

CHAPTER III

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Chapter – III

Procedure

3.1 Introduction

Research methodology refers to the theory of the research and the reasons for the way the research has been designed. Methodology explains the research question and why the question is important. It explains the starting point of the research, the directions of the research and the possible implications of the research when it is completed. Methodology explains about the literature, which the researcher is using, the language and terminology, the other theories and explanations being used, the methods and the type of analysis that will be used to interpret the data and information collected.

Many research designs have been developed in psychology over the last century. The most-favored design in modern psychology is the experiment. Experimental method is a scientific method. It is oriented to the future in the sense that the researcher is seeking to evaluate something new. It is a process of contribution to the already acquired fund of knowledge. Thus, the experimenter operates under the basic assumption that the research situation he/she wishes to evaluate has never existed and does not now exist. Situation here means in the sense of a program, curriculum or method for organizing class, as well as a 'situation' created to test.

When the term experiment is used in research design, it refers to a specific method as described, not generically to any kind of empirical research. Experiments are special because they are the only kind of design that can, if everything is done just right, unambiguously demonstrate a cause-effect relationship. To qualify for an experiment, a study must have the following minimal characteristics:

1. The independent variable must be completely controlled.
2. The sample of research participants (subjects) must be randomly chosen.

3. The research participants (subjects) must be assigned randomly to conditions.

The concept of cause and effect is the main focus and scientific study through, to analyze the functional relationship of the variables. The functional relationship refers to the cause and effect relation between the variables. The cause and effect relationship can be studied by applying the 'Law of Single Variable'. A researcher wants to study the effectiveness of new teaching methods, For this purpose two equivalent groups are selected, one group will be taught through new methods and another group with traditional methods. Same content will be taught and same criterion test or achievement test will be administered on both groups. The performance of new methods group is significantly higher than that of traditional methods group. It may be concluded that new methods is effective than the traditional methods, because the performance of experimental group is caused by the new strategy of teaching.

A hypothesis is a tentative statement about the relationship between two or more variables. A hypothesis is a specific, testable prediction about what you expect to happen in our study. A hypothesis is tentative explanation for an observation, phenomenon, or scientific problem that can be tested by further investigation. A research hypothesis is a knowledgeable statement that is tentatively advanced to account for particular facts. It is a testable idea or testable question on some phenomenon of interest. We call it a testable question because we believe that the truth or falsity of it can be investigated by recording facts (data) on the phenomenon of interest.

The Scientific Method is a way to make sure that our experiment can give a good answer to our specific question. The Scientific Method is a logical and rational order of steps by which scientists come to conclusions about the world around them. The Scientific Method helps to organize thoughts and procedures so that scientists can be confident in the answers. The scientific method is intended to meet three goals: description, prediction, and understanding. Both quantitative and qualitative researches are used to describe behavior. Observation is the principal basis of scientific

description. When two measures correlate, we can predict the value of one measure by knowing the value of other. Understanding is achieved when the causes of a phenomenon are discovered. This requires that evidence be provided for conversation of events, that a time-order relationship exists, and that alternative causes be eliminated. When two potentially effective variables covey such that the independent effect of each variable on behavior cannot be determined, then the research is confounded. Confounding must be avoided in order to produce a study with internal validity. The research study must also have external validity which involves the extent to which research results can be generalized to different populations, settings, and conditions.

Scientific theory construction and testing provide the basis for a scientific approach. Theories have the important function of guiding research and organizing empirical knowledge. Finally, to answer the ethical questions raised by research; it is important that the research should be carried out according to the highest standards of scientific integrity. Sociologists need to be aware of having the responsibility to secure the actual permission and interests of all those involved in the study. They should not misuse any of the information discovered, and there should be a certain moral responsibility maintained towards the participants. There is a duty to protect the rights of people in the study as well as their privacy and sensitivity. The confidentiality of those involved in the observation must be carried out, keeping their anonymity and privacy secure.

3.2 Research Methodology

In the experimental study all the students of STD VIII (168) students were administered a pre-test. The pre-test was prepared based on the students' previous knowledge of STD V, VI, and VII (Appendix G,H). The scores of the pre-test were collected. Then the previous academic record of these students was collected from the school of the concern science subject. An intelligence test was also administered to the students. Thus STD VIII students were selected based on these levels.

1. Pre- Test.
2. Intelligence – Test.
3. Pervious academic year science subject record.

Two almost equal groups of 30 each was selected from the total of 165 students and divided in to experimental group and control group:

1. Control group: 30 students (15 boys, 15 girls).
2. Experimental group: 30 students (15 boys, 15 girls).

The experimental group was taught science subject by using (Cooperative learning - Role play- Games) methods for two months during science subject the control group was taught by regular traditional methods in the same duration. At the end of the experimental study in the school both the groups were tested by administering a post test and emotional intelligence test. Data was collected and then analyzed.

For teaching experimental group were selected four unit of science subject to STD VIII and have been built as follows:

Units in science subject of STD VIII.

Four teaching units were selected based on the (part II) of the Science subject of STD. VIII of Basic Educational Students (edition of 2010). These units are (Light refraction - Relationships between living organisms- Natural cycle for some components of the atmosphere - Accidents & First aid). Also, three teaching methods were used: (Cooperative Learning - Role Play - Games). Consequently, a teacher's guide and a student's guide were set.

Teacher's guide:

1. **Objective of the teacher's guide**, the teacher's guide aims to:
 - Improve student of STD VIII of Basic Education Students of the Educational outcome in Science subject.

➤ Improve students of Emotional Intelligence skills

2. The targeted student's category and their characteristics, The child's cognitive development stages were positively classified into the following four stages:

- Sensory-Motor (Ages Birth Through Two).
- Preoperational (Ages Two Through Seven).
- Concrete Operations (Ages Seven Through Eleven).
- Formal Operations (Ages Eleven Through Sixteen)

Most of the experiments that aimed to study the cognitive growth of student proved that he/she does not reach the formal operations until the age of thirteen.

3. Scientific content:

Four teaching units were selected based on the (part II) of the Science subject of the STD VIII of Basic Education Students. These units are (Light refraction, Relationships between living organisms, Natural cycle for some components of the atmosphere and Accidents & First aid. Also, three teaching methods were used: (Cooperative Learning - Role Play - Games). Then, the selected scientific contents were divided into several lessons ensuring that the time specified for the altered learning units corresponds with the time specified by the Ministry of Education for these lessons as defined in the Teacher's Guide issued by the ministry.

1. Reasons for selecting the scientific content

There are several reasons for choosing the scientific contents for those units, which can be summarized in the following:

1. The unit of refraction of light includes several scientific experiments that present an opportunity for group work. As a result, students ability to understand and appreciate others' feeling increase, along with the ability to introduce himself/herself as a

cooperative and constructive team member, as well as building and preserving good relationships.

2. Accidents and first aid unit includes concepts about some accidents like poisoning, shock, bee sting, snakebites and rabies. In order to the students can perceive these concepts, there is a need to perform role-play, which results in an increase in the student's ability to experience such accidents and deal with them positively and efficiently.
3. The unit of relationships between organisms includes concepts that can be taught by games method, like food chain, food webs, food pyramid and biological balance, which leads to increase the student's ability to understand and express his/her emotions properly.
4. The unit of the natural cycle of some components of the atmosphere includes some concepts that are explained through games and role-play such as oxygen cycle, nitrogen cycle and water cycle. This can lead to increase the student's ability to express his/her emotions and the reality, and the ability to adapt his emotions in accordance with the situation.
5. The units also include scientific concepts related to life and environment, such like accidents, lenses, eyes, microscope... etc. those concepts help the student to look at the bright side of life and to lead a positive life style.
6. Teaching these units increases the student's Educational outcome and emotional intelligence scale.

2. Requirements for applying the teacher's guide.

The required tools, materials and equipment: all the tools, materials and equipment needed for implementing the lessons are identified in the.

3. Lessons of the units, and distribution.

As shown in the appendix (L), (M), (N), (O) all lessons related to the units were identified, in addition to the timetable of implementing them and the teaching methods.

4. Lesson Evaluation:

The Evaluation were used through the evaluation card for cognitive domain (knowing – Applying - Reasoning) whereas, the note cards are used for monitoring and evaluating the Emotional Intelligence side of the students.

5. Lesson Plan:

The lesson plan includes:

1. Concept of the lesson.
2. Tools, materials and equipment required for the lesson.
3. Lessons' procedures are in accordance with the adopted teaching methods (Cooperative learning - Role Play- Games). Each of these teaching methods has its (cards). Appendix (A) and appendix (B).

4. The teacher's guide Validity:

The guide was presented to a committee of experts in order to ensure the following:

1. Lessons' plans are adequate for the teaching methods.
2. Plans are adequate for the student's level.
3. Scientific accuracy.

In accordance with the experts committee suggestions, few phrases were adjusted in regards to rules and articulation.

The Student's book

Student's book included:

1. Unit's title.
2. Concept of each unit.
3. Steps of the adopted teaching methods.
4. Tools and materials required for lesson.
5. The learning card for each teaching methods includes questions for the students and spaces for notes and results reached by the students. However, the note card for role-play should include dialogues for performing.
6. A special evaluation for cognitive domain (Knowing – Applying - Reasoning) and another one for emotional intelligence represented with the note card.

Validity of the Student's Book :

The students' book was presented to a group of specialists in order to make sure of:

1. Authenticity of scientific material clarity - Linguistic accuracy.
2. Lessons correspondence to the goals to be attained.
3. The appropriateness of the student's book for students in the eighth grade of basic education.

After that, the proposed amendments have been applied and presented the book in its final form.

3.3 Tools of the Research

The tools used for the purpose of collecting data were as follows :

3.3.1 Emotional Intelligence (EI) for Students:

Bar-On Reuve, Parker James (2000) developed a scale to measure Emotional Intelligence and management of emotions of students in the age group of 7-18 years. It is a multidimensional scale consisting of 60 items divided into six areas. This Emotional Intelligence scale was translated in Arabic by Randa Sohail Rizkallah in 2006 for her research worked the same standardized translated version was used by researcher. In the present research as the students of the sample were of Arabic back-ground test was administered the scores were collected which measures the following six factors of Emotional Intelligence.

The test measures the following 6 factors of Emotional Intelligence skills:

1. **Intrapersonal skill:** It is the skill of the individual's awareness and understanding of his feelings, self, and express them properly covered by items (7 - 17-28 - 31 - 43-53).
2. **Interpersonal skill:** The mean of the individual skill in understanding the feelings of others, and appreciation and sympathy and skill in directing himself as a member of collaborator, in true reciprocal relationships with others, and preservation, items covered (2 - 5-14 - 20-24 - 36 - 41 - 45-51 - 55 - 59).
3. **Stress Management skill:** The psychological pressure: It is the skill of the individual to bear the bad events, and difficult situations by dealing with these pressures positively and effectively covered by items (3 - 6 - 11-15 - 21-26 - 35-39 - 46-49 - 54-58).
4. **Adaptability skill:** And include individual skill in distinguishing between feelings and reality, and to modify his emotions required by

the position, and find effective solutions to the problems that we encounter, items covered (12-16 - 22 - 25-30 - 34-38 - 44 - 48-57).

5. **General Mood skill** : It is the skill of the individual in the formation of a positive look to the diverse aspects of his life, and maintain the positive trend even in the face of negative feelings, items covered (1-4 - 9 - 13-19 - 23-29 - 32-37 - 40 - 47-50 - 56-60).
6. **Positive impression skill**: This scores about itself the impression of Screened covered by items (8 - 18-27 - 33 - 42-52).

It is scale based on likert type technique wherein there are a total of 60 items which correspond to the above six areas.

Administration of the scale:

The scale was administered individually. The instructions printed on the response sheet are sufficient to take care of the questions that were asked. No time limit was given for completing the questionnaire in the scale. However most of the respondents could complete it in about 30 minutes. Before administering the scale, it was emphasized that responses for all students, through the researcher on the passage of each student. Assured that their response would be kept confidential. It was also emphasized that there is no right or wrong answer to the statements. The statements are designed to understand the difference in the individual reactions to various situations and that the scale is meant to know the difference between individuals and not meant to rank them a god or bad. However it was duly emphasized that all statements have to be responded to and that no statements should be left unanswered.

Scoring:

The respondent is provided with four alternatives to give their response ranging from high degree to low degree. The response key of students responded to the emotional intelligence items such that for first (highest degree) the score is 4, second (high degree) the score is 3, for third (medium degree) the score is 2, and fourth (low degree). The summated

scores of the entire sixty items provide the total scores of emotional intelligence.

Interpretation:

1. To compare the answer Emotional Intelligence EI and Educational outcome, initially the details of each student like: name, section, gender were entered in program SPSS.
2. Based on the responses of statements, the researcher had entered all the data manually in the first SPSS. The responses were entered as 1, 2, 3, and 4 for high degree, high degree, medium degree, low degree.
3. The responses of statements were taken on the four point's categories i.e. high degree, big degree, medium degree, and low degree. Positive statements were scored as 4, 3, 2, 1, marks and negative statements were scored as 1, 2, 3, 4 marks for the four responses respectively.
4. In program SPSS, the score of EI with its skills were calculated.
5. Emotional Intelligence of the students was measured for the total of 240 marks for 60 statements.

Reliability and validity of the scale

The Pearson correlation reliability coefficient was found to be of 0.84 and the validity of the scale is 0.80. Appendix (E), (F).

3.3.2 The Educational outcome (Achievement test) for Students:

The international association for the evaluation of educational achievement with a goal (desire) to improve the mathematics and science education of the students globally prepared an assessment framework to analyses students' achievement. TIMSS 2011 (The Trends in International Mathematics and Science Study) is a global, cooperative enterprise involving more than 60 countries from all around the world provided an

assessment frame work for fourth and eighth grade students which were followed by researcher as an educational outcome tool.

Table 3.1 shows the framework and classification of cognitive domains and its percentage at eighth grades by TIMSS were taken as follow.

S.No.	Cognitive Domains	Weightage in percentage %
1	Knowing	35
2	Applying	35
3	Reasoning	30

The question for the above TIMSS testing criteria was prepared by preparing standard blue print on the selected lessons of STD.VIII.

A table 3.2 show the criterion of the blue print with levels of cognition (TIMSS)

Unit	Time for teaching (minutes)	Weightage in percentage %	Knowing (35%)		Applying (35%)		Reasoning (30%)		Total number of question
			question number	Serial number in test	question number	Serial number in test	question number	Serial number in test	
1	518	36	6	3,6,7,11,44,46	7	1,2,4,5,8,47,49	5	9,10,45,48,50	18
2	202	14	2	12,15	3	13,16,17	2	14,18	7
3	202	14	2	19,22	2	20,24	3	21,23,25	7
4	518	36	8	26,29,31,32,34,36,43,42	5	27,28,30,39,41	5	33,35,37,38,40	18
4	1440	100	18		17		15		50

The tests consist of 50 questions with 37 multiple choice questions and 13 short answer questions. For pilot study, the test was administered to twenty (20) students of different section of STD.VIII in Al-Khadem Al-Wajeeh Basic Education School. The results of the test were used to improve the final frame work. The following test instructions were framed in the test:

- A. The objective of the test.
- B. The answer sheet with complete direction to the students.
- C. Mark distribution.
- D. Time allotment.

The revised framework consists of following test item: 18 knowing questions, 17 Applying questions and 15 Reasoning questions out of 50 total items. Appendix I (1, 2, 3, 4, 5, 6).

The scoring of the test items was simple and easy. Each question was allotted 1 mark. The students could score one mark for every correct answer of multiple-choice and 0 for every wrong answer type. The same criteria were followed for short-answer. The maximum scores in Educational outcome were 50 marks and the minimum scoring fixed for Educational outcome was 25 marks for passing.

Reliability:

The alpha cronbach reliability coefficient was found to be of 0.84.

Validity:

The authenticity of educational outcome has been verified by presenting the test to a group of committee of experts specialized in measurement, evaluation and science curriculum and methods as described. According to the classification of TIMSS for the levels of cognition, they were provided with both of a copy of the test and a list of the levels of targets covered by the questions with the definition of each level of the main ones, its subsidiary skills and specifications table on which the test was based. Also, the committees of experts were asked to determine the level of each paragraph, the extent of linguistic appropriation and the clarity of the paragraph. After the completion of all the observations, the proposed amendments have been incorporated into the test, with some paragraphs re-

worded. Subsequently, the test became ready for piloting in the study application. Appendix (C), (D).

3.4 Statistical Measure

Data were using analyzed statistics program of SPSS. The statistics calculated and applied were:

- Means and standard deviations.
- t- test.
- Pearson correlation coefficient.
- Alpha Cronbach.

3.5 Population and Sample of the Research

3.5.1 Population of Students

The population consists of all the students of urban area in the, Basic educational schools in Hajja city of Yemen and its suburbs for the academic year 2012-2013. The table shows those schools in appendix (P)

3.5.1 Sample of Students

The Research is an experimental study, so the sample consists of 60 students of STD VIII of AL-Khadem AL-Wajeesh School in Hajja city of Yemen.

3.6 Sampling design

The sample for the experimental research was selected from students of the STD VIII of Al-Khadem Al-Wajeesh student's school in Hajja City. It comprises two groups:

1. Control group: 30 students (15 boys, 15 girls).
2. Experimental group: 30 students (15 boys, 15 girls).

The selection of Al-Khadem Al-Wajeesh School premised on the following reasons:

1. Sufficient number of boy and girl students for forming the experimental and control groups.
2. Ease of establishing the external variables in regards to social economic and cultural statues.
3. Ease in moving between the two groups which helped not to waste so much time on experiments.
4. Ease in controlling the independent variable.
5. Cooperation of the school's principal and teachers.
6. Escalating complaints from teachers about the emotional negativity of male students in the STD VIII.

Students of STD VIII were selected for the importance of this stage of teenager development in shaping their emotions, passions and behavior. In this stage, instable emotions start to appear, which might be unfamiliar to the child, parents and teachers. Therefore, modern teaching methodologies are required, in order to improve the child's emotional intelligence and enable him to understand and live with such changes.

3.7 Pilot Study

For pilot study, the tools (Educational outcome, Emotional Intelligence) were administered to twenty (20 students) of different section of STD VIII in Al-Khadem Al-Wajeesh student's school in Hajja of Yemen. The in order to check the following: determine the time of the test: After the workout of the test on the sample, the time specified for the test was calculated by the average of first exit student and the last one of the test. The estimation of time was equal to their average of 80 minutes for Educational outcome and 30 minutes for Emotional Intelligence.

Based on the results of the pilot study, the test items were analyzed to find the reliability and validity of the Educational outcome and Emotional Intelligence.

3.8 Procedure

The study was carried out by using the following steps:

1. Reading the literature, studies and previous research in order to:
 - Theoretically study of the teaching methods used in this study (Cooperative learning - Role-play- Games).
 - Emotional Intelligence in terms of the its concept , history , basics and applications, and skills.
 - The trends in international mathematics and science study (TIMSS) has been read its literature, and how to classify the cognitive levels upon which the questions in the tests for STD VIII and the percentage of each of levels cognitive and the levels of the questions framing in these global test.
2. The determination of the units content based on experimental methods in the science subject (Part II) scheduled to STD VIII students in the second semester of the year (2012-2013).there are four units: (Light Refraction, Relationships between Living Organisms, Natural cycle for some components of the atmosphere and Accidents & First aid.
3. A teacher's guide and student's book lay out and given teacher and students.
4. Educational outcome building in accordance with the international recognized levels for the collection of science and mathematics (TIMSS) and have been ensured of the reliability and validity of the test

5. Testing the tools of the study experiment which are of the Educational outcome and the Emotional Intelligence scale in order to calculate the reliability, validity.
6. Approval request to conduct the study the researcher applied for permission to make the experiment to the director of education office – Hajjah and AlkhademAlwajeh School in order to cooperate with her and facilitate her mission.
7. Selection of the study sample: The sample of the study was selected and organized into two experimental groups (15 boys, 15girls). One of them are taught by the teaching methods (cooperative learning, role-play, games) and a control group (15 boys, 15 girls) taught by the traditional methods (lectures, dissections, Laboratory). The equivalence of the two groups has been ensured by using pre-test, intelligence-test and previous academic year science subject record.
8. Pre-Application for the two tools of the study: The application of the Educational outcome and the emotional intelligence scale have been done previously before taught the experimental and control groups.
9. Being ready to implement the teaching methods after the distribution of the two groups, the researcher taught the experimental group (boys, girls) by the teaching methods (cooperative learning - role play - games). It has been teaching in accordance with the steps of the teacher's guide. Students' books have been distributed to students and how to use the card has been clarified to students. And the control groups (boys, girls) are taught using the traditional methods (lectures, dissections, Laboratory).
10. Teaching: Units learning began teaching for the two groups (experimental – control) began from the 10/4/2013 for (5) a period per week of one section of STD VIII. According to the plan established for science subject to STD VIII School in republic of Yemen. Material

potentials have been provided for the experiments and activities of the educational cards that are in the teacher's guide and student's book.

11. Post-application of the two tools of the study: After completion of the teaching process, have been done post - application of the educational outcome and emotional intelligence scale on experimental group and control groups. The researcher corrected the test, wrote the scores and data were using analyzed statistics program of SPSS.

3.9 Epilogue

In this chapter experimental course was adopted because it provides good result, and require several steps to make the experiment succeed, such as: determining Research methodology (Methods used for existing), the tools that are necessary for the research are Emotional Intelligence (EI) and Educational Outcomes, identifiedp of statistical Analysis for research. The population and sample was chosen carefully deliberately for a number Basic Education Students in Hajjah – Yemen formal School, the number of the sample research (60) students both boys and girls (30 students of experimental group), (30 students of control group), the pilot study that is necessary for the research were administered to twenty (20 students) of different section of STD VIII in Al-Khadem Al-Wajeesh student's school in Hajja of Yemen, and have also been explained to point the procedure was applied in this study, finally have been done Epilogue about chapter III