of all Sudanese people.

The impression given in reviewing these aims, was that the government intended to reform Sudanese education to remove the educational weaknesses existing at that time. The aim of widening women's education was the first attempt made by Sudanese government regarding development of girls' education. The government laid down the initial Act of the Revolution. Under this Act, 173 new intermediate schools and 13 secondary schools were to be established.<sup>38</sup> At this point, it could be argued that colonial educational aims had been revived. Educational aims in the May Revolution period were not directed to employment, but were strongly linked with development.

The May Revolution finally declared its attempts at educational development in two National Plans for Social and Economic Development. The first plan was known as the 'Five-Year Plan' implemented in 1971/1972 to 1976/1977. In this plan several targets were formulated, including the provision of universal education as a basic human right.<sup>39</sup> Emphasis was put on primary education. Another target was the diversification of higher secondary education to achieve a balance between academic and vocational education. The envisaged ratio was 60% to 40% respectively. The decentralization of the educational administration was also included in the plan. Moreover, illiteracy and the modernisation of education were targeted. The Five Year Plan was followed by the 'Six Year Plan for Social and Economic Development' 1977/1978 to 1982/1983.<sup>40</sup>

Evaluation of the implementation of the New Educational Plan can be divided into three categories: successes, partial successes and failures. Compared to the post-independence period, the successes of the May Revolution regarding the development of education were greater. The most successful radical innovation introduced by the Revolution was the new educational ladder. In the new ladder, the 4 4 4 system was altered to the 6 3 3/4 system.<sup>41</sup> Primary education of six years duration replaced the four-year elementary stage. General secondary education of three years replaced the four year intermediate stage. The higher secondary education of

three years began with a year of general education followed by a division into art and science streams in the following two years, with an extended year for technical courses. Alongside these three stages, Youth Vocational Training Centres were established to absorb and train dropouts.<sup>42</sup> At the community level, the success of the NEP was revealed in the spread of the Fathers' Councils all over the country to establish more schools that were funded locally.<sup>43</sup> Accordingly, the number of primary school pupils almost doubled between 1970/1971 and 1983/1984 and the number of school teachers at this level increased from 35,000 to 47,000.<sup>44</sup> Another successful outcome was the surge in enrolment in both junior and senior secondary schools. The growth in the period just mentioned was from 53,000 to 334,000 and from 21,000 to 163,000 respectively.<sup>45</sup> The numerical increase in schools and pupils' numbers in urban and rural regions which were basically funded by self-support efforts was one of the NEP successful outcomes. Other successful results were the decentralisation of the examination system, as a result of which the conduct of exams and publishing of results became much better and quicker, and lastly, the elimination of the dual system of religious and secular elementary schools.<sup>46</sup>

Among the partial successes of the NEP was that the aim of providing universal primary education by the 1980s which was not met in full. Although the number of pupils enrolled in schools increased, fewer than half school-age



children were in schools in the 1983/1984 academic year compared to the target of 100%.<sup>47</sup> Also, the advantages of urban over rural areas were not significantly reduced. This is evidenced from the fact that all senior secondary institutions were still located in urban regions.<sup>48</sup> In addition, vigorous efforts to improve the situation of unequal educational provision between boys and girls were only partially successful. For example, the statistics presented in 1976 and 1981 showed that the percentage of girls' enrolment was 34.3% and 36.8% respectively,<sup>49</sup> only a very slight increase. Thus, the fundamental aim of providing equal education at the primary and secondary levels for both sexes had not been achieved. Similarly, attempts to broaden the basis of secondary education were uneven in their impact. The expansion fell short of the targets laid down both in the NEP and the Addis Ababa Conference.<sup>50</sup> Admittedly, some aspects of vocational and technical education such as HE education were reinstated. However, proposals to balance academic with technical education continued to be thwarted by the Sudanese Educational Authority. In practice, only a few technical schools were developed, these were based on the junior technical schools already in existence, and on a small number of technical and vocational training centres which had been established to provide post-primary education for those who failed to enter academic schools.<sup>51</sup> Technical schools continued to be single-sex, catering for boys rather than for girls. They tended to be filled

by the less capable students after the more able group had been allocated to academic schools. Thus, the objective outlined by the NEP to diversify secondary education was never developed fully and provision of secondary education was mainly academic. It could then be argued that technical education was merely used as a means to protect the academic stream. By absorbing the less capable pupils, it provided a better opportunity of education for the latter. Accordingly, secondary education continued to assume an academic nature and to be geared towards reaching university qualification and employment in the government sector.<sup>52</sup> Indeed, the emphasis on promoting academic qualifications became the most prominent feature of the May Revolution educational system.

To minimize the negative effects of elitism, the policy of introducing a non-selective system was adopted. In fact, the government became very conscious of the need to raise educational standards at all levels. However, for no obvious reason, progress toward full abolition of selection was not attained.<sup>53</sup> Selection of children for a particular educational path and the narrow classification of them as academic or technical remained a recognisable feature of the Sudanese educational system.

Although the NEP promised to provide full secondary educational opportunities to all Sudanese children, this promise was not fulfilled because the government applied itself to other political and administrative affairs.

Indeed, there was little evidence of planning for the greater demand for secondary education which would result from the expansion of education at the primary level. An example of the pressure on the system was that in 1976, among a total of 13,000 pupils who had passed the Senior Secondary Examination, only 35% were accommodated in the secondary schools.<sup>54</sup>

Another shortcoming was the frequent change in the direction of the NEP. This is evidenced by the fact that 10 persons were appointed as ministers during the period of the May Revolution, which lasted for 16 years.<sup>55</sup> This meant that frequent changes were made as each minister had a different educational policy and perspective. Such a situation also suggested that the management and leadership of the NEP was vague, as it failed to provide suitable resources and a good system of inspection, follow-up and supervision.

Although the educational authority proposed the nationalisation of the curriculum, this issue was not fully resolved. Possibly the goals set by the NEP were too ambitious compared to the available resources.<sup>56</sup> For example, in the area of curriculum innovation, only a few textbooks and other essential resources were provided for schools. Although these facilities were included in the NEP initiatives to reinforce, develop and coordinate education activities, this promise was not sustained by the government. This is because the cost of these materials was beyond the limits of the Sudanese economic



resources. Another factor linked with the failure of curriculum innovation was the lack of adequate teacher training to implement the new curriculum.<sup>57</sup> Having noted that the NEP's agenda of action was large, there were particular aspects that needed to be given special consideration. For instance, dissemination of good and appropriate teacher training should have been given priority. I believe this was the only way to ensure that the desired curriculum could be properly implemented.

In short, despite the vigorous attempts of the NEP to establish Sudanese education on a much sounder basis, and its success in some areas, the implementation of the Plan revealed that in practice, it followed a similar direction to that of the earlier post-independence period.

#### 2.6 Education Development: the 1985-1992 Period

This period includes three political eras, namely The Transitional Government (1985-1986), the April Revolution (1986-1989) and the National Salvation Revolution (1989-1992). In this section, the education development in these periods will be presented.

The Transitional Government was a one-year stage during which authority was transferred from the government to the Sudanese people after the overthrow of the May Revolution in 1985. The focus of this period was on political issues, particularly the planning for the election of a democratic government. As the period itself

was short, nothing was done regarding the education system.

As soon as the democratic government was elected in April 1986, the governors of the April Revolution focused their effort on political issues rather than on anything else. In a survey conducted towards the end of 1986, the illiteracy rate stood at 68% among men and 82% among women.<sup>58</sup> Thus, although the Sudanese were very enthusiastic about getting democracy at first, their aims and ambitions were not achieved. As a result the people were overwhelmed by the political conflicts and practices arising from the parliament, regarding these aims and ambitions.<sup>59</sup> This situation led to anger and frustration among Sudanese citizens, who finally overthrew the April Revolution. Therefore, during this period, the education system remained as it had been in the May Revolution period.

The National Salvation Revolution represents the current government which overthrew the April Revolution in 1989. This government showed an immediate interest in Sudanese educational development. Indeed, in summer 1990, the National Salvation Revolution expressed its concerns about educational development, making reference to what it termed an 'Education Revolution'. The aims of this Educational Revolution are fourfold: Sudanisation of the curricula, intensifying Islamic studies at all levels of education, expansion of higher education and Arabisation

of the language of instruction in higher educational institutes.<sup>60</sup>

However, examination of the progress and outcome of the Education Revolution so far, reveals that at the general level, the system remains as it was in the May Revolution period. Currently, the educational ladder is 6 years primary education and 3 years each of intermediate and secondary education (fig. 2.2). Although a change in this ladder has been proposed by the Ministry of Education, it has not been published and will not be implemented before 1994.<sup>61</sup>

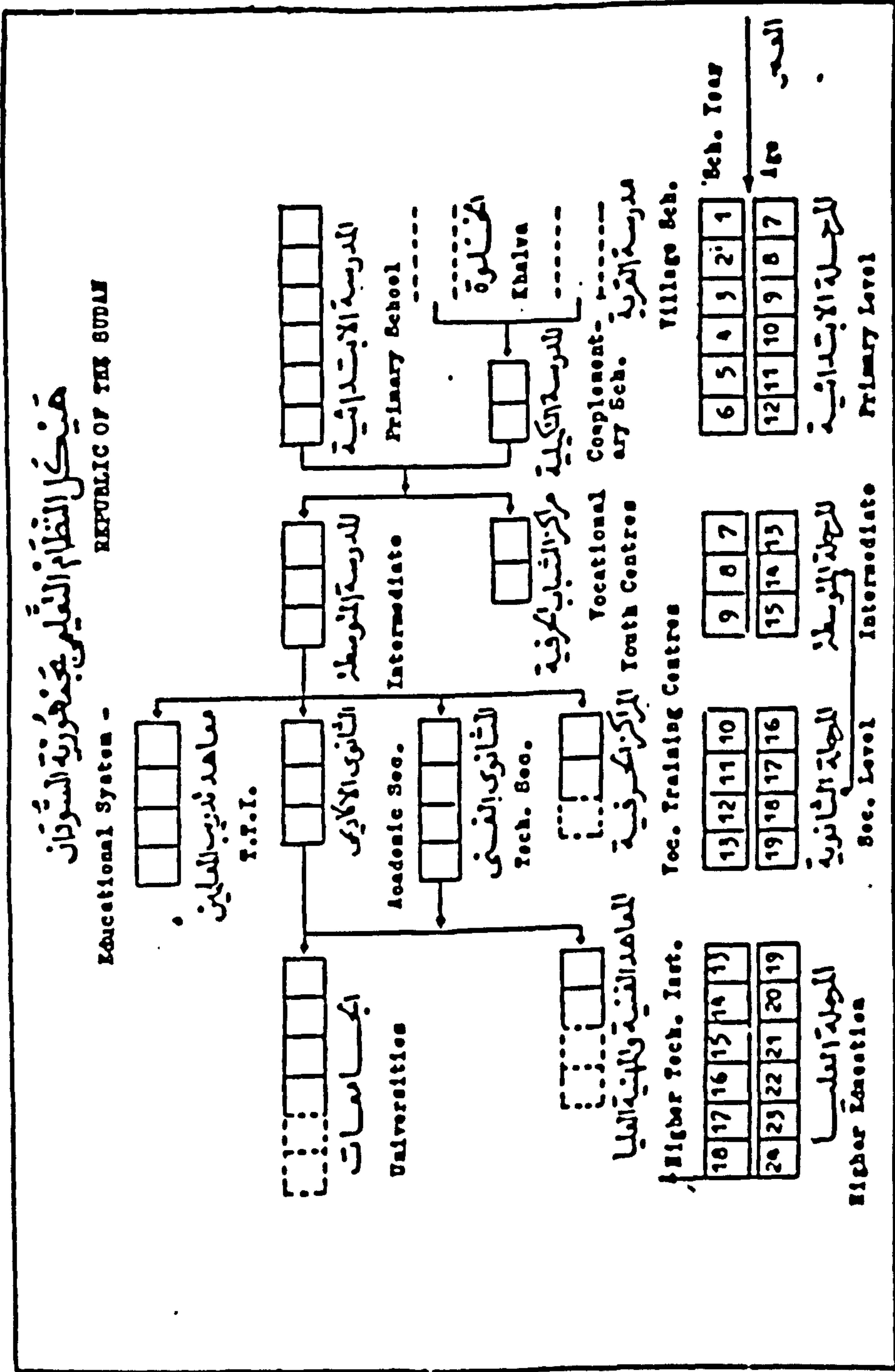
At the higher level, however the outcome is quite different. Seven regional universities have been opened recently.<sup>62</sup> An outside observer who was neither an opponent, nor an arbitrator of the higher Educational Revolution at this stage of its development, might think that its actions exceeded the available local human and economic resources. The establishment of seven universities in such a short time may lead to a deterioration in the standard of the original universities, as the lecturers of the latter are obliged to extend their efforts to cover the acute shortage of trained staff at the new universities, at the expense of their work in the older universities. As the trained staff of the old universities have less time to concentrate on their own work, their output will be reduced. To add to the problem, the trained lecturers have also been involved with the translation of the



materials written in English into Arabic and the Sudanisation of the curricula. In view of these burdens, two or three new universities would, perhaps have been a more realistic development at the present stage.

Generally, education in the Sudan is financed chiefly by the national budget, with schooling being free of charge at all levels.<sup>63</sup> But, education also receives marginal financial aid from international bodies such as the United Nations Educational, Scientific, and Cultural Organization (UNESCO) and the United Nations Children's Fund (UNICEF). Notwithstanding this, the country has also developed private systems of education, which are sometimes subsidised by the government.<sup>64</sup>

Figure 2.2 : Education System in Sudan



This figure has been taken from: The Ministry of Education, Educational Statistics: Academic Year 1989/1990, Educational Planning - Section of Educational Statistics, Khartoum, April/1992, P.1.

## 2.7 The Development of HE Education in Sudan

During its development, the subject matter of HE has been accorded various names: Domestic Science, Family Science, and Home Economics (HE). In this thesis, the last name will be used whenever the subject is referred to. It was discussed earlier in the Traditional Education section that HE skills were considered the core subject of traditional women's education, which extended into the Condominium Agreement period. In this section, it is argued that girls' education in the Sudan reflects a colonial process, because the policy of colonial education rejuvenated Sudanese traditional expectations of sex discrimination associated with education. It also used them as a vehicle to maintain social control. Assuming that the British realised that a meaningful educational development in the Sudan would require a more equitable pattern of education distribution, the educational authority should also have realised that equity demanded that the contribution of women be taken into account. However, the fact was that the colonizers showed no concern about the development of women's education. Thus, both Sudanese traditional views and the colonial attitude to women's education were in accord.

Let us now trace the development of HE education in the Sudan. As part of traditional education, HE consisted of a group of activities that directly related to the home. These activities included cooking, sewing, knitting and handicrafts. Indeed, HE education was first



established as an entertainment programme for women, who at that time were not engaged in any formal schooling system.<sup>65</sup> This programme ran under the supervision of women, who were highly experienced and skilful in the above mentioned activities. Emphasis on the activities varied from one neighbourhood to another. Generally, learners met together in each of the members' homes on a rotational basis. Although there were no fixed schedules for these meetings, in most cases women gathered together in the evenings.

When the National Educational Authority found that the number of women engaged in HE had increased, 'Sewing Houses' were established in 1907.<sup>66</sup> These Houses were originally learning centres located in different parts of the country to run HE activities. However, the facilities offered in these centres depended upon factors such as the number of learners and the extent of their enthusiasm and ambition to develop HE. Indeed, the establishment of Sewing Houses brought HE into another stage of development. In this stage, a movement to bring about cooperation and coordination among members to create a more systematic schedule and to raise funds for a programme of HE development began to take shape. The impact of such a movement on Sudanese society was highly welcomed by the local citizens. The evidence is found in Sudanese national folklore, where it is said that Sewing Houses were highly favoured because they were the only places for men to see beautiful girls. The point was that

girls at that time were not allowed to work or even, normally to leave their homes. However, because parents were convinced of the importance of HE, they allowed their daughters to join the Sewing Houses. This suggests that through HE, Sudanese women were introduced to social life. HE then progressed to become a training rather than an entertainment subject, one that involved girls in learning skills and abilities that were important and useful for their future as parents and housewives. It is worth noting that the contribution of Egyptian and British wives, who accompanied their husbands to work in the Sudan, played a major role in the success of this training programme.<sup>67</sup> At that time, little was written about HE or how its programme was performed. The only documents that I have found are some instructions on sewing, knitting, needle work and recipes for preparing some dishes.<sup>68</sup> Nevertheless, it can still be argued that HE was a major form of women's non-formal education in the Sudan.

This situation continued until 1911 when El-Sheikh Babiker Bedri, the first founder of women's formal education in the Sudan, opened the first primary school for girls at Rofaa.<sup>69</sup> One of the major aims of opening this school was to teach girls HE. In 1921, cooking and needle work were introduced as compulsory subjects in the teacher training schools. In 1930 the British educational authorities introduced sewing and cooking subjects into the elementary schools.<sup>70</sup> But the aim was basically to

introduce British culture to Sudanese society through the popular subject of HE. Up to that time, all the elementary school HE teachers were British and Egyptians. When the first intermediate and secondary school for girls was opened in 1939,<sup>71</sup> HE continued to be a major subject in the curriculum.

In 1940, Sudanese teachers joined the HE teaching staff for the first time and by 1947, the HE curricula began to include some Sudanese aspects.<sup>72</sup> Thus, it was only when Sudanese teachers were recruited, that the curricula began to be more orientated to suit the Sudanese culture. By 1954 the first Sudanese supervisor for girls' education was appointed in the National Department of Education. However, in general, the HE curriculum offered in schools was still not entirely Sudanese. It was modelled on Egyptian and British disciplines. Even the trainers of HE teachers were usually supplied from Egypt.<sup>73</sup> This suggests that since its establishment, the curriculum of HE was not based on real Sudanese needs and interests. Instead, it adopted material from other countries, a procedure that did not guarantee its success in the Sudan.

After the independence, and due to the policy of educational expansion to include new subjects, namely sciences and mathematics began to develop.<sup>74</sup> The result of this new interest was that schools curricula put more emphasis on these subject, rather than on HE. Bearing in mind that HE was only offered in girls' secondary



schools, which were far fewer in number than those for boys, the Ministry of Education ignored the development of this subject.<sup>75</sup> The negative consequences of this educational practice were that the centralisation of HE in the girls' curriculum began to deteriorate. Indeed, HE became an activity, rather than a subject in many schools.<sup>76</sup> Also, HE teachers were omitted from teacher training programmes. The Sudanese Agriculture Department, however, made use of this opportunity in enhancing their agricultural extension programmes by including HE.<sup>77</sup> Thus, HE lost its momentum as a proper subject in Sudanese educational system. I believe that because of this shift in the history of HE education many of the present shortcomings of its curriculum began to take shape. As indicated earlier in this chapter, during the period of the May Revolution, the Ministry of education experienced a special interest in developing girls' education. This educational policy stimulated HE education in the school curriculum. Indeed, the apex of this development was reflected in the establishment of the Department of Home Economics in the University of Khartoum, the top educational institute in the country. Since then, efforts to develop HE education have been gradually extended.

## 2.8 Home Economics Education: A Modern Perspective

As a result of modernisation and technological development, HE education is no longer confined to teaching practical skills. Instead, it has expanded to involve theoretical studies in order to cope with contemporary civilization.<sup>78</sup> In other words, Sudanese HE education has been modernized. It has become the science which deals with the study of the present-day family, its functions and fundamental needs.<sup>79</sup> As reported by Kojek, new aspects of family and social affairs have been incorporated into the HE curriculum. The ultimate aim of this ambitious endeavour is to provide the means of a better family life.<sup>80</sup> This orientation highlights the need for teaching CTSS in general and PS in particular, to be included in the HE curriculum in order to improve means of Sudanese family living.

In the field of child development and family relations, for example, modern HE is concerned with the social, psychological, educational and health aspects of the mother and the child. The major goal of this area is to prepare a healthy generation that plays its role properly in the family and the society.

In the area of nutrition, the old curriculum aimed to help girls to acquire skills in the art of cooking while the modern one incorporates more scientific aspects. These include: food production, nutritional value of food, the individual needs for nutrition, the planning and preparing of meals that satisfy the basic

principles of good nutrition, the effect of preparation and cooking procedures on the nutritional values of food, food preferences and food taboos. In addition, modern nutrition education aims to help individuals to acquire the scientific skills of preparing complete and well-balanced meals. This involves the consideration of factors such as the age and the health condition of each family member as well as family resources.

Concerning home management and family economics, modern HE considers this area to have an intimate relationship with all other aspects of the subject. It is concerned with careful planning for the provision of the family's clothes, food and shelter. Modern home management also includes the promotion of consumer education.

With regard to sewing, nowadays this aspect is referred to as 'textile and clothing construction'. It focuses on studying textiles in terms of original resources, quality of materials, and the effect of cleaning substances and so on. This suggests that the physical and chemical properties of the materials used for sewing are now being taken into account. Considerable attention is also being paid to the artistic, social and practical aspects of the clothes. In addition, in the area of the home, the modern curriculum emphasises the creation of a healthy environment that copes with the family size and resources. Family planning, home furnishing and decoration are also being included. The



use of essential and convenient equipment that saves time, money and effort constitutes a major part of the study.

In short, the modern HE curriculum focuses on the family as the core of the study in an attempt to bring together major family aspects. Special consideration is given to modern scientific and technological developments and the creation of the means to cope with such a progressive evolution. Attention is also given to the application of scientific approaches in learning both practical skills and theoretical knowledge in relation to the home and family affairs.

#### 2.9 Summary

This chapter has described the educational development in Sudan from its origin to the present day. In this description, the aims proposed, the obstacles experienced, and the outcomes achieved in different stages of educational development have been discussed. A brief account of the development of HE education, which includes both the traditional and modern perspectives of HE has been given. In the next chapter, the current HE curriculum of Sudanese secondary schools will be presented in more detail.

## References

1. Khattab, A. Food Group Production in the Sudan Food and Nutrition in the Sudan, Proceedings for the First National Food and Nutrition Seminar, March 1972, National Council for Research, Khartoum, 1973.
2. Sudan Information Office. Sudan News, A Weekly Information Bulletin Published by the Sudan Embassy in London, Vol. 1, No. 6, pp. 1-9.
3. Beshir, M. Education in Africa: Two Essays, Khartoum University Press, 1974.
4. Khattab, A. Op.cit., p. 8.
5. Beshir, M. Education Development in the Sudan: 1898-1956, Ph.D. Thesis, Oxford University, 1966.
6. Ibid. p. 18.
7. El Seed, N. History of Politics and Education in the Sudan, Khartoum University Press, 1990. (In Arabic).
8. Ibid., p. 122.
9. Abdel Wahab, O. Curriculum Development in Biology in the Sudan with Special Reference to Higher Secondary Level, Ph.D. Thesis, Sheffield University, 1975.
10. Robatabi, S. Integration of Population Education and Home Economics Curriculum in the Sudanese High Secondary Schools for Girls, M Sc. Dissertation, Khartoum University, 1987.
11. El Seed, N. op.cit., p. 121.
12. Ibid., p. 150.
13. Beshir, M. op.cit., 1966, p. 35.
14. El Seed, N. op.cit., p. 122.
15. Uthman, M. Current Philosophies, Patterns and Issues in Higher Education: Sudan Education in an International Perspective, Khartoum University Press, 1988.
16. Uthman, M. op.cit., pp. 14-15.
17. Beshir, M. op.cit., 1978, p. 6.

18. El Seed, N. op.cit., p. 120.
19. Beshir, M. op.cit., 1978, pp. 8-9.
20. Edith, H. and Badri, G. The Impact of Cultural Factors on Children's Creativity. Second International. Sudan Studies Conference Papers: Sudan Environment and People, 8-11 April 1991, University of Durham, 1991, pp. 7-15.
21. Ministry of Education The Eleventh Educational Anniversary, Educational Planning Department, 1981 Khartoum, p. 12. (In Arabic).
22. El Seed, N. op.cit., p. 213.
23. Ministry of Education. Education in Sudan: Progress Report 1956/1959, Ministry of Education Documentary Centre, 1960, Khartoum, p. 17.
24. Ibid., 223.
25. The Republic of the Sudan. Akrawi's Committee Report, Ministry of Education Documentary Centre, 1954, Khartoum, p. 1.
26. Ibid., p. 2.
27. Ibid., p. 3.
28. El Seed, N. op.cit., p. 224.
29. Beshir, M. op.cit., 197<sup>4</sup>8, p. 29.
30. Ibid.
31. Ibid.
32. Abu Sin, M. The New Educational Plan in the Republic of the Sudan Journal of Educational Planning in the Arab Countries, No. 2, 1963. (In Arabic).
33. Ministry of Education. The New Educational Policy Document No. 11, Khartoum, 1972.
34. Ibid., p. 7.
35. The Democratic Republic of the Sudan. Ministry of Education Official Documents on the New Educational Policy No. 11, Khartoum, 1970. The New Educational



- Policy. By Mohi El Din Sabre, Minister of Education, p. 3-5.
36. Ibid. p. 9.
  37. Ministry of Education The New Educational Policy. Documents No. 11. Opcit., p. 12.
  38. Ibid., p. 13.
  39. The Democratic Republic of the Sudan. Ministry of Education, Education Documentation Centre, Khartoum. Major Trends in Education, National Report to the XXXVth Session of International Conference on Education, Geneva, 27th August-4th September, 1975.
  40. The Democratic Republic of the Sudan, Ministry of National Planning, The Six-Year Plan for Social and Economic Development, 1977/1978-1982/1983, Khartoum, 1977.
  41. The Democratic Republic of the Sudan, Ministry of Education. Official Document Series on the New Educational Policy, No. 111, Khartoum, 1970. The New Educational Ladder and its Implementation by Dr. Mohi El Din Sabre, Minister of Education.
  42. The Democratic Republic Of the Sudan, Ministry of Education. Official Documents Series on the New Educational Policy, No. 1, Khartoum, 1970.
  43. Ministry of Education. Sudanese Education : An Appraisal and Strategy for Action, Khartoum, Ministry of Education, 1977.
  44. Ministry of Education. Educational Statistics for the Academic Year 1970/1971, Section for Educational Statistics, 1970. Also: Ministry of Education. Educational Statistics For the Academic Year 1983/1984, Section for Educational Statistics, 1985.
  45. Ibid., p. 37 in the first reference and p. 25 in the second one.
  46. The Democratic Republic of the Sudan. Ministry of Education. Education in the Sudan: Reform and Strategy of Work. Report including the Results of the General Survey for the Educational Sector, Khartoum, 1977.

47. Ministry of Education. Educational Statistics for the Academic Year 1983/1984. op.cit., p. 28.
48. Ibid., p. 39.
49. Ministry of Education. Educational Statistics for the Academic Year 1976/1977. Section for Educational Statistics, Khartoum, 1978. Also Ministry of Education. Educational Statistics for the Academic Year 1981/1982, Section for Educational Statistics, Khartoum, 1983.
50. The Democratic Republic of the Sudan, Ministry of Education and Guidance, Khartoum. Development of Education 1978-1980. National Report Presented to the 38th Session of the International Conference of Education, Geneva, Sept 1981.
51. Ministry of Higher Education and the local Centre for Educational Planning in Arab Countries in Beirut. The Seminar for Diversification of Secondary Education to Relate it to Social and Economic Development Requirements in the Five Year Plan. Khartoum, 27th March-5th April, 1971. (In Arabic).
52. Uthman, M. Op.cit., 1988, p. 10.
53. Ibid., p. 11.
54. Ministry of Education. Educational Statistics for the Academic Year 1971/1972, Section for Educational Statistics, Khartoum, 1973.
55. Ministry of Education. Educational Statistics for the Academic Year 1984/1985, Section for Educational Statistics, Khartoum, 1986.
56. Tameem, A. 'The Higher Education Revolution: The Real Independence', El Sudan El Hadeeth, No. 426, Jan, 1991, pp. 1-8. (In Arabic).
57. University of Khartoum. Faculty of Education: Systems, Regulations and Curricula, Khartoum University Press, 1987.
58. El Nourany, A. Literacy and Development in the Sudan: 1956-1975, Non Formal Education and Development in the Sudan- Proceedings of a Workshop Held at the Development Studies and Research Centre, 6-9 March 1978. Development Studies Book, Series No.

University of Khartoum

- 59 Tameem, A. op cit., p. 7.
60. Ibid.
61. Ibid.
62. Ibid., p. 8.
63. Ministry of Education. Education in the Sudan; the Eleventh Educational Anniversary, Educational Planning Department, Khartoum, 1981. (In Arabic).
64. Ibid.
65. Babiker, M. Guide for the Arts of Needlework for All Stages of Education, Department of Home Economics, Section of Curriculum, Ministry of Education, Khartoum University Press, 1978. (In Arabic).66. Ministry of Sports. Sudanese National Folklore, Tamadon Press, 1978. (In Arabic).
67. Abdel Raheem, F. Home Economics Education in Sudanese Secondary Schools, Master Dissertation, Khartoum University, 1987.
68. Babiker, M. op.cit., p. 15.
69. Abdel Raheem, F. op.cit., p. 7.
70. Ibid.
71. Ibid, p. 9.
72. Ibid.
73. Shommo, M. Developing Thinking Skills in the Secondary Home Economics Classroom, Master Dissertation, University of Nebraska-Lincoln, 1986, p. 118.
74. Abdel Wahab, O. op.cit., p.29.
75. Shommo, M op.cit., p. 100.
76. Ibid, p. 101.
77. Farah, A. 'Enhancing Women Participation in Agricultural and Rural Development' , Paper



Presented in Agricultural & Rural Development Seminar, Development Studies and Research Centre, Khartoum University, April 1984.

78. Kojek, K. New Trends in the Curriculum and the Teaching of Home Economics, Alam Al Kutob Press, 1983. (In Arabic).
79. Ibid, p. 16.
80. Ibid, p. 19.

## Chapter Three

### The Home Economics Curriculum for Girls' Secondary Schools in the Sudan

#### 3.1 Introduction

As data about the secondary HE curriculum are fragmented and not fully developed, in writing this chapter, I have attempted to include first-hand knowledge obtained from my experience as a student, teacher-trainer, and lecturer to supplement the literature. The first source of this personal knowledge was my experience as an undergraduate HE teacher-trainee in Omdurman Women's Technical School in 1980/1981. The second source is my experience as a full-time teaching assistant in the Department of Home Economics in the Faculty of Education - Khartoum University, and as a part-time teaching assistant in the Home Economics Department in the Girls' College - Islamic University of Omdurman from 1981-1983. My job in these departments was to train secondary school HE teachers and supervise them during their period of practical training in schools. Thirdly, I have drawn on knowledge developed during the course of my work as a full-time lecturer in Khartoum University and as a part-time lecturer in Ahfad University for Women from 1986 to 1990.

This chapter attempts to explain the weaknesses of the HE curriculum with special reference to the lack of attention paid to teaching CTSS in Sudanese secondary schools, which, I believe, constitutes the major defect of the HE curriculum. I shall begin by explaining the

position of the HE curriculum in the Sudanese general education. The weaknesses in the design of the curriculum will then be examined. The qualifications and training of the HE teachers will then be discussed, and the teaching methods and materials in use will be explained. In addition, approaches to the assessment of students will be presented.

### 3.2 The Position of the Secondary HE Curriculum in Sudanese Education

The secondary school HE curriculum is designed only for girls' State schools. It is incorporated into both types of secondary education namely, academic and technical schools. In this thesis, both types will be referred to together as secondary schools. The age of the pupils is 17-19 years in the academic schools where the duration of the course is 3 years, whereas in the technical schools the pupils' age is 17-20, as the course of study lasts for 4 years. Since HE is considered as an area of study appropriate only for girls, it is not offered in private schools, which have a single curriculum for both boys and girls.<sup>1</sup> HE has, however, occasionally played a marginal role under the heading of "general activities" in girls' private schools. Some parents opt for private schools because they believe that their curricula prepare children for modern instruction in science and technology.<sup>2</sup> A previous study conducted by the present author revealed that HE is considered by many parents to be a trivial subject which they do not choose



for their children, because they believe that the curriculum of private schools, in which HE is excluded, facilitates entrance to the universities and other institutes of higher education.<sup>3</sup>

Compared with its peer curriculum subjects, HE has not been considered as a major element in the academic secondary schools. Indeed, it is not considered an essential subject at any level of general education. This problem was investigated in a survey conducted in 1990 by Washi and Juzolee, who argued that, although there is no official written statement from the Ministry of Education to this effect, the evidence of this view is found in the results of their survey, which indicated that the participation of HE in the total periods of each of the elementary, intermediate and secondary schools was found to be less than 10%. In a study conducted in 1987 by Abdel Raheem, the author argued that, sometimes in the academic schools, pupils do not even take examinations in their HE classes.<sup>4</sup> Abdel Raheem based her evidence for this claim on the fact that HE syllabuses are reduced towards the third year because the subject is excluded in the National Certificate Secondary Examinations.<sup>5</sup> It was found that this exclusion is applied in both arts and science streams of secondary education. Only in the technical schools is HE curriculum fully implemented and the subject included in the National Examinations for Girls' Technical Secondary Education.<sup>6</sup> The above findings suggest that graduates of the technical schools seem to

have a better opportunity for HE education. Further evidence of this better opportunity is that the greater duration of the course of study (4 years instead of 3) allows longer time to learn the subject; moreover, the technical schools implement the majority of HE disciplines such as Art and Handicrafts, Housing and Home Management. In the view of the apparent advantages of studying HE in the technical schools, it is surprising and confusing to note that the Sudanese National Admission Office prefers academic rather than the technical graduates to join HE higher education. The evidence is found in the prospectus of the Faculty of Education, University of Khartoum, where the biggest Department of HE exists. The regulations stated in the prospectus permit only students of academic science streams to join the Home Economics Department.<sup>7</sup> In the researcher's view, this paradoxical policy has created the problem of students who enter the higher level of education without having enough background in the subject to major in it. According to my own experience, these students usually have to struggle for a period of time to get acquainted with even the basic concepts of the subject. My argument here is that, the loss to higher education of the more competent technical school graduates who had greater experience in the HE field exacerbates and perpetuates the problem of the subject's low status and weak curriculum. Because of these decisions, it is the less well-prepared academic school

graduates who, on completing their education, become teachers of HE. To me, this situation partially answers the questions: 'Why is HE's contribution to Sudanese education is poor?' and 'Why has it no solid foundation?'

It could also be suggested that the omission of HE from the examination curriculum of academic public schools has negatively affected girls' motivation to learn this subject. Washi and Juzolec,<sup>8</sup> believe this negative attitude can be attributed to the fact that the HE curriculum has not been designed to meet the basic needs and interests of the pupils, and that HE has not been considered as a major subject in the secondary education curriculum.<sup>9</sup> Hence, it has been given less emphasis and sometimes the time allotted for the subject has been used for teaching other subjects, which are deemed more valuable than HE. In addition, there are many other obstacles which confront HE such as inadequate laboratory facilities, limited teaching resources, and insufficient funds.

Since the seventies, attempts have been made to improve the curriculum of HE to make it more applicable to Sudanese culture. The desire for curriculum innovation experienced as a result of the May Revolution is reflected in the committees that were formed by the Ministry of Education in 1977.<sup>10</sup> The major concern of these committees was to survey the position of HE education at the general education stage. The results of



the survey revealed that the general situation of HE in secondary schools was better than that of both primary and intermediate schools.<sup>11</sup> The school facilities were, however, very poor and the laboratories, even when available, were inadequately equipped. The funds were also very small and the schools generally suffered from an acute shortage of qualified staff. It was noticed that most of the schools had only two HE teachers to teach up to twelve classes. In addition, it was found that the curriculum was not fully developed. At the end of the survey, a number of recommendations were made, examples of which, are summarised in the following points:<sup>12</sup>

a) The curriculum of HE should be reorganised to satisfy the needs and interests of pupils and to suit Sudanese culture.

b) Owing to the shortage of qualified and well-trained HE teachers at all levels of general education, a comprehensive training programme for teachers should be established.

On receiving the results and recommendations of the survey, the Ministry of Education called for a National Conference. All HE teachers and supervisors in the Sudan attended this conference in Khartoum. The results and recommendations were presented to the conference for the purpose of further discussion. Unfortunately, despite the vigorous efforts of the 1977 Conference, its recommendations have not so far been implemented. This is evidenced by the fact that in many of the schools,

particularly the academic ones, HE is still perceived as an extra school activity.<sup>13</sup>

A recent committee was formed in 1990 as part of the Educational Revolution movement created by the National Salvation Revolution. The aim of this committee was to survey the position of the HE curriculum in general education. Special consideration in this survey was given to the rural education syllabuses to cope with the circumstances and the environmental changes that Sudan had experienced in the last two decades. The committee found that the position of HE education was almost the same as it was in 1977. Accordingly, findings and recommendations mostly similar to those of the 1977 Conference were made. One new recommendation raised was the integration of nutrition and rural education to be taught as a single subject in both boys' and girls' schools. A second was that the subject be included in the National Secondary School Certificate Examination.<sup>14</sup>

Despite the unanimous views of the several committees that have surveyed the position of HE in Sudanese general education, the development of this subject remains in doubt. HE is still being considered as an extracurricular activity in some schools, and in my experience, has been perceived as an outlet for low achievers. Sudanese educators should unite their efforts to point out the threat to the development of HE education. This threat is more serious if HE is to be used to improve conditions in the country as desired by

the National Salvation Revolution. It is suggested in this respect that PS approaches be used as tools for teaching HE, because the use of HE to improve living conditions makes it more important that CTSS particularly PS, be included in the curriculum. It is through these skills HE can be applied and the teaching/learning of this subject can be developed.

### 3.3 Weaknesses in the Design of the HE Curriculum

Weakness in the content and teaching of the HE curriculum can be traced in part to the provisions involved with the writing of the syllabus and course of study. The designers of the secondary HE curriculum in the Sudan are people who have worked for the Ministry of Education for a long time, and have accordingly been upgraded to work for the Department of Curriculum Design.<sup>15</sup> Indeed, apart from the assistance of a few traditional home economists, there is no involvement in the process of curriculum design of those with an advanced educational background in HE. The curriculum producers view their work solely in terms of content, more specifically, a traditional content, and no thought is given to teaching methods. As a result, the curriculum is too academic, with little use of practical approaches. Teaching is seen as nothing more than the transmission of this knowledge from one generation to another. In this respect, Kelly argued that looking at the curriculum merely as content "is a very limited and unsophisticated



view both of curriculum and of the demands for curriculum planning".<sup>16</sup> This is a correct description of the process of HE curriculum design in the Sudan. Indeed, an examination of our existing secondary HE curriculum reveals that it includes only a set of general aims, specific objectives and a brief statement of content for each of its aspects.

Accordingly, HE has never been comparable to its peer subjects. Its deficiency is reflected in the fact that, although this subject has been taught in schools since 1907, supposedly with a view to enhancing family life, it has not yet had any noticeable effect on Sudanese society. Based on my experience, another factor which has contributed to the suppression of HE is the lack of contribution of professional home economists to the field. Many of those who have had advanced education in HE and who feel dissatisfied with its position fear to express their views or suggest any revolutionary change, as a result of the inherited traditional image of HE as an easy subject which can be learned naturally. In fact, this attitude has been strongly maintained by the curriculum designers themselves. The result is that professional home economists and teachers, feel sceptical about taking the risk of trying to change the curriculum or even of revealing its weaknesses.

A further negative aspect of the HE curriculum design is the failure of the designers to define appropriate methods of teaching. This is linked with the

image of the subject as a simple activity that can be learned without any instructional effort. Thus, the misconceptions surrounding the teaching of HE stemmed from the stereotypes experienced and perpetuated by our curriculum designers. In this respect, it could be argued that a major obstacle for the development of the HE curriculum is that even though it contains some sound objectives, its teaching methods are inadequate and unsuitable to achievement of these objectives. The evidence is the poor contribution of HE to the whole body of Sudanese education compared to those of other subjects whose methods are clearly expressed. To me, the most pertinent style of HE education in the Sudan is one that aims and seeks to overcome its learners' fears and feelings of hesitancy and inadequacy when facing a problem.

In a recent book by Lipman,<sup>17</sup> the author admitted that it is traditionally true that the major concern of any education was the passing on of knowledge from one generation to the next. But, at the same time he argued "the great paradigm shift in the history of education has been the redesign of education to have thinking rather than learning as its target".<sup>18</sup> Lipman went on to argue that "once better thinking (reasonableness) was accepted as the goal of education other things began to fall, domino-fashion, into place".<sup>19</sup> Looking at the Sudanese secondary HE curriculum, there is no evidence to indicate that teaching for developing thinking has been

implemented. However, in other subjects which are deemed more valuable and thought-provoking, CTSS have been taught. For example, in mathematics, problem-solving is being used in schools of all levels as a method of teaching CTSS, as clearly stated in the objectives of the secondary mathematics curriculum designed by Bukht er Ruda Institute of Education and published by the Ministry of Education.<sup>20</sup>

Thus, it might be suggested that the inability of HE to help Sudanese individuals and families to live more effectively is attributed to the neglect of teaching CTSS when designing its curriculum. HE is the only subject that does not teach CTSS, and having consistently neglected the teaching of CTSS throughout its various aspects, HE has shown no development.

The omission of CTSS as an element of the HE curriculum reinforces the notion that HE is an ineffectual subject in Sudanese society. An underlying assumption of the present study is that teaching CTSS in HE could provide an excellent opportunity for the designers to tailor the curriculum to be able to meet its objectives relating to the development of desired abilities, skills and values. In short, it can be concluded that we need to intensify our efforts to incorporate teaching CTSS into our existing secondary HE curriculum. The teaching of home economics should be oriented toward the development of students' both basic HE and cognitive skills.



### 3.4 Disciplines of Secondary HE Curriculum

HE is a diverse subject that includes the following disciplines:<sup>21</sup>

- a) sewing and needlework
- b) cooking and food preparation
- c) housing and home management
- d) family education
- e) food and nutrition
- f) arts and handicrafts
- g) health education
- h) first aid and home nursing
- i) textiles and clothing construction
- j) childhood and motherhood.

Each of these disciplines has its own objectives and content. Examples of these disciplines will be discussed below.

#### 3.4.1. Sewing and Needlework

The discipline of sewing and needlework is focused on products made from local materials. In the sewing component, girls are trained to take measurements and construct patterns for family clothes, particularly those for children. Girls are also trained in using various models of sewing machines. Needlework, on the other hand, deals with the development of girls' skills in producing different needle products. As sewing and needlework share similar materials and ideas, they have been considered as a single unit in the curriculum. The aims of this unit are to:<sup>22</sup>

- a) train girls to acquire the skills of using needles and sewing machines in producing attractive products;
- b) train girls in activities that can be used as means of raising their family income.
- c) develop the sense of self-satisfaction and self-amusement;
- d) utilise the available and cheap materials to produce various models and styles of products;
- e) promote the appreciation for other cultures' fashions and styles;
- f) encourage girls to learn to be patient and flexible while producing their work;
- g) develop the sense of dignity and pride in Sudanese cultural resources.

The above-mentioned aims all seek to nurture the skills of Sudanese girls in sewing and needlework. However, one missing aim that should be included is to help girls to develop the skills of self-discovery. Another objective should also be the development of the ability to transfer what has been learned in the classroom into new situations, perhaps outside the school. My justification for the inclusion of these two objectives stems from the fact that in teaching sewing and needlework, teachers usually provide instructions for girls to follow in producing any piece of work. The pupils are offered no chance to create or express their own ideas. This suggests that when the girls leave the

schools, there is no guarantee that they will maintain the skills of sewing and needlework. No instruction is offered in sewing and needlework outside the schools, apart from some marginal activities provided in a small number of Youth Centres, so the best resource for girls in this regard is a thoughtful and creative mind. Yet, this does not appear to be the part of focus of the present curriculum. Experience as a high school teacher-trainer revealed that most of the sewing and needlework course is devoted to providing the girls with information about international fashions and models, and that no attention has been paid to the development of the girls' own ideas and thoughts. It is such observations which have stimulated me to attempt to offer a more thinking-oriented HE curriculum. To tackle the issue of this aspect of HE, teaching CTSS should be given major consideration in the curriculum to solve practical everyday problems. Teaching of Sewing and Needlework should involve methods such as debate, which provides a good opportunity for girls to explain, criticise and defend their thoughts and ideas in this area.

#### 3.4.2. Cooking and Food Preparation

Cooking and food preparation is considered as a single course in the secondary HE curriculum. It is one of the major subjects emphasised in any HE programme in the Sudan. Topics identified under this aspect include methods of cooking, food preparation, and methods of food



preservation. Special emphasis has been placed on sanitation and hygiene. Cultural practices are also considered, as are food preferences. In addition, food garnishing, decoration and food presentation are included. The specific objectives of the discipline are to enable girls to:<sup>23</sup>

- a) demonstrate cooking and preparation of foods in order to help them to acquire and to develop their skills in this area;
- b) become aware of the common foods in the Sudan;
- c) improve their skills in dealing with kitchen equipment;
- d) acquire the ability to plan meals for various occasions.

These objectives reveal that cooking and food preparation involve the girls actively in real practice and demonstration. However, one missing area in this course is the development of ability to create new dishes rather than merely following other people's ideas and thoughts. This means that by the end of the course, although girls will have developed the skills and abilities to cook and prepare food, these skills and abilities do not, in fact, involve the girls' own thoughts or ideas. It has been suggested that food preparation is highly rewarding for a person who has a lively interest in this activity and who has well-developed skills.<sup>24</sup> My argument is that foods which have been rejected as disliked or uninteresting can be

transformed by a thoughtful person and skilful hands into a delicious and attractive menu. The introduction of CTSS skills in cooking and food preparation could make it possible to produce low-cost food and dishes that are enthusiastically accepted. For example, in teaching this aspect, problem-solving could be a pertinent method. This is because developing PS skills while learning nutrition would solve many of Sudanese expensive and poorly nutritious dishes.

This suggests that, the development of thinking skills should be nurtured through the teaching of cooking and food preparation. Opportunities for developing inventiveness, manipulative skills and ample discussion about preparing and cooking food should therefore be given considerable attention. Working with each other would also provide a chance for girls to encounter various degrees of interest and different levels of skill.<sup>25</sup> Sharing ideas, experiences and skills with others could also facilitate the development of creativity, thinking, reflection, and invention, as well as powers of self-expression. All these elements can meet together in the teaching of cooking and food preparation using CT approaches, such as teaching for transfer, which enables students to convey what they have learned in schools to their homes and community. Using writing of ideas as a method in teaching of cooking and preparation could also help students in developing their CTSS while learning HE.

### 3.4.3 Family Education

Family education is basically concerned with the welfare of the family. Although HE programmes world-wide share the common desire to help people to improve their family living conditions, it is difficult to teach this aspect in Sudanese schools. The reason is that the role of each family member is clearly defined by Islamic laws, as well as by tradition; the father is the breadwinner and decision-maker, while the mother is responsible for taking care of children and carrying out household responsibilities. Children are to help their parents in doing their work and are obliged to support them when they become older.<sup>26</sup>

Topics offered under family education include: family development; family structure; traditions and social habits; the cost of family living; the role of men and women in the family; friendship formation. The curriculum, however, emphasised teaching the three first topics. Issues of concern in this unit include: marriage; divorce; child care; women's employment; obedience to parents and elders that the teacher tells students factual information about them. The aims of the discipline are:<sup>27</sup>

- a) explication of the girl's role and obligation in her family;
- b) encouragement of the girl to gain knowledge of family problems and the ways to solve them;



- c) identification of the role of each family member with a special emphasis on the role of mothers and wives;
- d) promotion of knowledge essential for girls to choose good husbands;
- e) acquisition of basic skills necessary for the establishment of a healthy family;
- f) acquisition of knowledge and skills about how to plan, manage and overcome each stage of family development;
- g) training of girls to be successful family and social leaders.

Although the second aim clearly states the target of family education is to help girls to solve family problems, the behavioural aspect of how to achieve this aim is not expressed. As a result, in practice, girls' involvement and contribution to family issues have often been unrecognised, unrewarded and under-utilised. In some parts of the country, women have not yet been involved in making decisions concerning family issues. Men are always considered as the decision makers because they are the bread winners for their families. Even if the woman is the real financial supporter, the taking of decisions is still considered the man's function. Thus, much remains to be resolved about family education if we want to convince Sudanese society that women are capable of making good and sound family decisions. Because of women's long disadvantaged position in the Sudan, there

is an urgent need for serious steps to enable girls to contribute in solving family problems. I believe the best way to attain these aims is to widen the horizons and experiences of girls through the provision of a CT-oriented curriculum. Sudanese women should acquire CTs in order to achieve positive changes in the family. For example, one aspect of promoting a good family living involves an understanding of and justification for the concept of family planning. Sudan has a very high birth rate, particularly among poor people, leading to the doubling of the Sudanese population between 1956<sup>28</sup> (13,500,000) and 1990<sup>29</sup> (26 million). At the same time, food and economic resources have become increasingly limited. If women perceive the relationship of family planning to the available health, economic and educational resources, they will probably make a positive change in the country. This is particularly important if we note that the culture gives women responsibility for children. Aim number (f), acquisition of knowledge and skills about how to plan, manage and overcome each stage of family development needs to involve students in thinking activities in order to be achieved.

Let us now turn our attention to the way family education is being taught. One of the shortcomings in teaching this unit is that teachers do not like to discuss private matters such as family relations and divorce with girls. This attitude is due mainly to the fear of religious beliefs and the traditional outlook

which exists towards family affairs. The unit is therefore taught by rote-learning, and does not even explore, let alone improve, Sudanese family conditions. In practice, the teaching of this course does not attempt to promote discussions of or deepen insights into family issues in an open or liberal manner. Even when concepts such as equality or division of labour among family members are raised, they must be dealt with carefully. In the context of the Sudanese family, such issues are perceived as very sensitive and should not be openly discussed. Certainly, cultural and religious values are very important in every society so, free expression and rational solutions to family issues are very important in maintaining them. In other words, CT about and reflection on family issues would not jeopardise the survival of our family values, but would help to protect them by solving the problems that hinder their continuation and, perhaps, their survival.

In short, the task of teaching family education in secondary HE curriculum is really difficult. Obstacles and constraints that face thinking-oriented family education in the Sudan therefore should be a major teaching concern. The teaching of family education could be enhanced by using methods such as open discussion, simulations and role playing will enable students to identify their family problems and to develop means to solve them.



#### 3.4.4. Food and Nutrition

The general focus of the food and nutrition element of the school HE curriculum is twofold: to develop pupils' awareness of the importance of improving the standard of individual nutrition, and to maintain better health and growth for a productive population. The syllabus of this aspect of HE has been designed to embody the following specific objectives:<sup>30</sup>

- a) increasing understanding of the role of nutrition in improving the health of Sudanese families;
- b) correcting false ideas, bad habits and misguided traditional taboos and practices in relation to the Sudanese diet;
- c) enabling pupils to develop and prepare a balanced diet from the local food resources to meet the needs of all family members;
- d) familiarising pupils with the different food groups and their functions in the human body;
- e) providing knowledge and information about food poisoning, food perishability and food preservation;
- f) fostering an appreciation of the utilization of modern food equipment;
- g) developing an understanding of interdependence and interaction within family and community establishing good nutrition.

These objectives, are clearly sound, particularly the first one. This is because improving the nutritional

status of many Sudanese people, who are currently struggling to survive should be one of the central concerns of Sudanese education. Recently, there has been increased awareness of the relationship between good nutrition and physical fitness. Also nutrition education has now become a powerful weapon to fight malnutrition in most developing countries.<sup>31</sup> However, in the Sudan, despite the attempts to promote this unit, nutrition educators continue to be frustrated by a lack of evidence that their message has been heeded or even heard.<sup>32</sup> This suggests that such a message might not have been delivered properly or some important elements might have been neglected. In a report introduced to the Sudanese National Council for Research on nutrition in schools it was found that:

In the Sudan, the diet of the people living in the rural areas is largely based on carbohydrate foods. In many areas the diet lacks animal protein, plant protein, vitamins and minerals, which are all important to children's growth. Social and cultural factors also have their influence in the diet, especially the consumption of some valuable foods. Therefore there is a need to increase food production, especially vegetables, fruits, poultry and eggs, since all of these items are of good nutritive value.<sup>33</sup>

Although this was published two decades ago, the situation in the Sudan with regard to food and nutrition is still the same or even worse. The evidence is that currently, nine million lives in the Sudan are expected to be lost as a result of malnutrition.<sup>34</sup> This confirms that the inclusion of food and nutrition education in the

Sudan is absolutely vital. Nevertheless, although, teachers are aware of the fact that nutrition in the Sudan requires active reflection and participation of the pupils, in practice, they tend to stress only the teaching of factual information about nutrition. Teachers do not emphasise discussion, encourage debate, and/or use problem-solving that help students to suggest ways of handling controversial nutritional issues.

My own approach in looking for successful tactics to promote food and nutrition education in the Sudan consists of two parts. Firstly, the curriculum should cover a much wider range of nutritional aspects. For instance, critical thinking about how to introduce concepts of food and nutrition education to the Sudanese citizen should be given priority; food and nutrition education should be used as one of the key elements for helping to solve the problem of malnutrition prevailing all over the country. Secondly, in teaching this discipline, pupils should be given ample opportunity to discuss and argue about food and nutrition issues in an open manner. They should be taught the skills of creating means for increasing food production, using food alternatives, maximising the nutritive value of available foods, analysing prepared meals from the nutritive value viewpoint, justifying food choices and evaluating food products based on different scientific criteria. Teaching CTSs using methods such as these I have just underlined is one of the best ways, if perhaps not the only way, to



achieve these objectives. Methods of teaching CTSS would equip pupils with all the skills needed to resolve the problems associated with issues of food and nutrition. Indeed, teaching these skills is of particular importance in introducing aspects of food and nutrition in the curriculum. Fostering CTSS simply means teaching pupils how to argue, act on reasons, recognize and avoid vague reasoning, make decisions and offer justifications when facing a problem.

### 3.5 The Qualifications and Training of Teachers of Secondary HE

Nearly all teachers of secondary HE in the Sudan fall into one of three categories. The first includes women ( Egyptians as well as Sudanese) who learned this subject in its traditional form (mostly cooking and sewing). This group have no advanced qualification in the field and some of them have never had formal teacher training, but rely on their talent, skill, and their enthusiasm and ambition to promote the subject. The second category is of those who were originally not home economists, having majored in other subjects, but began to teach HE because of the shortage of specialised teachers. It is assumed by the Sudanese educational authority that any female teacher, irrespective of her training and educational background, can easily teach HE. The third and smallest group is that of recruited HE teachers. This group includes those who have graduated from HE departments in the higher educational

institutions. These graduate teachers, are however, not in large enough supply to satisfy the demand for HE teachers in the whole country. They tend to take assignments in the central part of the Sudan. The reason for this is that, because of transportation difficulties, the Sudanese educational authority tends to appoint teachers to schools in their home areas. As the majority of graduate teachers are from Khartoum and the surrounding areas, those teachers are more available in the central part of northern Sudan. It is to be hoped that the number of this category will be increased as recently proposed by the Higher Educational Revolution Project.<sup>35</sup>

The most common arrangement of the secondary teachers in the Sudan is for one HE teacher to be responsible for one or more aspects of HE, for example, cooking, food preparation and nutrition education, for the entire school. Organisation based on a specialist approach of teaching HE is very rare, but it could be developed as the number of recruited graduate teachers rises.

It can be seen from the above description, that the large majority of HE teachers have never been professionally trained. Even the graduate teachers have never been involved in any in-service training programme. Whereas other subject teachers are offered annual training opportunities provided by Khartoum University as well as the Ministry of Education, there is not a single

in-service training programme available for HE teachers, even though funds for training HE teachers are available. The problem is simply that no one has tried to develop in-service training programmes for HE teachers, perhaps because of the assumption, referred to earlier, that any woman can teach HE without special training.

The general pattern of in-service training programmes for secondary school teachers consists of two kinds. In one of these, teachers are brought from their regions to Khartoum to be trained by the lecturers of the different departments in the Faculty of Education, Khartoum University. This is the more common approach to secondary school teachers' training. In the less common method, lecturers are sent to train teachers in their own regions.<sup>36</sup> In this regard, it may be said that the omission of HE teachers from in-service training programmes is one of the reasons why the teaching of HE has not developed beyond the traditional approaches. This is particularly true for the traditional teachers who have had no teacher training in progressive methods of teaching or, perhaps, no HE educational background.

The severe deficiency of in-service teacher education hinders the ability of HE teachers to cope with the new educational trends. In this respect, Stenhouse argues that the "classroom cannot be bettered except through the agency of teachers: teachers must be the critics of work in the curriculum, not docile agents."<sup>37</sup> He states that "there can be no educational development



without teacher development; and the best way of development is not by clarifying ends but by criticising practice".<sup>38</sup> This suggests that a radical reform of the HE curriculum in the Sudan would also involve the development of teacher training in HE as one of its priorities.

The most important resource in the development of HE education remains the teacher in the classroom. Thus, Sudanese educators as well as teachers must be aware of the problems posed by the hidden curriculum that reinforces discrimination against HE among its peer subjects. This is because the teacher's role and perception are central to the development of a positive approach to teaching HE. In fact, the crucial role of the teacher places a major responsibility on the quality of his/her training. Both initial and in-service teacher training must be given greater consideration. In this regard, it will be particularly important to provide in-service training programmes that focus on teaching thinking. In implementing this suggestion, the emphasis must be put on fostering a positive approach to teaching CTSS rather than simply eliminating the traditional rote-learning method. That is to say, the approach of teaching CTSS must be perceived in the process of teacher education as a more advanced and more positive alternative to traditional methods. This trend should be given priority to ensure that teachers will be able to enhance pupils' skills and inculcate positive attitudes

towards HE. If the teaching of CTSS is to be implemented in the Sudanese HE classroom, teachers will need to understand and find some solid basis for planning and implementing the process. In short, it does not seem possible that the teaching of CTSS can be implemented unless teachers have full professional preparation in this area. How and when to break the traditional HE teacher training pattern could pose some problems in the routine of Sudanese teacher education. It is essential to challenge the present widely-accepted marginal role of HE teacher education at the secondary level, if equality of school subjects is to be achieved.

### 3.6 Methods of Teaching HE

Although HE is a practical subject, the most commonly used method of teaching is by lecturing. Typically the teacher stands in the front of the class, and imparts information, while students listen to her. Sometimes the teacher writes information on the board for students to copy. Teachers seldom ask students to copy information from posters or diagrams. Quite often, teachers dictate notes for students to write in their notebooks. This is considered as a golden opportunity for teachers to develop CTSS in their students. This can easily be done by asking girls to write their own notes, which will involve them with developing, organising, sequencing and reflecting on their thoughts and ideas in learning cooking and food preparation for instance.

The only occasions of teacher-student interaction is when the teacher asks students brief and simple questions. In most cases, these questions require students to recall given information, rather than to think for themselves. Broadly speaking, in the teaching/learning process, pupils are merely recipients of information whilst the teacher is always the source of this knowledge. Girls are seldom encouraged to talk about their work, ideas or interests. Instead, many of the activities involve either writing or listening to the teacher. Even in the lessons that could involve the girls actively, such as arts and handicrafts, the teacher always gives instructions for the students to follow. An objection here is that because the aim of HE is the enhancement of the quality of life, students could be encouraged to think about fundamental problems of life and living. The teaching of HE should ensure that pupils acquire more than just information. It could incorporate approaches such as discussion, thinking aloud and debate in teaching nutrition education for example. These methods help students to interpret, evaluate, analyse, reason, justify, reflect, search for evidence and produce something new from the given knowledge. These ideas must become central to our teaching activities in HE classes.

In current practice, HE teaching in secondary schools in the Sudan focuses on two goals: the transmission of facts, and the management and control of the classroom. In future HE classes, students should be



encouraged to learn more than facts or basic knowledge. It is not disputed that facts and basic knowledge are fundamental to any academic discipline; nevertheless, students should learn how to manage and interpret them in a meaningful manner. This is the only path by which the students can attain an adequate perspective of what the given fact or information represents. To achieve these aims, I believe that teachers should encourage critical reading in their HE classes. Teaching pupils to interpret, transfer and to seek evidence behind the facts and information should be an integral part of our expectations in teaching HE. For example, in teaching home management, students should be given the opportunity to debate and think aloud about current economic events, to investigate the causes that shape them, the political and environmental facts that reinforce them and the reasons why we are affected by them. Above all, the teacher should help the students to think of ways of solving these problems. This could only be attained by introducing CTSS into our teaching approaches, helping students to formulate, express and connect their thoughts.

Although CTSS have been taught in subjects such as science and mathematics, this is not sufficient if students are to address adequately many family problems. Indeed, in viewing HE in terms of a family-oriented subject, we can see the gap between what HE currently is and what it ought to be. This gap is created by the

traditional instructional approaches that have been used in teaching this subject, which emphasise the provision of information rather than thinking and reflection.

Such methods ignore the active role that pupils should play in order to make use of what they have learned. My personal observations since 1981 have found no sign of willingness among secondary HE teachers to invite their students to participate in open discussion or investigation. Recently, in America HE educators argued for the development of a critical thinking-centred curriculum for secondary schools.<sup>39</sup> In this regard, teachers of secondary HE are urged to emphasise "discussion that focuses on practical reasoning, sound judgement and action".<sup>40</sup> However, in the Sudan none of these ideas has been considered in teaching HE so far. Consequently, teaching approaches are perpetuated which leave students closed-minded, which is to say indoctrinated. Students are expected to accept and memorise the information delivered by their teachers, but not to reflect on it. In this respect, Costello is correct when he argued, "omitting to offer children explicit teaching which is aimed at fostering their thinking and valuing processes, may have serious implications for their intellectual development".<sup>41</sup>

In short, many Sudanese HE teachers still subscribe to the preservation of traditional methods of teaching HE. A teaching method need not be new in order to be effective, but it must be suited for what it is designed

to accomplish. Certainly, it is a waste of both teachers' and the learners' time if lectures are used merely to present, without analysis, explanation, or practical application using material that is already available for them in the textbooks, for instance. Lectures could be used to elucidate basic principles, to emphasise important issues and to illustrate novel ideas. While lecturing, a teacher should foster the habit of listening, reasoning, the art of expression and the organisation and pursuit of thoughts. These arguments give rise to questions regarding the curriculum design. This is because the historical process of the HE curriculum design in the Sudan has been part of its teaching tragedy. Whilst teachers of other subjects seek to update their teaching methods, those of HE have never been given the opportunity to do so. Accordingly, there is a lack of suitable teaching methods. This shortcoming of the HE curriculum must be corrected. When setting the HE syllabus, the designer must have two main points in view: the intended product, and the way it is to be achieved.

However, teaching practices in the Sudanese secondary HE classroom suggest that the teaching process is predominantly teacher-based. Although some books are used, the teacher is the major knowledge provider. The kind of knowledge provided is concentrated on basic HE. This type of content may be useful and probably necessary when dealing with first year students, particularly as



the majority of girls entering the secondary schools have little knowledge about HE. But, as the girls progress within their studies, their mode of learning should gradually become resource-based and self-oriented. It is worth noting in this regard that this argument does not mean that the teacher would become obsolete, but rather, that teaching will increasingly take other forms which are no less important than direct lecturing. The teacher's effort in this case could be directed towards involving her pupils in activities such as investigations and projects that provoke their thinking and ideas instead of imposing on them the available knowledge practiced in the traditional period.

### 3.7 Teaching Resources

Although HE is a practical subject that require materials and media to enrich the teaching/learning process, the main, indeed, almost the only teaching resources used in HE classrooms are chalk and blackboard. Posters are sometimes used as facilitators in teaching some aspects of HE, but there is no involvement of other teaching aids such as computers, overhead projectors and other audio-visual equipment. In recent years, the idea has been promoted in the educational media that teaching aids are essential, particularly if the subject taught involves practical lessons or if the aim of using a specific resource is to provoke students' thinking. In an article entitled 'When Reason Sleeps: Arguments for the Introduction of Philosophy into Primary Schools',

Costello points out "diagrammatic representation (e.g. overhead projector transparencies) may be used to initiate discussions".<sup>42</sup>

As far as reasoning and discussion are concerned, the teaching materials used in our secondary HE classrooms do not seem pertinent for developing such aspects of thinking. Certainly, there are many examples of teaching materials suitable for use with secondary HE pupils such as overhead projectors and computers. It does not seem appropriate to prescribe any particular teaching material for use in the Sudan, as there is such diversity in students, schools, teachers and environments, it is likely that no single set of teaching materials could achieve the aim of fostering CTSs in the Sudan. Moreover, the multifaceted nature of the HE subject suggests that it may be exemplified in a variety of ways. Thus, it seems that, it is more appropriate to draw attention to possible teaching materials than to prescribe them for teachers.

### 3.8 Assessment of the Students

The system of assessment of HE in secondary schools is through written examinations. Even in some practical areas such as cooking, paper and pencil tests are the only means of evaluation used for assessing the students' performance. In such examinations questions are mostly designed in terms of multiple choice or the yes/no type of questions that ask students to define terms, state

facts and so forth. In very few cases, short essays are included. Most of these questions require direct answers taken directly from the notes that have already been dictated to the pupils. Indeed, the focus of the tests is usually on recalling the given information on basic HE.<sup>43</sup> There is no involvement of questions that require students to discuss, reflect on or evaluate the basic knowledge in relation to the circumstances that exist in their communities. The current assessment methods, in my judgement, reinforce the belief that HE is an easy subject which every girl is capable of passing without any difficulties or constraints. Students need only to be able to recite what is written in their notebooks, since the system of examination does not demand more than this from them. This assessment practice indicates that without having any evidence, HE curriculum producers assume that students are not capable of pursuing thinking in the HE context. Indeed, that is why the educational policy allows girls who are unable to pursue any other subject because of their low grades to major in HE

It is central to my argument that the current focus of the assessment is on the extent to which girls know about the subject rather than on how they react to it. The purpose of the tests seems to be to compare pupils with each other i.e, selection rather than competence. Girls have never been stimulated in such examinations to think about, to discuss, or to seek evidence about the information required in the tests. The emphasis of the



tests is on recall rather than on the analysis, interpretation, reflection and synthesis of knowledge. Used properly, assessment could be a fundamental part of the HE curriculum, incorporating various methods of assessment to assess different skills. Provision of a variety of assessment instruments, such as practical tests, would give all students adequate opportunity to show their achievement in different ways.

### 3.9 Summary

This chapter has emphasised the need for the development of CTSs among Sudanese secondary HE students. Although this involves many aspects such as objectives, content, teaching materials and so on, the present thesis emphasises teaching methods, because it is the area that is most neglected, and most deficient in the curriculum at present.

It has been discussed that the major problem with the curriculum of HE stems from the belief that the subject requires no thinking effort for girls to learn. HE is therefore, taught only via rote-learning, as the subject is perceived to be learned spontaneously. For the same reason, the teachers of HE have been given no opportunity for teacher training in using advanced methods of teaching. The consequence of this situation is that the image of the subject is very poor and is selected only by academically low-achievers. It has been suggested that in order to improve pupils' attitudes, a

change in teaching methods should be given priority. Such change is urgently required, since the methods used in teaching HE have never been updated or even thought of with deep insight.

Another related shortcoming in the teaching of HE is the lack of in-service training for its teachers. This problem has adversely affected teaching practices in the HE classrooms, because many teachers are traditional in their outlook and methodology.

Based on the various constituents such as the teaching methods and materials that have been presented in this chapter, it can be argued that HE is a practical subject that has the potential to integrate theory with practice to build knowledge and skills to solve real life problems. This suggests that the teaching of HE should involve both theoretical and practical perspectives that allow students to be trained to develop abilities and skills such as inquiry, investigation, argumentation, reasoning, clarification, analysis, interpretation, making inferences, justification and so on. However, in the current HE curriculum, the notion of teaching CTSS is totally neglected. Whatever the causes of this neglect, we need to minimize the threat to HE curriculum development, by introducing the teaching of CTSS. The assumption is that as HE is a multi-disciplinary subject, the interrelationship between these disciplines could be brought about by teaching the subject via critical thinking approaches.

At this point two questions arises 'Can teachers of HE, accommodate CTSs in their lessons?' and 'Can students learn from these new methods?' In the next chapter the research design and the methodology used for demonstrating that teachers can learn to teach CTSs in HE lessons and that students can benefit from them will be presented.



## References

1. Shommo, M. Developing Thinking Skills in the Secondary Home Economics Classroom, Master Dissertation, University of Nebraska-Lincoln, 1986, pp. 119-120.
2. Ibid.
3. Ibid, pp. 117-118.
4. Abdel Raheem, F. Home Economics Education in Sudanese Secondary Schools. MSc. Thesis, Khartoum University, 1987, p. 57.
5. Ibid, p. 58.
6. Washi, S. and Juzolee, S. Nutrition Education and the Home Economics Curriculum, Ministry of Education, Section of Nutrition and Rural Education, Khartoum, 1990.
7. Faculty of Education. Prospectus: System, Regulations and Laws, Khartoum University, 1990, p. 141.
8. Heui-Yiboe, L., Fanslow, A. and Cowan, D. 'Ahfad Students: Attitudes and Behaviours Regarding Women's Role in 1985', The Ahfad Journal - Women and Change, Vol. 3, No. 2, December 1986, pp. 28-36.
9. Washi, S. and Juzolee, S. op.cit., p. 9.
10. Ibid, p. 10.
11. Ibid.
12. Ibid, p. 11..
13. Ibid.
14. Ministry of Education, Bukht 'er Ruda Institute of Education, The Home Economics Curriculum for Secondary Schools, El Deiwaim, 1987, P. 1. (In Arabic).
15. Shommo, M. op.cit., p. 114.

16. Kelly, A. The Curriculum-Theory and Practice, Third Edition, Paul Chapman Publishing Ltd., 1989, p. 44.
17. Lipman, M. Philosophy Goes to School, Temple University Press, 1988.
18. Ibid, p. 141.
19. Ibid.
20. Ministry of Education. The Curriculum of Mathematics for Secondary Schools, Bukht' er Ruda Institute of Education, El Deiwaim, 1990, p. 4.
21. Ministry of Education and Bukht er Ruda Institute of Education. op.cit, 1987, p. 3.
22. Ibid, p. 7.
23. Ibid., pp. 8-9.
24. Kojek, K. New Trends in the Curriculum and the Teaching of Home Economics, Alam Al Kutob Press, 1983, p. 37. (In Arabic).
25. Ibid, p. 38.
26. Abdel Mahmood, F. Employment of Women in the Sudan. The Ministry of Social Welfare in Collaboration with the United Nations Economic Commission for Africa, Khartoum, 1975, p. 2. (M75-127).
27. Ministry of Education and Bukht' er Ruda Institute of Education, 1987, op.cit., p 6.
28. Ibid, p. 10-11.
29. Ibid., pp. 11-12.
30. Ministry of Education and Bukht er Ruda Institute of Education. op.cit., p. 16.
31. Abdel Wahab, O. Curriculum Development in Biology in the Sudan With Special Reference to Higher Secondary Level, Ph.D. Thesis, Sheffield University, 1975, p. 1.
32. Sudan Information Office. Sudan News, A Weekly Information Bulletin published by the

- Sudan Embassy in London, Vol. 1, No. 6, 1991, p. 2.
33. Ministry of Education, Bukht'er Ruda Institute of Education, 1978, op.cit., p. 13.
34. Zumrawi, F. Nutrition Education in the Sudan. Khartoum University Press, 1989. (In Arabic).
35. Tameem, A. 'The Higher Education Revolution-The Real Independence', Al Sudan Al Hadeeth, No. 426, 1991, pp. 1-8. (In Arabic).
36. Faculty of Education. op.cit., p. 150.
37. Stenhouse, L. An Introduction to Curriculum Research and Development, Heinemann, 1975, p. 75.
38. Ibid, p. 83.
39. Copa, P., Hultgren, F. and Wilkosz, J. 'Critical Thinking as a Lived Activity', in Costa, A. Developing Minds: A Resource Book for Teaching Thinking, Vol. 1, ASCD, 1991, pp. 188-192.
40. Ibid, p. 190.
41. Costello, P. 'When Reason Sleeps : Arguments for the Introduction of Philosophy into Primary Schools', Irish Educational Studies, Vol. 8, No. 1, 1989. p. 150.
42. Ibid, p. 153.
43. Shommo, M. op.cit., p. 117.



## Chapter Four

### Design and Methodology of the Empirical Study

#### 4.1 Introduction

This chapter presents the problem and an overview of the research conducted. Also, the chapter explains the development of both the research hypotheses and questions. Moreover, it describes the research design and the methodology of the empirical study conducted in Sudan. In addition, the instruments used for data collection and the samples of the study are included.

#### 4.2 The Research Problem

The problem which the present research is focused on is the fact that in Sudanese educational practice HE has been exempted from methods of teaching CTSS, namely the PS approaches and has only been taught through traditional methods.

#### 4.3 The Research Questions

This research was designed to answer the following questions:

- a) Can secondary teachers be trained in teaching PS in HE?
- b) Is there any difference in the learning of HE between students taught HE topics in PS-style and students taught the same topics in a more traditional style?

#### 4.4 Overview of the Research

This study investigated the teaching of Critical Thinking Skills in the Sudanese secondary Home Economics curriculum. A four-day in-service training course in teaching HE through Problem-Solving was conducted for secondary HE teachers of Omdurman. During the course, teachers planned HE lessons according to the PS-style. After the course, the planned lessons were taught and tested. Data were collected from classes by means of achievement tests and teachers' diaries. Teachers' views were collected by means of questionnaires and interviews.

#### 4.5 Research Hypotheses

##### a) Formulated Hypothesis

The hypothesis formulated for the first question is that: after receiving a training programme, secondary HE teachers would be able to teach HE using PS approaches and would be confident to plan and implement PS-style lessons.

##### b) Null Hypothesis

The null hypothesis for the second question is that: there is no difference in achievement tests between students taught HE topics in PS-style and students taught the same topics in a more traditional style in their mean scores on existing HE achievement tests formulated according to the current pattern.

#### 4.6 Explanation of the Research Hypotheses

Hypotheses are defined as "educated guesses about possible differences, relationships or causes."<sup>1</sup> According to Borg and Gall, the research hypothesis is the prediction derived from a theory under test. It has also been suggested that "formulation of an hypothesis, and gathering of relevant evidence to test the hypothesis, is usually the most productive approach to throwing light on educational problems."<sup>2</sup>

In the formulation of the present study the researcher hypothesizes that after a programme of in-service training, Sudanese secondary HE teachers will be able to plan lessons on current topics of HE that include the teaching of PS. Teachers will feel confident in their ability to plan and deliver the new-style lessons and will believe that, compared with more traditional lessons, pupils derive greater enjoyment and benefit from them. It will be demonstrated that pupils learning in the new-style lessons is not less than in traditional lessons on the same topics of HE.

This means that the research is planned to be a quasi-experimental study in which the researcher hypothesizes possible differences between the traditional and the PS-style methods. Consequently, a null hypothesis will be used to state that no difference will be found between the new and the traditional methods in relation to students achievement tests. In this regard it is worth



noting that the null hypothesis is defined as "hypothesis of no difference"<sup>3</sup>

#### 4.7 The Research Design

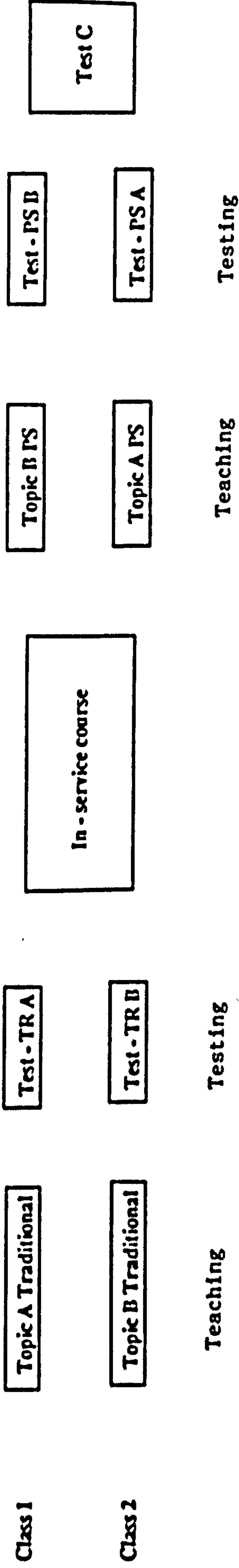
The term 'design' "refers to the plan and strategy used in an attempt to solve a research problem."<sup>4</sup> The literature on research in education confirms that pretest-posttest-experinental-control-group design is a suitable design for the current study. In this regard, Borg and Gall argue that : "Nearly every study that can be conducted using a single-group design can be carried out satisfactorily by using a control-group design."<sup>5</sup> The authors also argue that: "The pretest-posttest-control group design is among the most commonly used experimental designs in educational research. If properly carried out, it effectively controls for the high threats to internal validity identified by Campbell and Stanley: history, maturation, testing, instrumentation, regression, selection, mortality and interaction effects."<sup>6</sup> The researcher agrees that pretest-posttest experimental-control-group design is important for the achievement of the internal validity of the experimental study in educational research. Nevertheless, she felt unable to use this design in her present study for two major reasons. The first was that the sample of the teachers involved in the study was very small, only sixteen. This meant that if this design was implemented, the sample would be divided into two groups of 8 teachers each. A

sample of 8 cases is very small for statistical analysis. The second reason was that it was not possible to randomise the pupils and the teachers to classes as requested by experimental-control-group design. Instead, the study used intact classes, the teachers' regular classes. This design is better described as a quasi-experimental design. In which, each teacher taught her two regular classes both before and after the in-service programme.

In order to cover the diversity of HE, three different topics: A (nutrition), B (cooking and food preparation) and C (sewing and needlework) were taught without conducting any pretest. Since the classes were considered equal, teachers taught and tested topic A in class 1 and topic B in class 2, using traditional methods (see diagram 4.1). As the classes were treated as equal, it was assumed that results of pretest A (posttest A traditional) in class 1 could be compared with Posttest A (posttest A PS) in class 2. Similarly, results of pretest B (posttest B traditional) in class 2 could be compared with posttest B ( Posttest B PS) in class 1. This meant that for each teacher, classes 1 and 2 acted as a control-group for one of the topics, A,B, and experimental-group for the other, B,A. Therefore, the terms 'pre- and post-tests' referred to in this thesis, were actually comparisons of traditional with PS posttests.

Diagram 4.1

# Quasi - Experimental Design





To check for equivalence of the classes, a test on topic C was conducted for all groups as a covariate. Full details about this test will be presented in Chapter 6. The quasi-experimental design is summarised in Diagram 4.1. The design was implemented in three major steps which are presented below in chronological sequence.

a) Negotiations With Teachers Prior To The In-Service

Course

Prior to the in-service course negotiations with teachers regarding topics and tests to be included in the study were conducted. Teachers were then encouraged to select 3 topics, A, B, and C. As every teacher had two parallel classes in the school on which the experiment was based, she was asked to teach topics A and B by the traditional method in class 1 and 2 respectively. Teachers were also asked to test their students using achievement tests suggested by teachers and approved by the researcher. Because the classes were 'intact', they were not matched in any way beyond the school's normal arrangements. In this regard, 'parallel' classes means similar or analogous in terms of academic achievement, age, sex and background. Topic C was planned, taught and tested after the in-service course took place.

### b) During the In-Service Course

An in-service training course was conducted. The programme showed teachers how to plan HE lessons having a substantial input of PS. Lessons on three topics A, B and C were prepared during the programme. A test on topic C was also developed by the teachers, discussed in the class and approved by the researcher. Teachers then returned to their classrooms and taught the topics according to their lesson plans. They tested topics A and B using the same tests that had been used before the course. Results on topics A and B were considered as forms of posttests. Topic C was taught to all classes involved in the study. Full details about the in-service course are provided in the following chapter.

### c) After the In-Service Course

On the last day of the in-service programme, the researcher distributed the Post-Lesson Diary Report Forms to the teachers. She explained briefly how and when the forms were to be filled in. The purpose of using the diaries was to find out how far the new-style lessons were implemented in the classroom. The diaries covered three topics.

When each teacher had finished teaching and testing her 3 topics, she was interviewed. Each teacher also completed a questionnaire. Both instruments were used to assess teachers' reactions to their experience with teaching PS. In short, the design of the research can be summarised as follows:

- Prior to the in-service course:

Meetings with teachers in their schools

Class 1	Topic A is taught (trad)	Test on topic A
Class 2	Topic B is taught (trad)	Test on Topic B

- During the in-service course:

Teachers plan lessons on Topics A, B and a further Topic C. All lessons to include elements of PS.

Class 1	Topics B and C taught PS	Tests on Topics B + C
Class 2	Topics A and C taught PS	Tests on Topics A + C

- Following the in-service course:

- a) Collection of posttests and diary forms from schools.
- b) Conducting individual interview with each teacher.
- c) Administration of a questionnaire to each teacher.

#### 4.8 Research Instruments

Because of the breadth of this study, the investigator has used a variety of research methods to collect the required data. This use of multiple methods is in keeping with the opinion of Van Dalen who argued that:

One does not master a single method of obtaining data, such as the questionnaire, and apply it to every problem that arises. Each tool is appropriate for acquiring particular data, and sometimes several instruments must be employed to obtain the information required to solve a problem. Researchers, therefore, must possess considerable knowledge about a wide variety of techniques and instruments.<sup>7</sup>



To test the formulated hypothesis, instruments included the following:

a) Questionnaires to assess teachers' opinions about PS as a result of the in-service course on teaching PS in HE as well as their experiences in their own classes.

b) Interviews with the teachers who participated in the course to find out their views on what they had learned about the PS skill as well as their experiences in class. The purpose of using the interview as a method for collecting data from teachers was that "the interview as a research method in survey research is unique in that it involves the collection of data through direct verbal interaction between individuals".<sup>8</sup> Also, it is reported that "in a small scale survey, a researcher may decide to carry out his own interviews. He knows better than anyone else the purpose of his questions, and may be better than anyone else to resolve queries that arise during the interview."<sup>9</sup> According to Jaber and Kadhim, the interview is necessary in order to ensure the validity and correctness of the information collected from independent sources."<sup>10</sup> Dunham and Smith indicated that "the unique strength and weaknesses of both interviews and questionnaires suggest that a combination of the two techniques provides the most effective organisational survey

programme."<sup>11</sup> Accordingly, the researcher has decided to use the interview as one of the methods in her study.

- c) The diary study, was a survey designed to investigate teachers' responses to a Post-Lesson Diary Report Form in order to know PS-planned lessons were implemented in the HE classrooms.
- d) To test the null hypothesis, achievement tests using both PS and traditional HE questions were given to the students of the parallel classes before and after their teachers had offered the in-service course. If a difference is found between students taught HE topics in PS-style and those taught similar topics in a more traditional style then the null hypothesis is false. Consequently, the null hypothesis will be rejected in favour of concluding that the difference between mean scores reflects a true difference.

#### 4.9 Samples of the Study

The sample of the present study included:

- a) Secondary HE teachers in the Omdurman area. This sample included teachers of both technical and academic schools.
- b) Second-year students of parallel HE classes.

#### 4.10 Tests for the Students

##### Objective

The objective of testing students was to demonstrate that pupils' learning in the new-style lessons that incorporate a substantial input of PS is not less than in traditional lessons on the same HE topics.

The idea behind the above mentioned objective was that teachers who participated in the in-service course might be concerned that their pupils would in consequence of the new-style lessons, do less well than pupils taught in more traditional styles. Thus, this possibility was investigated using existing tests that had been reviewed, updated, and approved by the researcher. The reason for this was to satisfy teachers' authority. Some extra questions were added to test PS because a special test for measuring PS was not available.

#### 4.11 Development of the Achievement Tests

The purpose of this section is to provide a clear description of the procedures followed in order to develop the students' achievement tests in the present study.

As it has just been mentioned, one of the most crucial problems facing the present research was largely concerned with developing a suitable measuring instrument. This is because there was no available standardized test that can be used to measure the skill of PS. This suggests that the researcher had to develop her own evaluation instruments. Therefore, constructing



reliable and valid achievement tests played a central role in the evaluation of the student's learning outcomes. This reliability and validity based essentially on the procedures of planning and preparing the tests. Subsequently, the following points were followed:

- a) To balance between traditional HE and PS content, the same number of traditional questions on basic HE was also constructed on PS and included in the tests.
- b) The initial items chosen for each test were carefully reviewed by the researcher and discussed with the teachers to check that they were considered suitable and were likely to be understood by the students.
- c) As a means for carrying this check further, four Sudanese independent judges including two secondary HE teachers and two lecturers of HE at Khartoum University were asked independently about the suitability of the test items in terms of the expected difficulty level and the cognitive skills to be measured. This procedure in particular was aimed at developing tests with a high content validity.
- d) To ensure the provision of a common ground of the study, it should be remembered that the tests were developed on the topics included in the aspects which had commonly been taught across the schools. This was particularly important

since not all aspects included in the HE curriculum had been taught in all schools.

In short, the appropriateness of the presentation of the test items was ensured following the suggestions and comments that were provided by the independent judges. The tests were marked and scored by the researcher.

#### 4.12 Procedure for Conducting the Tests

The procedures for conducting the tests are summarised in the following steps:

##### a) The Pretests

Before the course, tests on topics A and B in classes 1 and 2 were conducted. The results of the tests were considered as forms of pretests for those particular topics and in that pair of classes.

##### b) The Posttests

After the course, new-style lessons were given on Topics A, B to classes 2 and 1 and a further Topic C to both classes. The same tests on Topics A and B which had been used as pretests were conducted. Bearing in mind that the two classes were parallel, the tests results of Topics A and B were considered as posttests and were then compared to those of the pretests. Topic C was post-tested in both classes.

#### 4.13 Procedure of Marking the Tests

Each test consisted of six questions corresponding to the six levels of questioning identified in the method of teaching PS. These included: recall, descriptive, synthesizing, judgemental (evaluation), and open-ended questions. In reviewing many test papers, the researcher has found that the range of 0 to 6 points for each question was reasonable to mark the test since it provided a chance for all levels of answers to be adopted. Accordingly, each question of the tests was marked as follows:

6 points = a full answer was provided.

5 points = the answer lacked a small amount of the required information.

4 points = the answer included about two thirds of the required information.

3 points = half an answer was provided.

2 points = the answer included about one third of the information required.

1 point = the answer included a small amount of the required information.

0 = the answer was wholly incorrect or there was no answer.

To get better insights into marking, two independent markers were involved. They were lecturers of biology in the Faculty of Education in Sudan living in Britain. The purpose of independent marking was important for the validation of the procedure followed. Thus, copies of 222



test papers were given to the independent markers after they had been marked by the researcher. They included pre and post tests on topics A and B as well as posttests on topic C. The level of agreement between the researcher and the independent markers was over 95%.

#### 4.14 Interpretation of Tests' Results

The process of interpreting the findings in the students' study can be illustrated by the results themselves. For example, if classes taught by traditional methods get significantly lower scores in the learning achievement tests in the same HE topics than classes taught by PS methods, the researcher could conclude that there was no lowering in students' academic achievement in HE as a result of the implementation of the new planned lessons. It would also be concluded that there was a positive relationship between the teachers' use of PS approaches and students' learning (achievement) in HE lessons. This means that the null hypothesis stated in this study that there is no difference between the achievements of students taught HE topics in PS-style and those taught the same topics in a traditional style would be rejected in favour of PS- group.

#### 4.15 The Diary Study

The diary study, a survey of HE lessons, was based on the teachers' responses to the Post-Lesson Diary Report Form (which will be referred to as the PDRF). Each teacher filled in 3 Forms for her three topics (A, B and

C). The major aim of the diary study was to investigate how far planned lessons were implemented in the classroom based on the following concepts: lesson duration, lesson type, resources used by the teacher, resources used by pupils, homework set for the lesson, level of lesson satisfaction for teachers as well as for students and lesson activities which included both teachers' and pupils' activities.

#### 5.16 Interviews with the Teachers

##### Objective

The major objective of conducting interviews with teachers was to find out their views on what they had learned about the PS skill as a result of the in-service course, and also their experiences of PS in classes.

The teachers who participated in the in-service course were interviewed to provide an immediate feedback on the course and to help full understanding and interpretation of their responses.

#### 4.17 Type and Focus of Interviews

The interviews were semi-structured ones that allowed the interviewer (researcher) to record notes. They also allowed the respondents to express themselves at some length. The interview schedules included initial questions followed by probes (see Appendix for questions), which investigated teachers' opinion about the:

- a) Enjoyment of their experience with PS methods.
- b) Impact of PS on the way they will teach HE.
- c) Necessity and the role of teaching PS in HE.
- d) Participation of PS input in planning HE lessons and in solving Sudanese problems associated with HE.
- e) Effectiveness of PS in the students' learning of HE.

#### 4.18 Judgements of the Interview Schedules

The major purpose of conducting judgements of the interview schedules was to assess the content validity of the interviews. When the interview schedule was assembled the researcher conducted judgemental consultations in three stages. In the first stage, the schedule was written in English and was passed to 2 experienced lecturers in the School of Education at the University of Hull. The comments and judgements of these people on the wording, content and pertinacity of concepts were taken into consideration. In the second stage, the researcher translated the interview schedule into Arabic. She conducted one consultation with the group of Sudanese students studying in Britain. Another consultation was also carried out with two experienced lecturers in the Faculty of Education at Khartoum University. The comments of these people on the wording of the questions were also taken into consideration. In the third, stage a further consultation was conducted with three typical respondents. These were Sudanese secondary mathematics teachers who taught PS in their own classes. The comments of this group were positive and they involved no further changes in the



schedule. The final form of the interview schedule is provided in the appendices.

#### 4.19 Procedure of Conducting the Interviews

In conducting the interviews the points below were followed:

- a) At the beginning of each interview the researcher explained to the interviewee the objective of the interview.
- b) The interview was then conducted by asking the initial questions and following probes. For example in question 3c, the question was: 'Do you think that Problem-Solving is necessary in teaching Home Economic?' and if so, 'Why?'
- c) Each teacher was asked if she had any comment, suggestion or question.
- d) At the end of each interview the researcher assured the teacher that the interview was confidential and that her answers would only be used for the purpose of the present research. Each interview lasted for 15-20 minutes.

#### 4.20 Recording of Data

In conducting the interviews, the researcher recorded the answers as they were given. This point was particularly important because trying to remember answers and fill them in later might lead to inaccuracy. It was also important for the open-ended questions to be recorded in full and in the respondents' own words.

#### 4.21 Construction of the Questionnaire

The objective of the questionnaire was to assess teachers' opinions about PS as a result of the in-service course as well as their experiences in their own classes.

The question of the construction of the questionnaire was very important in this study. This is because the questions must be framed in such a way as to obtain the necessary material without unduly influencing the respondents. In this regard, Evans argued that "statements on questionnaires collected through investigation must be relevant to the specific objectives of the investigation."<sup>12</sup> Also, Oppenheim has stated that "a questionnaire is a scientific tool and therefore must be constructed with great care in line with the specific aims and objectives of investigation."<sup>13</sup> These arguments suggest that the questionnaire is not merely a list of questions, but is a scientific tool constructed for a specific purpose.

Since much of the information required for this aspect of investigation was in the form of opinions and views, it was decided that the inquiry should be conducted by means of a questionnaire. To this end, the researcher conducted a search of current literature related to questionnaire design. This search helped to identify the various key issues in the area. The procedures followed in the development of the questionnaire were, essentially those recommended by Oppenheim.<sup>14</sup> Such procedures consider that the first step

in the design stage, is to list the specific objectives and to relate each question to these objectives. According to Oppenheim, "a questionnaire has a task to do, its function is measurement, therefore, the specification should clearly state the main variables to be measured."<sup>15</sup> In addition, Cohen pointed out that "a good questionnaire should be easily understood, short, uncomplicated, reliable and valid."<sup>16</sup>

After an extensive review of a number of exploratory studies of literature available, the first version of the questionnaire was developed. In developing such a version, the researcher used an outline of the topics that had been identified as important in relation to the teachers' opinions and views on their experience in teaching PS. The final version of the questionnaire was designed as a self-completion one that consisted of two major parts. The first part sought teachers' answers about their opinions on the experience with PS. The second part is concerned about teachers' demographic and personal information. A copy of the questionnaire is included in Appendix C.

The items of the questionnaire were in the forms of statements rather than questions. Since the questionnaire was designed to measure teachers' opinions, the researcher would expect a range of answers. Thus, the Likert scale of rating partial agreement was used for answering the questionnaire. Indeed, it has been argued that "in Likert scaling the respondent is not asked to



decide just whether he agrees or disagrees with an item, but rather to choose between several response categories, indicating various strength of agreement".<sup>17</sup> This means that respondents were asked only to respond to each item by choosing the category representing their own opinion.

The questionnaire consisted of four sub-scales (concepts) that measured different areas of teachers' views about their experience of teaching PS lessons. The sub-scales included the following concepts:

- a) Teachers' reactions to the in-service programme and to the challenges of preparing and teaching the new-style lessons (12 items).
- b) The success of the new-style lessons (14 items).
- c) Pupils' reaction to the new-style lessons (12 items).
- d) The need for further teacher training (10 items).

#### 4.22 Judgements and Pilot Studies

The central purpose of conducting judgemental and pilot studies has been based on the following argument: "the creation of good questionnaires does not have to rely solely on perspective researchers. At some stage in the design process the questionnaire should be subjected to a field test".<sup>18</sup> Thus, pilot tests and the opinions of judges were particularly important in this study since the questionnaire was constructed by the researcher herself. Indeed, the advantage of piloting was that it was very useful in "refining the wording, ordering, lay

out, filtering and so on and in helping to prune the questionnaire to a manageable length".<sup>19</sup> Pilot and judgements were conducted in the following stages:

a) The First Stage

In this stage, consultation was conducted with two lecturers in the School of Education at the University of Hull including an expert in research methodology. The comments provided by these two persons on the wording, appearance, the congruity of the items of the questionnaire to the main research theme and the length of the statements were taken into consideration.

b) The Second Stage

The second stage the questionnaire was translated by the researcher into Arabic as it is the language of instruction in the Sudan. After this, consultation was conducted with 10 Sudanese teachers studying for higher degrees in Britain. This group was asked to comment on the wording and other linguistic aspects of the items included in the questionnaire. The comments and suggestions provided were also considered. Indeed, these comments involved a further consultation with the team of the lecturers at the University of Hull before the researcher returned to Sudan.

### c) The Third Stage

At this stage consultation was undertaken in the Sudan with two lecturers in the Faculty of Education at the University of Khartoum. These included an expert in research methodology and a HE lecturer. They were asked about the wording and other linguistic aspects of the items included in the questionnaire. The comments provided required no further changes to be made.

### d) The Fourth Stage

It was found necessary to carry out a preliminary test of the interview to locate any ambiguities in the schedule. Thus, in this stage, a final consultation was conducted with typical respondents that included 4 HE teachers in Bahri, another area of Khartoum State. The central purpose of this pilot study was to make sure that all items included in the questionnaire were understandable by a sample of the target population respondents. This consultation was found positive and it involved no modifications.

## 4.23 Validity of the Scale

Moser and his colleague pointed out that:

By validity is meant the success of the scale in measuring what is sets out to measure, so that the difference between individuals' scores can be taken as representing true differences in the characteristics under the study.<sup>20</sup>

In the present study content validity was used as an approach for measuring the validity of the Likert scale. In this respect, it has been reported that: "The



assessment of content validity is essentially a matter of judgement; the judgement may be made by the surveyor or, better by the team of judges engaged for the purpose".<sup>21</sup> Thus, the judgements that had been provided by the two teams of lecturers at the University of Hull and the University of Khartoum, Sudanese teachers studying in Britain and the HE teachers were considered as a means for measuring the validity of the questionnaire.

#### 4.24 Administration of the Questionnaire

The questionnaire was administered immediately after conducting the interview with each teacher. The reason for this was threefold, firstly, to get fresh memories in answering the questionnaire secondly; to save time in distributing and collecting the questionnaire and thirdly, to obtain 100% responses important in a small sample.

#### 4.25 Summary

The problem of this research is focused on a practical issue in Sudanese secondary HE education. This issue has been the absence of methods of teaching CTSs and the concentration on traditional approaches. Thus, an empirical research has been designed and conducted by the researcher in her home country. The implementation of the design of the study involved 3 major stages. Firstly, negotiations with teachers regarding topics and tests to be conducted prior to the in-service course. Results of such tests were to be considered as forms of pretests.

Secondly, during the course, teachers were involved with developing 3 HE topics using the PS-style. Thirdly, after the course had been conducted, teachers taught and tested their new-style lessons. Results on such tests have been considered as forms of posttests. To assess how far lessons had been implemented in the classes, Post-Lesson-Diary-Report-Forms were provided to the teachers to fill in immediately after each class. Teachers were also asked for their views about being participated in the in-service training programme and their experience with teaching PS in HE. These data were collected by means of a structured interview and a self-report (Likert) questionnaire.

## References

1. Borg, W. and Gall, M. Educational Research: An Introduction, Fifth Edition, Longman, 1989, p. 94.
2. Ibid, p. 65.
3. Best, J. Research in Education, 4th Edition, Prentice Hall Inc, New Jersey, 1981, p. 7.
4. Dolland, T. Designing an Experiment, Rediguide 13, Edited by Youngman, M., Nottingham University, School of Education, 1978, p. 11.
5. Borg, W. and Gall, M. op.cit., p. 674.
6. Ibid.
7. Van, D. and Deabold, B. Understanding Educational Research, McGraw-Hill, 1979, p. 127.
8. Ibid, p. 466.
9. Hoinville, G. Jowell R. and Associates. Survey Research Practice, Gower, 1987, p. 90.
10. Jaber, A. and Kadhim, A. Curricula of Research in Education and Psychology, Cairo: Dar Al Nahda, 1973, p. 257.
11. Dunham, R. and Smith, F. Organizational Survey: An International Assessment of Organisational Health, Illinois, Scott, Forman and Co., 1979, pp. 14-15.
12. Evans, K. Attitudes and Interests in Education, Routledge and Kegan Paul, 1965, p. 103.
13. Oppenheim, A. Questionnaire Design and Attitude Measurement, Heinemann, 1966, p. 2.
14. Ibid., p. 2.
15. Ibid., p. 24.
16. Cohen, L. Educational Research in Classrooms and Schools: A manual of Materials and Methods, Harper and Row, 1989, p. 82.
17. Moser, C. and Kalton, G. Survey Methods in Social Investigation, Second Edition, Gower, 1986, p. 362.



18. Hoinville, G. and Jowell, R. and Associates.  
op.cit., Gower, 1987 p. 51.
19. Ibid.
20. Moser, C. and Kalton, G. op.cit., p. 355.
21. Ibid, p. 365.

Chapter Five  
The In-Service Training Course In Teaching Problem-  
Solving In Home Economics

5.1 Introduction

This chapter describes the methodology followed in conducting the in-service training programme in Sudan. It presents the method followed in teaching PS and the sessions that were undertaken during the course.

While in-service education is increasingly recognised as an important part of teacher education, there seems to be different views regarding its definition. However, Edelfelt and his colleagues use the term 'In-Service Education' as a synonym for the other terms when they define it as follows:

In-service education of teachers (or in-service training, staff development, continuing education, professional development) is defined as any professional development, activity that a teacher undertakes, singly or with other teachers, after receiving his or her initial teaching certificate and after beginning professional practice.<sup>1</sup>

Although development of in-service training may prove to be valuable to the teaching profession and education, it is still doubtful whether any initial training can fully prepare a teacher for a life career. It has been recognised that teachers should be involved in a continual learning process throughout their careers.<sup>2</sup> Many, educationists have also argued that pre-service training is often too theoretical and reflects

more personal views of the faculty members, rather than dealing with the practical situation that arises in the classroom which must be faced by the teacher. Borg for example, argues that pre-service training suffered mainly from the following deficiencies:<sup>3</sup>

- a) Emphasis is usually on telling rather than doing and instruction is largely divorced from actual classroom behaviour.
- b) Instruction is general rather than specific and most teacher-training programmes deal with vague generalities.
- c) Effective models are not provided.
- e) Effective feedback is not provided.

Regarding the need for in-service training, advocates argue that, even in countries with a teacher surplus such as America, there is still need for further in-service training. The innovations that have been introduced as a result of curriculum development have left many American teachers ill equipped to implement them without further training. In this regard, a survey conducted by the National Educational Association, revealed that large numbers of classroom teachers had received too little preparation in using instructional methods, materials and equipment.<sup>4</sup> Taking into account the complexity of the teaching task in a rapidly changing world, it is evident that many teachers are poorly prepared for their tasks even in the developed countries. According to UNESCO, the provision of in-service training



is based on the assumption that it will help teachers to meet changes in the curriculum, changes in school organisation, teaching and personal changes due to progress in their careers.<sup>5</sup> The above mentioned arguments suggest that there is no alternative other than to put into operation the concept of in-service training used in the present study. This is particularly true if we note that no single in-service training programme has been provided, so far, for Sudanese secondary HE teachers. To show the feasibility of training HE teachers through in-service training, the researcher decided to conduct an in-service course for training teachers on the implementation of PS approaches.

## 5.2 The In-Service Course

The in-service training programme for secondary HE teachers was planned and undertaken in Omdurman, one area of Khartoum State.

The major objective of the course was to train teachers in planning HE lessons which incorporate a substantial input of PS. To achieve this objective, teachers were trained in the PS method that will be presented in the next section as approaches for teaching PS in the HE context.

As has been explained in the previous chapter, the hypothesis formulated for this part of the study was that: after receiving the training programme, teachers would be able to teach HE using PS approaches and would

be confident to plan and implement PS-style lessons in their secondary HE classes.

### 5.3 The Method of Teaching PS

The method of PS presented in this section was developed by two American HE experts, Dewald-Link and Wallace in 1983. This method has been implemented in teaching PS in the present study. In developing the method, the authors suggest that it could be adapted for teaching all areas of HE. Thus, they provide examples of problems in which the HE student may be engaged. These problems as quoted include: 1) controversial issues, such as abortion; 2) management issues, such as dual roles; 3) consumer issues, such as the use of credit; 4) human relations issues, such as stereotyping; 5) nutrition issues, such as fad dieting; and 6) parenthood issues, such as discipline.<sup>6</sup>

In using this method, the authors suggest that PS is first taught as a concept to provide an opportunity for the pupils to see all the strategies that they will be using. In the present study, this suggestion had been applied. This is because besides being recommended in the method, it is also advocated by the experimental researchers for the following reason. The training of subjects in simple instructions for a short time prior to the start of the experiment provides an excellent chance for them to be transferred to the set required by the experimental task.<sup>7</sup> The method followed and was explained

to the teachers consists of three parts: the basic steps in teaching the PS process, the teacher's role and the implementation of PS.

a) The Process of PS

As presented in the method, the process of PS includes the following steps:<sup>8</sup>

- Identifying the Problem

This step is described as the critical first one. If a person has a goal and an obstacle to that goal exists, a problem surfaces. Obstacles to goals take many forms. For example, they may be mental, emotional, financial, managerial, or related to other people, things, places or time. People often confuse dilemmas with problems. While it is true that a dilemma can cause one to be puzzled, it does not interfere with the goal and it does not have a solution.

- Interpret the Problem

After the problem is identified, one must collect data about the problem in order to interpret it in a valid manner. Quite often, when two people are engaged in a discussion concerning a problem, one can be heard to remark, "but that's not the issue." Obviously, each is focusing on a different aspect of the problem. The more information that is available, the easier it is to identify the real issue, the real problem.



- List Alternatives

Listing alternatives whether figuratively or literally, allows one to consider the opinions available. After identifying the alternatives, the advantages and disadvantages of each can be weighed. This step is often overlooked when people sense a problem. Frequently, the most obvious solution is chosen as reflective thought processes are by-passed.

- Select the Solution

When selecting one solution, the consequences of each alternative solution must be considered. The solution to the problem should be the one which is most nearly associated with attaining the desired goal. It is often helpful to identify the criteria that the solution must satisfy before making a final decision.

- Implement the Decision

This step focuses on the solution selected. Implied in the chosen alternative is a plan of action to be followed, a direction.

- Evaluate the Consequences

Evaluation of the consequence relies on the criteria related to the desired goal. Within the criteria related to the ultimate goal is the means for judging its success or failure. If the goal is not satisfactorily achieved, one must consider the other alternatives, or possibly, the re-interpretation of the problem itself.

## b) The Teacher's Role

In teaching PS the major role of the teacher focuses on helping students apply basic skills and knowledge necessary for solving the problems. Thus, "teachers need to supervise the selection of problems, provide guidance in the problem-solving process, reinforce problem-solving behaviour, assist the students in seeking the limitations imposed by the problems themselves, and encourage structured argument, i.e. thinking aloud, in an environment of mutual respect."<sup>9</sup>

Among the activities identified to foster PS abilities are: simulations, values clarification, case studies, games, debates, projects, brain storming and group discussions. From these many alternatives, Dewald-Link and her colleague emphasised the use of group discussion for the following reason. They said discussion "helps students understand their own perceptions and perceptions of others related to a specific problem".<sup>10</sup> Discussion is also recommended because it "assists students in understanding that there may be several possible solutions to a problem depending upon the ultimate goal of the problem solver".<sup>11</sup> In this respect, the role of the teacher is to create a suitable climate that stimulates the expression of divergent ideas and thoughts that lead to open discussion. To do so, "teachers must be willing to spend time when teaching the problem-solving process".<sup>12</sup> The point is that, learning how to think and learning content at one and the same

time requires more time than merely being taught about thinking.

### c) Implementation

Questioning is found to be the key for the teachers as they implement PS. In this regard, various levels of questions have been provided to the teachers further to become familiar with. These questions are perceived as crucial for the teacher to understand what he or she is really asking of the students. The questions are classified to include the following categories:<sup>13</sup>

#### - Recall Questions

This category is designed to see if students have acquired information. Questions that begin with "who", "what", or "where" are at the recall level. They ask students to recall given information or knowledge. This knowledge is essential, because it gives students something about which to think.

#### - Descriptive Questions

Descriptive questions organise previously gathered facts and ask for them to be described. Questions that begin with "Describe...?", "How is...?", or "Compare..." are of a descriptive nature.

#### - Explanatory Questions

The category of explanatory questions helps to seek cause and effect. This requires analysis. Examples of



beginning phrases at the explanatory level are "Explain what you mean...", "Why did you choose...?", "Why do these things happen?", "What causes...?", and "What other alternatives...?"

- Synthesizing Questions

Synthesizing questions requires students to combine information. Questions that begin with "How would you sum up...?", "What implications...?", and "What conclusions can you make about... ?" are at the synthesizing level.

- Judgemental Questions

A Judgemental category question students to choose among alternatives. As students are choosing, the criterion for judgement must be previously established. Questions that begin with "Which statement...?", "Which of the following...?", "On what grounds...?", or "Should...?" are at the judgemental level.

- Open-ended Questions

The category of open-ended questions encourages divergent thinking that involves searching for non-obvious relationships. Questions that begin with "What might happen if...?", "If you were...?", "Why do some...?", or "How would you ?" are of often an open-ended nature.

The method of teaching PS indicates that the categorisations of questions mentioned above enable the teachers to make valid distinctions between levels of

questions. Nevertheless, it has been argued that it is not sufficient for the implementation of PS. The reason is that, the "questions which teachers ask should cause students to think in terms of the identified problem-solving steps."<sup>14</sup> This means that the teacher should be alert enough to raise the right questions and at the right time. At the same time, the questions that students raise "should indicate to the teacher that students are using reflective inquiry and the problem-solving process."<sup>15</sup>

#### 5.4 Location of the In-Service Course

The training was held at the Home Science Department, Faculty of Education at Khartoum University at the beginning in September 1992 (see letter in appendix A). For practical reasons, the schools near this department were chosen to be included in the study. The course lasted for 4 consecutive days. Programmes of the in-service course and the activities that had been carried out in each day throughout the course are presented.

#### 5.5 The Session of the First Day

At the opening of the first session of the course, the researcher introduced the teacher-trainees to the movement of critical thinking education in general and the teaching of CTSS in particular. Participants were also told briefly about the teaching methods being used to explore and develop students' CTSS. Moreover, the

purpose and the methodology of the present study were briefly explained. In addition, participants were informed about the significance of the course in the present research and that their cooperation would be appreciated greatly. Indeed, in the first session, the researcher introduced the teacher-trainees to the concept of PS as a process, the six steps of the PS process that has been included in the method. In introducing these steps the researcher provided teachers with further explanation for each step. Opportunity for discussion was also provided.

#### 5.6 The Session of the Second Day

The major objective of the second session was to show teachers how a PS lesson can be taught in HE and to get them to participate in its implementation.

The second session therefore focused on the implementation (teaching) of an HE lesson that incorporated a substantial input of PS (copy of lesson is included in appendix A. This lesson was selected and developed within the HE topics included in the secondary HE curriculum. The idea behind this was to train teachers in teaching a topic similar to those they had been teaching in their own classes. To do so, emphasis was put on selecting a topic that involved a great deal of the PS skill to be pursued. Accordingly, the 'unbalanced meal' that characterized the common diet for the majority of Sudanese families was chosen as a good topic in nutrition



education aspect (see lesson on unbalanced meal in appendix A).

The researcher then helped and guided the teachers to go over the rest of the steps of the PS process that have been discussed in the previous session. This process was carried out in the context of the unbalanced meal. Questioning was also applied in the lesson according to the way suggested in the PS method. Moreover, the strategies that had been selected from Richard Paul's list, which were included in the lesson were briefly explained and discussed with the teachers. In this regard teachers were told that Richard Paul is an American educationist, who is interested in the area of developing critical thinking skills in school children. He developed a group of 35 strategies for teaching CTSS in classrooms, which he published in his book Thinking Handbook 4-6 Grades: A Guide for Remodelling Lessons in Arts, Social Studies & science. A full list of these strategies was translated into Arabic, distributed as handouts and discussed with the participants during this session (see both versions of the strategies in appendix A). In addition, development of tests that involved all levels of cognition included in the format were fully discussed with teachers. To facilitate this discussion, the test on balanced meal that had been constructed by the researcher under the supervision of two lecturers at the University of Hull was presented (see appendix A on the test development). The discussion of test construction was

considered as a central activity in this session. This is because as a part of the research design, teachers were asked to develop test questions on topic C by themselves.

In the lesson of the in-service course the researcher emphasised the use of debates and discussions as activities to help to develop the PS skill. Emphasis was also put on helping teachers to apply their knowledge and skills in the context of the identified problem. This is because the researcher wanted the teachers to improve the way their students think through a problem. Thus, students would be convinced that HE is for thoughtful students rather than just for the low-achieving ones.

What the researcher intended to convey throughout the in-service course was encouragement to the teachers to cultivate the love of thinking in their students. The idea behind this was to achieve the "lasting value"<sup>16</sup> of thinking that has been advocated by many HE educators such as Hall and Paolucci. Teachers were also encouraged to help girls to develop the ability to reflect on each other's thinking and to be confident to think through our difficult problems in order to improve the desperate situation in the Sudanese society.

Towards the end of the second session, the participants were given another opportunity to discuss and ask questions about the PS approaches and all features of this phase of the study. In addition, teachers were encouraged to discuss the application of critical thinking concepts in education.

Since this session represented the core of the researcher's personal work in the in-service course, the lesson presented and the test developed on the unbalanced meal have been translated into English. They are presented in the appendix. As an assignment for the second day session the teachers were asked to attempt to develop their lesson plans in the three chosen Topics, A, B and C according to the given method explained in the first day session. The purpose of this assignment was to save time for the next session by getting teachers to think over their lesson plans prior to the session that had been identified for this purpose. To facilitate planning lessons for the teachers, teachers were recommended to use handouts on strategies of teaching. Consequently, by the start of the third day, teachers had prepared tentative lesson plans which made it easier for the researcher to review and comment on all of them.

### 5.7 The Session of the Third Day

The objective of the third session was to provide a chance for the teachers to plan their own lessons which incorporated a substantial input of PS. In this session each teacher presented her new-style lessons on the three topics, A, B and C that had been selected before the course. During the session the researcher supervised each teacher in producing a final form of her lesson plans on topics A and B. However, teachers were encouraged to develop lessons on Topics C without the help of the



researcher. One reason for doing so was to find out whether or not teachers had become capable of producing their own lesson plans that incorporate the PS skill. This particular interest was to be assessed by tests on topics C as well as the diary study.

This session took the full day because the researcher discussed two lesson plans with each teacher individually and also provided adequate time for feedback. Afterwards, for the purpose of generating discussion, and as a further opportunity for the teachers to weigh, diagnose and re-look at their lesson plans, PS was compared with traditional methods through an open group discussion.

As an assignment for the next session, teachers were asked to construct their test on topic C. They were also reminded to bring their schedules for teaching and testing of the three topics. After collecting all schedules the researcher developed a general schedule for all teachers. One reason for developing such a schedule was to organise visits to schools for the purpose of ensuring that no organizational problems interfered with the teaching of the lessons prepared in the course. Indeed, the intention for conducting these visits was to create a good rapport with the teachers that was perceived to be important for further co-operation. Another reason was to organise the collecting of the posttests, the conducting of the interviews and the administering of the questionnaires to the teachers.

### 5.8 The Session of the Fourth Day

The aim of the fourth session was to provide a chance for each teacher to present her new-style lesson plans and to discuss them with the rest of the teacher-trainees under the researcher's supervision.

The fourth session provided an opportunity for discussion, comment and feedback on the lesson plans and the test on topic C. It also assured the researcher that the lessons were planned according to the intended style. This opportunity was considered as essential for the success of the instruments of the whole study including the posttests, the diary study, the interviews, and the questionnaires.

The teachers were encouraged to teach and test their lessons very soon after they finished the course. This was considered as an important point for getting fresh memories from the teachers in the interviews and the questionnaires. Participants were also reminded to fill in the diary forms immediately after teaching each of their new planned lessons.

At the end of the session, the schedules of teaching and testing the planned lessons that had been collected earlier were reviewed with the teachers before they left. Guided by the general schedule that the researcher developed, she was able to organise her visits to schools.

## 5.9 Summary

The course conducted in this study aimed to train Sudanese secondary HE teachers in teaching PS. In a four-day comprehensive course, sixteen teachers were trained in the implementation of the method of teaching PS that has been developed by two American HE educators. The training course included four sessions each of which focused on specific activities. In the first session, the emphasis was put on introducing teachers to the movement of teaching CTSS. Teachers were also introduced to the purpose of the study. Moreover, participants were involved with PS as a method of teaching CTSS. The second session was focused on teaching teachers the lesson developed by the researcher on the unbalanced meal. The third session provided opportunity for the participants to develop their own PS-lesson plans and test on topic C. In the final session, teachers were given an opportunity for ample discussion in presenting their new-style lesson plans and tests. The teachers' reactions to the in-service course revealed that good communication and cooperation between teachers and the researcher had been established.



## References

1. Edelfet, R. and Johnson, M. Rethinking In-Service Education, National Education Association, Washington D.C., 1975, p. 10.
2. Lord James of Rusholme. The Education and Training of Teachers in Klassen, F and Collier, J. (Eds) 1972, Innovation Now: International Perspectives in Teacher Education, Washington, International Council on Education for Teaching, 1972, p. 18.
3. Borg, W. et al. The Mini Course: A Micro Teaching Approach to Teacher Education, Collier Macmillan, 1970, p. 18.
4. Brown, J. Administering Educational Media, New York, McGraw Hill, 1986. p. 581.
5. UNESCO, op.cit, 1970, p. 13.
6. Dewald-Link, M. and Wallace, S. 'Help Students Face Tomorrow: Use Problem Solving Approaches in Your Classroom Today', Clearing House, Vol. 56, No. 5, Jan 1983, p. 215.
7. Borg, W. and Gall, M. op.cit., p. 657.
8. Dewald-Link, M. and Wallace, S. op.cit., p. 215.
9. Ibid., p. 216.
10. Ibid.
11. Ibid.
12. Ibid.
13. Ibid.
14. Ibid, p. 217.
15. Ibid.
16. Hall, O. and Paolucci, B. Teaching Home Economics, John Wiley and Sons Inc., 1970, pp. 200-201.

## Chapter Six Analysis of the Achievement Tests

This chapter presents the procedures used in analysing the tests conducted in the present study and the results obtained. As mentioned in Chapter Four, the objective of conducting the tests was to demonstrate that pupils' learning in the new-style lessons that incorporate a substantial PS input is not less than in traditional lessons on the same HE topics. The theory the study addresses is presented by the null hypothesis which states that there is no difference in achievement between students taught HE topics in PS-style and students taught the same topics in a more traditional style as measured by their mean scores of a HE achievement test.

Accordingly, three achievement tests were carried out. Tests A and B were conducted to compare the mean scores between students taught HE topics in traditional methods and those taught the same two topics in PS-style. Test A represented the first topic while test B represented the second topic. Test C that represented the third topic, was conducted to test whether the pairs of classes involved in the study were matching groups. Each test included 6 questions and each question had a maximum score of 6 points. Thus, the maximum score for each test was 36 points.

### 6.1 Analysis Procedures Used for the Tests

The analysis of the tests was based on comparing the mean scores in the HE theoretical achievement tests between classes. The researcher is interested in comparing the mean scores of the achievement tests that were conducted prior to (pretests) and after the experimental treatment (posttests). The purpose is to

determine whether they are significantly different. Thus, analysis of variance was conducted to find out differences between mean scores of the tests. In this regard, Minium argued that: "Analysis of variance is a powerful aid to the investigator. It enables him to design studies more efficiently, to generalise more broadly and to take account of the complexities of interacting factor. Analysis of variance is a class of techniques, designed to aid in hypothesis testing."<sup>1</sup> It has also been stated that: "Analysis of variance enables average scores of several groups to be compared."<sup>2</sup>

## 6.2 Test on Topic C (Test C)

The researcher is interested in determining whether a difference between the two groups on the experimental treatment can be explained by another difference that exists between these groups. To investigate this possibility, test on topic C was conducted. The purpose of this test was to correct for possible between-class differences for example, one class might have been of higher overall ability than the other. If the groups are different, results on a common test (the covariate) are used to compensate for differences. The covariate should be a test that is expected to correlate strongly with the results to be corrected for this reason test C was in other HE topic. Thus, analysis of covariance was proposed to be used to test the possibility just mentioned. In this regard Best reports that: "This method permits the experimenter to eliminate initial differences on several variables between the experimental and control groups by statistical methods."<sup>3</sup> Similarly, Borg and Gall state that "analysis of



covariance is often used to determine the statistical significance of mean score differences between the various treatment groups in an experiment."<sup>4</sup> Indeed, the need of using analysis of covariance in the present study was that the researcher was not able to select comparison groups of students that were matched with respect to all relevant variables except the one that is the main concern of the investigation (the experimental treatment). This indicates that comparisons of results on topics A and B would be better interpreted with the aid of results of another test. Thus, test C was considered as a possible compensatory variable. The idea behind conducting test C after the in-service course (posttest) rather than before it (pretest) was to demonstrate that classes were parallel with regard to PS rather than traditional learning of HE. Accordingly, the mean scores of test C on 'sewing and clothing construction', were obtained after teachers had attended the in-service course on teaching PS. To investigate if there were differences between groups, a two tailed t-test was made on the means of the scores on test C for the two classes of each teacher to find out whether the difference was significant. From the results shown in Table 6.1, it can be seen that in classes of fifteen of the sixteen teachers there was no significant difference between the means of the scores of the two classes. Only in one of the teacher's classes (teacher 6) was a significant difference found ( $P = < 0.05$ ). The finding of one significant result with  $P = 0.05$  (i.e 1/20) is quite likely in the making of 16 comparisons even when no true difference exists. Thus, this one result from 16 can be disregarded. In confirmation of this, the t-test made on the means of the scores for the classes of all teachers, the difference was found to be not significant ( $P = .680$ ). This confirmed

that the pair of second-grade classes of 15-year old girls, were also parallel in terms of their academic achievement as they were in their sex and age. Therefore, there was no need to correct for between-class differences by using test C as a covariate. Accordingly, analysis of covariance was not conducted in the tests described in the remainder of this chapter.

Table 6.1

Summary of results of t-tests on the mean scores of test C by teacher.

Teacher No.	No.of St/Cl.	Test C Class1	Test C Class2	T-test P
1	15	29.0	29.6	.671
2	15	30.6	28.6	.108
3	11	32.3	31.7	.501
4	12	31.5	30.6	.279
5	17	27.7	29.3	.742
6	10	32.3	29.5	.020*
7	14	31.8	31.5	.726
8	10	30.5	28.3	.142
9	16	30.0	30.5	.696
10	17	28.8	28.5	.787
11	17	29.1	29.1	1.000
12	27	29.6	29.5	.966
13	13	32.8	31.8	.214
14	11	29.6	29.0	.605
15	12	27.0	28.0	.743
16	17	29.1	29.5	.357
-----				
All	All	29.1	29.5	.680

(\*)  $P < 0.05$  (Significant difference).

### 6.3 Tests on Topics A and B (Tests A and B)

The approach to the problem of comparing two or more groups with only one paper in common has been argued by Birnbaum. The central issue of this argument is that marks on the paper not taken

by a group are estimated from their joint marks on the common paper and the paper specific to their group. The author also discussed the case of "two groups taking a common paper each, but generalisation to more complex cases will be straightforward."<sup>5</sup> He explained that: "these papers are measuring the same thing, albeit on a different scale. Thus, if they were tests of mathematics, we could need to assume they were all measuring the same compound variable which we might call 'mathematical ability and attainment'."<sup>6</sup> Based on this argument the pretests were compared with the posttests in the present study although these tests were conducted in different classes.

To compare the students' learning of HE topics taught in traditional fashion and students' learning the same topics in PS-style, the tests on topics A and B were conducted before and after the teacher-training course in PS. The purpose of using two topics rather than one was twofold. First, to provide a wider opportunity in order to get more reliable comparisons. Second, to include more topics of HE for the generalisation of the results. By carrying out the tests on two different HE topics, it will be easier to generalise results to the whole of HE curriculum. Thus, the mean scores of the pretests and posttests of both topics were obtained. To investigate the differences between these scores, a t-test was conducted for the parallel classes of each teacher separately.



Table 6.2

Summary of results on the mean scores and the t-tests of pre- and post-test on topics A and B by teacher.

Teac.	No. of	PreA	PostA	T-test	PreB	PostB	T-test
No.	St/Cl	Trad	PS	Sig	Trad	PS	Sig
1	15	21.7	31.7	***	27.2	24.4	NS <sup>-</sup>
2	15	24.8	29.3	*	27.4	28.7	NS <sup>+</sup>
3	11	23.2	28.7	**	23.5	30.7	***
4	12	25.5	28.3	NS <sup>+</sup>	26.9	30.4	**
5	17	19.3	17.8	NS <sup>+</sup>	24.4	26.4	NS <sup>+</sup>
6	10	26.3	33.5	***	22.3	29.9	**
7	14	21.4	28.9	***	19.3	26.9	***
8	10	22.8	30.9	**	23.8	29.8	***
9	16	23.8	30.5	***	25.0	31.0	**
10	17	21.4	24.7	NS <sup>+</sup>	17.2	30.5	***
11	17	21.1	23.0	NS <sup>+</sup>	23.6	31.0	***
12	27	24.6	30.5	***	23.1	28.8	***
13	13	23.7	28.0	***	18.8	27.9	***
14	11	25.4	29.2	*	25.5	30.9	**
15	12	26.5	32.4	***	23.7	29.0	***
16	17	20.4	21.2	NS <sup>+</sup>	24.0	27.8	*
-----							
All	All	23.1	27.7	***	23.4	28.9	**

(\*) P= < 0.05 (sign.)    (\*\*) P= < 0.01 (highly sig.)  
 (\*\*\*) P= < 0.001 (very highly sign.)  
 (NS<sup>+</sup>) = not sign. gain.    (NS<sup>-</sup>) = not sign. loss.

The data presented in Table 6.2 show that in test A (nutrition) in all between-class comparisons, higher scores were achieved in those classes taught after the teachers' period of training evident by the higher mean scores of the posttest compared with those of the pretest. However, the significance of the difference between pretest and posttest scores varied from one teacher's classes to the other.

For example, for seven of the teachers (1, 6, 7, 9, 12, 13, and 15) the t-tests indicate that the differences between students' gain in the posttest were very highly significant ( $P = < 0.001$ ). In the classes of two teachers, 3, and 8, the difference was found to be highly significant ( $P = < 0.01$ ), whereas in teachers 2 and 11 the t-tests show that the difference between the mean scores of the pre- and post-test was significant ( $P = < 0.05$ ). Only the t-tests made on the mean scores for classes of teachers 4, 5, 10, 11 and 16 show that the gain of these groups in the posttest were not significant. These results are referred to by NS<sup>+</sup> in Table 6.2. Thus, on this test, eleven of the sixteen results were in favour of the posttest group with five results showing no significant difference. There was no instance, of the pretest group showing a higher score. The t-test that was conducted for all teachers' groups indicates that the difference between the mean score of the students in the pretest compared with that of the posttest was very highly significant ( $P = < 0.000$ ). This confirms that the differences between the students' mean scores of pretest A and posttest A were real differences.

In comparing the mean scores of groups on test B, the data in Table 6.2 show that in the first teacher's classes the mean score of the pretest was higher than that of the posttest. Nevertheless, the t-

test result confirms that such a difference is statistically not significant.

In the classes of teachers 2 and 5 Table 6.2 shows that although students gained in their mean scores on the posttest, the t-tests made indicate that these gains were also statistically not significant. For the remaining 13 of the 16 groups, the differences between the classes ranged from significant to very highly significant, all in favour of the classes taught via PS after the in-service training course.

For instance, in the classes of teacher 16 the difference was found to be significant. While in classes of teachers 4, 6, 9 and 14 the differences were very significant ( $P = < 0.01$ ). The individual t-tests for half of the teachers (teacher 3, 7, 8, 10, 11, 12, 13, and 15) indicate that the progress that happened in students' mean scores of posttest B compared with those of the pretest were very highly significant.

As a further check for differences between the groups, a t-test on the mean scores for classes of all the teachers was made. The result obtained as seen in the Table proves that the difference between the mean score of students in pretest B compared with that of the posttest was a true difference, a very highly significant one, in favour of teachers' training in using methods of PS.

Based on the results obtained in comparing between groups' mean scores, of pretests and posttests on topics A and B, we can conclude that students' mean scores in the posttests, after teachers were involved in the in-service training course, were higher than those of the pretests, before the conduction of the in-service programme in teaching PS. Consequently, we reject the null



hypothesis that there is no difference between students taught HE topics in PS-style and students taught the same topics in a more traditional style in their mean scores of the HE achievement tests. The direction of the difference shows that pupils' learning in the new-style lessons that incorporate a substantial PS input is greater than in traditional lessons on the same HE topics.

#### 6.4 Comparisons of the Mean Scores of the First Three Questions on Basic HE Between Pre- and Post Tests A and B

As indicated in earlier chapters, the traditional HE tests concentrated on the basic knowledge and skills of HE. This part was tested by question 1 (recall), question 2 (explanatory) and question 3 (descriptive). Thus part 1 of each test represented the traditional HE achievement tests on topics A, B and C. The second part of the same tests was concentrated on problem-solving. This part was assessed by question 4 (synthesizing), question 5 (evaluation) and question 6 (open-ended). While students mean scores on the whole achievement tests were improved after lessons were remodelled to include PS, it could be claimed that this improvement may be at the expense of students' learning of basic HE provided by the traditional methods. In other words, the improvement in the posttest results as a whole could be explained as a very large improvement in PS (second part) together with a modest fall in students' performance in traditional HE (first part). To test for the claim made at the beginning of this thesis that there will be no lowering in students' mean scores in the traditional part of HE achievement test as a result of PS input, t-tests on the mean scores of the first 3 questions (total score = 18) of tests A and B were conducted.

As seen in Table 6.3 the t-tests show that in comparing the mean scores of pretest A with those of the posttest, in twelve of the teachers' classes there were true differences in favour of the PS (i.e. posttest) group. The significance of these differences varies from one teacher's groups to another. For example, in the classes of two of these teachers (1 and 7) the differences were very highly significant ( $P = < 0.001$ ). In the classes of seven of teachers (5, 6, 8, 12, 13, 14 and 15) the differences were highly significant ( $P = < 0.01$ ) while in groups of three of the teachers' classes (3, 9 and 10) the differences were significant ( $P = < 0.05$ ).

The t-tests show that although in two of the teachers' classes (2 and 11) there were improvements in the mean scores of the posttest, this progress was statistically not significant. Similarly, the lowerings in the mean scores of groups of two teachers (4 and 16) were found not to be significant. These are referred to by NS<sup>-</sup> in Table 6.2. Thus, there were twelve significant differences in favour of the PS group, four cases of no significant difference between the groups and no instance in favour of the traditional (non-PS) group. Moreover, the t-test conducted on the combined mean scores of classes of all the teachers indicates that the difference between the scores of pre- and post-test A on the basic IIE was very highly significant. It can be concluded that the mean scores of the students on the traditional part of posttest A (PS) were higher than those of the pretest (traditional methods).

Table 6.3

Summary of the results of the t-test on the mean scores of the first 3 questions on the basic HE of pre- and post-tests A and B.

Teac.	No. of	PreA	PostA	T-test	PreB	PostB	T-test
No.	St/Cl	Trd	PS	Sig	Trad	PS	Sig
1	15	11.8	16.8	***	13.3	13.1	NS <sup>-</sup>
2	15	13.3	14.4	NS <sup>+</sup>	14.0	14.0	NS
3	11	13.5	15.5	*	14.2	15.5	*
4	12	14.2	13.9	NS <sup>-</sup>	14.7	14.2	NS <sup>-</sup>
5	17	09.1	12.2	**	13.4	13.7	NS <sup>+</sup>
6	10	14.3	16.8	**	13.9	17.3	*
7	14	11.5	14.7	***	10.3	12.0	*
8	10	12.1	16.3	**	13.9	16.6	*
9	16	14.3	16.2	*	15.1	16.6	NS <sup>+</sup>
10	17	13.1	11.1	*	10.0	15.5	***
11	17	12.0	12.3	NS <sup>+</sup>	12.6	16.1	**
12	27	14.1	15.9	**	14.0	14.9	NS <sup>+</sup>
13	13	12.7	14.9	**	09.7	12.4	***
14	11	13.3	15.9	**	15.0	16.7	NS <sup>+</sup>
15	12	14.2	16.5	**	15.3	16.1	NS <sup>+</sup>
16	17	12.8	11.3	NS <sup>-</sup>	13.3	14.0	NS <sup>+</sup>
-----							
All	All	13.1	14.1	***	13.2	14.8	***

(\*) P= < 0.05    (\*\*) P= < 0.01    (\*\*\*) P= < 0.001  
 NS<sup>+</sup> = not sig gain    NS<sup>-</sup> = not sig loss  
 NS = not sig when no difference was found.



In comparing the mean scores of pretest B with those of the posttest, the t-tests conducted indicate that in seven of the parallel classes the differences vary from significant to very highly significant. These are the groups of teachers 3, 6, 7, 8, 10, 11 and 13. In the classes of the other nine teachers the difference were found not to be significant whether there was a gain or loss. Notwithstanding this, the t-test of the mean scores for all of the teachers' classes confirms that the difference between pre- and post-test B on the mean scores of the first three questions on traditional part that represented the basic HE was very highly significant ( $P = < 0.001$ ).

According to the findings obtained in this investigation, it could be concluded that we will accept the claim that: there will be no lowering in students' mean scores in the HE achievement tests as a result of the incorporation of PS. In fact, this result is strongly in favour of the introduction of PS methods in teaching HE evident by the significant progress that happened for most of the students' scores on their posttests after their teachers had planned and taught the lessons to include PS.

Therefore, we can conclude that the improvement of learning HE as a result of using methods of teaching PS was not at the expense of learning basic HE. Indeed, learning basic HE was improved as a result of teaching PS. This is particularly important since we have noted in Chapter Three on the curriculum of HE that the basic knowledge of HE is essential for learning CTSS (PS).

### 6.5 Comparisons of the Mean Scores of the Second Three Questions on PS Between Pre- and Post-tests A and B

As a further investigation of students' learning, it was decided to compare the mean scores of pretests A and B with those of the posttests on PS questions. These were questions 4 to 6 included in the second part of the tests. Accordingly, t-tests on the mean scores of tests A and B for each pair of classes were conducted. The results presented in Table 6.4 indicate that in comparing pre- with post-test A, students of all teachers' classes gained in their mean scores of the posttests. In 14 of the teachers' groups, the t-tests show that these gains vary from significant to very highly significant.

Only in classes of teachers 5 and 14 the gains were found to be statistically not significant, which were referred to by NS<sup>+</sup> in Table 6.4. The t-test made on the mean scores of all teachers classes, confirms that the difference between pre- and post-test A , was a very highly significant of  $P = > 0.001$ .

Table 6.4

Summary of the results of the t-test on the mean scores of the second three questions on PS of pre- and post-tests A and B.

Teac.	No. of	PreA	PostA	T-test	PreB	Post B	T-test
No.	St/Cl	Trad	PS	Sig	Trad	PS	Sig
1	15	9.9	14.8	***	14.1	11.0	** <sup>+</sup>
2	15	11.4	14.8	**	13.3	14.6	*
3	11	9.7	13.1	**	9.2	15.1	***
4	12	11.2	14.4	**	12.1	16.1	***
5	17	7.1	8.6	NS <sup>+</sup>	11.0	12.7	NS <sup>+</sup>
6	10	12.0	16.7	***	8.4	12.6	**
7	14	9.8	14.2	***	9.0	14.6	***
8	10	10.7	14.6	**	9.9	13.2	**
9	16	9.5	14.2	***	9.8	14.3	***
10	17	8.2	13.6	***	7.1	15.0	***
11	17	9.0	10.7	*	11.0	14.9	***
12	27	10.4	14.6	***	9.1	13.8	***
13	13	11.0	13.0	**	9.0	15.4	***
14	11	12.0	13.3	NS <sup>+</sup>	10.5	14.1	***
15	12	12.3	15.8	***	8.4	12.9	***
16	17	7.5	9.9	**	10.7	13.8	**
-----							
All	All	9.9	13.4	***	10.2	14.0	***

(\*) P= < 0.05 (sign.) (\*\*) P= < 0.01 (highly sign.) (\*\*\*) P= < 0.001 (very highly Sign.)  
 NS<sup>+</sup> = not sign. gain  
 (+) = in favour of traditional methods



In comparing the mean scores of pre- and post-test B, Table 6.4 shows that like test A, the t-test results indicate that in 14 of the 16 teachers' classes the gains vary from significant to very highly significant with a majority of the latter. In classes of teacher 5 the gain in the mean score of the posttest was calculated to be statistically not significant. Only in the first teacher's classes, was there a loss in the mean score of the posttest. Nevertheless, the result of the t-test conducted on the mean scores of pre- and post-test B for groups of all the teachers fully confirms that the difference between the mean scores of pre- and post- test B was very highly significant ( $P = < 0.001$ ).

The mean scores for all groups of both posttests A and B were far higher than those of the pretests. Clearly, the results obtained in the investigation of students learning of PS indicate that teachers succeeded in planning and teaching PS lessons that resulted in gains of students' achievement. The evidence is reflected by the very highly significant gains in the mean scores of posttests A and B, which were conducted after the training course in teaching PS. Indeed, the t-test results obtained validate the formulated theory that has been presented in the methodology chapter which states that: after receiving the specially designed training programme, teachers would show they will be effective to teach HE using PS approaches and would be confident to plan and implement PS style lessons in their secondary HE classes.

#### 6.6 Threats to the Validity of the Experiment

Borg and Gall state that: "The scientist in his laboratory may rigourously control all the variables in an experiment. However, this

is not always possible in studies of human behaviours."<sup>7</sup> This argument indicates that in experimental research, there are often variables other than the independent ones which may powerfully influence the results. These inevitable dangers are known as the threats to the validity of the experiments. In this regard, Campbell and Stanley explained that the major purpose of experimental design is to impose control over conditions that would otherwise cloud the true effects on the independent variables upon the dependent variables. Important to the present study is when the authors argue that:

clouding conditions that jeopardise the validity of experiments are of greater consequence to the validity of quasi experiments (more typical in educational research) than to the true experiments in which random assignment to treatments occurs and where both treatment and measurement can be more adequately controlled by the researcher.<sup>8</sup>

Based on the above quoted argument, the researcher decided to encompass this section in her thesis. As identified by Campbell and Stanley the threats to the validity of experiments consists of internal and external dangers each of which will be discussed briefly in the following sections.

#### 6.6.1 Threats to the Internal Validity of the Experiment

Internal validity is concerned with whether the experimental treatments do in fact, make a difference in the specific experiments under scrutiny. This implies that, the experiment can only be internally valid when the results within its own confines are credible. The threats identified in this part include: history, maturation, statistical regression, testing, instrumentation, selection and experimental mortality.

**a) History**

The threat of history is represented by events other than the experimental treatments that occur during the time between pretest and posttest observation. Such events produce effects that can mistakenly be attributed by researchers to differences in treatment. This is particularly important when the experimental treatment extended over a period of time. This factor could threaten the experiment of the present study. As topics A and B were taught and tested one after the other before topic C, students could have learned PS from the former topics (A & B). This could improve the students' scores in the tests of the later topic (C), which given to all classes. The researcher admits that students might have gained from their previous experiences with PS. Nevertheless, this possibility has a weak effect for the following reason. As shown in Diagram 6.1 the interval time between the occasions of teaching and testing topics A and B according to the PS- style (after the training course), compared to the teaching and testing topic C (PS) in the present study was designed to be a brief one, it was only 15 days. In short, history did not constitute a real threat to the internal validity of the present experimental study.

**Diagram 6.1**

Summary of the design of the study based on the time factor.

<b>Class One</b>	<b>Teach Trad Topic A</b>	<b>Pre Test Topic A</b>	<b>Train (PS)</b>	<b>Teach (PS) Topic B</b>	<b>Post Test Topic B</b>	<b>Teac &amp; Test Topic C</b>
<b>Class Two</b>	<b>Topic B</b>	<b>Test B</b>		<b>Topic A</b>	<b>Test A</b>	<b>Te/-Ts Topic C</b>
<b>Time/Day</b>	<b>10</b>	<b>5</b>	<b>4</b>	<b>10</b>	<b>5</b>	<b>10</b>



The second reason is based on the fact that the pre- and post-test for each topic were conducted on different groups. This means there was no chance allowed for the students involved in the experimental study to learn from the pretests. In short, history did not constitute a real threat to the internal validity of the present experimental study.

#### b) Maturation and Statistical Regression

Statistical regression often happens when test-retest produce is used to assess change as an effect of the experimental treatment, the probability exists that statistical regression can occur for observed gains in learning. The effect of statistical regression on test scores is that if the same students are tested again, on a similar test, they will earn a higher mean score because of statistical regression with or without an intervening experimental treatment. Since the pre- and post- tests were conducted on different groups in the present study, there was no way of knowing whether the differences in students' mean scores reflect a differential statistical regression rather than, or in addition to the effect of treatment, the problem-solving method. Thus, statistical regression did not jeopardise the internal validity of the present experimental study.

Often in the educational research, while the experimental treatment is in progress, biological or psychological changes in students are likely to occur. For example, they may become stronger, more cognitive able, more self-confident and more independent. The effect of this factor on the subjects of the experimental study is known as maturation. As the experimental study of the present research was very brief, coupled with the fact that students were at

the same grade level, this extraneous variable was not a problem to threaten its validity.

### c) Testing

The threat of testing occurs when pre-tests at the beginning of an experiment can produce effects other than those due to experimental treatments. Such effects can include sensitizing subjects to the true purpose of the experiment and practice effect which produce higher scores on posttest measures. This means that the procedure of testing could influence the variable being measured and the effect on a subject of having been tested may influence its further performance. Although testing could have been a threat to the present experimental study, this probability was minimized for the following reasons. Firstly, because the pre- and post-tests were conducted on different groups. Secondly, because of the fact that no real pretests were conducted for all the groups before teaching topics A and B according to the traditional style. Indeed, this why it has been noted in Chapter Four on the methodology and research design that the terms pre- and post-tests used in this study were forms of pretests and posttests rather than real ones. Finally, the three topics in which the tests were conducted were different. They were 'nutrition education' representing topic A ; 'cooking and food preparation' representing topic B ; and 'sewing and clothing construction' representing topic C. Thus, the testing factor had no positive effect on the progress of the mean scores upon the posttests

### d) Instrumentation

Unreliable tests or instruments can introduce serious errors into experiments. With human observers or judges, error can result

from changes in their skills and levels of concentration over the course of experiment. In other word, over a period of time, the instrument used to investigate an aspect of behaviour may become out of date, or the entire technique may become inappropriate as a result of a clearer understanding of the subjects to the theory behind the phenomenon being testing. These arguments suggest that the time factor as well as the test construction are central to the threat of instrumentation. As discussed earlier, the experiment of the present study was a brief one. The procedure followed in tests' construction discussed in Chapter Four deny the danger of instrumentation factor. This is because of the comprehensive consultation conducted in developing the tests which ensured their validity.

#### e) Selection

The arguments provided in the effect of selection variable confirm that because it is rarely feasible to test an entire population, to which it is hoped that the finding may be generalised, it is always possible that bias is accounting for results which are being attributed to the influence of the independent variables. Bias may be introduced as a result of differences in the selection of the subjects for the comparison groups or when intact classes are used as experimental or control groups. This implies that the effect of selection procedures rather than that of the experimental variables may bias the result. As the researcher as well as the teachers did not employ any selection for the subjects included in the tests' study coupled with the fact that each of classes was treated as a control



and an experimented group, this factor constituted no contamination to the validity of the present quasi experiment.

#### f) Experimental Mortality

The threat of experimental mortality is the loss of subjects that often occurs in long-running experiments, which may result in confounding the effects of experimental variables, for whereas initially the groups may have been randomly selected, the residue that says the course is likely to be different from the unbiased sample that began it. Similar to the maturation and history, clearly experimental mortality is also associated with the increasing time interval between pre- and post-test. For the same reason of the short-running of the present experimental study that has been discussed earlier, the experimental mortality had no effect, whatsoever in threatening its internal validity.

#### 6.6.2 Threats to the External Validity

External validity is the extent to which the findings of an experiment can be applied to particular settings. The threats to the external validity are likely to limit the degree to which generalisations can be made from the particular experimental conditions to other populations. This indicates that, a researcher must always question the extent to which his/her results are representative and whether results obtained with on set of subject can be generalised to the population as a whole. Put it another way, the results of an experiment can only be generaliseable beyond the confines of this particular experiment when it is externally valid. Six factors that can jeopardise the external validity to experiments have then been identified by Campbell and Stanley. They include:

#### a) Failure to Describe Independent Variables Explicitly

The threat of this variable is that unless independent variables are adequately described by the researcher, future replications of the experimental conditions are practically impossible. Since the major variables are fully defined in the tests' study this threat did not cloud its external validity.

#### b) Lack of Representativeness and Target Population

Whilst the subjects involved in the experiment may be representative of an available population, they may not be representative of population to which the experimenter seeks to generalise his/her findings. This means that the sample of the study should be representative of its population in order to generalise the findings. Once again, the full definition provided for the sample of the present study, which indicated that the tested groups were secondary HE students of Omdurman secondary school HE teachers who participated in the in-service training course in teaching PS, denies the threat of this factor.

#### c) Hawthorne Effect

The literature reviewed for this variable asserts that Hawthorne effect often occurs when researchers perform experiments to determine the effectiveness of innovative educational practices. In explaining the threat of this factor Borg and Gall report the following:

This effect is produced where subjects of the experiment become aware that they are participating in an experiment. Consciously or unconsciously subjects may change their behaviour to conform to the behaviour which they feel the experiment is looking for. The effect may not be noticed in the cause of an experiment.

However, should a replication study be carried out and the effect not apply, then quite different results may be obtained.<sup>9</sup>

This indicates that Hawthorne effects threaten to contaminate experimental treatments in educational research when subjects realise their role in the experiment. The effects of the Hawthorne variable suggest that it could have had threatened the external validity to the experiment of the present study. This is because from the beginning, teachers were informed that the purpose of the study was to find out the difference between teaching specific topics of HE using their own methods and teaching the same topics using PS approaches on students' learning. Thus, it could be claimed that improvement in the mean scores of the posttests on topics A and B is due to the effect of teachers' enthusiasm on return from the in-service course, rather than the treatment of teaching HE using the PS methods. The researcher agrees that this factor very likely had a positive effect in teachers' way of teaching particularly the teaching of earlier lessons that carried out immediately after the in-service course. However, she would argue that this possibility was not responsible for all pre-post test differences. The reason is reflected by the results of the t-tests obtained for classes of all teachers in tests A and B which are found to be very highly significant ( $P = < 0.001$ ) compared with the positive effect of teachers' enthusiasm. Thus, the probability of having a positive effect of teachers' enthusiasm in the improvement of students' mean scores of posttests if it were found would be very minor. It can then be concluded that at least the greater part of the improvement that happened to the students in their mean scores of the posttests can only be attributed to the methods of problem-solving.



#### d) Inadequate Operationalising of Dependent Variables

With regard to the above threat, it has been discussed by the authors that dependent variables that the experimenter operationalises must have validity in the non-experimental setting to which he/she wishes to generalise his/her results. This suggests that the researcher should operate dependent variables that are representative to the population or setting of his/her study in order to generalise the findings. This threat was carefully tackled by the full definition of the major variables of the present study.

#### e) Sensitizing to Experimental Conditions

The data reviewed for this threat indicate that in some instances the pretest may act as part of experimental treatments and thus effect the research results. For example, as with threats to the internal validity, pretests may cause changes in the subjects' sensitivity to the experimental variables and thus cloud the true effects of the experimental treatment. As far as the present study is concerned, the conduction of the pretests on groups that were different from those of the posttests refutes the threat of this factor. In fact, the avoidance of this threat was one of the important reasons for choosing the present design.

#### f) Interaction Effects of Extraneous Factors and Experimental Treatments

All of the above threats to the external validity represent interaction of various clouding factors with treatments. Interaction effects may also arise as a result of any or all of the above factors identified under the section on threats to internal validity. This suggests that all of the factors included as threats to the validity of

experiments make it nearly impossible to operate out the effects of the experimental variables. It also suggests that with a careful precaution, such threats could be minimized.

### 6.7 Summary

This chapter has described the purpose and the theory for conducting the tests in the present study. The sample of the study is represented by the students included in the parallel classes of the sixteen teachers who had been trained in teaching PS. For the assessment of the students' academic achievement in HE, three achievement tests (A, B and C) were conducted. These tests included an equal number of traditional as well as PS questions. Tests A and B were conducted on two different occasions, before and after the course as forms of pre- and post-tests to compare between the groups. Test C was conducted to investigate for possible in-between class differences.

Analysis of variance using a two-tailed t-test was conducted to investigate whether there were differences between classes.

The t-test results made on the mean scores of test C for each teacher separately showed no significant difference for 15 of the 16 teachers' groups. The same test conducted on the combined mean scores for all teachers also showed no significant difference between the classes. These results support the claim that the classes of each teacher were parallel. Thus, it was not necessary to use covariate analysis.

The very highly significant differences ( $P = < 0.001$ ) obtained by the t-test conducted on the mean scores of tests A and B for all teachers' classes and also for overwhelming majority of the separate

teacher by teacher comparisons, falsifies the null hypothesis that there is no difference between students learning of HE lessons taught in the PS-style and students learning the same topics in a more traditional fashion in their mean scores of the HE achievement tests. The direction of this rejection is in favour of the PS groups.

The very highly significant difference ( $p \leq 0.001$ ) obtained from the t-test made on the mean scores of all groups in the traditional questions that concentrate on the traditional part of basic HE verifies the claim that: there will be no lowering in students' mean scores in the HE achievement tests as a result of a substantial PS input.

Like the basic HE, the t-tests conducted on the mean scores of the second part on PS revealed a very highly significant difference between the pre- and post-tests A and B for classes of all teachers. This result verifies the formulated theory stated for this study that after receiving the specially designed training programme, teachers would be confident to teach HE topics using PS approaches and would be confident to plan and implement PS-style lessons in their secondary HE lessons. It also reinforces the validity of the in-service course in teaching PS. The point is that the success of teachers in doing so, is reflected by the results of the students achieved in the posttests. Thus, it could be concluded that teachers were effective in teaching PS in their HE classes.

As a result of the discussion about the threats to the validity of experimental research, it has been concluded that history, testing, instrumentation and Hawthorne effect were unlikely to be serious threats to the validity of the present experimental study. Against these threats the researcher has argued that the short-running



experimental research, the very highly significant t-test results obtained in all teachers' classes on the posttests (after the conduction of the in-service course), the use of different topics and the conducting of pretests on different groups than the posttests, are all conditions that minimize these threats. It has been explained that the threats to the validity are quite small in comparison with the strong effects obtained. Thus, she concluded that at least a great deal of the improvement achieved by the students on their mean scores of the posttests can only be associated with the new methods of teaching PS. It was also concluded that the consistency of the findings obtained across all the 16 teachers is in favour of the in-service training programme and the use of problem-solving methods in teaching home economics.

Based on the encouraging results obtained in the tests' study, the researcher hopes to generalise the training of all Sudanese secondary HE teachers in using PS method in teaching their HE lessons in all their classes. The application of this would include both technical and academic schools for girls in urban and rural areas.

## References

1. Minium, E. Statistical Reasoning in Psychology and Education, Second Edition, John Whiely & Sons, 1978, p. 390.
2. Ibid
3. Best, J. Research in Education, Fourth Edition, Printice-Hall, 1981, p. 62.
4. Borg, W. and Gall, M. Educational Research: An Introduction, Fifth Edition, Longman, 1989, p. 702.
5. Birnbaum, I. 'A Modified Regression Approach to the Problem of Comparing Two or More Groups with only One Paper in Common,' British Educational Research Journal, Vol. 8, No. 2, 1982, pp. 159-166.
6. Ibid, p. 160.
7. Borg, W. and Gall, M. op.cit., p.7.
8. Campbell, D. and Stanley, J. Experimental and Quasi-Experimental Designs for Research, Rand McNally, 1966, p. 14.
9. Borg, W. and Gall, M. op.cit., p. 13.

## Chapter Seven

### The Diary Study

#### 7.1 Background to Diary Research

Collecting information about actual classroom practices is one of the more important parts of curriculum evaluation and research on teaching. In conducting investigations of classroom practices, direct observation and questionnaires have been commonly employed as methods of educational research. Recently, many researchers have found that each of these approaches suffers serious limitations. For example, in criticising the use of these two methods Tamir argues that:

Direct observations are very expensive, even when one wishes to procure a representative sample of lessons of a single teacher and certainly so as one purports to characterize the instruction pertaining to a particular curriculum. They require observers who need careful training and the kind of information obtained greatly depends on the bias of the instruments used and/ or of the observer's interpretation of the observed situations. Although the use of questionnaires is relatively inexpensive, the results obtained with them tend to provide general and idealistic views which are highly susceptible to social desirability.<sup>1</sup>

Accordingly, the development of the idea of some form of teacher-reported diary study has been advocated by many researchers as an alternative to direct classroom observation or questionnaires. Tamir designed the Self-lesson Report Form (SLRF) instrument in an aim to collect information about classroom transactions in Israeli secondary schools. One purpose of his study was "to illustrate the kinds of information that can be obtained through the use of SLRF using the example of science teaching."<sup>2</sup>



Similarly, Stewart argues that observation and self-recording using a diary are "likely to be more reliable than self-estimate, and also have the advantage that they can show variations in how individuals spend their time."<sup>3</sup> In comparing the diary method with observation, the author pointed out the following advantages of the former approach:<sup>4</sup>

- a) It is less time-consuming, less expensive and much less restricted in locality.
- b) The length of study is less restricted; with observation the longer the period, the fewer the number of people that can be studied.
- c) Classification is made by those who know what they are doing. For some types of analysis the observer would have to ask them to explain their actions.
- d) All time can be recorded, whereas an observer may be excluded from confidential discussions.

In a recent survey conducted by Moore, the researcher designed a structured diary-like instrument study entitled the Lesson Diary Report Form (LDRF). The objective of the development of this instrument was to facilitate teachers' reporting of computer studies lesson in some English secondary schools. The form was then broken down to collect data about the location and duration of lesson, the style of lesson, the use of resources, homework assignment and the time distribution of lesson activity. In conducting his study, Moore argued that "the results of the diary study demonstrate that the LDRF collected significant and reliable information about the teaching of computer lesson studies for 16 year old pupils."<sup>5</sup>

Based on the above arguments put forward by researchers in favour of the use of the diary instrument, a diary study, the Post Lesson Diary Report Form (PLDRF) was designed by the researcher of the present study to collect data from teachers about their

implementation of PS lessons. The reason for developing a new diary instrument, rather than adopting those already been developed by previous researchers is attributed to the unsuitability of the instruments to HE. For instance, in Moore's study, the LDRF was designed to collect data on computer studies, which is a totally different subject from HE. Thus, it was found necessary for the researcher to devise her own instrument that matches with her subject as well as other resources available in her home country.

The aim of the PLDRF survey was to discover to what extent PS lessons were implemented in HE classes. It was hoped that information about how teachers teach PS-style lessons could be of use in the development of Sudanese secondary HE education. Most of the items included in the PLDRF were structured so that the teacher had to select and tick the appropriate option. In this manner, information was obtained on:

- Lesson duration.
- Lesson-type.
- Resources used.
- Homework.
- Teacher lesson-satisfaction.
- Teachers' view on student lesson-satisfaction.
- Lesson activities.

Copies of Arabic and English versions of the Post Lesson Diary Report Form are presented in appendix B.

## 7.2 Validity and Reliability of the Instrument

The content-validity of the diary instrument was ascertained through an in-depth consultation made with two lecturers in the

School of Education at Hull University. Similar consultation was also carried out in Sudan with three lecturers in the Faculty of Education, including an expert in HE. These two teams examined the categories of the diary and found them to be adequate descriptors of HE classroom interactions. The final diary was based on simple elements that could be clearly explained to the teachers. Through this procedure, content-validity was obtained.

The reliability of the data was significantly enhanced by the fact that teachers were asked to relate their responses to one particular lesson at a time, rather than to make generalisations for their teaching as a whole. The clear items included in the PLDRF aids the reliability too. This is because teachers clearly understood the items they were asked about before providing their responses.

### 7.3 Administration of the PLDRFs

Three copies of the diary PLDRF were given to each of the sixteen teachers on the last day of the in-service training course in teaching PS. Respondents were asked to complete one copy of the PLDRF after teaching each of the three lessons they had planned during the course. Because the researcher had developed systematic contact with the teachers in their schools throughout the research, all 48 PLDRFs were returned. All the forms were usable and the items were analysed for frequencies. The results obtained are presented in Tables 7.5 to 7.10.

### 7.4 Lesson Duration

In all the returned PLDRFs, teachers reported that in teaching each of the three lessons, they had a double-period totalling 90 minutes. Thus, the same length of time was provided for all students



in learning the three PS topics. This finding permits easier generalisation of other results of this study.

### 7.5 Lesson-Type

The PLDRF listed six lesson-types from which the teacher was asked to choose one type that best described the lesson that had just been taught. A seventh category, "Other- please describe" was also included in the forms. The results are presented in Table 7.1.

Table 7.1

Summary of the teachers' choice of lesson-type arranged by number and percentage.

Less Type	Lesson-type Description	NO	(%)
1	Teacher talks/demonstrates; Pupils observe/listen.	2	4.2
2	Teacher talks/demonstrates; pupils do some talking/ demonstration.	8	16.7
3	Teacher asks questions, pupils answer these questions.	3	6.3
4	Pupils express ideas/ thoughts; teacher listens.	4	8.3
5	Pupils pursue PS, teacher guides class by questioning.	27	56.3
6	Class debate/discussion.	4	8.3
7	Other	0	0.0

Table 7.1 shows that some lesson-types were comparatively rare. Four types of lesson denoted in the Table as numbers 1, 3, 4 and 6 together account for less than 30%. As might be expected, the use of lesson-type 5 obtained the highest response frequency, this type alone accounting for more than 55% of the sampled lessons. The

use of lesson-type 2, which accounted for more than 15%, followed. These results indicate that the predominance of teachers' talking and demonstration in HE classes, discussed in Chapter Three had begun to be abandoned in teaching PS lessons. This can clearly be seen in the low response rate (4.2%) given to the first lesson-type, Teacher talk/demonstration, pupils observe/listen.

As seen in Table 7.1, teachers did not use the category "Other" to record any lesson type. This indicates that the respondents were satisfied to use the lesson activities included in the list. In short, in the teachers' view, the typical lesson-type used in teaching the PS-style lessons was: Pupils pursue PS, teacher guides class by questioning.

## 7.6 Resources

Information about teachers' and pupils' use of resources in PS-lessons is summarised in Table 7.2.

Table 7.2

Summary of the resources used by the teachers and students.

No.	Resource Description	Frequency	(%)
T 01	Sewing machine	1	2.1
T 02	Food items	0	0.0
T 03	Textbook	0	0.0
T 04	Published materials	0	0.0
T 05	Kitchen equipment	0	0.0
T 06	Patterns	5	10.4
T 07	Garments	1	2.1
T 08	Hand needles	1	2.1
T 09	Posters	4	8.3
T 10	Diagrams	1	2.1
T 11	Written handouts	0	0.0
T 12	Chalk and board	47	97.9
Other		0	0.0
-----			
P 01	Sewing machines	1	2.1
P 02	Food items	0	0.0
P 03	Kitchen equipment	7	14.6
P 04	Garments	1	2.1
P 05	Hand needles	1	2.1
P 06	Patterns	4	8.3
P 07	Pens and notebooks	39	81.3
Other		0	0.0

T = teacher's resource    P = pupils' resource.

The data in Table 7.2 show that in PS lessons, teachers rarely used resources other than chalk and board. Indeed, none of the resources numbered 02 to 05 was used by the teachers throughout their three lessons. This finding verifies the claim made in Chapter Three that, apart from a few simple teaching materials such as



posters, only board and chalk were available for teaching HE. The absence of textbooks confirms the urgent need for a fully-developed curriculum and accompanying texts. It can, then, be concluded that most information in HE classes was taken from the teachers. This finding highlights the great importance of providing a wider range of teaching materials in HE classes. This is particularly true since we noted earlier in this thesis that HE is a practical field that requires students to carry out learning activities. The lack of resources also restricts the use of some methods of teaching critical thinking skills for example, Reading.

The information about pupils' use of resources shown in Table 7.2 indicates that although seven resources were listed, their use, with the exception of kitchen equipment, was low. Once again, this finding supports the claim that, as with the teachers, resources were not available for the students in their HE lessons. The high frequency of the answers given to the seventh resource in the list, fully confirms earlier claims that almost the only resource used by students throughout HE lessons are pens and notebooks.

## 7.7 Homework

In this part of the form, teachers were asked to circle the alternative that best described the homework set. Table 7.3 shows the results obtained.

Table 7.3

Summary of homework assignment set by teachers.

---

Homework	Homework Description	No	(%)
1	Reading from textbook	00	0.0
2	Writing notes/def	06	12.5
3	Revising/learning	26	54.2
4	Writing answers to qu	02	4.2
5	Open enq/search for info	07	14.6
6	Making/needlework prod	01	2.1
7	None	06	12.5

---

Table 7.3 shows that the first category, Reading from textbook, received no responses. This result is further support for the claim that no HE textbooks are available for students to use in schools, which in turn, restricts homework reading activities. This finding again suggests that in the development of HE education, the issue of resources should be given priority. Revision was the most common homework type, assigned for more than half of the lessons. Open enquiry/search for information was used as a homework for about 15% of the lessons, indicating that teachers had begun to involve their students actively in collecting relevant data and information by themselves, rather than simply giving them such data. This finding is

considerable importance if we remember that the collection of data by students is a crucial step in their learning of PS skills.

### 7.8 Teacher Lesson-Satisfaction

For each of the three lessons, teachers were asked to rate their own level of satisfaction on a five point scale. The data collected were analysed in terms of frequency distribution based on number and percentage. The results are presented in Table 7.4.

Table 7.4

Summary of teachers' level of lesson-satisfaction.

Level of Teacher Lesson-Satisfaction					
	High or V. High	Slightly Above Average	Average	Rather Below Average	Low Dis
	(1)	(2)	(3)	(4)	(5)
N.	36	11	1		
%	75	23	2		

Table 7.4 shows the level of teachers' lesson-satisfaction was generally high, evident by the three-quarters of the responses given to this category. Satisfaction was above average (rating 2) for more than one-fifth of the lessons. This means that 98% of the answers were grouped under High/Very High and Slightly Above Average categories, while only for one lesson was the degree of satisfaction found to be only Average (rating 3). No rating was reported at the lower end of the scale. It is encouraging to conclude that teachers were highly satisfied with using PS methods in teaching HE after only a brief experience provided in the in-service training course.



## 7.9 Student Lesson-Satisfaction

Using the same scale, teachers were also asked to estimate their students' level of satisfaction with each of the lessons taught. These data were also analysed using a simple description based on frequency of use. The results are shown in Table 7.5.

Table 7.5

Summary of students' level of satisfaction estimated by their teachers.

---

Level of Students' Lesson-Satisfaction					
	High or V. High	Slightly Above Average	Average	Rather Below Average	Low Dis
	(1)	(2)	(3)	(4)	(5)
N.	42	5	1		
%	88	10	2		

---

As seen in Table 7.5, the level of students' lesson-satisfaction as estimated by their teachers was very high. Indeed, nearly 90% of the lessons were rated under the category High or Very High. Satisfaction was Above Average for five of the lessons, while only for one lesson, was satisfaction estimated to be Average. It may be observed that, as with the teachers' scale, no answer was given to categories 4 and 5. Hence, it is interesting to conclude that teachers' estimation of their students' level of satisfaction was high. In fact, this is one of the most important findings of the present study, since it was stated in Chapter Three that students used to be dissatisfied with HE lessons because they believed that the subject is only chosen by the low achievers. Taking into account that this previous

perception was associated with the use of traditional methods in teaching HE, the new finding should encourage teachers to use PS approaches in teaching the subject.

#### 7.10 Lesson Activities

At the end of each PLDRF, eighteen teaching and learning activities, plus a nineteenth category, "Other- please name" were listed. Respondents were asked to check more than one column if the same activity was used more than once for the reported lesson. Teachers' use of the activities is summarised in Table 7.6.

Table 7.6

Summary of the teachers' use of the teaching/learning activities.

---

No.	Lesson Activity	F	S	T	N	Fq
01	T explains PS process	25	13	05	02	43
02	T poses questions for class	07	27	06	02	40
03	T writes alternatives	02	14	22	09	38
04	T dictates notes	03	08	30	07	41
05	T asks individuals quest.	09	10	17	10	36
06	T listens to students ideas	05	18	22	10	45
07	T asks for a final decision	00	05	36	04	41
08	T asks to evaluate alternt.	00	01	38	07	39
09	T requires writing notes	00	04	13	29	17
10	T requires copying notes	00	10	13	26	23
11	T stands in front of class	30	09	01	08	40
12	P make notes from textbooks	00	00	00	41	00
13	P read from textbooks	00	00	00	43	00
14	P lead discussion alone	01	06	04	34	11
15	P ask each other questions	00	11	13	22	24
16	P work out a problem togeth	03	20	15	07	38
17	P use other resources	00	04	11	24	15
18	Class discussions/debates	01	09	27	08	37
19	Other activity	00	00	00	00	00

---

Total number of lesson activities used = 529.

F, S and T show use of activ. in the first, second & third part of lesson. N= not used Fq= frequency



The data in the Table show how each activity was used in the first (F), second (S) and third (T) part of the reported lesson. A fourth column, not used (N) was also included in the list to allow teachers to indicate if the activity was not used.

As seen in Table 7.6 the frequency of use of the activities numbered 01 to 08, 11, 16, and 18 is approximately the same at about 40 instances each. Activity number 06, teacher listens to students' ideas and thoughts was most frequently used. This finding is important because it indicates that, contrary to what has happened in the past in these lessons, teachers provided time for students to talk. Indeed, the data show that an important dimension of expressing thoughts and ideas in developing PS skill was greatly involved in teaching the remodelled lessons.

The Table shows that activities numbers 12, Pupils make notes from the textbooks, (N=41) and 13, Pupils read from the textbooks, (N=43) were not used at any time in any of the reported lessons. Again, this finding fully supports teachers' earlier answers that textbooks were not used as a teaching/ learning resource throughout the PS lessons.

With regard to the lesson activity, Teacher explains PS process the high frequency of answers were given to the first (25) and second (13) parts of the lesson. On the contrary, lessons activities such as: Teacher writes alternative, Teacher asks for a final decision, and Teacher asks to evaluate activities were frequently used in the last part of the lessons. These findings indicate that teachers apply the method of PS correctly, as discussed in the in-service training sessions.

Class discussions and debates that encouraged by the designers of the problem-solving methods and also by the researcher in the in-service course, was a frequently (37) used activity. This result is in favour of the validity and usefulness of the in-service course.

### 7.11 Discussion

Obtaining a description of the actual lesson-type was the most challenging and perhaps the most important task of the PLDRF. This is because it sought to get a complete description of what actually happened in the reported lesson. Moreover, the data had to permit useful generalisations about teaching PS, beyond the mere description of a single lesson. In this regard, the results obtained indicate that teacher-student interaction seemed to be a common teaching activity in PS classes.

Although teachers' use of chalk and board, was widespread, the use of other resources was rare. Similarly, few examples were found of students' use of resources other than pens and notebooks. These two results indicate that resources did not constitute a major feature of the teaching/learning of PS lessons. The lack of resources could also restrict the implementation of other approaches of teaching CTSS such as laboratory work, writing and reading.

The survey has shown that only about one-tenth of the classes received no homework assignment for the three lessons. It also shows that when homework was set it was most likely to be Revising/learning, Open enquiry/search for information or Writing notes/definitions. The absence of involvement of any reading assignment fully supports the TR 11 result shown in Table 7.2 that

no written handouts were given to the students to read in learning the three topics.

Teachers were very satisfied with their PS lessons and they believed they achieved the same level of satisfaction for their students regarding HE lessons planned according to the PS-style. This finding is very important since these variables are considered the key to the successful development of PS skills in learning HE.

The results obtained with regard to lesson activity indicate that most of the teachers had followed the method of teaching PS provided in the in-service programme. The chief evidence for this claim is found in the result of the first activity, Teacher explains PS process, where the highest frequency of the responses was for the first and second parts of the lessons. This finding is in agreement with the PS method that encourages the use of this activity in the early stages of PS-style lessons. Further evidence is provided by the pattern of use of the following activities: Teacher writes alternatives, Teacher asks for a final decision, and Teacher asks to evaluate alternatives. These activities were most frequently used in the final part of the lessons, confirming that most teachers had implemented PS as it is desired by the designers of the PS method and offered in the in-service course. Since Class discussions/ debates obtained a high frequency of 37 uses throughout the lessons, it is reasonable to expect that these activities would lead to meaningful PS learning. The point is that in the format of teaching PS, discussions and debates were identified as central teaching/learning activities. This result matches the low use of resources in lessons.

One of the most encouraging findings in the diary study was that a few days of in-service training in teaching PS can positively



change the teachers' habit of using traditional methods in teaching HE. The finding is consistent with the claim that the practice of teaching of HE through traditional methods only, was mainly attributable to the lack of teacher training in more advanced methods.

In a general comment on the diary study, the researcher believes that there should be limited observation to confirm teachers' use of the diary form (PLDRF). Also, it would be interesting to use the diary form to compare other teachers' activities before and after the attending of an in-service training course. Moreover, as teachers become more accustomed to the using of PS methods, the categories of lesson-type and perhaps, the pattern of lesson-activity could be refined.

#### 7.12 Summary

The major purpose of the diary study was to obtain information on how far PS teaching ideas had been implemented in the HE classes. Thus, the structured PLDRF was developed to collect descriptive information about the lesson duration, lesson-type, resources used, homework assignment, teacher lesson-satisfaction, student lesson-satisfaction and lesson activities.

The content-validity of the data was ensured by the intensive consultation conducted with the two teams of the Universities of Hull and Khartoum. Reliability and validity were achieved by the fact that teachers were asked to relate their responses to one particular lesson at a time, rather than to make generalisation for the series of lessons. The data presented in Table 7.6 shows that in teaching their

PS remodelled lessons, teachers were approximately consistent with the PS methods provided in the training programme.

The pattern of teachers' use of the lesson activities indicates that they had implemented the major features of the method of teaching PS correctly.

## References

1. Tamir, P. 'Teachers' Self Report as an Alternative Strategy for the Study of Classroom Transactions' , Journal of Research in Science Teaching, Vol. 20, 1983, pp. 815-823.
2. Ibid., p. 816.
3. Stewart, R. The Managers and their Jobs: A Study of the Similarities and Differences in the Ways Managers Spend Their Time, Second Edition, Macmillan, 1988, p. 5.
4. Ibid.
5. Moore, J. A Questionnaire Survey Of the Teaching of Computer Studies, Pupils Attitudes Toward Computers and Perceptions of the Learning Environment, Ph.D Thesis, University of Hull, 1988, p. 200.



Chapter Eight  
Teachers' Opinions About the In-service Course and the  
Teaching of Problem-Solving in Home Economics

This chapter presents teachers' opinions about the in-service training course and the teaching of home economics using problem-solving method. The data of the chapter were collected by means of interviews and questionnaires. The chapter consists of two parts, Part One presents the analysis of the interviews and Part Two presents the analysis of the questionnaire study.

Part One  
Analysis of the Interviews

The interview investigation was planned to explore Sudanese secondary HE teachers' opinions about teaching PS in their classes. To this end the sixteen teachers who participated in the in-service course on teaching PS were interviewed. The teachers' views were sought on several aspects of their experience with teaching PS in HE classes. As has been indicated in Chapter Four, these aspects were the:

- a) Enjoyment of their experience with PS methods.
- b) Impact of PS on the way they will teach HE.
- c) Necessity and the role of teaching PS in HE.
- d) Participation of PS input in planning HE lessons and in solving Sudanese family problems associated with HE.
- e) Effectiveness of PS in the students' learning of HE.

To gain information from the teachers, a semi-structured interview technique that included 7 major questions with probes was used. Copies of English and Arabic versions of the interview schedule

are presented in Appendix C. Opportunity for comment by the interviewees was also provided.

### 8.1 Analysis Procedures of the Interviews

The interviews were first written in Arabic and then translated into English. Descriptive analysis in terms of frequencies (numbers and percentages) was conducted. As the respondents gave a wide range of responses to many of the questions they were asked, these responses have been categorised by the researcher. In reporting the interviews, only the names of the categories are mentioned. Examples of the answers given to each of the categories that received the majority (50% or more) of the responses are included in this chapter. The teachers' comments are presented.

Q 1a: Having participated in the in-service course on teaching PS in HE, what did you enjoy most? and Why?

The opening question of the conversation was on the teachers' enjoyment of the in-service course. To this question all the teachers answered that they had enjoyed the course, providing 50 answers. The responses obtained have been grouped under five statements composed by the researcher as covering the reasons for the teachers' enjoyment. The first one was that: the methods of PS provided a good opportunity for discussion, sharing different viewpoints and debate. All the respondents indicated this. The second statement, the in-service training course on teaching PS was useful, sums up the opinions given by half of the respondents (50 %). An example of these answers was: "Excellent planning and implementation of the in-service course." Teachers' outcome of the in-service course represents the third opinion, which ten responses (62.5%) gave. Some of the answers

given to this statement were: "Break in the routine of being in schools continuously since recruitment." ; and "Discussing issues of common concern and interest."

Lesson planning and test construction represents the fourth group of opinions offered by half the teacher-interviewees (50%). Examples of these opinions were: "Deep thinking about lesson planning, collecting enough data about the planned lesson and developing the skills of analysis." ; "Abandonment of the habit of sticking to what is in the textbook or the traditional curriculum as well as the routine of preparing notes to dictate to students." ; and "Improvement of test construction". The fifth group of answers come under the heading: implications for students in the classrooms. Some of the answers included: "Stimulation of learning in the classroom." and "Elimination of the feeling of hesitancy or failure." Similarly to the second group, eight teachers (50%) responded with this point.

Q. 1b: What part did you enjoy least?

In answering this question all the sixteen teachers interviewed, (100%) agreed that they had highly enjoyed all parts of the course.

Q. 2a: Was There any part that you would have liked to be longer?

In reply to this question all of the respondents agreed that the whole course needed to be longer. The reasons they gave included: First, to identify more problems in HE. This reason was provided by two teachers (12.5%). Second, to practise more PS. Around this reason eleven answers (68.8 %) were clustered. Third, to listen to more viewpoints. This reason was given by three respondents (18.6%). To learn more methods similar to PS was the fourth reason provided by four respondents (25%).



Q. 2b: Was there any part you think should have been shorter?

To this question all the teachers, (100%) answered that they would not have liked any part of the course to be shorter.

Q. 2c: Had you ever used PS approaches in teaching HE before this in-service course?

In answering this question, fourteen respondents (87.5%) answered that they had had no experience with teaching PS before. Two teachers (12.5%) explained that they had encountered PS as a general method of teaching during their college education. Nevertheless, these respondents admitted that they had not been trained in teaching PS in the context of HE before the in-service course. They confirmed that they had never used it in their teaching before.

Q. 3a: To what extent do you favour/not favour teaching PS as a means of promoting CT in HE?

A total of 28 answers were given to this question in which, all the teachers indicated that they favoured teaching PS to a great extent. The reasons they provided to explain their answers were grouped into three major ideas. The first one was that: PS is an ideal method for teaching HE. This was affirmed by thirteen respondents (81.3%). Among the answers provided were that "PS process is clear for teachers to implement" ; "It provides an opportunity for teachers to estimate the extent to which their lessons have been understood" ; "It provides a good opportunity for teachers to better understand their students' background, which will help in solving students' individual or family problems" ; and that "PS is appropriate for teaching HE and within the existing schools' limitations." The second

idea, around which ten answers (62.5%) were grouped was that: PS will enhance students' learning of HE. One of the answers given to this idea was that "PS helped students to think seriously about problems in the context of HE and to better understand the content of this subject."

The third idea was that: PS approaches disclose the daily-life problems of students as well as those of teachers. This idea was supported by five teachers (31.3%). It represents the smallest group of the answers given to this question.

Q. 3b What do you think the impact of PS will be on the way you teach HE?

In reply to this question all the respondents expressed their firm intention to continue using PS in teaching HE. They explained their satisfaction with PS approaches since they had implemented them in teaching their first lessons. The 45 answers provided were grouped under five headings. The first one pertained to: teaching PS in the classroom. On this topic all of the interviewees (100%) gave answers. Some of these answers included: "PS is an advanced and satisfactory method in teaching HE in the classroom" ; "PS banished the silence and routine that had characterised HE classes" ; and "PS facilitated the transmission of knowledge and understanding to students in the classroom." The second heading represented students' learning of PS. To this group thirteen respondents (81.3%) argued that PS skills develop students learning of HE. Some of the points they made were that: "PS enabled students to think about solving problems in HE as well as in other subjects." and that "PS stimulated and encouraged students' learning of PS skills." The third group of opinions concerned the development of lesson planning and procedure

of assessment. This heading covered the responses of four teachers (25%). The feasibility of teaching PS in HE in terms of the available limitations and funding of the schools. represented the fourth heading of the answers provided, under which four responses (25%) were grouped. Finally, half of the teachers (50%) gave answers that fell under the fifth heading, which concerned the positive implications of teaching PS in HE in the Sudanese society. An example of these answers was that: "PS is useful in solving bitter problems currently existing in Sudanese society."

Q. 3c Do you think that PS is necessary in teaching HE, and if so, why?

In responding to this question, all the teachers argued that PS is necessary for teaching HE, and provided a total of 34 reasons. These reasons have been grouped by the researcher under five statements. The first one is that: PS is necessary for generating discussion about problems and searching for alternatives. On this statement half the interviewees were agreed. An example of the responses given was that: "PS is necessary in teaching HE because it provides an opportunity for students to discuss problems openly." The second statement was that: teaching PS in HE deals with the realities of Sudanese families. This statement represented the largest agreement- that of ten teachers (62.5%). Among the reasons provided in explaining this statement were that teaching PS in HE is necessary because: "It simply means fostering the skills for confronting problems that exist in Sudanese families" ; "It will encourage the students to think about alternatives regarding their family problems in terms of priorities" ; "It will enable students to think seriously about solving other problems outside the classroom" ; and "PS is



appropriate to the teaching of practical and theoretical aspects of HE." The third statement represented the necessity of teaching PS in HE in relation to: the development of secondary HE curriculum. On this point four positive responses (25%) were given. Transference of PS skills into other contexts or subjects represents the fourth group of positive answers provided, again the responses were given by four teachers (25%). Teaching PS in HE is necessary because it provokes thinking and understanding of this subject was the final reason identified in the answers. This responses characterises the opinions of eight teachers (50%). One of the answers provided here was that: "Teaching PS encouraged students to involve their minds in learning HE."

Q. 4 What do you think should be the role of teaching PS in the task of developing our current secondary HE curriculum?

In responding to this question all the participants answered that teaching PS should play a central role in the development of the current secondary HE curriculum. The interviewees believed that teaching PS could make a turning point in the history of secondary HE education in the country. All of the interviewees suggested that teaching HE through PS approaches should be the threshold to its curriculum reform.

There was a total of 33 answers pertaining to the role of PS teaching and represented by five ideas. These ideas revealed that the role of PS teaching in developing the current secondary HE curriculum should be: firstly, to link the curriculum with the community. Eleven teachers (68.8%) argued for this idea. In their arguments these teachers explained that to achieve this goal, the implementation of PS should be based on "The existing needs of the

family and the community," should aim at "The confrontation of current problems of the Sudanese community," and that "The curriculum should be based on the philosophy and ideology of the community."

Secondly, the aim of teaching PS should be the improvement of students' thinking and learning skills. This aim was supported by five respondents (31.3%). Improvement of teaching methods as well as teacher training represented the third aim supported by six responses (37.5%). Fourthly, answers given were also clustered around this aim: the improvement of the image of the HE curriculum. Similarly to the second idea, five responses (31.5 %) were grouped under this aim. Fifthly, some teachers argued that the role of teaching PS in the task of developing the current curriculum should be: the development of students' assessment and curriculum evaluation. Six responses (37.5%) gave this as an aim.

**Q. 5 What should be the role of PS skill in the planning of HE lessons?**

After preparing the first transcript of the 40 answers given to this question, the researcher categorised the responses into four groups. Each one revealed the teachers' views about the role that PS should play in planning HE lessons. The first category comprised the prerequisites for lesson planning. All the teacher-interviewees (100%) indicated involvement in this area. Some of the answers given included: "Involvement of teachers in a continuous search for data and information regarding the problems to be solved" ; "Collecting data from various sources" ; "Examining the problem carefully before teaching the lesson" ; and "Abandonment of the traditional style of planning HE and the involvement of various levels of thinking."



The second category comprised opinions on the teacher's behaviour in the classroom that should be considered in planning PS-style lessons. For example, "Providing time for students' participation and discussion" ; "Listening to students' ideas and thoughts" ; and "Listening as well as making use of different viewpoints." Answers grouped under this category represented the opinions of twelve teachers (75%). Involvement of social problems and local family needs was the third category to which six (37.5%) of the responses were given. The same number and percentage of responses were also provided in the fourth category, which asserted that the role of PS in planning HE lessons should be: the development of students' skills and knowledge.

Q. 6 What do you think will be the effect of teaching PS in HE on the Sudanese family?

In the 36 answers given to this question, all the respondents indicated that the effect of teaching PS in HE would be a positive one for the Sudanese family. The responses have been grouped into three categories. The first one concerned the effect of teaching PS in relation to the development of family awareness and understanding. In this category fifteen responses (87.9%) were clustered. Some of the answers predicted: "Development of family resources and culture" ; "Development of the nutritional status and means of living of the family" ; and "Development of family ability to pursue thinking and to nurture PS skills."

Solution to many problems of Sudanese families represented the second heading, which characterised fourteen responses (87.5%). Among these were confident predictions on: "Solution of family problems and thinking deeply about family problems based on a more



thoughtful foundation" ; "Better understanding of Sudanese family problems" ; and "Thinking seriously about solving family problems systematically, rather than spontaneously." The third category, improvement of the image of HE among its peer subjects was viewed to be one of the positive effects on Sudanese families of teaching PS in HE. In this category the opinions of seven teachers (43.8%) have been placed.

Q. 7 According to your own experience of teaching PS, how effective do you think this skill has been in your students' learning of HE?

In providing a total of 47 answers to this question all of the interviewees agreed that the effect of PS on students' learning was certainly positive. These answers were grouped into four areas. The first one represented learning in relation to the understanding of HE and PS. In this area fifteen positive responses (87.9%) were grouped. Respondents explained that: "PS encouraged students' understanding of HE problems" and "PS allowed learning of HE based on individual level as it involved personal thoughts or viewpoints."

Learning HE in relation to classroom activities covers the second area of the responses. To this group ten positive responses (62.5%) belong. Among the answers given here were that: "PS allowed learning from each other in the classroom as students were engaged in debate, questioning and discussion." and "PS encouraged students to express their ideas and to become independent learners rather than unthinking followers of their teachers." The same number and percentage of positive responses were also given to the third area, learning in relation to the implementation of PS. In this area some of the answers given included: "PS facilitated learning the practical aspects of HE by the pursuit of thinking skills as well as the

transference of PS skills into solving personal and family problems." ; "The implementation of PS encouraged learning of collecting relevant data from various sources." ; and " PS implementation involved learning to become patient in approaching a problem." The fourth area in which good reports were grouped concerned: learning in relation to the development of students' skills and abilities. In this area, twelve positive responses (75%) are placed. Respondents answered that teaching PS in HE encouraged learning through developing: "Thinking rather than recitation" ; "PS skills under a systematic guidance" ; "The skills of questioning as a key to pursue PS" ; "Discussion and reasoning" ; and "Creativity through the development of thinking skills."

## 8.2 Comments of Teachers on the Interviews

The general comments offered by teacher-interviewees were processed and the number of respondents (N), who gave similar comment are indicated. The comments are presented below:

1. I think that training in teaching PS in HE needs more time than was provided in the course. (N=3).
2. We are in need of a well-organised curriculum that should include all the disciplines of HE in order to get the maximum benefit of teaching PS. (N=4).
3. I found that the in-service course was marvellous because the format provided for teaching PS was clear. (N=12).
4. I found that the strategies that were given as handouts during the course were helpful in developing lesson plans. (N=12).

5. Although the in-service course was short, it covered many important issues regarding the teaching of PS in HE. (N=13).
6. I believe that the construction of HE tests, that included all levels of thinking, was excellent. Thus, my suggestion to my colleagues is to maintain developing this type of tests. (N=11).
7. The regular contacts that were carried out by the researcher with teachers in schools improved the image of HE of both students and staff. (N=6).
8. We need regular in-service training similar to the one that we had in teaching PS. (N=16).
9. I believe that I have now learned methods that I had been seeking for a long time. Being trained in teaching PS has finally answered many of my questions and concerns about teaching HE. (N=5).
10. Being trained in teaching PS in HE helped me to discover that the weakness of HE education is not merely the fragmented curriculum, but also the methods of teaching this subject. (N=4).
11. I wish that the researcher could attend the classes where teachers were giving PS-style lessons, for the provision of further comment at the stage of their actual implementation. (N=3).
12. I suggest the development of project works for students over the summer vacation to help in solving local community and neighbourhood family problems. (N=1).
13. I suggest the training of all HE teachers in Sudan in teaching PS. (N=7).



14. I found a big difference between my previous methods and the PS approaches in teaching HE. I believe that by using PS we can achieve the goals of secondary HE education. (N=2).

15. The in-service course on PS renewed and reinforced my ambition for the development of teaching HE. (N=1).

The general impression provided by the above comments can be subsumed in three major points. The first one is that teachers were satisfied with their experience with teaching PS in the in-service training course as well as in their own classes. The second one is that the teachers expressed their great desire for further training. The third point is that the interviewees indicated their urgent need for a well developed curriculum.

### 8.3 Discussion

One of the main findings of the interviews study is that all teachers indicated that they had enjoyed the in-service course and the teaching of HE using PS method. Also, participants expressed their intention for developing the teaching of HE courses in their schools. These two findings suggest that the issue of development of in-service training for secondary HE teachers should be given consideration by Sudanese educational authorities. This is particularly important since teachers had emphasised in their conversation the positive effect of the new method on students' learning providing the evidence of high gain of their students in learning HE lessons taught by PS.

It was found that two graduate teachers indicated that they heard about PS as a general method of teaching, but they had never used it before this in-service training course. This finding has

implication for HE departments that provide initial teacher training courses. These departments can emphasise the use of PS as a specific rather than general method of teaching in its initial training programmes for teaching HE.

The interviewees indicated that the development of PS skill is necessary for teaching/learning of HE and the need for this skill in the Sudanese society. Among many other reasons, for the sake of community development, the researcher believes that PS should be part of Sudanese home economics education.

#### 8.4 Summary

The sixteen teachers who participated in the in-service course on teaching PS in HE were interviewed by the researcher. Respondents' views were solicited on several areas, including: the enjoyment of teachers' experience with PS; the impact of PS in the way they will teach HE; necessity and the role of teaching PS in HE; participation of PS input in planning HE lessons and in solving Sudanese family problems associated with HE; and effectiveness of PS in the students' learning.

Teachers were informed about the purpose of the enquiry and were encouraged to express their views without hesitancy. By using these measures, the full confidence and cooperation of the interviewees were gained. As a result teachers talked freely on a range of topics regarding their experience with teaching PS in HE.

The answers provided have been processed and translated into English by the researcher. After a critical revision, responses to many questions have been categorised to facilitate the reporting procedure. Examples of the answers of the categories are presented

in the chapter if they received at least 50% of the responses. As the teachers were also asked if they had any comments to add, their comments given have also been presented in this chapter. Discussion of the major findings of the interviews study and the implications of these results were included.



## Chapter Eight: Part Two Analysis of the Questionnaire

In the questionnaire study the opinions of the teachers' sample were investigated by means of writing rather than conversation. The questionnaire consisted of 48 items, plus questions seeking personal data about the teachers. Opportunity for comment was also provided for the respondents. Copies of the Arabic and English versions of the questionnaire are included in Appendix D. The questionnaire booklets were administered by the researcher immediately on completion of the interviews. Because the booklets were collected in presence of the researcher, all were returned and all of the responses received were usable.

### 8.5 General Demographic Characteristics of the Sample

Tables 8.1 to 8.3 summarise the personal data supplied by the teachers.

Respondents were allowed to indicate they had more than one area of responsibility. The data presented in Table 8.1 show that over nine-tenths of the teachers had a major instructional responsibility in Nutrition Education, nearly seven-tenths in Cooking and Food Preparation, slightly over six-tenths in Sewing and Needlework, and none of the sample was involved in teaching Arts and Handicrafts.

Table 8.1

Instructional responsibility of the teachers' sample.

---

Instructional responsibility	No.	(%)
Sewing and needlework	10	62.5
Cooking and food preparation	11	68.8
Nutrition education	15	93.8
Childhood and motherhood	09	56.3
Textile & clothing construction	06	37.5
Home management	08	50.0
Arts and handicrafts	00	00.0
First aid	03	18.8
Family education	03	18.8
Health education	02	12.5

---

The results shown in Table 8.1 validate the claim that the three topics which were selected, taught and tested in the students' study were those most commonly taught in the schools. The fact that none of the sample taught Arts and Handicrafts supports the claim that not all branches of HE are taught in schools.

The respondents were also asked how long they had been involved in teaching HE. Table 8.2 shows that slightly over one-third of the teachers had from 2 to 7 years experience of teaching. The same proportion had from 14 to 19 years. Only one-tenth of the respondents had been teaching HE for 8 to 13 years. The same percentage had been teaching HE for over 19 years.

Table 8.2

HE teaching experience of the teachers' sample.

---

Teaching Exp (years)	Number (N=16)	Perc (%)
2-7	6	37.5
8-13	2	12.5
14-19	6	37.5
19+	2	12.5

---

The data presented in Table 8.2 show that the sample represented a wide range of length of teaching experience.

The academic and teacher training qualifications of the sample are summarised in Table 8.3. The largest group of respondents (five) was those who had General Diploma in Education, while only one teacher had "other" degree, a Diploma in Home Economics.



**Table 8.3**

**Teachers' academic qualification in HE.**

---

<b>HE Academic Qualification</b>		
<b>Degree</b>	<b>NO</b>	<b>(%)</b>
BSc. in HE Education and Social Work.	3	18.3
Bachelor of Nutrition and Dietetics.	1	6.3
Diploma of Higher Teachers' Training Institute	3	18.3
Ahfad Diploma of Family Science	2	12.5
Ahfad Bachelor of Family Science	1	6.3
General Diploma in Education	5	30.8
Others	1	6.3

---

The data presented in Table 8.3 support the claim made in Chapter Three on the HE curriculum, that the majority of Sudanese secondary HE teachers (30.8%) have no home economics educational background, instead, they only have general educational qualification.

### **8.6 Analysis of the Questionnaire Items**

As mentioned in the discussion of the methodology chapter, the purpose of the questionnaire was to assess the teachers' opinions about their experience of teaching PS as a result of being involved in the in-service training course, as well as their experience in their

own classes. The questionnaire consisted of four different sub-scales.

They were:

- a) Teachers' reaction to the in-service programme and to the challenges of preparing and teaching PS-lessons (TR), example: I feel confident in planning HE lessons that incorporate a substantial input of PS.
- b) The success of the new-style lessons (LS), for example: I believe that teaching PS makes students better at thinking.
- c) Pupils' reaction to the PS-lessons (PR), for example: Students are interested in pursuing debates in HE classes that incorporate a PS input.
- d) The need for further teacher training (TT), for example: Training in using PS approaches makes teachers actively seek new teaching ideas.

The first step in the analysis was to calculate the mean and the standard deviation for each item. A full summary of the results is shown in Table 7.4 (A and B) with the number of responses received in each response category. The means shown were obtained by assigning numerical values to the responses as follows:

For the positive items (indicated by "+" in the Table):

Strongly Agree = 5, Agree = 4, Undecided = 3, Disagree = 2, and Strongly Disagree = 1.

For negative items indicated by "-", the scale was reversed, i.e:

Strongly Agree = 1, Agree = 2, Undecided = 3, Disagree = 4, and Strongly Disagree = 5.

Table 8.4 (A)

Description of the responses, with means and standard deviations, of the questionnaire items of scales (TR) and (LS).

Item*	Scale	(Response-Categories)					Mean	St. Dv
		SA	A	UD	DA	SD		
1 <sup>+</sup>	TR	11	5				4.6	.479
2 <sup>-</sup>		1	1		12	2	3.8	.981
3 <sup>-</sup>		1			8	7	4.2	1.000
4 <sup>+</sup>		12	4				4.7	.447
5 <sup>+</sup>		10	6				4.6	.500
6 <sup>+</sup>		13	3				4.8	.403
7 <sup>-</sup>			4		11	1	3.5	.964
8 <sup>+</sup>		10	6				4.6	.500
9 <sup>-</sup>			3		10	3	3.8	.981
10 <sup>-</sup>					12	4	4.2	.447
11 <sup>-</sup>		1	3		10	2	3.5	1.153
12 <sup>-</sup>					11	5	4.3	.479
-----								
13 <sup>+</sup>	LS	16					5.0	.000
14 <sup>-</sup>			2		7	7	4.1	.981
15 <sup>-</sup>					13	3	4.1	.403
16 <sup>+</sup>		8	6		1	1	4.1	1.167
17 <sup>-</sup>			1	1	13	1	3.8	.619
18 <sup>+</sup>		10	6				4.6	.500
19 <sup>+</sup>		13	3				4.8	.403
20 <sup>+</sup>		5	11				4.3	.479
21 <sup>-</sup>					9	7	4.4	.512
22 <sup>+</sup>		5	10		1		4.1	.750
23 <sup>+</sup>		11	5				4.6	.479
24 <sup>+</sup>		4	4		6	2	3.1	1.500
25 <sup>+</sup>		7	9				4.4	.512
26 <sup>+</sup>		8	8				4.5	.516

1. TR = teachers' reaction    LS = lessons' success
2. SA = strongly agree    A = agree    UN = undecided  
D = disagree    SD = strongly disagree
3. (+) = positive item.    (-) = negative item
4. (- - ) = different scale
5. (\*) see Appendix D for items.



**Table 8.4.(B)**

Description of the responses with means and standard deviations, of the items of scales (PR) and (TT).

Item*	Scale	(Response-Categories)					Mean	Sd.Dv.
		SA	A	UN	D	SD		
27 <sup>+</sup>	PR	13	3				4.8	.403
28 <sup>-</sup>					6	10	4.6	.500
29 <sup>+</sup>		12	4				4.7	.447
30 <sup>-</sup>					5	11	4.6	.479
31 <sup>+</sup>		9	6		1		4.4	.814
32 <sup>-</sup>					10	6	4.3	.500
33 <sup>+</sup>		10	6				4.6	.500
34 <sup>-</sup>			3		10	3	3.8	.981
35 <sup>+</sup>		6	8			2	4.1	.957
36 <sup>-</sup>		2	1		9	4	3.7	1.291
37 <sup>+</sup>		11	4		1		4.5	.841
38 <sup>-</sup>		1	1		8	6	4.0	1.124
-----								
39 <sup>+</sup>	TT	9	7				4.5	.512
40 <sup>+</sup>		10	6				4.6	.500
41 <sup>+</sup>		15	1				4.9	.250
42 <sup>+</sup>		12	4				4.7	.447
43 <sup>+</sup>		15	1				4.9	.250
44 <sup>-</sup>			1		13	2	4.0	.630
45 <sup>+</sup>		7	7	1	1		4.2	.856
46 <sup>+</sup>		13	3				4.8	.403
47 <sup>-</sup>		1	2		6	7	4.0	1.265
48 <sup>+</sup>		12	3		1		4.5	1.031

1. PR = pupils' reaction      TT = teacher training
2. SA = strongly agree    A = agree    UN = undecided  
D = disagree    SD = strongly disagree
3. (+) = positive item      (-) = negative item
4. (- - ) = different scale
5. (\*) see Appendix D for items.

## 8.7 Discussion of Some of the Questionnaire Items

As seen in Table 8.4, the highest response in the Strongly Agree category was given to item 13, I believe that teaching PS makes students better at thinking, this rating being given by all the respondents. The largest response in the Strongly Disagree category was given to item 30, by eleven respondents.

Only two items of the questionnaire, items 17, Average students are incapable of pursuing PS, and 45, We should be trained in teaching thinking skills and stop using traditional methods, received responses in the Undecided category. The low frequency of responses observed for this category shows that the opinions of the teachers on the items of the questionnaire were very clear. The low number of undecided responses also indicates the items of the questionnaire were unambiguous.

For both items 41, More attention should be given to the training of HE teachers in PS skills, and 43, All secondary HE teachers should be trained in teaching PS, almost all responses were "Strongly Agree" , while only one answer in each case was reported in the "Agree" category. Bearing in mind that the two items were positive, they had the same mean value of 4.9, the second highest in the whole questionnaire.

Five of the eight items which had standard deviation values of 1.000 or above (numbers 3, 11, 36, 38 and 47) were found to be negative. This finding indicates that the range of the responses given to the negative items was wider than those provided for the positive ones.

In general, the responses included in Table 7.4 show that the majority of the teachers reported their opinions as Strongly Agree or

Agree for the positive items. For the negative items the answers were grouped in the Strongly Disagree and Disagree categories. This finding is in an agreement with the high mean values of 4 or more for 40 of the 48 questionnaire items.

### 8.8 The Reliability of the Scales

The objective of conducting the reliability tests in the questionnaire study reflects what Youngman reports that: "Reliability estimates enable the consistency of a proposed test to be determined."<sup>1</sup> The alpha reliability was calculated for each scale separately.

#### 8.8.1 The Reliability of the Scale TR

The TR scale (teachers' reaction) was represented by items 1 to 12. The value of the alpha reliability for this scale was: Alpha = 0.559. However, item 5, Teaching HE lessons requires teachers to be skilful in PS, had a low negative item total correlation, showing that it did not belong to the TR scale. Table 8.4 indicates that the range of answers given to this item was Strongly Agree to Agree. These responses suggest strong agreement in the attitudes of respondents towards the item. Nevertheless, it seems that for no obvious reason, the item was misinterpreted. Accordingly, this item was deleted. This raised the value of alpha to 0.624. The mean was found to be 46.44 and the standard deviation was 3.86.

#### 8.8.2 The Reliability of the Scale LS

The LS scale (lesson success) included 14 items, numbers 13 to 26 in the questionnaire. In conducting the reliability test the result of the alpha value was found to be 0.659. When the reliability test for



this scale was conducted for the first time, item 13 showed no correlation with the scale, having zero variance. As seen in Table 8.4, this item was the only one to which all the responses given were grouped under one category, the Strongly Agree. Consequently, it also had the maximum mean value of 5 points and the lowest value of standard deviation, .000. Based on these results, the item showed no correlation with the scale and was deleted in conducting the final reliability test. Item 16 was also deleted, this time because of the wide spread of the answers given to the item, reflected in the high standard deviation value of 1.167. For a similar reason, item 24 was deleted from the scale. The evidence of the variation of responses given to this item, as seen in Table 8.4, was the lowest mean score (3.1) and the highest value of standard deviation (1.500) among the items. When these three items were deleted, the alpha value became 0.868. The mean was 48.25 and the standard deviation was 4.20.

### 8.8.3 The Reliability of the scale PR

Scale PR (pupils' reaction) consisted of 12 items, numbers 27 to 38. The alpha reliability of this scale was 0.688. The reliability analysis showed that item 36 had no correlation with the scale. The reason, as shown by the data presented in Table 8.4, was the wide spread of responses, which ranged from Strongly Agree to Strongly Disagree, reflected in the relatively small mean value of 3.7 and the high value of the standard deviation, 1.291 (the second highest in the questionnaire). The deletion of this item raised the alpha value to 0.762. The mean was found to be 48.88 and the standard deviation was 4.35.

#### 8.8.4 The Reliability of the scale TT

Scale TT (the need for further teacher training) was composed of 10 items, numbers 39 to 48. The results of the value of alpha reliability conducted on this scale was 0.466. In this scale, only item 44 showed no correlation with the scale and was deleted. As seen in Table 8.4, the reason for this seems to be the clustering of 15 responses in one category of Strongly Agree. This narrow range of answers is confirmed by the second highest mean value of 4.9 and the second smallest standard deviation value of .250. The removal of item 44 increased the alpha value to become 0.545. The mean was 41.44 and the standard deviation was 2.92.

The finding of the relatively low value of reliability in scale TT can be attributed to the use of a homogeneous sample of teachers regarding their training in teaching PS. This finding probably reflects the answers given to question 2c asked to the teachers in the interviews, about their previous training in teaching PS. In answering this question, 14 of the teachers (87.5%) responded that they had never been trained in teaching PS, which provides evidence of the homogeneity of the sample. This characteristics may also explain the lower value of the standard deviation found in this particular scale, if it is assumed that teachers with varying training experience will be more likely to provide a wider range of views.

**Table 8.5**

Summary of the results of the means and reliabilities.

---

Scale Name	NO of Items	Scale-Range		Observed Mean	SD	Alpha Reliability
		Mini.	Maxi.			
TR	11	11	55	46.44	3.86	.624
LS	11	11	55	48.25	4.20	.868
PR	11	11	55	48.88	4.35	.762
TT	09	09	45	41.44	2.92	.545

---

(\*) After deletion of items with low correlations.

### **8.9 Correlation Matrix**

As a further step in testing the content validity of the questionnaire, the scale-scale correlations were calculated. Indeed, the reason for including the correlation matrix in the analysis of the questionnaire was to obtain an additional measure of the validity. The results obtained are presented in Table 8.6.

**Table 8.6**

Summary of the results of the scale-scale correlation test.

---

<b>Correlation Matrix</b>			
	Scale TR	Scale LS	Scale PR
Scale LS	.008		
Scale PR	.253	.002	
Scale TT	.285	.014	.001

---

No correlation significant at 0.05.



From the data presented in Table 8.6, the four scales show no significant correlations with each other. Nevertheless, compared with other correlation values, scale Teacher Reaction shows a higher correlation with scale Teacher Training. Indeed, this result represented the highest correlation value obtained. The impression given by this result was that although the correlations were statistically not significant, this result suggests that both scales were investigating similar aspects of teachers' opinions about the in-service course in teaching PS. Putting it another way, the two scales were inquiring into teachers' views about their reaction to and their need for further in-service training in teaching PS.

Scale Students Learning showed lower correlations with all the other scales. As noted earlier, this scale assessed teachers' opinions about the success of the PS-style lessons. In the light of the low value of the correlation with other scales, the result obtained confirms that the scale was assessing a different aspect of teachers' views.

Table 8.6 shows that the second high value of  $P = 0.253$  was found between scale PR with scale TR. Although it has just been explained that none of the scale-scale correlations was found to be statistically significant, this result suggests that the two scales assessed nearly similar aspects, the reaction to the PS lessons. Not surprisingly suggests that the reactions of teachers and those of students (in the view of teachers) to the PS lessons were somewhat similar.

Table 8.6 shows that scale TT had the lowest correlation with scale PR, correlation value = 0.001. This finding confirms that the two scales were investigating teachers' opinions in totally different

respects. These were pupils' reaction to the PS lessons on the one hand and the teachers' perceived need for further teacher training on the other.

From the correlation matrix results shown in Table 8.6, the conclusion could be drawn that, the four scales assessed different aspects of the teachers' opinions about teaching PS as a result of having participated in the in-service training course, as well as their experience in their classes. Accordingly, the results validate the claim raised earlier that the four scales of the questionnaire were developed to assess different areas regarding teachers views. Indeed, the non significant correlation values obtained for the scale-scale correlations, fully confirmed that each scale stands alone in assessing a different aspect of teachers' views.

#### 8.10 Teachers' Comments on the Questionnaire

At the end of the booklets, teachers were given opportunity to comment. The comments provided by all the respondents were grouped according to their similarity under the following headings:

##### 8.10.1 Teachers Outcome of the In-Service Training Course

a) The in-service training course was useful and successful. It provided an opportunity for the first time for the HE teachers to be trained in using new methods. The course also provided an opportunity for the teachers to meet together and to discuss issues of common concern. We suggest that the other teachers should be trained in teaching PS. (N=12).

This comment indicates that 75% of the teachers were satisfied with their participation in the in-service course and they wished to have further training. Indeed, this comment is in close agreement

with interview comment No. 3, provided by the same number of the teachers. This agreement supports the validity of the two comments.

### 8.10.2 Teaching PS in HE Classes

a) Teaching PS needs more time than allowed for the period. (N=2).

This comment is in consistent with the first interview comment.

b) PS should be included in the Secondary School Certificate Examination, this would have a positive influence on HE education. (N=2).

c) Teaching PS strengthens the link between the theoretical and practical aspects of HE. (N=2).

d) I think that we need observers in the classrooms to correct and reflect on our implementation of teaching PS. (N=3).

This comment verifies comment No 9 given in the interviews.

e) PS should be a revolutionary method for the development of methods of teaching HE. (N=7).

A similar comment was also made by the teachers in the interviews (comment No 12).

In general, the comments provided under this heading indicate that a wide-range of views were given regarding teaching PS lessons. This variety of opinions are valuable in developing further research on the development of HE education.

### 8.10.3 The Students' Learning Outcome

a) PS will be a pertinent method of teaching HE in Sudan because it allows a good opportunity for students to think about problems in the context of this subject. We have got to abandon our old methods and generalise teaching PS because Sudanese families are in urgent need to foster these skills in their children. (N=9).

b) PS allows a good opportunity for students' action and reaction in HE classes. It encourages the exploration of



the skills of thinking and creativity. PS also encourages students to express their ideas without fear or hesitancy and to discover and create solutions based on a more structured framework. (N=8).

c) PS provides an active atmosphere in the classroom in which all students participate. It stimulates students to train their minds by thinking about their problems. (N=8).

d) The students expressed their interest in participating in the discussions and debates. (N=8).

As at least one comment from this group was given by over 50% of the respondents, these results suggest that the outcome of teaching PS on the teachers' perceptions of students' learning of HE was positive.

#### 8.10.4 Development of the HE Curriculum

a) We need a complete and well-developed HE curriculum to be available for all teachers in order to generalise teaching PS. (N=16).

This was the only comment made by all the respondents. It confirms the urgent need for a fully developed curriculum.

b) The Ministry of Education should be urged to include teaching PS in the HE curriculum. (N=13).

Once again, this comment confirms that, as well as in-service training in using new methods of teaching HE, teachers need to have a better-planned curriculum. This comment also fully supports the previous section.

c) PS will improve the image of the HE curriculum, so many students will opt for it. (N=6).

This comment fully supports the answers given to question 4 of the interviews, in which teachers expressed the view that the aim of teaching PS should be the improvement of the image of the HE curriculum.

#### 8.10.5 The Influence of PS Input in HE Lesson Planning

a) The stage of identifying the problem is very important because some topics may include more than one problem. Thus, teachers should be alert enough to manage this stage. (N=4).

b) In planning their lessons, teachers should select a problem that will be appropriate to the level of knowledge and understanding of their students. (N=2).

c) In planning PS lesson, I found that it is important for the teacher to encourage her students to implement the most feasible rather than imaginative solutions to the problems. This is very important to convince the students about the positive outcome of learning PS skills. (N=7).

The comments given to this group clearly reflect the extent to which teachers considered that pre-lesson preparation determined the success of their PS lesson.

#### 8.11 Discussion of the Findings

A major finding of the questionnaire study is the confirmation that not all the HE disciplines included in the curriculum are being taught in schools. This suggests that if radical development of the curriculum is to be achieved, all branches should be taught in the HE courses.

Another fundamental finding is that the majority of teachers had no home economics educational background. The researcher believes that this finding in particular aggravates the problem of methods of teaching HE since teachers had no adequate experience. This highlights the need for the development of in-service training education for HE teachers.

## 8.12 Summary

This chapter has described data obtained from the HE teachers' questionnaire. The data show that the majority of the respondents had no HE educational background. As regards teaching experience, the results indicate that a heterogeneous group of teachers was included in the questionnaire study. The data in the teachers' instructional responsibility confirm that the topics selected for the tests' study were the ones most commonly taught across the schools.

The chapter also described the four different scales of the questionnaire and presented an analysis of teachers' responses to the items included in the booklets. The results suggest that for nearly all the items the meaning was clear and elicited clear responses.

After removing selected items, three of the scales had acceptable reliabilities ( $\alpha = > 0.7$ ) whilst the low alpha of Further Teacher Training ( $\alpha = > 0.5$ ) possibly reflected the homogeneity of teachers background.

The inter-scale correlation matrix was constructed to find out the scale-scale correlations. The low correlation values validate the claim that the four scales were developed to assess different aspects of teachers' opinions regarding their experience with teaching PS in their classes as well as in the in-service course.

The teachers were provided an opportunity to comment, the comments provided by all the respondents were grouped by the researcher under five headings. Generally, the comments were found to be positive, sound and constructive. They also supported several responses and comments given in the interview study. The agreement of the comments in both studies indicates that the teachers felt under no pressure to bias their responses.



## Reference

1. Youngman, M. Foundation Statistics for Education Part 2- Procedures, Study guide 5, Nottingham University, School of Education, 1984, p. 57.

Chapter Nine  
Summary of the Findings, Discussion, Development of Practical  
Implications and Suggestions for Development of Sudanese Secondary  
HE Education and Further Research

This chapter summarizes the main findings of the study. Some discussion of the findings will be given. Practical implications of these findings will be discussed and, finally, suggestions for development of secondary HE education in the future will be given.

9.1 Summary of the Findings

The theoretical part of the present study revealed that the teaching of HE in the Sudanese secondary schools is often done by means of traditional methods. There is no involvement of methods of teaching CTSs in the curriculum, which is believed to be a major defect in teaching/learning of HE. Also, there is a complete omission of provision of any in-service training for secondary HE teachers regarding the improvement of their methods of teaching.

In reviewing methods of teaching CTSs in the context of HE, numerous approaches were found. Owing to its appropriateness to Sudanese needs, problem-solving method was chosen for training HE teachers in the present study.

One of the main findings of the empirical part of the study was that students' achievement in learning HE was greatly increased after their teachers had remodelled HE lessons while attending the in-service training course in using the PS method.

Regarding the teaching of PS in HE classes, all the lessons reported in the diary study indicated that the remodelled lessons involved both teachers and students in the teaching/learning process. The diary study indicated the lack of resources in HE classes but it

revealed that teachers were very satisfied with the PS-style lessons and they perceived the same level of satisfaction for their students. The pattern of the activities used in teaching PS lessons indicated that teachers had generally applied the method as implemented in the in-service course.

The interviews and questionnaire studies revealed teachers' enjoyment of the training course and the teaching of PS in HE. Participants indicated their intention to use PS in teaching HE lessons in the future. However, respondents strongly complained about the omission of HE teachers from all in-service training programmes provided for secondary school teachers. They strongly advocated development of in-service training programmes to improve instruction and methods of teaching HE. The interviewees indicated their urgent need for a well-organised curriculum and the generalisation of the present in-service course for all secondary HE teachers in Sudan.

## 9.2 Discussion

The importance of teaching CTSS in the HE curriculum has to be considered in terms of the benefit to be gained by developing these skills among students. In other words, "Why should the HE curriculum incorporate teaching CTSS?" The discussion and views presented in Chapter 3 confirm that the thinking content of the current secondary HE curriculum is very poor, and, perhaps inhibits the study of a subject, which it has been argued has special importance for the Sudan and by extension, other developing countries.



One of the encouraging findings of this study is the availability of several methods of teaching critical thinking skills in the literature. With the exception of those which involve resources such as computers and reading materials, most of the reviewed methods seem to be applicable in the Sudanese current secondary HE curriculum.

Another major finding has been the positive effect of the in-service training and the teaching of PS in girls' learning of home economics. If the current curriculum were to incorporate the teaching of problem-solving and perhaps other CTSS, higher student achievement would be obtained from HE courses and it seems reasonable to assume that the image of the subject would be enhanced.

Teachers' positive reaction, satisfaction and the intention for further using of PS in teaching HE classes, are all findings that count in favour of both the in-service course and the PS method.

The high level of students' achievement as a result of learning PS-style lessons is a major evidence that teachers had learned and taken PS skill to their own classes. This finding also indicates that the current shortcoming in the learning of HE is largely attributable to the teaching of this subject by traditional methods and the lack of in-service teacher training in more appropriate approaches. The provision of in-service training of similar direction should therefore be encouraged.

Participants' free comment on their experience with PS is a further evidence of the success of both the training course and the PS method. The comments given, once again, confirm the need for

development of methods of teaching home economics and teacher training programmes.

### 9.3 Development of Practical Implications for Secondary HE Education in Sudan

Based on the findings of the present study, a number of implications are drawn and are presented in the following sections:

- a) In-service training programmes for secondary HE teachers.
- b) Initial training for student-teachers of HE.
- c) Curriculum modification.
- d) Teachers' attitudes and Students' achievement.

#### a) In-service Training Programmes for Secondary HE Teachers

The findings of the present study confirm that HE teachers feel competent and perform well in the classroom as a result of being trained in teaching CTSS. Further effort should be made to involve other teachers in teaching PS as well as other CTSS.

Respondents in this study were in favour of the use of PS methods and they indicated their preference for using it in teaching HE lessons. This finding should encourage institutions such as University Departments of Education to consider setting up programmes for the training of teachers in other methods of teaching CTSS. This could be done by using the annual funds provided by the University of Khartoum for training secondary school teachers in the Faculty of Education. If this opportunity were provided, teachers would, on the results of the current study, show enthusiasm to increase their repertoire of teaching tactics and thereby strengthen their instruction in HE. In-service teacher training programmes in using methods of teaching CTSS should therefore be expanded from

their present very low level. This is of particular importance for non-graduate teachers, if there is to be a purposeful effort to help students to develop CTSs in learning HE.

#### b) Initial Training of HE Student-Teachers in Teaching CTSs

The finding of the positive correlation between the teaching of PS and students' learning of HE, and teachers' favourable responses, suggest that special emphasis should be given to methods of teaching CTSs within initial, rather than only in in-service teacher training. The point is that the burden of providing in-service training programmes will be reduced, if teachers are more adequately trained at the pre-service stage. This is particularly true since we noted earlier that two graduate teachers reported that they had been told briefly about PS but had not used it. This suggests that greater emphasis should be put on application of this method in the initial training courses.

It was pointed out in Chapter 3 that lecturing has long been used as the main method of teaching HE in Sudanese secondary schools. Initial training should equip student teachers with a wider repertoire of teaching methods so they can take a fresh approach into the schools in which they are eventually employed, and so help to develop HE teaching. Since the findings of this study confirmed the success of teaching PS in HE, methods of teaching CTSs might be a desirable alternative.

#### c) Curriculum Modification

The research has shown that there is a lack of resources used in teaching lessons of HE. This makes the teaching/learning process very sterile, since we noted that HE is a practical subject that



requires media to reinforce conceptual development in students. Therefore, the use and availability of resources should be one of the major concerns of HE curriculum development.

It has been shown that, sometimes HE is being taught by teachers of other subjects, who have no HE educational background. This finding should oblige curriculum designers to restrict assignment to teach HE, to those teachers who have majored in the subject.

Ways of bringing about a decrease in the reliance on lectures as a method of teaching, and moves toward a more active and thoughtful involvement of students in the learning of HE lessons should be given high priority in the revision of the HE curriculum.

The results of the present study can provide helpful pointers to the curriculum designers that teacher training can positively affect both classroom practices and students' learning. They also indicate that the curriculum designers need not worry about HE teachers' abilities to teach CTSS in their classes; the pre- and in-service training courses set up at the same time will overcome these problems.

#### d) Teachers' Attitudes and Students' Achievement

A fundamental finding that has important implications is that, although the in-service course in teaching PS took only a few days, the effect on teachers' attitudes was very great. In the long-run, if the training and teaching of PS were to be continued, teachers' attitudes about PS and, perhaps, other methods of teaching CTSS should be investigated.

Similarly, teachers estimated that their students' satisfaction from PS lessons was very high. This finding is of a special importance to the present study since we noted earlier in this thesis that because of the poor image of HE, students are dissatisfied with learning it. Therefore, if the students' satisfaction is to be maintained, the teaching of PS (CTSs) should be continued. If so, the long-term effect of teaching PS on students' attitudes should be investigated. The study also shows that the students' achievement in the HE lessons taught by PS after their teachers had attended the in-service course, was far higher than the achievement of those taught by traditional methods. The long-term effect of PS skill on students' achievement in HE should be investigated.

#### 9.4 Suggestions for Development of Sudanese Secondary Home Economics Education

Although it is not part of the scope of the present study, possible suggestions for development of secondary HE education are drawn. These suggestions are based on the current problems of this subject.

- Owing to the difficult circumstances currently prevailing in the Sudan, the idea of in-service training of all secondary HE teachers in teaching CTSs would be faced by several obstacles. One of the most important of these problems is the difficulty of transport to bring all teachers together in one place to train them. Another potential obstacle is the pressure that would be put on the Ministry of Education in providing accommodation, food and other expenses, if teachers were brought to Khartoum State. Therefore, if teachers of HE are to be trained in teaching CTSs, they should be trained in their regions.

The researcher suggests that master trainers should be used to train teachers in their areas. This involves selecting and then training a few persons from each region, who are capable of training HE teachers in teaching CTSs successfully. An appropriate group from which to draw these trainers could be the teaching assistants who work for the departments of HE in the institutes of higher education that exist in Khartoum State. This group is suggested for three reasons: first, these teaching assistants have a good standard of HE educational background and teaching experience; second, because they are all situated in Khartoum, it will be easier to arrange their training; and third, because teaching assistants do not have a heavy work-load since they do not carry instructional responsibility, this group would have more time to do this job than the researcher, who will be a full-time lecturer.

As was discussed in Chapter 3, the common pattern of in-service training of secondary school teachers in the Sudan is either to bring teachers in Khartoum to be trained in the University Departments of Education, or to send University lecturers to train them in their regions. In the researcher's view, this training practice in itself limits the opportunity for providing a wide range of in-service training programmes for all teachers. The idea of training master trainers, if implemented, would overcome constraints of time, effort and economic resources, and would represent significant development in the process of Sudanese in-service training of secondary school teachers.

- Another alternative regarding the difficulty of providing similar in-service teacher training for all secondary HE teachers is the development of models of teaching CTSs in the form of workbooks



for teachers to use. This is of considerable importance for HE teachers of rural regions, as it would be difficult either to bring them to Khartoum or to send trainers to train them in their areas. Similarly, self-study, pamphlets and other written materials on teaching CTSs for teachers to use in order to improve their teaching methods could be no less important than attending in-service training courses.

#### 9.5 Suggestions for Further Research

If the idea about master trainers is to be implemented, the characteristics of the chosen group (e.g teaching assistants) which led to becoming successful master trainers could be investigated. This might include aspects such as personality, self-concept and communication of the master trainers. In this regard, using check lists to record the trainers' behaviour in the training sessions could be a viable approach for investigating the criteria of successful master trainers. This is particularly important if training in all methods of teaching CTSs is to be developed in a wider scale.

As far as training in teaching CTSs is concerned, the period of training could be a central variable in determination of the successful learning of the method (s) under consideration. Therefore, the determination of an optimum length of the course, whether to be in one session of day, two weeks or several smaller parts of 2 to 3 days each could be investigated. This could be done through surveying teachers' views by means of questionnaires

and interviews. This is perceived to be a key issue because if CTSs are to be foster in schools, teachers should receive appropriate training both qualitatively and quantitatively. Teachers opinions on what is appropriate is central to success.

As the training of teachers is largely associated with changing behaviour, in the future, observation of teachers in classrooms could be included as a research technique. Although classroom observation could not be employed in the study designed in this thesis, it should be seriously considered in any large-scale research. One part of the observational research could involve investigating whether the relationship between high achievement in students' learning of HE and the implementation of the methods of teaching CTSs remains positive.

As written teaching materials are suggested to be an approach of training HE teachers in teaching CTSs, research could be conducted to assess the effect of these materials in the teaching/learning of HE. A possible way that could be done is through talking to the teachers. Also, a follow up study of a similar nature could be conducted to investigate opinions of teachers in remote areas or whether the materials used help teachers in other 'new' areas.

If the Sudanese secondary HE curriculum were approved a long-term commitment regarding the teaching of CTSs, the effect of this on Sudanese community might be investigated. The implementation of the social research

could involve a larger number of staff researchers outside of 'pure' educational research. This is particularly important if the curriculum considers and deals with HE as a sorting out mechanism for Sudanese family problems.



## Bibliography

- Abdel Wahab, O. Curriculum Development in Biology in the Sudan with Special Reference to Higher Secondary Level, Ph.D. Thesis, Sheffield University, 1975.
- Abu Sin, M. 'The New Educational Plan in the Republic of the Sudan', Journal of Educational Planning in the Arab Countries, No. 2, 1963. (In Arabic).
- Abdel Raheem, F. Home Economics Education in Sudanese Secondary Schools, Master Dissertation, Khartoum University, 1987.
- Abdel Mahmood, F. Employment of Women in the Sudan. The Ministry of Social Welfare in Collaboration with the United Nations Economic Commission for Africa, (M75-1270, Khartoum, 1975, p. 2.
- Beyer, B. 'Improving Thinking Skills- Practical Approaches', Phi Delta Kappan, Vol. 65, April 1984, pp. 556-560.
- Beyer, B. 'Improving Thinking Skills: Defining the Problem', Phi Delta Kappan, March 1984, pp. 22-24.
- Beyer, B. Teaching Thinking in Social Studies, Columbus, Ohio, Bell and Howell, 1970.
- Berman, S. 'Thinking in Context: Teaching for Openmindedness and Critical Understanding' , in Costa, A. Developing Minds: A Resource Book for Teaching Thinking, Vol. 1, ASCD, 1991. pp. 10-16.
- Brown, M. and Paolucci, B. Home Economics: A Definition, American Home Economics Association, 1979.
- Brown, M. 'Point and Counterpoint: Response to Hindsight and Foresight: Basis for Choice' , Journal of Home Economics, Vol. 75, No. 1, 1983, pp. 48-59.
- Blair, J. 'Dialectical Thinking: Richard Paul's New Criteria', A Paper Delivered at The Second International Conference on Critical Thinking and Educational Reform, Sonoma State University, California, July 1984, pp. 2-4.
- Bogniard, J. and Dalrymple, J. 'The Use of Simulation Techniques', Journal of Home Economics, Vol. 62, No. 10, Dec 1979, pp. 729-732.

- Bannister, D. and Mayo, C. 'Learning Through Writing in Home Economics Classes' , Illinois Teacher, Vol. XXVII, No. 5, May/June 1984, pp. 187-188.
- Beshir, M. Education in Africa: Two Essays, Khartoum University Press, 1974.
- Beshir, M. Educational Development in the Sudan: 1898-1956, Ph.D. Thesis, Oxford University, 1966.
- Babiker. M. Guide for the Arts of Needle Work for All Stages of Education, Department of Home Economics, Section of Curriculum, Ministry of Education, Khartoum University Press, 1978. (In Arabic).
- Borg, W. and Gall, M. Educational Research: An Introduction, Fifth Edition, Longman, 1989.
- Borg, W. et al. The Mini Course: A Micro Teaching Approach to Teacher Education, Gollier Macmillan, 1970.
- Best, J. Research in Education, 4th Edition, Printice Hall Inc, New Jersey, 1981.
- Brown, A. Administering Educational Media, New York, McGraw Hill, 1986.
- Birnbaum, I. 'A Modified Regression Approach to the Problem of Comparing Two or More Groups with Only One Paper in Common, British Educational Research Journal, Vol. 8, No. 2, 1982, pp. 159-166.
- Costa, A. 'Mediating the Metacognitive', in Costa, A. Developing Minds: A Resource Book for Teaching Thinking, Vol. 1, ASCD, 1991, pp. 211-214.
- Copa, P., Hultgren, F. and Wilkosz, J. 'Critical Thinking as a Lived Activity', in Costa, A. Developing Minds: A Resource Book for Teaching Thinking, Vol., ASCD, 1991, pp. 188-192.
- Costello, P. 'When Reason Sleeps: Arguments for the Introduction of Philosophy into Primary Schools' , Irish Educational Studies, Vol. 8, No. 1, 1989, pp. 146-159.
- Costello, P. Theory Teacher Education and Thought Control, pp. 166-180, in Teacher Education in the Nineties: Towards a New Coherence, Vol. 1, Edited by: John Coolahan, Papers from the Annual Conference of the Association for Teacher Education in Europe (ATEE), Mary Immaculate College of Education, Limerick, Ireland, 1990.



- Cohen, L. Educational Research in Classrooms and Schools: A Manual of Materials and Methods, Harper and Row, 1989, p. 82.
- Campbell, D. and Stanley, J. Experimental and Quasi Experimental Designs for Research, Rand McNally, 1966.
- Department of Educational Science and the Welsh Office. Technology in the National Curriculum, 1990.
- Dewey, J. Educational Thinkers Series, Collier-Macmillan, 1970.
- DeYoung, R. and Glenn, M. 'Developing Critical Thinkers Through the Art of Questioning', Journal of Business Education, Vol. 4, No. 51, Oct 1981, pp. 17-19.
- Dewald-Link, M. and Wallace, S. 'Help Students Face Tomorrow: Use Problem Solving Approaches in Your Classroom Today', Clearing House, Jan 1983, pp. 214-217.
- Dolland, T. Designing an Experiment, Redguide 13, Edited by Youngman, M., Nottingham University, School of Education, 1978.
- Dunham, R. and Smith, F. Organisational Survey: An International Assessment of Organisational Health, Illinois Scott, Forman and Cop., 1979.
- Ennis, R. 'Rational Thinking and Educational Practices' in Robinson, W. 'What is Critical Thinking', Curriculum, Vol. 10, No. 2, 1989, pp. 87-93.
- El Seed, N. History of Politics and Education in Sudan, Khartoum University Press, 1990. (In Arabic).
- Edith, H. and Badri, G. The Impact of Cultural Factors on Children's Creativity. Second International Sudan Studies Conference Papers: Sudan Environment and People, 8-11 April 1991, University of Durham, 1991, pp. 7-15.
- El Nourany, A. Literacy and Development in the Sudan: 1956-1975, Non Formal Education and Development in the Sudan- Proceedings of a Workshop Held at the Development Studies and Research Centre, 6-9 March 1978. Development Studies Book, Series No. 3, Edited by: Rasheed, S. and Sandell, T. University of Khartoum, 1980, pp. 81-100.
- Evans, K. Attitudes and Interests in Education, Routledge and KeganPaul, 1965.
- Edelfet, R. and Johnson, M. Rethinking In-Service Education, National Education Association, Washington D.C., 1975.



- Freire, P. *The Politics of Education*, Macmillan, London, 1985, p. 181.  
in Harbour, C. 'Education for Consciousness in African Social Studies', International Journal of Education Development, Vol. 10, No. 1, 1990, pp. 27-36.
- Farah, A. 'Enhancing Women Participation in Agricultural and Rural Development', Paper Presented in Agricultural and Rural Development Seminar, Development Studies and Research Centre, Khartoum University, April 1984.
- Faculty of Education. Prospectus: System, Regulations and Laws, Khartoum University, 1990.
- Grubb, B. 'Activities Can Surprise and Motivate', Illinois Teacher, XXV111, Jan/Feb 1984, pp. 135-137.
- Gall, M. 'The Use of Questions in Teaching', Review of Educational Research, Vol. 40, No. 5, pp. 707-720.
- Govier, T. 'Ways of Teaching Reasoning Directly', pp. 30-38, Critical Thinking, Proceedings of the First British Conference of Informal Logic and Critical Thinking, Edited by: Fisher, A., University of East Anglia, 1988.
- Hall, O. and Paolucci, B. Teaching Home Economics, John Wiley & Sons Inc., 1970.
- Horn, M. and East, M. 'Hindsight and Foresight: Basis for Choice', Journal of Home Economics, Vol. 74, No. 7, Winter 1982, pp. 10-17.
- Harbour, M. 'Back to Basics: Teaching Reading in Home Economics', Illinois Teacher, Vol. XXV111, No. 2, Nov/Dec 1984, pp. 56-57.
- Heui-Yiboe, L., Fanslow, A. and Cowan, D. 'Ahfad Students: Attitudes and Behaviours Regarding Women's Role in 1985', The Ahfad Journal - Women and Change, Vol. 3, No. 2, Dec 1986, pp. 28-36.
- Hoinville, G., Jowell, R. and Associates. Survey Research Practice, Gower, 1987.
- Johnson, J. 'Role Playing: Using Scenarios to Teach the Interrelationship of Work and the Family', Illinois Teacher, Vol. XXV111, March/April 1985, pp. 151-153.
- Jaber, A. and Kadhim, A. Curricula of Research in Education and Psychology, Cairo: Dar Al Nahda, 1973.
- Kwonslar, A. 'What Worth Having Students Think Critically About? A Democratic Lesson', Social Education, 1985, p. 304.

- Kluver, K. and Kendall, E. 'Integrating Microcomputers into Youth Group Activities', Illinois Teacher, Vol. XXVIII, No. 1, Sept/Oct 1984, pp. 18-19.
- Khattab, A. Food Group Production in the Sudan' Food and Nutrition in the Sudan, Proceedings for the First National Food and Nutrition Seminar, March 1972, National Council for Research, Khartoum, 1973.
- Kojek, K. New Trends in the Curriculum and the Teaching of Home Economics, Alam Al Kutob Press, 1983. (In Arabic).
- Kelly, A. The Curriculum Theory and Practice, Third Edition, Paul Chapman Publishing Ltd., 1989.
- Lipman, M. Philosophy Goes to Schools, Temple University Press, 1988.
- Lord James of Rusholme. The Education and Training of Teachers in Klassen, F and Collier, J. (Eds) 1972, Innovation Now: International Perspectives in Teacher Education, Washington, International Council on Education for Teaching, 1972.
- Ministry of Education, Bukht er' Ruda Institute of Education. The Home Economics Curriculum for Secondary Schools, El Delwaim, 1987.
- Ministry of Education. Education in Sudan: the Eleventh Educational Anniversary, Educational Planning Department, Khartoum, 1981. (In Arabic).
- Ministry of Education. Education in Sudan: Progress Report 1956/1959, Khartoum. 1960.
- Ministry of Education. The New Educational Policy, Document No. 11, Khartoum, 1972.
- Ministry of Education. Sudanese Education: An Appraisal and Strategy for Action, Khartoum, 1977.
- Ministry of Education. Educational Statistics for the Academic Year 1983/1984, Section for Educational Statistics, 1985.
- Ministry of Education. Educational Statistics for the Academic Year 1976/1977, Section for Educational Statistics, Khartoum, 1978. Also, Ministry of Education. Educational Statistics for the Academic Year 1981/1982, Section for Educational Statistics, Khartoum, 1983.
- Ministry of Higher Education and the Local Centre for Educational Planning in Arab Countries in Beirut. The Seminar for



Diversification of Secondary Education to Relate it to Social and Economic Development Requirements in the Five-Year Plan. Khartoum, 27th March-5th April, 1971. (In Arabic).

Ministry of Education. Educational Statistics for the Academic Year 1971/1972, Section for Educational Statistics, Khartoum, 1973.

Ministry of Education, Educational Statistics for the Academic Year 1984/1985, Section for Educational Statistics, Khartoum, 1986.

Ministry of Sports. Sudanese National Folklore, Tamadon Press, 1978. (In Arabic).

Ministry of Education. The Curriculum of Mathematics for Secondary Schools, Bukht er Ruda Institute of Education, 1990.

McTighe, J. and Clemson, R. 'Making Connections: Toward a Unifying Instructional Framework', in Costa, A. Developing Minds: A Resource Book for Teaching Thinking, Vol. 1, ASCD, 1991, pp. 304-311.

Munro, G. and Slater, A. 'The Know How of Teaching Critical Thinking', Social Education, April 1984, pp. 284-292.

McPeck, J. Critical Thinking and Education, Oxford, Martin Robertson & Company, 1981.

Moser, C. and Kalton, G. Survey Methods in Social Investigation, Second Edition, Gower, 1986.

Minium, E. Statistical Reasoning in Psychology and Education, Second Edition, John Whiely & Sons, 1978.

Moore, J. A Questionnaire Survey of the Teaching of Computer Studies, Pupils' Attitudes Toward Computers and Perceptions of the Learning Environment, Ph.D. Thesis, University of Hull, 1988.

Nickerson, R. 'Kinds of Thinking Taught in Current Programmes', Educational Leadership, Vol. 42, No. 8, Sept 1984, pp. 26-36.

Olson, C. 'Fostering Critical Thinking Skills Through Writing', Educational Leadership, Vol. 42, No. 7, Nov 1985, pp. 28-38.

Oppenheim, A. Questionnaire Design and Attitude Measurement, Heinmann, 1966.

Paul, R. 'Critical Thinking: Fundamental to Education for a Free Society', Educational Leadership, Vol. 42, No. 1, Sept 1984, pp. 4-14.



- Paul, R., Bineker, A., Jensen, K. and Krelau, M. Critical Thinking Handbook: 4th-6th Grades. A Guide for Remodelling Lesson Plans in Language Arts, Social Studies and Science, Rohnet Park, Sonoma State University, 1990.
- Porgow, S. and Buchanan, B. 'Higher-Order Thinking for Compensatory Students', Educational Leadership, Vol. 43, No. 2, Sept 1985, pp. 40-43.
- Perkins, D. and Salomon, G. 'Teaching for Transfer', in Costa, A. Developing Minds: A Resource Book for Teaching Thinking, Vol. 1, ASCD, 1991, pp. 215-223.
- Robinson, W. 'What is Critical Thinking?', Curriculum, Vol. 10, No. 2, 1989, pp. 87-93.
- Rielly, K. 'Teaching Critical Thinking in High School US History', Social Education, No. 49, April 1985, pp. 281-284.
- Raths, L., Arnold, R. and Wasserman, S. Teaching for Thinking- Theory and Application, Columbus, Ohio, Charles E Merrill Books, 1979.
- Rossmann, M. 'Enhancing Learning in the Classroom: Using Informal Debate', Illinois Teacher, Vol. No. 1, Sept/Oct 1982, pp. 23-24.
- Robatabi, S. Integration of Population Education and Home Economics Curriculum in the Sudanese High Secondary Schools for Girls, M Sc. Dissertation, Khartoum University, 1987.
- Sternberg, R. 'Teaching Critical Thinking Part I: Are We Making Critical Mistakes?', Phi Delta Kappan, Vol. 2, 1985, pp. 194-198.
- Sigel, I. 'A constructive Perspective for Teaching Thinking', Educational Leadership, No. 42, Nov 1984, pp. 18-21.
- Shommo, M. Developing Thinking Skills in the Secondary Home Economics Classroom, M.Sc. Thesis, University of Nebraska, Lincoln, 1986, p. 102.
- Sudan Information Office. Sudan News, A Weekly Information Bulletin Published by the Sudan Embassy in London, Vol. 1, No. 6, pp. 1-9.
- Stenhouse, L. An Introduction to Curriculum Research and Development, Heinmann, 1975.
- Stewart, R. The Managers and Their Jobs: A Study of the Similarities and Differences in the Ways Managers Spend Their Time, Second Edition, Macmillan. 1988.

- The Republic of the Sudan. Akrawi's Committee Report, Ministry of Education Documentary Centre, 1954, Khartoum.
- The Democratic Republic of the Sudan. Ministry of Education Official Documents on the New Educational Policy No. 11, Khartoum, 1970. The New Educational Policy. By Mohi El Din Sabre, Minister of Education.
- The Democratic Republic of the Sudan. Ministry of Education. Education Documentation Centre, Khartoum. Major Trends in Education, National Report to the XXXVth Session of International Conference on Education, Geneva, 27th Augst-14th Sept 1975.
- The Democratic Republic of the Sudan, Ministry of National Planning. The Six-Year Plan for Social and Economic Development, 1977/1978-1982/1983, Khartoum, 1977.
- The Democratic Republic of the Sudan. Ministry of Education. Official Document Series on the New Educational Policy, No. 111, Khartoum, 1970. The New Educational Ladder and its Implementation, by Dr. Mohi El Din Sabre, Minister of Education.
- The Democratic Republic of the Sudan. Ministry of Education. Official Documents Series on the New Educational Policy, No. 1, Khartoum, 1970.
- The Democratic Republic of the Sudan. Ministry of Education. Education in the Sudan: Reform and Strategy of Work. Report Including the Results of the General Survey for the Educational Sector, Khartoum, 1977.
- The Democratic Republic of the Sudan, Ministry of Education and Guidance, Khartoum. Development of Education 1978-1980. National Report Presented to the 38th Session of the International Conference of Education- Geneva, Sept 1981.
- Tameem, A. 'The Higher Education Revolution: The Real Independence', El Sudan El Hadeeth, No. 426, Jan 1991, pp. 1-8. (In Arabic).
- Tamir, P. Teachers' Self Report as an Alternative Strategy for the Study of Classroom Transactions', Journal of Research in Science Teaching, Vol. 20, 1983, pp. 815-823.
- Uthman, M. Current Philosophies, Patterns and Issues in Higher Education: Sudan Education in an International Perspective, Khartoum University Press, 1988.
- University of Khartoum. Faculty of Education: Systems, Regulations and Curricula, Khartoum University Press, 1987.

- Van, D. and Deabold, B. Understanding Educational Research, McGraw-Hill, 1979.
- Wesswick, L. 'Coping with Microcomputers- Byte by Byte', Illinois Teacher, Vol. XXX111, No. 1, Sept/Oct 1984, pp. 17-18.
- Washi, S. and Juzolee, S. Nutrition Education and the Home Economics Curriculum, Ministry of Education, Section of Nutrition and Rural Education, Khartoum, 1990.
- Youngman, M. Foundation Statistics for Education Part 2- Procedures, Study Guide 5, Nottingham University, School of Education, 1984.
- Zumrawi, F. Nutrition Education in the Sudan. Khartoum University Press, 1989. (In Arabic).



## Appendices

<u>Name</u>	<u>Page</u>
<u>Appendix A</u>	280
- Official letter from the Department of Home Economics, Faculty of Education, University of Khartoum about the conduction of the in-service training programme	281
- Lesson plan on balanced meal	282
- Development of achievement test on balanced meal	297
- Strategies of teaching critical thinking skills developed by Richard Paul and his colleagues (English)	302
- Strategies of teaching critical thinking skills (Arabic version)	305
<u>Appendix B</u>	310
- Post Lesson Diary Report Form (English)	311
- Post Lesson Diary Report Form (Arabic)	315
<u>Appendix C</u>	321
- English copy of the interview	322
- Arabic Copy of the interview	325
<u>Appendix D</u>	331
- English version of the questionnaire	332
- A booklet of the questionnaire in Arabic	336

Appendix A

University of Khartoum

FACULTY OF EDUCATION

P. O. Box 406 Omdurman

Sudan



جامعة الخرطوم

كلية التربية

ص.ب : 406 امدرمان

السودان

Ref. \_\_\_\_\_

Date : 9/3/1993

الرقم : \_\_\_\_\_

التاريخ : \_\_\_\_\_

HOME SCIENCES DEPARTMENT  
TO WHOM IT MAY CONCERN

THIS IS TO CERTIFY THAT Mrs. MAHASIN SHOMMO HAS CONDUCTED AN IN - SERVICE TRAINING COURSE FOR THE SECONDARY HOME ECONOMICS TEACHERS OF OMDURMAN PROVINCE IN 22- 27 SEPTEMBER, 1992 AT THE DEPARTMENT OF HOME SCIENCES, FACULTY OF EDUCATION, UNIVERSITY OF KHARTOUM.

Dr. A/KHALIG MUDDATHIR  
HEAD. DEPARTMENT

Dept. OF HOME SCIENCES





## Outline for the lesson Plan

Date:

Duration: 70 minutes

Number of Participants:

### Objectives

The teacher-trainees will:

1. Practice developing criteria for evaluating meals.
2. Evaluate meals.
3. Compare and contrast different meals.
4. Develop alternatives for providing balanced meals as a means for solving the common problem of Sudanese unbalanced meals.
5. Identify and implement the steps of the PS process.

### Teaching Materials

1. Blackboard and chalk.
2. Pens.
3. Posters listing the components of a balanced meal.
4. Note books.
5. Diagrams to supplement blackboard work.
6. Handouts on the critical thinking strategies (attached).

## Content of the Lesson

### Stage 1: Introduction

Stimulation of interest in the concept of teaching CTSS in the subject of HE. The definition of a balanced meal will also be introduced at this stage.

#### Methods:

- A) Interest will be aroused initially because the teachers had been previously introduced to the nature and the approaches of the lesson. (In the previous session).
- B) Stressing the relevance between the PS approaches and the teaching of CTSS in HE.
- C) Opportunities will be given to the teachers to ask questions and to contribute from their own general knowledge and interest to whatever will be said.

### Stage 2: Presentation

- A) Revision of the process of PS that had been introduced in the previous session.

#### Method:

In order to set the approach of the lesson the contribution of the PS methods to the teaching of CTSS will be noted. The steps leading to PS will be described to the teachers. A short summary of these steps will be built up on the blackboard in the course of description.

B). Old lesson plan on balanced meal together with its critique will be introduced. The critique will be focused on identifying a problem within the topic that needs to be solved. In this Lesson the problem is identified in advance to be the 'unbalanced meal'.

Method:

Narration, discussion and debate.

C). Presentation of the remodelled lesson. This will include the presentation of the steps of PS in the context of the unbalanced meal.

Methods:

- Each step of the PS process will be explained and described to the teachers in terms of the questions to be asked and the strategies to be applied.

- By means of further questions at each step, participants will be led to discuss the strategies pertinent to each step.

- The stated and elicited information will be built up in a blackboard summary. This is particularly important in listing alternatives.

- Methods of this stage will be supported by presenting appropriate teaching materials selected for this lesson.

- Full detail about the remodelled lesson will be presented in a separate section later.



### Stage 3: Application

A) As an application for what will be learned in this lesson, each participants will be asked to plan 3 lessons using the PS approaches that had been implemented in the lesson.

#### Methods:

- As an aid to motivate teachers to plan their own lessons, the criteria by which these lessons will be evaluated will be explained by the researcher.

- Teachers will also be informed that two of their lessons (topics A and B ) will be reviewed, discussed and approved by the researcher before their implementation in the classrooms. At the same time participants will be informed the third lesson on topic C will be left for them to manage.

- Handouts on all strategies identified for teaching CTSs will be distributed and discussed briefly with the teachers. The discussion and explanation of the strategies will be focused on defining each strategy and providing an example of using it. In this respect, it is worth remembering that such examples will be provided in the context of HE. The reasons for including these strategies in the course will be presented later.

### Stag 4: Conclusion

- Conducting statement which will include a brief summary of the main points of the lesson, questions, strategies and the use of PS approaches in planning other HE lessons. Reference will be made to the movement currently taking place in teaching CTSs and the

effectiveness of PS methods in teaching these skills in the subject of HE.

- When assignments will be completed, the researcher will explain the tasks of the teachers for the next session.

- Oral evaluation of assignments will be introduced by the researcher.

## The Lesson Plan for the In-Service Course

In planning the lesson introduced in the in-service course, the researcher followed the remodelling procedure developed by Paul and his colleagues for teaching critical thinking. The reason for remodelling the lesson was to show the difference between the current traditional lesson plans and the intended PS-style lessons. The idea behind the remodelling was to identify a problem within this particular lesson.

According to Paul and his colleagues, "to remodel lesson plans is to critique one or more lesson plans and formulate one or more new lesson plans based on that critical process".<sup>1</sup> They also explained that the remodelled lessons have three major components:<sup>2</sup>

1. 'Original Lesson', or statement of the 'Standard Approach' which describes the topics and how it is covered including questions and activities.
2. The 'Critique' which describes the significance of the topic and its value for the educated thinker, evaluates the original, and provides a general idea of how the lesson can be remodelled.
3. The 'Remodelled Lesson' which describes the new lesson, gives questions to be posed to students and student activities, and cites the critical thinking strategies by number. A full list of these strategies will be presented later and will be translated into Arabic as a handout for the teachers in the in-service course. The reason for providing a full list of strategies for the teachers is twofold. First, it gives the participants an excellent



chance to choose the strategies that fit with their own lesson plans identified for the purpose of this study. Second, it encourages the teachers to use such strategies in planning their lessons in the future.

In discussing the above mentioned components, the authors explained that "complete remodelled set also include a list of objectives which integrate the objectives of the original with the critical thinking goals." <sup>3</sup>

In developing her lesson for the in-service course , the researcher had implemented the three components of the remodelling procedure. Precisely, she presented the original lesson to describe the topic and how it has been covered in the HE classes. The researcher considered this step crucial because it provides the reader with an idea about the traditional lesson plans. It is also essential because it provides the opportunity to compare the traditional lesson plans with the PS-style ones.

The intention of using the critique in the lesson is to identify a problem within the topic, which has been considerably neglected and which needs to be thought about. Thus, the focus of the critique was on identifying a missed or a neglected aspect that in practice constitutes a problem within the topic.

By identifying the problem of the topic, the remodelled lesson had been presented according to the format of PS. This means that, the remodelled lesson which included the description of the new lesson, the questions asked and the strategies used was presented in the context of the PS process. In other words, a combination of the remodelling procedure with the format of teaching PS as approaches for teaching CTSS in HE was used for planning the PS-style lesson.

The idea behind using a combination of the remodelling procedure and the PS format was the following. The former was designed as a guide for teaching critical thinking in general. However, the lesson plan as well as the study as a whole were focused on teaching these skills in the context of PS. This suggests two things. The first is that, in teaching such skills the specific approaches identified for teaching PS in HE should be implemented. The second is that these approaches should be the central part of teaching CTSS when solving problems. Thus, the PS format had been integrated with the remodelling procedure of teaching critical thinking in planning the PS-style lessons in the present research.

In developing the objectives of the remodelled lesson, the PS-style one, the researcher followed the procedure introduced by Paul and his colleagues. This procedure was based on the integration of the objectives of the original lesson with the critical thinking (represented by PS approaches) goals.

### Balanced Meal

#### 1) Original Lesson Plan

##### Methods of Teaching/Learning in Traditional lesson Plan

In the traditional lesson plans, the teaching learning process takes place as follows:

1. The teacher stands in the front of the class, gives information and knowledge whereas students listen to her.

2. The teacher writes information in the board - students copy it.
3. Students recite or recall given information.
4. Students read and copy information from textbooks.
5. Students copy information from posters and diagrams.
6. Students follow teacher's ideas or instructions in doing some activities such as cooking, sewing, knitting and crafts.
7. Teacher dictates notes for students to write in their note books.
8. Teacher asks students questions - students answer these questions by recalling given information.

### Abstract

In a double period (70 minutes students discuss the importance of a balanced meal, identify its basic food groups or components and mention which food items are included in each of these groups. Students learn that a balanced meal consists of proteins, vitamins, carbohydrates and minerals. Girls are also taught that a balanced meal should include all the identified food groups and that it keeps a person fit, healthy and in a good nutritional condition. Students learn that a meal which is composed of a mixture of foods is better than a meal of a single food. Balanced meals provide energy and nutrients essential for health and proper growth. Most foods contain a number of nutrients in varying proportion and thus it is necessary to eat meals composed of more than one food. Moreover, girls learn that balanced meals are composed of a staple plus a variety of foods from three major groups which are classified as being: protein-rich foods; vegetables and fruits, specially those rich in vitamins and minerals;



and supplementary energy-rich foods. Students learn the importance of each component in the diet together with its function in the human body, and discuss the different forms of foods they include. Girls also learn that the components of the major foods together with water, are essential to the human body. In addition, students mention what people of different regions of the Sudan eat for their meals.

## 2) Critique

The original lesson plan provides students with the components of balanced meals, rather than having girls suggest and discuss examples of these meals. By talking only about the resources, forms and advantages about balanced meals discussion about unbalanced meals is completely neglected. In other words, meals that do not include the major identified food groups are not incorporated in the discussion.

To emphasise that a balanced meal should include all the basic food groups suggests that girls are obliged to provide balanced meals for their families. However, the means for achieving this aim are totally neglected. This also suggests that after learning this lesson, there is no guarantee that girls will be able to apply the concept of balanced meals in their real life. The reason is partially the unavailability and high price of foods. But, not less important is the lack of a thoughtful mind and the skill of converting an unbalanced meal into a balanced one. To me, emphasis should be put on thinking about how to solve the problem of the unbalanced meals which constitute the common feature of the diet of the large majority of Sudanese families. Although students discuss meals of different areas of the Sudan, the difference between these meals are not compared or

evaluated from balanced/unbalanced point of view. For example, eggs and meat in one meal are treated as equally valuable sources of proteins as meat and bread are valuable sources of both protein and energy.

Thus, this lesson is a missed opportunity for girls in evaluating the strengths and weaknesses of different meals, using widely accepted criteria of a balanced meal such as high proteins, essential minerals, vitamins and high energy resources. Indeed, it is a missed opportunity for the students to discuss, search for , and share ideas about finding possible alternatives for providing balanced meals that will improve the nutritional conditions of their families.

In short, it is true that students are taught about the balanced meal, its forms, components, nutritional value, resources and so on. Nevertheless, it is not clear how students will respond or what they will do if they will be given a chance to think about how to solve the problem of their unbalanced meals. In other words, what would be the result if students were given enough time to disclose the problem of the unbalanced meals and think about the means or alternatives for solving it.

### 3-The Remodelled Lesson

#### The problem Solving-Style Lesson

##### 1. Identification of the problem

The unbalanced meal is a nutritional problem in Sudanese society. This problem has been identified in the critique. In order to figure out what the problem really is the following strategy will be used. (S-27: Comparing and contrasting ideals with actual practice.

## 2. Interpretation of the Problem

The researcher will begin by facilitating a discussion of what makes our meals in the Sudan unbalanced. She will ask: 'Can anyone give me an example of a common meal in your area?' 'Is this meal balanced?' 'Why/Why not?' meal (S-1): Fostering independent thinking. In answering this question, the researcher will keep a list of criteria the participants come up with. (S-15): Developing criteria for evaluation.

After eliciting several responses the researcher will pick up a teacher and ask her : 'Can you tell me what you had in your breakfast today?' The meal will be listed in the board. The participants will be asked: 'Is this a balanced meal?' 'Why is it a balanced/unbalanced meal?' 'Does such a meal harm your health or nutritional condition?' 'Does such a meal not meet certain needs of your body?' 'Why?' 'Does it include the essential nutrients?' 'Explain how?'...etc. (S-12): Clarifying ideas.

## 3. Listing Alternatives

After participants have investigated a number of different areas' common meals, the researcher will ask them to apply the criteria previously developed. She asks of each meal 'Is this a balanced meal?' 'Why do you think so?' 'How does it compare with another common meal?' 'What do you think makes this meal balanced compared to that one?' (S-6): Developing intellectual courage which means not to be afraid to think differently. Also, (S-12): Developing one's perspective, creating or exploring beliefs, arguments or theories.

At this stage, the researcher will encourage the teachers to discuss explicitly the strengths and weaknesses of different areas'



meals. For example, in discussing meals which contain animal protein and those which contain plant protein, participants will be asked: 'Which meal do you think is better for your family?' 'What are the reasons for your choice?' (S-13): Clarifying issues, conclusions, or beliefs.

To sum up the discussion of this step of PS, the researcher will once again ask about the criteria of having balanced meals. She will also encourage the teachers to think about creating means for improving our meals which could help Sudanese families to improve their health condition. (S-7): Developing intellectual good faith or integrity.

At the end, the researcher will list the alternatives provided by the teachers on the board. These alternatives will be presented in terms of possible means for solving the problem of unbalanced meals commonly used in the Sudan. In this regard, alternatives could include:

1. Providing people with information about using variety of foods instead of concentrating only on one food. This is particularly important for people who are capable of purchasing variety of foods but who lack the skill and knowledge to do so.
2. Providing information about the alternatives of each food group to be included in the meal. For example, if meat is expensive or not available eggs or vegetables could replace it because they all sources of the same group, the protein foods.
3. Raising cows, lamb and poultry at home would be an excellent alternative for solving the problem of high price

or unavailability of meat, eggs and milk. This is very important for families with children to improve their nutrition and growth. To me, this alternative is pertinent for the majority of Sudanese families because Sudan is a large land compared to its population. Thus, every family particularly those who live in rural areas could own a small area for raising animals and poultry without having difficulties.

4. Establishing a kitchen garden is also a possible alternative for providing vegetables and fruits covering the daily needs of the family.

#### 4. Selection of the Solution

In selecting a solution to the problem of unbalanced meals, the consequences of each alternative will explicitly discussed with the trainees. Before making a final decision regarding this problem, the criteria that have been identified earlier should be used in determining each alternative and its consequences. This is particularly important in determining whether or not each listed solution satisfies the identified criteria prior to selecting a final one. (S-19): Generating or assessing solutions.

To pursue this stage the researcher will ask questions such as: 'Which of the listed alternatives do you prefer most?'; 'Give reasons'. The purpose of asking these questions is to have teachers choose among alternatives based on the previously established criteria. (S-9): Developing confidence in reason.

## 5. Implementation of the Decision

At this stage, the researcher will focus on the solution that has been selected. The implementation of the decision will be accomplished by providing a plan of action or a direction to be followed. For example, if the idea of developing kitchen garden had chosen as the best solution, teachers (with their students) will produce a plan to put this solution into practice and see the consequences later. (S-30): Examining or evaluating assumptions.

## 6. Evaluation of the Consequences

As the desired goal for the present lesson is to solve the problem of the unbalanced meal used by Sudanese people, the evaluation of the consequences of the chosen solution will be discussed and weighed in relation to the identified criteria of the balanced meal. This indicates that these criteria will be used as means for judging the success or failure of the solution.

Since the evaluation of the consequences of the present problem cannot be fully achieved due to the limited time of the course, all possible alternatives will fully discussed with the teachers. In this respect, the common questions will be: 'What do you think the effectiveness of the chosen alternative in solving the problem of unbalanced meal?' 'What do you think the consequences of implementing this particular alternative?'. 'If this alternative failed to solve the identified problem, what will be the next best alternative to implement?' (S-35): Exploring implications and consequences.



## Development of Achievement Test on Balanced Meal

### 1) Recall questions:

1. Define the term balanced meal.
2. What is balanced meal means?
3. Where can we find the vitamins?
4. What are the components of energy foods?
5. Where can we find foods that contains proteins?
6. What are the major sources of the proteins?
7. What is the difference between plant and animal proteins?

### 2) Descriptive questions:

1. Describe the balanced meal.
2. How can we develop a balanced meal?
3. Describe the components of the balanced meal.
4. How can we determine wether a meal is balanced/unbalanced?
5. Compare a meal which contains eggs, a salad, bread and orange with a one which contains bread, lentils and rice pudding from a balanced/unbalanced point of view.
6. Compare animal protein with plant protein.

### 3) Explanatory Questions:

1. Explain what makes a meal which contains cheese, eggs and milk unbalanced?.
2. Why do Sudanese families tend to have unbalanced meals?
3. What are the causes of having unbalanced meals in the Sudan?
4. What are the alternatives for solving the problem of the unbalanced meals in the Sudan?

5. What are the reasons that make most of Sudanese families concentrate only on one or two food groups in preparing their meals?
6. What do you think is the solution (s) for the problem of the unbalanced meal in the Sudan?
7. Explain what makes Sudanese meals unbalanced? What are your suggestions for solving this problem?
8. The common meal of the Sudanese meal is unbalanced, Discuss.

4) Synthesizing Questions:

1. What conclusions can you make about the problem of Sudanese unbalanced meal?
2. What are the alternatives for solving the problem of our unbalanced meal to be a balanced one?
3. How would you sum up the alternatives of converting the unbalanced meal into a balanced one in the Sudanese society?
4. What implications do you think about regarding the problem of the unbalanced meals commonly used in the Sudan?

5) Judgemental Questions:

1. What do you think is the best alternative for solving the problem of Sudanese unbalanced meal and Why?
2. what do you think is the best alternative for solving the problem of our unbalanced meal? Provide reasons for your answer.
3. Which alternative do you think is the most suitable one in providing balanced meals for Sudanese families?

4. On what basis do you determine whether a meal is balanced or unbalanced?
5. Should we apply the concept of balanced or unbalanced meals in our life? Why do think so?

6) Open-ended Questions:

1. What do you think might happen if we provide balanced meals for all Sudanese families?
2. What do you think would be the consequences of delivering information for Sudanese families about the importance of balanced meals and the alternatives for providing them?
3. How would you be if you eating meals that composed of only one food group for the rest of your life?
4. Why do some families concentrate only on eating one or two groups of the basic foods although they are capable of purchasing variety of foods?
5. If you were offered a chance of preparing a balanced meal for your school dinner, what meal would you make?
6. What would happen if we feeding a young child only with porridge?



### The final Test on Balanced Meal

Q 1: We have a meal which consists of the following ingredients:

- jam
- bread
- doughnuts

a) What are the component of this meal?

b) What are the missing components of this meal?

c) Where can we find each of the missing components?

Q 2: Compare the above-mentioned meal with a meal which consists of eggs, bread and orange from balanced/unbalanced point of view.

Q 3: What do you think is the reason (s) for having unbalanced meals in the Sudan?

Q 4: How would you sum up the alternatives for converting the meal in question No. 1 into a balanced one?

Q 5: What do you think is the best alternative for those which you have suggested in the previous question and why?

Q 6: If you were asked to convert a meal for a young child of an average family which consists of the following:

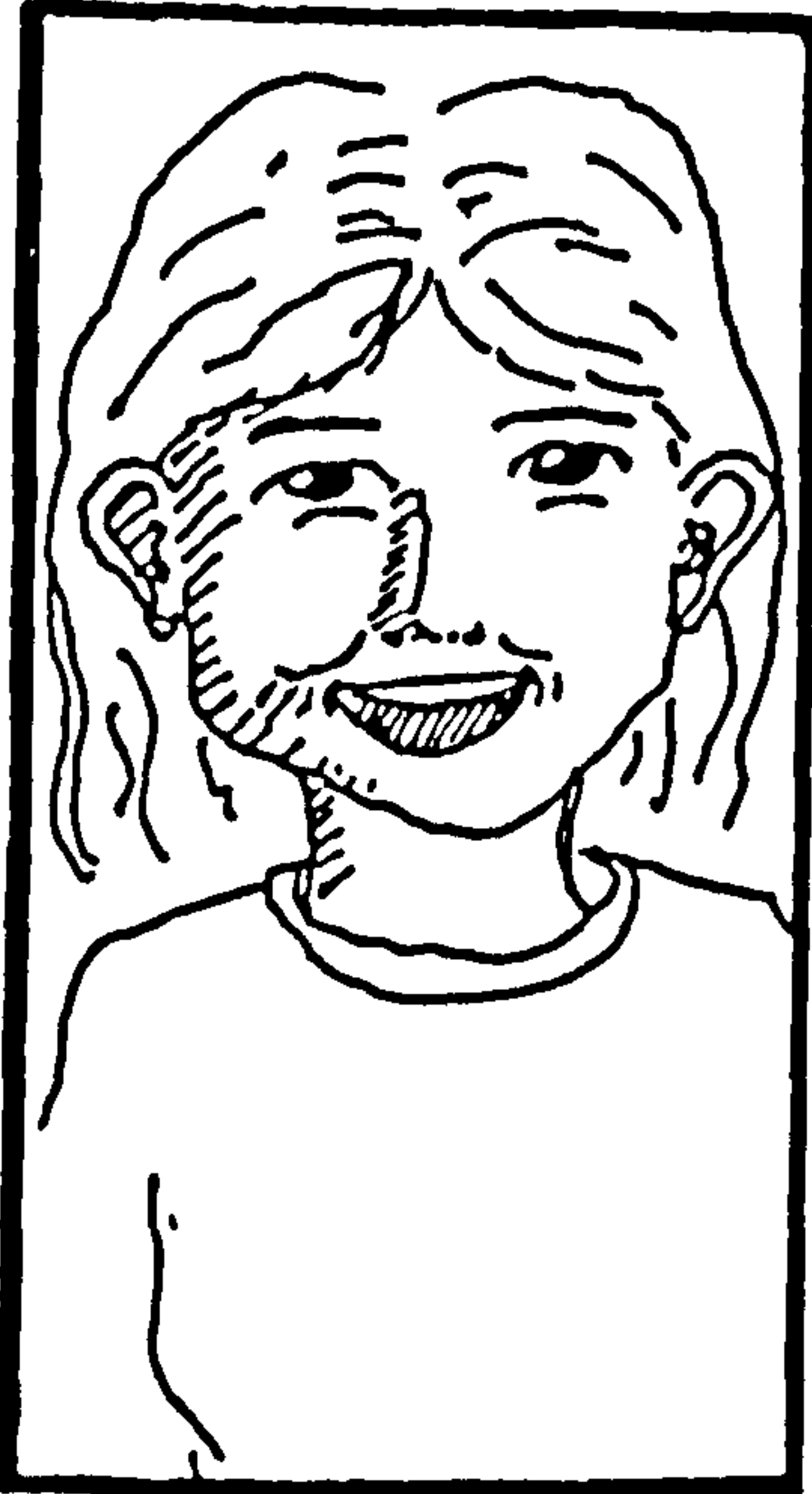
- Pudding in the breakfast
- Porridge in dinner
- Shiariah (form of noodles) in supper

What would you do to provide a balanced diet for this child on that particular day?

## References

1. Paul, R., Binker, A., Jensen, K. and Kurek lau, H. Critical Thinking Handbook: Grades 4th - 6th. A Guide for remodelling lesson Plans in Language Arts, Social Studies and Science. The Centre for Critical Thinking and Moral Critique, Sonoma State University, 1990, p. 8.
2. Ibid., p. 9.
3. Ibid.

## Strategy List: 35 Dimensions of Critical Thought



In the chapter "Making Critical Thinking Intuitive" we introduced three hypothetical characters whose way of thinking illustrated the distinction between uncritical thinking (Naive Nancy), weak sense critical thinking (Selfish Sam), and strong sense critical thinking (Fairminded Fran). Before you examine our more formal explanations of the 35 dimensions of critical thinking you might find it useful to examine the following summaries as they might be expressed by Fairminded Fran. It is our hope that students will begin to think in these ways as we foster their thinking and encourage them to become not only skilled but fairminded as well.

### As They Might Be Explained by Fairminded Fran

#### A. Affective Strategies

- S-1 thinking independently: "I try to do my own thinking, to figure things out for myself. It's good to listen to others to find out what they're thinking, but you must always use your own thinking to decide who to believe and what to do."
- S-2 developing insight into egocentricity or sociocentricity: "If I don't watch myself, I pay too much attention to what I want, and go along too quickly with what my friends say. I have to remember that everyone usually puts what they want first and believes what their friends believe. Just because I or my friends think something doesn't make it so"
- S-3 exercising fairmindedness: "Whenever I disagree with someone I should try to look at things from their point of view. Maybe if I see why someone disagrees with me, I will find a reason to agree with at least part of what they are saying."
- S-4 exploring thoughts underlying feelings and feelings underlying thoughts: "When I get angry or sad, I should think about why. Maybe I could change the way I am looking at things and then not be so angry or so sad after all."
- S-5 developing intellectual humility and suspending judgment: "I shouldn't say things that I don't really know are true. Lots of things that people say aren't true. Even TV and books are sometimes wrong. I should always be willing to ask 'How do you know that? How do I know that?'"
- S-6 developing intellectual courage: "I should be ready to speak up for what I think is right, even if it is not popular with my friends or the kids I am with. I should be courteous but I should not be afraid to think differently."
- S-7 developing intellectual good faith or integrity: "I should be careful to practice what I preach. It is no good saying I believe in something if I don't really act on it."



- S-8 developing intellectual perseverance: "It isn't always easy to solve problems. Sometimes you have to think for a long, long time to do it. Even though my mind gets tired, I must not give up too easily."
- S-9 developing confidence in reason: "I know my head can figure things out. If I am willing to think logically, look for evidence, and accept only good reasons for things."

**B. Cognitive Strategies — Macro-Abilities**

- S-10 refining generalizations and avoiding oversimplifications: "It's wrong to say 'everyone' when you only mean 'most' or 'no one' when you only mean just a few. It's nice to make things simple, but not so simple that they're not true."
- S-11 comparing analogous situations: transferring insights to new contexts: "Lots of things are like other things. Being lost in the city may be in some ways like being lost in your life. May be in both cases you need a map!"
- S-12 developing one's perspective: creating or exploring beliefs, arguments, or theories: "It takes time to figure out what you really think, sometimes years! I should be ready to listen to what other people think and why. Then my own ideas can grow and grow."
- S-13 clarifying issues, conclusions, or beliefs: "Often what people say is not as clear as they think. You should always be ready to say 'What do you mean?' or 'Could you explain that to me?'"
- S-14 clarifying and analyzing the meanings of words or phrases: "Words are funny. Sometimes it sounds like you know them when you don't. Yesterday when my teacher asked me what 'democracy' meant, I thought I knew, but I found I couldn't explain it."
- S-15 developing criteria for evaluation: clarifying values and standards: "If we are going to judge something as good or bad, we need a way to do it. But often we decide that something is good or bad and really don't know why we said so. People are funny!"
- S-16 evaluating the credibility of sources of information: "We learn lots of things from other people, and from books and TV. But sometimes what we learn isn't so. We need to question what we hear people say and what we see on TV. Do they really know? Maybe and maybe not!"
- S-17 questioning deeply: raising and pursuing root or significant questions: "My teacher often asks us questions that sound easy but aren't. The other day she asked us what a country is and it took us a lot of time to figure it out. I guess sometimes simple things aren't so simple."
- S-18 analyzing or evaluating arguments, interpretations, beliefs, or theories: "The other day my brother and I argued about who should do the dishes. Finally we decided that we should do them together."
- S-19 generating or assessing solutions: "It's interesting to try to solve problems. Sometimes there are even different ways to get the same job done."
- S-20 analyzing or evaluating actions or policies: "I get mad when I am not allowed to do what my brother is allowed to do. My parents say it is because he is older than me, but sometimes I am not allowed to do what he was when he was my age. That's not fair!"
- S-21 reading critically: clarifying or critiquing texts: "When I read I try to figure out exactly what is being said. Reading is like being a detective. You have to ask questions and look carefully for answers."
- S-22 listening critically: the art of silent dialogue: "When I listen to someone I ask myself whether I could repeat what they are saying and whether I could explain it to someone else. Sometimes I ask myself, 'Did anything like this ever happen to me?' This helps me see if I'm listening carefully."

**S-23 making interdisciplinary connections:** "I am finding out how I can use what I learn in one subject while I'm working on another. Lots of ideas work in different places."

**S-24 practicing Socratic discussion: clarifying and questioning beliefs, theories, or perspectives:** "I am finding out that you learn a lot more if you ask a lot of questions. I am also learning that there are different kinds of questions and that you can find out different things by asking them."

**S-25 reasoning dialogically: comparing perspectives, interpretations, or theories:** "It helps to talk to other kids when you are trying to learn. Sometimes they have good ideas, and sometimes it helps you to try to explain things to the other kids."

**S-26 reasoning dialectically: evaluating perspectives, interpretations, or theories:** "It even helps to talk to other kids who think differently from you. Sometimes they know things you don't and sometimes you find out that you need to think more before you make up your mind."

### C. Cognitive Strategies — Micro-Skills

**S-27 comparing and contrasting ideals with actual practice:** "Lots of things we say we believe in, but then we don't do it. We say that everyone is equal but we don't give them an equal chance. We need to fix things so that we mean what we say and say what we mean."

**S-28 thinking precisely about thinking: using critical vocabulary:** "There are special words you can learn to help you talk about what goes on in your head. For example, inferences happen when you learn some things and decide other things because of that. Assumptions happen when you believe things without thinking about them. I try to watch my inferences and assumptions."

**S-29 noting significant similarities and differences:** "Sometimes it is important to see how alike things are that are different. Sometimes it is important to see how different things are that are alike. I always try now to see how things are both alike and different."

**S-30 examining or evaluating assumptions:** "To do a good job of thinking you have to pay attention to what you believe without thinking. Sometimes we go along with stuff without thinking about it. When you do, watch out! You probably missed something important!"

**S-31 distinguishing relevant from irrelevant facts:** "It may be true but is it related? We often forget to ask this. To figure things out you must stick to the point and not get other things mixed in."

**S-32 making plausible inferences, predictions, or interpretations:** "I sometimes decide things that aren't true. Then I have to stop and think about why I did that. I try to be more careful next time. Things often seem to be one way at the moment and then turn out to be different."

**S-33 evaluating evidence and alleged facts:** "Detectives and police look carefully for evidence so they can find out who really did it. We need to find out evidence too, when we read and write and talk. We should try to find evidence before we decide who is right and wrong."

**S-34 recognizing contradictions:** "Sometimes kids say one thing today and another thing tomorrow. Sometimes parents and teachers do too. That's confusing. You should decide what you really mean and then stick to it and not go back and forth and back and forth."

**S-35 exploring implications and consequences:** "When things happen, other things happen because of them. If you say something mean to someone, they may feel bad for a long, long time. It's important to see that, otherwise we won't notice all the things we are making happen."



## استراتيجيات تدريس التفكير المتعلق بحل المشكلات

- ١- التفكير المستقل، تساعد هذه المهارة الطالب على أخذ القرار بنفسه و تحديد الشيء الذي يجب عمله. مثال:  
ممل قطعة فنية من صميم تفكير الطالب.
- ٢- تطوير ذاتية الفرد و ذلك بالنظر والتمنن في المشكلة دون التأثر بآراء الغير مثال: عند تصميم ملابس للطالبات يجب أن تتاح الفرصة لكل طالبة في اعداد الفستان الذي ترى أنه مناسب لها.
- ٣- النظر في آراء الغير من وجهة نظرهم الخاصة. مثال: اذا اختلفت طالبتان في كيفية اعداد وجهة لذهابية لطفل في سن معينة، يجب أن تتاح الفرصة لكل منهما للنظر في كيفية اعداد هذه الوجة من وجهة نظر زميلتها.
- ٤- تطوير التفكير المتعلق باكتشاف الاسباب من وراء الشهور أو التصرفات وذلك بكشف العلل. مثال: اذا اختلفت الطالبة ألوان معينة لعمل لوحة فنية يجب أن تفكر جيدا في الاسباب التي جعلتها تختار هذه الالوان.
- ٥- تطوير التفكير المتعلق بالحكم على الامور و المواقف. يجب أن يفكر الطالب جيدا و أن يتفحص الامور قبل الحكم عليها. مثال: هناك امتكاه يقول بأن أكل البيض منذ الاطفال حديثي السن يؤخر الكلام. هذا النوع من الحكم يحتاج الى تفكير لاثبات صحته.
- ٦- تطوير الشجاعة الالهية في طرح الآراء و وجهات النظر حتى ولو كانت تتعارض مع آراء الغير كالاصدقاء، الاهل أو الاقارب.



٧- تطوير التفكير و ذلك بربط و تطبيق المبادئ و المعتقدات في الحياة العملية. مثال: اذا كانت الطالبة تعتقد

في أهمية نظافة المنزل، يجب أن تطبق ذلك في حياتها الاسرية.

٨- تطوير التفكير بالمواظبة على حل المشكلات. مثال: اذا كانت المشكلة معقدة فيجب تشجيع الطالب على حلها

بشتى الطرق و من مختلف الزوايا ذلك لان حل المشكلة لا يتم دائما من أول محاولة.

٩- تطوير التفكير عن طريق تطوير الثقة و التأكد من الاسباب التي يدلي بها الفرد في حل المشكلة.

١٠- تطوير التفكير عن طريق ضبط التعميم و تفادي البساطة في الرأي. مثال كأن تقول الطالبة أن الرضاة

الصناعية أفيد من الطبيعية علما بأن ذلك قد يكون صحيحا في بعض الحالات و ليست كلها.

١١- تطوير التفكير عن طريق الاستفادة من مقارنة المواقف السابقة و التي تشبه الموقف الحالي الجديد. بمعنى

اخر تحويل حل مشكلة معينة الى معالجة مشكلة اخرى مشابهة لها.

١٢- تطوير التفكير وذلك بتطوير التأمل و الرؤى في كشف المعتقدات أو النظريات. مثال: اذا كانت الطالبة تعتقد

أن أكل السمك مع اللبن يفسد صحة الطفل يجب أن تفكر جيدا و أن تبحث الاسباب من وراء هذا الاعتقاد.

١٣- توضيح ملخصات القضايا و المشكلات و ذلك بطرح الاسئلة مثال ماذا يعني هذا؟

١٤- توضيح و تحليل المعاني و الكلمات. تتمثل أهمية هذه المهارة في أن الفرد أحيانا يعتقد انه يعرف المعاني

ولكن عندما يُسأل لا يستطيع الاجابة.

١٥- تطوير المعايير أو المقاييس اللازمة للتقويم وذلك بتوضيح القيم و المستويات القياسية للاشياء. مثال: اذا

إذا حكمت الطالبة على أن ترتيب الغرفة بوضع معين هو الأفضل فيجب عليها أن توضح المعيار أو المقياس الذي استخدمته في هذا الحكم.

١٦- تقويم مصداقية المعلومة . يتعلم الفرد من مصادر مختلفة كالأهل، الجيران، الأصدقاء ، الشارع، المذيع، التلفزيون... الخ و بالتالي يجب أن ننمي في الطالب المقدرة على تقييم ما يسمعه.

١٧- التعمق و التفكير في السؤال المطروح لمعرفة جذوره و أهميته. تركز أهمية هذه الاستراتيجية في أنه يحدث أحيانا طرح سؤال بسيط ولكن تصعب الاجابة عليه بسبب عدم التفكير في السؤال نفسه قبل الاجابة عليه.

١٨- تحليل و تقويم المعتقدات و التأويلات.

١٩- استحداث أو تخمين الحلول للمشكلة ذلك لأنه يمكن حل مشكلة واحدة بطرق متعددة.

٢٠- تحليل أو تقويم المواقف و السياسات. مثال: كثير من الاسر السودانية يسيطر فيها الزوج على الزوجة في أخذ القرار خاصة اذا كان هذا القرار مادي. يجب التفكير في تحليل هذا الموقف.

٢١- القراءة المرتكزة على النقد البناء وذلك عن طريق توضيح المعاني و المحتوى المكتوب. وعليه يجب أن يفكر الطالب في الشيء الذي يقرأه و أن يبحث عن الاجابة على الاشياء التي لم يفهمها.

٢٢- الاستماع الناقد أو ما يعرف بالحوار الصامت. يتم ذلك عادة عندما يستمع الفرد الى شخص اخر يتحدث فيسأل نفسه أسئلة في صمت عن الموضوع الذي يستمع اليه.

٢٣- ربط الأفكار و المعلومات التي يتعلمها الفرد في مادة معينة ببقية المواد الاخرى. مثال: اذا علمت الطالبة أن

نمو الطفل داخل جسم الام يزيد حجم بطنها يجب ربط و نقل هذه المعلومة عند تصميم قميص لام حامل.

٢٤- تطبيق مناقشات سقراط وذلك عن طريق طرح الاسئلة وتوضيح وجهات النظر المختلفة أثناء المناقشة.

٢٥- تطوير الحوار عن طريق تبادل الاراء ووجهات النظر.

٢٦- المجادلة عن طريق تقويم وجهات النظر المختلفة و التي تتيح الفرصة للطالب في التفكير في الشيء قبل

تقويمه.

٢٧- تحديد نقاط الشبه أو الخلاف بين المثاليات و ما نطبقه في حياتنا العملية. مثال: تحديد الشبه و الخلاف بين

ترسيد الاستهلاك الذي ينادي به مجتمعنا السوداني و بين ما هو موجود و مطبق في المناسبات و الافراح.

٢٨- التفكير في التفكير نفسه وذلك باستعمال بعض الكلمات التي تدل على ذلك. مثال: اذا فكر الطالب في

استخدام كلمة افتراض فيجب أن يعلم أن هذه الكلمة تدل على عدم صحة هذا الشيء بدرجة كاملة.

٢٩- تطوير التفكير الخاص بمعرفة أوجه الشبه و الخلاف بين الاشياء. تقع أهمية هذه الاستراتيجيات في أنه توجد

أحيانا أشياء تبدو متشابهة ولكنها في الواقع مختلفة جدا و بالعكس.

٣٠- اختيار و تقويم الافتراضات عن طريق التفكير عن مدى صحتها.

٣١- تمييز الحقائق المناسبة من غير المناسبة وذلك بالتركيز على الموضوع المطروح و علاقته بهذه الحقائق.

تتم أهمية هذه الاستراتيجيات في أنه فقط عن طريق التفكير يمكن أن يتم هذا التمييز.



٣٢- التفكير في صحة وسلامة الاستنتاجات و الاستدلالات.

٣٣- تطوير التفكير بتقويم الادلة و الحقائق عند البحث عن المشكلة.

٣٤- كشف المتناقضات من طريق التفكير في الاراء المتضاربة و بالتالي تفاديها.

٣٥- تطوير التفكير من طريق كشف المترتبات و المضاعفات التي تنتج عن موقف معين. مثال: في حالة عدم توفير

وجهات فذائية كاملة للطفل، يجب أن يفكر الطالب في النتائج المترتبة عن هذا الموقف.

Appendix B

## Post-Lesson Report Forms

Name:

School:

Directions: Please fill in each of the enclosed forms immediately after you finish teaching each topic



**Post-Lesson Report Form**

Date: ..... Lesson duration .....(min)

Lesson Type      Tick ONE that best gives a description of this lesson.

- Teacher talk/demonstration, pupils observe/listen \_\_\_\_\_
- Teacher talk/demonstration, pupils do little demonstration/talking \_\_\_\_\_
- Teacher asks questions, pupils answer these questions \_\_\_\_\_
- Pupils express ideas/thoughts, teacher listens \_\_\_\_\_
- Pupils pursue problem solving, teacher guides class by questioning \_\_\_\_\_
- Class debate/discussion \_\_\_\_\_
- Other (describe) ..... \_\_\_\_\_

**Resources Used by the Teacher: circle all those used in the lesson**

- |                              |                       |                                |
|------------------------------|-----------------------|--------------------------------|
| Sewing machines              | Food items            | Textbook                       |
| Published teaching materials | Kitchen equipment     | Patterns      Garments         |
| Hand Needles                 | Posters               | Diagrams      Written handouts |
| Chalk & Board                | Other (describe)..... |                                |

**Resources Used by Pupils: circle all those used in this lesson**

- |                 |              |                                |
|-----------------|--------------|--------------------------------|
| Sewing machines | Food items   | Kitchen equipment              |
| Garments        | Hand needles | Patterns      Other (describe) |

Homework Set This Lesson: circle ONE that best describes the work set

Reading from textbook

Writing notes/  
definitions

Revising/  
learning

Writing answers  
to given questions

Open enquiry/  
search for information

Making sewing and  
needle products

No homework set

Level of Satisfaction: circle ONE estimate for your own,  
ONE for pupils

The general level of your satisfaction with this lesson is:

High/  
very high

Slightly  
above average

Average

Rather  
below average

Low/  
dissatisfied

Your estimate of pupils' satisfaction with this lesson is:

High/  
very high

Slightly  
above average

Average

Rather  
below average

Low/  
dissatisfied

**Lesson Activities** For each activity indicate the period(s) of the lesson when it was used. Tick more than one column if appropriate.

	LESSON PERIOD			
	First third	Second third	Final third	Not used
1. Teacher explains the PS process				
2. Teacher poses problems for class solution				
3. Teacher writes problem alternatives on the board				
4. Teacher dictates notes				
5. Teacher asks individual pupils question(s) to check understanding				
6. Teacher listens to students' thoughts/ideas				
7. Teacher asks pupils to make a final decision about a problem				
8. Teacher asks pupils to evaluate a chosen alternative for solving a problem				
9. Teacher requires pupils to write notes as a follow-up for class discussion/debate				
10. Teacher requires pupils to copy notes from blackboard/textbook				
11. Teacher stands in the front of the class and provides information for students				
12. Pupils make notes from textbooks				
13. Pupils read notes from textbooks				
14. Girls lead discussion by themselves				
15. Pupils ask each other questions				
16. Pupils work out a problem together				
17. Students use resources other than textbooks				
18. Class discusses/debates a problem/issue				
19. Other activity (name).....				



بسم الله الرحمن الرحيم

استمارة تقرير ما بعد الدرس

الاستمارات المرفقة تتعلق بالدروس التي تم تحضيرها من خلال الدورة التدريبية المتعلقة باستخدام طريقة حل المشكلات في تدريس مادة الاقتصاد المنزلي.

- أرجو ملء كل استمارة بعد الانتهاء من كل درس مباشرة.

- اتبهي الارشادات المطلوبة في ملء الاستمارة.

- تذكرني تسليم هذه الاستمارات للباحثة بعد المقابلة الشخصية التي سوف تمقدها معك.

بسم الله الرحمن الرحيم

استمارة تقرير ما بعد الدرس

الاستمارات المرفقة تتعلق بالدروس التي تم تحضيرها من خلال الدورة التدريبية المتعلقة باستخدام طريقة حل المشكلات في تدريس مادة الاقتصاد المنزلي.

- أرجو ملء كل استمارة بعد الانتهاء من كل درس مباشرة.

- اتهمني الارشادات المطلوبة في ملء الاستمارة.

- تذكري تسليم هذه الاستمارات للباحثة بعد المقابلة الشهرية التي سوف تعقدها معك.

بسم الله الرحمن الرحيم

استمارة تقرير ما بعد الدرس

الاستمارات المرفقة تتعلق بالدروس التي تم تحضيرها من خلال الدورة التدريبية المتعلقة باستخدام طريقة حل المشكلات في تدريس مادة الاقتصاد المنزلي.

- أرجو ملء كل استمارة بعد الانتهاء من كل درس مباشرة،

- اتهمي الارشادات المطلوبة في ملء الاستمارة.

- تذكري تسليم ملء الاستمارات للهاجرة بعد المقابلة الشهرية التي سوف تعقدها معك.



استمارة تقرير ما بعد الدرس

زمن الحصة: (ق)

التاريخ:

عدد التلاميذ:

منوان الدرس:

نوع الدرس: اختاري مهارة واحدة فقط من المهارات الآتية التي تزين أنها تصف هذا الدرس وصفا مناسباً

المعلمة تشرح أو تطبق الدرس- الطالبات يستمعن أو يلاحظن الدرس.

المعلمة تشرح الدرس أو تطبقه- الطالبات يشاركن قليلاً في الدرس.

المعلمة تسأل الطالبات- الطالبات يجبن على هذه الأسئلة.

الطالبات يشرحن أفكارهن- المعلمة تستمع اليهن.

الطالبات يواصلن حل المشكلة المطروحة- المعلمة تقودهن على ذلك بطرح الأسئلة.

هذا الدرس مهارة من مناقشة و مناقرة في الفصل.

وصف آخر للدرس (أشرحي): .....

المواد التي استخدمتها المعلمة في هذا الدرس؛ وضح كل مادة أو مصدر استخدمتها بنفسك في هذا الدرس

ماكينة خياطة  مواد أظعمة  الكتاب المدرسي  مكتوبات تتعلق بالتدريس

معدات مطبخ  باترونات  مواد خياطة  اهر و مواد يدوية.

بوسترس.  مصادر مطبوعة.  مكتوبات لتوزيعها للطالبات.  سهرة وطباشير

مواد اخرى (أذكرها): .....

المواد التي استخدمتها الطالبات في هذا الدرس؛ وضح أي مادة استخدمتها الطالبات في هذا الدرس

ماكينات خياطة  مواد أظعمة  معدات وأدوات خياطة  أقمشة و كلف خياطة  اهر يدوية

□ باثرونات □ مواد اخرى: (أذكرى).....

الواجب الذي تم تحديده لهذا الدرس؛ ضمنى دائرة حول الواجب الرئيسي فقط الذي تم تحديده لهذا الدرس

القرائة من الكتاب المدرسي      كتابة ملخص للدرس      مراجعة عامة للدرس      حل بعض الاسئلة  
البحث و التنقيب عن المعلومات      عمل بعض المنتجات المتعلقة بالخياطة      لم يحدد أي واجب

درجة الرضى من هذا الدرس؛ ضمنى دائرة فقط حول العبارة التي تمثل درجة رضاك الخاصة عن هذا الدرس و اخرى

حول التي تمثل درجة رضى الطالبات حسب تقديرك الشخصي

درجة رضى المعلمة من هذا الدرس؛      عالية جدا      أعلى من المتوسطة      متوسطة  
أقل من المتوسطة      غير راضية

درجة رضى الطالبات من هذا الدرس تقريبا؛      عالية جدا      أعلى من المتوسطة      متوسطة  
أقل من المتوسطة      غير راضية

أقل الصفه ←

نشاطات الدرس: ضمي علامة ✓ لكل نشاط من النشاطات الآتية في المربع الذي يقابل الفترة الزمنية التي تم استخدامه فيها خلال الدرس، إذا استخدمت النشاط في أكثر من فترة زمنية واحدة وضحي ذلك على كل المربعات المقابلة لتلك الفترات الزمنية. إذا لم يستخدم النشاط في هذا الدرس أشيري الى ذلك بالعلامة ✓ تحت العمود لم يستخدم.

زمن الدرس

لم يستخ	الثالث الثالث	الثالث الثاني	الثالث الاول
---------	---------------	---------------	--------------

				<p>١- شرحت المعلمة طريقة حل المشكلات للفصل.</p> <p>٢- طرحت المعلمة المشكلة للطالبات لحلها.</p> <p>٣- كتبت المعلمة كل الحلول المقترحة في السبورة.</p> <p>٤- أملت المعلمة ملخص الدرس للطالبات.</p> <p>٥- وجهت المعلمة السؤال الى كل طالبة للتأكد من فهمها للدرس.</p> <p>٦- استمعت المعلمة الى أفكار و خواطر الطالبات.</p> <p>٧- طلبت المعلمة من الطالبات أخذ قرار نهائي لحل المشكلة.</p> <p>٨- طلبت المعلمة من الطالبات تقويم القرار الاخير.</p> <p>٩- طلبت المعلمة من الطالبات كتابة ملخص للنقاش أو الحوار الذي دار.</p> <p>١٠- طلبت المعلمة من الطالبات نقل المعلومات من السبورة.</p> <p>١١- وقفت المعلمة أمام الفصل و شرحت الدرس.</p> <p>١٢- الطالبات كتبن بعض المعلومات من الكتاب المدرسي.</p> <p>١٣- الطالبات قرأن في الكتاب المدرسي.</p> <p>١٤- واملت الطالبات النقاش دون الاستعانة بالمعلمة.</p> <p>١٥- سألت الطالبات بعضهن البعض أثناء المناقشة أو الحوار.</p> <p>١٦- تمارنت الطالبات مع بعضهن البعض في حل المشكلة المطروحة.</p> <p>١٧- استخدمت الطالبات مصادر اخرى لغير الكتاب المدرسي في حل المشكلة المطروحة.</p> <p>١٨- مناقشة عامة أو حوار حول المشكلة المطروحة.</p> <p>١٩- نشاط اخر (أشرحي).....</p>
--	--	--	--	---



**Appendix C**

Interview with Secondary Home Economics Teachers on their Views about teaching Problem Solving in Home Economics

Name:

School:

1. Having participated in the in-service course on teaching problem solving in home economics,

(a) What did you enjoy most?

Why?

(b) What part did you enjoy least?

Why?

2. (a) Was there any part that you would have liked to be longer?

Please explain:

(b) Was there any part you think should be shorter?

Please explain:

(c) Had you ever used problem solving approaches in teaching home economics before this in-service course?

YES

NO

If yes, please describe your experience briefly:

3. (a) To what extent do you favour/not favour teaching problem solving as a means of promoting critical thinking in home economics classes?

- Large Extent

favour/  
not favour

- Moderate Extent

favour/  
not favour

- Little Extent

favour/  
not favour

Please explain:

(b) What do you think the impact of problem solving will be on the way you teach home economics?

(c) Do you think that problem solving is necessary in teaching home economics, and if so, why?

- Very necessary

- Fairly necessary

- Unnecessary

Give reasons:

-  
-  
-  
-  
-

4. What do you think should be the role of teaching problem solving in the task of developing our current secondary home economics curriculum?



5. What should be the role of problem solving in the planning of home economics lessons.

6. What do you think will be the effect of teaching problem solving in home economics on the Sudanese family?

- Better

- Worse

Give reasons:

-  
-  
-  
-  
-

7. According to your own experience of teaching problem solving, how effective do you think this skill has been in students' learning of home economics?

Do you have any additional comments to make or questions that you would like to ask?

Thank you very much for your co-operation

بسم الله الرحمن الرحيم

مقابلات شخصية مع معلمات الاقتصاد المنزلي الأثري شاركن في الدورة التدريبية المتعلقة باستخدام طريقة حل المشكلات في تدريس مادة الاقتصاد المنزلي بعد تهيئتهن لهذه الطريقة في فصول الدراسة بالمداس الثانوية العليا للبنات بمنطقة ام درمان

س- نتيجة من مشاركتك في الدورة التدريبية المتعلقة باستخدام طريقة حل المشكلات في مادة الاقتصاد المنزلي؟

أ- هل هناك شيئ اثار اعجابك؟

إذا نعم- ما هو اكثر شيئ اثار اعجابك؟

إذا لا- لماذا؟

ب- هل تشمرين بانك استفدتي من هذه الطريقة؟

نعم- ما هو اكثر شيئ استفدتي منه؟

لا- لماذا؟

ج- هل هناك شيئ وجدتيه غير ممتع؟  
اذا كانت الاجابة نعم- ما هو الشئ الذي وجدتيه أقل متعة؟

اذا كانت الاجابة لا- لماذا؟

س٢ أ- هل هناك أي جزء من الدورة التدريبية تتمنين لو انه كان اطول او اكثر تفصيلا؟  
نعم - لا  
اذا كانت الاجابة نعم- ما هو؟

ب- هل هناك أي جزء تودين لو أنه يكون أقصر مما كان عليه؟  
نعم - لا  
اذا كانت الاجابة نعم- ما هو؟



ج- هل لديك أي تجربة سابقة في استخدام طريقة حل المشكلات في تدريس مادة الاقتصاد المنزلي؟

- نعم - لا

إذا كانت الاجابة نعم- اسلي تجربتك باختصار:

د- هل تفضلين استخدام طريقة حل المشكلات لتطوير التفكير والابتكار؟

إذا كانت الاجابة نعم- الى أي مدى تفضلين ذلك؟

إذا كانت الاجابة لا الى مدى لا تفضلين ذلك؟

هـ- في رأيك ماذا سيكون أثر طريقة حل المشكلات على الطريقة التي ستدرسين بها مادة الاقتصاد المنزلي في

المستقبل؟

ج- كيف ترين ضرورة استخدام طريقة حل المشكلات في تدريس الاقتصاد المنزلي ؟

وضحي اجابتك:

بالتواضع والاحترام

بالتواضع والاحترام

س- في رأيك ما هو الدور الذي يجب أن تلعبه طريقة حل المشكلات في تطوير منهج الاقتصاد المنزلي الحالي

بالمدارس الثانوية؟

بالتواضع والاحترام

بالتواضع والاحترام

بالتواضع والاحترام

بالتواضع والاحترام

بالتواضع والاحترام

بالتواضع والاحترام

س٩- ما هو الدور الذي يجب أن تكعبه مهارة استخدام طريقة حل المشكلات في تحضير دروس الاقتصاد المنزلي؟

س١٠- ماذا سيكون اثر استخدام طريقة حل المشكلات في تدريس مادة الاقتصاد المنزلي على الاسرة السودانية؟

س١١- نتيجة لتجربتك الشخصية في استخدام طريقة حل المشكلات- ما هو أثر هذه الطريقة على تعلم الطالبات

لمادة الاقتصاد المنزلي؟



هل لديك أي اقتراحات تعليقات أو استفسارات تريد طرحها عموماً عن طريقة حل المشكلات في تدريس مادة

الاقتصاد المنزلي في السودان؟

**Appendix D**

Questionnaires for Secondary Home Economics Teachers on their Views about Teaching Problem Solving in Home Economics

**Instructions:**

Below are Statements about Problem Solving (PS), an important Critical Thinking Skill in the teaching/learning of Home Economics (HE). To indicate the Extent to which you Agree with each statement, please Tick ONE box in each scale that best represents your Choice where:

SD = Strongly Disagree  
A = Agree

D = Disagree  
SA = Strongly Agree

UD = Undecided

	SD	D	UD	A	SA
1. I feel confident in planning HE lessons that incorporate a substantial input of PS					
2. Planning the PS-style lessons is a difficult task for HE teachers to accomplish					
3. Teaching the PS-style lessons is a difficult task for HE teachers to accomplish					
4. I think that lessons which incorporate PS skills make the teaching of HE more interesting for pupils					
5. Teaching HE lessons requires teachers to be skilful in PS					
6. With a substantial input of PS, HE can be as thought-provoking as other school subjects					
7. It is not easy to find resources for planning/teaching home economics lessons that include PS					
8. Preparing lessons that incorporate PS skills is a pleasing teaching experience					
9. It is difficult to find suitable resources for teaching PS lessons					
10. Teaching PS-style lessons is <u>not</u> suitable for most HE topics					
11. PS lessons are not suitable for large classes					
12. Planning and teaching PS is time-consuming					
13. I believe that teaching PS makes students better at thinking					
14. PS activities do <u>not</u> allow students to express their own ideas					



15. Planning HE lessons that incorporate PS is difficult for HE teachers					
16. Incorporation of PS in teaching HE lessons makes better use of students' knowledge and skills					
17. Average students are incapable of pursuing PS					
18. Teaching PS improves the existing secondary curriculum of HE					
19. PS approaches provide students with thoughtful learning experiences					
20. Developing the PS skill is one means of improving students' achievement					
21. PS does <u>not</u> help students to make sound decisions about problems in the HE context					
22. Students have more opportunities to become independent learners in classes that involve PS					
23. Girls ask more questions in HE lessons that include PS					
24. Students rely more on teacher's help in lessons that include PS					
25. Pupils seek reasons to justify ideas in lessons that include PS skills					
26. HE lessons which incorporate PS give students opportunities to share their viewpoints					
27. Students are excited in doing HE activities that incorporate a PS input					
28. I think that PS is a <u>boring</u> skill for students to learn in HE classes					
29. Girls have enjoyed their participation in open discussions					
30. Lessons which involve PS do <u>not</u> encourage pupils in learning HE					
31. Students are interested in pursuing debates in HE classes that include PS					
32. I believe it is more <u>difficult</u> to stimulate girls in HE classes which incorporate PS					
33. Pupils have enjoyed working out problems together					

34. I think that girls have been overworked in lessons that include PS				
35. PS is a useful skill for girls to learn in the context of HE				
36. Students are <u>unwilling</u> to participate in open discussion or debate in HE classes				
37. Girls are happy with learning PS in HE lessons				
38. Pupils are <u>passive</u> in HE lessons that require PS				
39. Training in teaching PS encourages teachers to provide resources other than textbooks for HE activities				
40. I believe that being trained in teaching PS has made me better at planning HE lessons				
41. More attention should be given to the training of HE teachers in PS skills				
42. Training in using PS approaches makes teachers actively seek new teaching ideas				
43. All secondary HE teachers should be trained in teaching PS				
44. We do <u>not</u> need to be trained in teaching thinking skills which are similar to the PS one				
45. We should train in teaching thinking skills and stop using traditional methods of teaching HE				
46. Training opportunities should be provided for HE teachers to cope with advanced teaching methods				
47. It is <u>inappropriate</u> to train HE teachers in PS approaches				
48. I would advise my friends to go on a similar in-service training course to learn PS skills				

## Personal Information

Directions: Please supply the information as requested

1. 'For which of the following Aspects' of HE do you have major responsibility(ies). Please tick all that apply.

- |  |   |
|--|---|
| <input type="checkbox"/> Sewing and needlework             | <input type="checkbox"/> Home management            |
| <input type="checkbox"/> Cooking and food preparation      | <input type="checkbox"/> Arts and handicrafts       |
| <input type="checkbox"/> Nutrition education               | <input type="checkbox"/> First aid and home nursing |
| <input type="checkbox"/> Childhood and motherhood          | <input type="checkbox"/> Family education           |
| <input type="checkbox"/> Textile and clothing construction | <input type="checkbox"/> Health education           |

2. How long have you been teaching HE? Please tick one box.

- |                                     |                                      |  |
|-------------------------------------|--------------------------------------|--|
| <input type="checkbox"/> 0-5 years  | <input type="checkbox"/> 11-15 years | <input type="checkbox"/> Over 20 years |
| <input type="checkbox"/> 6-10 years | <input type="checkbox"/> 16-20 years |  |

3. Qualifications Please tick to indicate your qualifications.

- Bachelor of Home Science Education and Social Work
- Bachelor of Home Science Nutrition and Dietetics - Khartoum University
- Higher Teacher Training Institute Diploma
- Ahfad Diploma of Family Science
- Ahfad Bachelor of Family Science
- General Diploma of Education
- Other (please specify)

4. If you have any comment on the in-service course or on your own experience of teaching PS please write it below:

Thank you for completing this Questionnaire













١- ما هي الفروع التي تنقسم إليها جميعها من فروع

خيطه وانفاق البرق.

لقرون وأصل بديرة.

سمنيت أو ليه.

لبرمة وطيرة.

ملبس والسحبة.

٢- صف كم صفة و أنت تترسم هذه القصة الممزوجة.....

٣- ما هي مميزات العمودية

يكلم يوس المذوم في القزوية و اللطمة الاجتماعية.

يذوم سميه المسمين المصلي.

يكلم يوس المذوم في القزوية و فلامت القرض.

يذوم كلية الاطفه للبيات في المذوم الاسرية.

يكلم يوس حصة الاطفه للبيات في المذوم الاسرية.

شهوات أو ملامت الخزي؛

-  
-  
-

أر جو كتابة بنية تنميطات أو القتر اجات افي الصفحة الغير فنة تتعلق بطريفة حل المشكلات من خلال خبرتك في

الذرة القتر بصرية المتصلة بهستطلم هذه القزوية أو من خلال تطبيقيها بنفسك. تأكد أن هذه المعلومات مستوحاة

بين الاختيار منه كتابة هذه القزوية وحه يهين الله تعالى.

لك مني جزيل الشكر والرفقن على تكملة هذا الاستبيان.

اذنت عليها حقة : محسن البراهيم شمر

كلية القزوية - جامعة القزوير

شعبة المذوم الاسرية.





المشكلات: فربما ينبغي علينا فهميات مختلفة باستخدام طريقة حل المشكلات في تدريس مادة الاقتصاد المميز لغيره. أكثر أو بحدود ما في فهمه وتطبيقه في أي منهج تدريسي، منه كل مبرر قد يفسر مدتها كما مرة واحدة فقط لعدم كل مبرر ولا في فهمه على وجهه بشكل، بل في فهمه وتطبيقه في أي منهج تدريسي، منه كل مبرر قد يفسر مدتها كما مرة واحدة فقط لعدم.

د- أكثر من مختلف منه تفكير مروس في اقتضاه المميز في التي تحتوي على طريقة حل المشكلات.  
 لا أوافق بشدة  لا أوافق  لا أوافق بشدة

د- استخدام طريقة حل المشكلات في تفكير مروس في اقتضاه المميز في مهمة معينة بهدف للتدريس.  
 لا أوافق بشدة  لا أوافق  لا أوافق بشدة

د- استخدام طريقة حل المشكلات مهمة معينة في تدريس مادة الاقتصاد المميز لغيره.  
 لا أوافق بشدة  لا أوافق  لا أوافق بشدة

د- أنه إن لم يكن طريقة حل المشكلات تجعل تدريس الاقتصاد المميز في أكثر متعة للطالب.  
 لا أوافق بشدة  لا أوافق  لا أوافق بشدة

د- يتطلب تدريس الاقتصاد المميز في أن تكون المصطلحات مؤهلات بسهولة لاستخدام طريقة حل المشكلات.  
 لا أوافق بشدة  لا أوافق  لا أوافق بشدة

د- إضافة طريقة حل المشكلات ستكون مادة الاقتصاد المميز في مشيرة للاستثمار.  
 لا أوافق بشدة  لا أوافق  لا أوافق بشدة

د- يسهل الحصول على المصطلح المناسب لتفكير مروس في التي تحتوي على طريقة حل المشكلات.  
 لا أوافق بشدة  لا أوافق  لا أوافق بشدة



□ زرینق پشمه □ زرینق □ زرینق □ زرینق □ زرینق پشمه

۳۱- من هروس لتي تتضمن طريقة حل المشكلات ينبغي مبدأ كبيراً على الصعوبات.

□ زرینق پشمه □ زرینق □ زرینق □ زرینق پشمه

۳۲- قد تساهم خبر طريقة حل المشكلات للطالبات على تعلم مادة الاقتصاد المنزلي.

□ زرینق پشمه □ زرینق □ زرینق □ زرینق پشمه

۳۳- لا تر في الصعوبات المشتركة في همنشئة في هروس الاقتصاد المنزلي لتي تحتوي على طريقة حل المشكلات.

□ زرینق پشمه □ زرینق □ زرینق □ زرینق پشمه

۳۴- تشير الصعوبات بالمتعة منه تعلم هروس الاقتصاد المنزلي لتي تحتوي على طريقة حل المشكلات.

□ زرینق پشمه □ زرینق □ زرینق □ زرینق پشمه

۳۵- تجاوب الصعوبات عليها مع هروس الاقتصاد المنزلي لتي تشمل طريقة حل المشكلات.

□ زرینق پشمه □ زرینق □ زرینق □ زرینق پشمه

۳۶- تدريب المبرسات على طريقة حل المشكلات يشجع من استخدام مصادر أخرى في التدريب غير الكتاب المدرسي.

□ زرینق پشمه □ زرینق □ زرینق □ زرینق پشمه

۳۷- تدريب المصلمات على طريقة حل المشكلات يحسن من مستوى تحوير هروس الاقتصاد المنزلي.

□ زرینق پشمه □ زرینق □ زرینق □ زرینق پشمه

۳۸- يجب الاهتمام بتدريب مدرسات الاقتصاد المنزلي على طريقة حل المشكلات.

□ زرینق پشمه □ زرینق □ زرینق □ زرینق پشمه

۳۹- تعلم خبر طريقة حل المشكلات تمكن الصعوبات يبحث من الصعوبات لتبرير أكثر من.

□ زرینق پشمه □ زرینق □ زرینق □ زرینق پشمه

۴۰- استخدام طريقة حل المشكلات في هروس الاقتصاد المنزلي يتيح للمدرا الصعوبات لتبرير أكثر من.

□ زرینق پشمه □ زرینق □ زرینق □ زرینق پشمه

۴۱- هروس لتي تحتوي على طريقة حل المشكلات تشير صفا الصعوبات في كبر نشأته الصعوبات.

□ زرینق پشمه □ زرینق □ زرینق □ زرینق پشمه

۴۲- على أن ندرج طريقة حل المشكلات تجربة في هروس الاقتصاد المنزلي.

□ زرینق پشمه □ زرینق □ زرینق □ زرینق پشمه

۴۳- تستخدم الصعوبات بالمشاركة في همنشئة صنفية في هروس لتي تتضمن طريقة حل المشكلات.

□ زرینق پشمه □ زرینق □ زرینق □ زرینق پشمه

۴۴- هروس لتي تتضمن طريقة حل المشكلات لا تشجع الصعوبات على تعلم مادة الاقتصاد المنزلي.

□ زرینق پشمه □ زرینق □ زرینق □ زرینق پشمه

۴۵- تجه الصعوبات الصنفية للمشاركة في همنشئة في هروس لتي تتضمن طريقة حل المشكلات.

□ زرینق پشمه □ زرینق □ زرینق □ زرینق پشمه

۴۶- يعمد حث الصعوبات على تعلم هروس الاقتصاد المنزلي لتي تتضمن طريقة حل المشكلات.

□ زرینق پشمه □ زرینق □ زرینق □ زرینق پشمه

۴۷- المشاركة الصعبة في حل المشكلات تزيد من الصعوبات في هروس.



١- ما هي الظروف التي تكوّن بترسيما أريثميا جسيما من قضاك

- ضيف واثنان لعدد
- عدد واحد
- تخمين وتجهيز الآلة
- فنون وأسلوب يدوية
- تنفيذية
- استمات أريثم
- أريثم وخطوط
- تربية أريثم
- ملامس والسحب
- تربية صعبة

٢- ماذا كم سنك ولت تترسبون سنة الأقسمة العشرية؟

٣- ما هي مميزات الكمبيوتر

- يكسر بروس العلوم في التربية والحفظ الاجتماعية
- يعلوم معهد المعلمين العاليي-
- يكسر بروس العلوم في التنفيذية وفنونات كسر ض-
- يعلوم كلية الأطفه للبيئات في العلوم الأريثم
- يكسر بروس جامعة الأطفه للبيئات في العلوم الأريثم
- شهادات أو مؤتمرات أخرى

-  
-  
-

أرجو كتابة أية تعليقات أو اقتراحات (في الصفحة الأخرى) تتعلق بطريقة حل المشكلات من خلال تجربتك في

الدورة التثريبية المتعلقة باستخدام هذه الطريقة أو من خلال تطبيقها بنفسك. تأكد أن هذه المعلومات مستوحاة  
بمجرد الاعتبار عند كتابة هذه الطريقة بالترتيب الآتي.

لك مني جزيل الشكر والوفاء على حكمة هذا الاستبيان.

بانتظار الباحثة: محاسن إبراهيم شمو

كلية التربية - جامعة الخرطوم

شعبة العلوم الأريثم.

١- من تربية على طريقة حل المشكلات بطلان الترسيم على شكل جبهة في الترسيم

٢- أريثم بطلان ١٥ أريثم ١٥ أريثم بطلان

٣- وهو تربية كل مرحلت الأقسمة العشرية بعلوم هذا التنفيذ على استخدام طريقة حل المشكلات

٤- أريثم بطلان ٢٥ أريثم ٢٥ أريثم بطلان

٥- نتاج مرحلت الأقسمة العشرية وتربية على مرحلت التفكير التي تشبه بطلان طريقة حل المشكلات

٦- أريثم بطلان ٢٥ أريثم ٢٥ أريثم بطلان

٧- من الأثبات بطلان استخدام طرق الترسيم وصعبة وتربية على مرحلت تربية مهارات الأثبات.

٨- أريثم بطلان ٢٥ أريثم ٢٥ أريثم بطلان

٩- وهو تربية كل مرحلت الأقسمة العشرية بعلوم هذا التنفيذ على استخدام طرق الترسيم لصعبة

١٠- أريثم بطلان ٢٥ أريثم ٢٥ أريثم بطلان

١١- وهو تربية على طريقة حل المشكلات ١٥ بطلان مرحلت الأقسمة العشرية

١٢- أريثم بطلان ٢٥ أريثم ٢٥ أريثم بطلان

١٣- من الأثبات بطلان استخدام طرق الترسيم وصعبة وتربية على مرحلت تربية مهارات الأثبات

١٤- أريثم بطلان ٢٥ أريثم ٢٥ أريثم بطلان

الجزء الثاني

لشبكة: أرجو الإجابة على جميع الأسئلة التالية