

# The Impact of Using Meta Cognitive Learning Strategies on Al-Hussain Bin Talal University Students' Achievement in and Attitudes towards Health Concepts in "Tenet of Worship" Course

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## Abstract

This quasi experimental study aims at investigating the impact of a Meta Cognitive Learning Model (MCLM) on the achievement of Al-Hussein Bin Talal University students and their attitudes towards health concepts included in the course "Tenet of Worship". The total sample of the study (# 120 students at Al-Hussein Bin Talal University) was selected purposively; then divided into two groups: a control group and an experimental group.

Two instruments were used to achieve the aims of this study: a) written test on the health concepts in "Tenet of Worship"; and b) attitude scale towards healthy concepts included in the course "Tenet of Worship".

In order to verify the level of variable significance between the two groups with regard to the two instruments mentioned above, means of students scores have been calculated according to each variable in each group. Data was analyzed using (ANCOVA). The findings of the study indicated:

- a significant difference between the mean scores of the experimental and control groups in the achievement test on the health concepts in " Tenet of Worship", in favors of the experimental group.
- a significant difference between the mean scores of the experimental and control groups in the students' attitudes towards the health concepts in " Tenet of Worship" in favors of the experimental group.

On basis of these findings, the study recommends the use of the MCLM in teaching healthy concepts in the course "Tenet of Worship" with other university students. The study concludes that it is vital to design the learning material in accordance with this model; and to carry out training courses for instructors of the health concepts in the course " Tenet of Worship" to enable them to apply this strategy. Finally, the study recommends conducting similar studies to measure achievement in other courses utilizing the MCLM; and the possibility to form integrated conceptual basis and develop positive students attitudes towards it.

**Keywords:** Meta cognitive, Learning strategies, Achievement, Attitudes, Health concepts

## Introduction

Educational research in the last two decades has witnessed a turning point in the researcher' vision of the learning process. Focus of concern that used to be on external factors that affect learning, such as teacher's character and clarity, has been transferred to enquiring how knowledge is established and acquired; i.e. what goes on within the students' brain, such as their previous knowledge, ability to recall and process knowledge, the way interpretations / meanings of concepts are formed and the role of previous knowledge in forming such meanings, and the relationships that link these concepts together. Concern tended to be towards helping students build their character physically, mentally, morally and affectively. Towards exploring what abilities and creative potential power students have got and attempt to demonstrate and develop. There existed a satisfaction to develop high level of thinking within the students which recalls consciousness – conscious brain that is able to treat knowledge, face problems and future challenges (Zolar, 1991).

This transfer was assisted by the new explorations in the teaching/learning psychology represented in Piaget research whose concern was on the internal cognitive processes such as attention, comprehension, memory, information reception and processing and the mental operations occurring within the student's mind. Flavell and Brown's research on development of memory and memorization also pushed this transfer of interest forward. They concluded that memory development process is, in a great deal of it, a result of building up and development of intelligence ; and the intelligent monitoring over data storage and recall. Thus, students having a higher level of consciousness in regard to the above-mentioned mental processes will possess considerable

ability to think deeper (Flavell, 1979). Flavell and Brown are pioneers in the field of the different mental processes research such as thinking, eliciting, memorization and recalling. They were the first to highlight that learning is an active process in which students look for knowledge; and as the students progress cognitively, they develop effective strategies to monitor their cognitive processes. When the students have such strategies, they possess a level of awareness which enables them to achieve the aim through monitoring and controlling their thinking: what is called meta cognition, (Reynolds & Wade, 1989).

### **The concept of meta cognition**

Meta cognition was first conceptualized by Flavell (1979) to add a new dimension in the field of psychology and open a new horizon for extended theoretical and empirical studies on thinking, memorization, understanding and learning skills.

The concept of meta cognition was used in a lot of research studies to refer to knowing about knowledge, thinking about the thinking process and knowing and awareness about consciousness. This expanded conception includes a number of sub-concepts such as: Meta Memory, Meta Comprehension, Meta Language, Meta Perception and Meta Cognition, (Nelson, 1992; Reader, 1996; Garner, 1987). Researcher view meta cognition as self-monitoring; or the conscious use of learning strategies (Borkowski, 1987). Bruer (1995) defined this as the individual's ability to think about the thinking minutes. Sternberg (1985) view it as the high-level control over the individual's cognitive performance, which includes high level planning, monitoring, control and evaluation. As shown above, meta cognitive thinking exceeds the limits of cognitive thinking; hence, it represents the mental activity in its highest level, when a student remains completely aware of him/her self when he/she is thinking in a certain task.

Components of meta cognition:

Meta cognition, as divided by Flavell (1979), has the following components:

1- 'Meta Cognition Knowledge', which refers to the individual's knowledge of facts about the cognitive processes and how to control these processes (Flavell, 1979). This in turn can be divided in to:

- a) Learner-related knowledge: which is the individual's awareness of his/her abilities and mental level; and his/her ability to evaluate his/her mental operations and details of his/her thinking processes.
- b) Task-related knowledge: which is the individual's awareness that each mission needs a special mental ability. Thus, tasks classified of a certain dimension are easier to recall than unclassified ones. For example, tasks of memorization nature need lower mental ability than analytical and evaluative tasks, which need higher level of mental processes.
- c) Strategy-related knowledge, which refers to memorization aids used by the learner, such as recurring, organization, expansion, linking previous knowledge with the new knowledge (Pintrich, 2002).

2- Meta Cognition Regulation: which refers to the different strategies a student uses interacting with a certain teaching situation. Examples of such strategies are: planning, monitoring, controlling, examining, error correction and reviewing (Narens, 1990).

Meta cognitive instructional strategies are considered of high significance, since it supports attaining effective learning through developing the students' thinking ability. It has a considerable compositional structure where students start with finding out the problem and end with closing up the learning circle: problem treatment and solving, through the students' participation in three stages of learning processes:

**First, planning:** which includes determining the objective related to the problem, nature of the problem and what strategy is most appropriate. The following skills are included at this stage:

- a) precise determination of the objective,
- b) choosing executive strategy to be followed,
- c) arrangement of procedures or steps in a serial order,
- d) determining expected obstacles and potential errors,
- e) determining methods of treating difficulties and errors,
- f) predicting desired or expected results.

Students can apply these skills through enquiring themselves during a task questions such as: What does this task aim at? What previous knowledge do I possess which helps me accomplish the task? What appropriate procedures and strategies can I use to achieve the task? What are the expected problems and errors I might face?

How long does it take me to achieve the task?

**Second, monitoring and controlling:** which includes:

- a) focus of concern on the objective,
- b) commitment to the procedures and steps serial order,
- c) knowing when sub-objectives are achieved,
- d) knowing when to move to the next process,
- e) choosing the appropriate process that goes with the context,
- f) exploring difficulties and errors,
- g) knowing how to overcome difficulties and treat with errors.

Students can apply the skill of monitoring and controlling through asking themselves while doing a task questions like: Did I understand what I have heard, read or seen? Am I in the right direction for achieving the task objective? How can errors, just in case, be discovered? Are the procedures I have followed so far appropriate for achieving the objective? Do the remaining procedures/steps harmonize with the plan?

**Third, assessment:** which includes:

- a) assessing level of achieving the objective,
- b) judging efficiency and preciseness of the results,
- c) assessing appropriateness of the methods used,
- d) assessing the way obstacles and errors were treated,
- e) assessing effectiveness of the plan and plan implementation.(Sternberg ,1985; Schraw,1994)

This skill can be applied through the students' enquiring themselves while doing a task: Were the objectives put for the task achieved? Was the method I followed successful? Shall I follow the same method next times? Which was the most effective method? Did the predicted problems exist? Were they overcome?

Some research studies, (Chiang, 1998; El-Hindi, 1997; Commander, 2001) for example, have shown that utilizing the meta cognitive strategy in instruction improves the learning process. Furthermore, the students' mastering of the processes demonstrated above assist student to:

- 1- develop positive attitudes towards learning and school (Osborne, 2000)
- 2- apply the training effect as to use meta cognitive consciousness processes in situations similar in difficulty to the original ones (the ones trained to), (Nickerson , 1985).
- 3- increase their vision about their effectiveness; they will confidently feel they are able to do the task and deal with different strategies to solve it. On the other hand, it decreases the possibility of "uselessness" the students might acquire when they feel they are unable to produce, (Osborne, 2000).
- 4- build up conscious meta cognitive character, who possesses high level of cognitive processing for problem solving. In addition, it develops feeling of responsibility towards the learning situation, its administration and the desired learning outcomes they have been endeavoring to achieve (Al- Shaikh, 1989; Osborne, 2000).

Brown demonstrated that meta cognitive teaching strategies are distinguishing features of effective thinking that can be transferable. When students attempt a certain problem they actually practice cognitive activities treating their own cognition systems in a continual process: they test their decisions and continually modify such decisions until they reach what they think is an appropriate solution for the problem. Thus, meta cognitive teaching strategies assist students to improve their abilities, problem solving processing. Consequently, it improves their thinking abilities. Brown also indicated that mastering meta cognitive strategies by the students is usually followed by the students employment of meta cognitive skills in controlling and organizing their thinking (Atallah, 1992).

A lot of researchers agree that "education for thinking or for learning its strategies" is a significant educational goal; nevertheless this goal encounters some troubles in practice. The running education system does not often have sufficient expertise in the field of "thinking skills". It is the teacher's word; and the teacher, whose only reference is often the course book, is the central player. His style of teaching utilizes the material in the book as absolute facts around which he composes questions that require no more than the lowest level of thinking. This means that a teacher is often still committed to his traditional role relying on staffing the students with information/knowledge and asking them to understand and memorize it. Then testing their performance via question types that demands

data memorization and recalling. (Jarwan, 1999).

In this unsatisfactory state of affairs of the educational system researcher started to look for ways to move from the traditional teaching/learning to teaching methods of thinking as a basic component of education and curriculum. Advocates of this movement in the educational process relied on the following principles:

- First, the students understand as sufficiently and precisely as desired only things they have created, realized or explored themselves (Woolfolk, 1997).
- Second, learning is an active process. During learning students build up new thoughts and develop their conceptual base. Thus, concept meaning is self-established by the students. This means that knowledge is deep-rooted within the student's mind; then meanings are composed as a result of their senses' interaction with the external environment. as a result of this continual interaction the students rearrange the knowledge they are learning as to suit their preparedness; the fact that enables them gain knowledge and skillfully apply its processes and minimize the gap between the high level of knowledge and the primitive level of it (Good and Brophy, 2004).
- Third, dedicating longer time on learning and problem solving will enhance students' proficiency (Jabir, 1999).
- Fourth, the logical sequence of the subject material and knowledge organization will facilitate learning. Meaning composition is a psychological process that demands training thinking on mental cognitive processes such as concluding, evidencing, eliciting, symbolization, organization, storage, recalling, ... etc (Miller, 2002).

Meta cognitive teaching strategies are considered highly effective in improving thinking. They lead to adaptation of the curriculum's material and method, in terms of difficulty/easiness with the students' abilities. Thus, they assist students of lower meta cognitive skills acquire such skills. They also help in acquainting concepts. The need for utilizing meta cognitive strategies in teaching tenet (Fiqqh) concepts is increasing; since the educational function of teaching such concepts is no more supplying students with amounts of information/knowledge, but providing students with expertise, opportunities that lead bring them up to understand knowledge as an organized cognitive structure, help them think and be creative, help them acquire self-learning skills, increase their long-life learning ability, and employ whatever they have learned to solve everyday-life problems; in a world of scientific, educational and technological revolution. This is assured in Abu Sammoor (1995) and Al-Masha'leh (2004).

Tenet concepts have play a distinguished role among other religious concepts in the students' life because they include the principles that regulate the individual's/student's relationship with his Lord through the Worshipping Do's for Allah. They also regulate the student's relationship with his community. Through such concepts students get acquainted with what is Halal (religiously allowed) and what is Haram (religiously forbidden); and through these teachers can estimate what/ how much religious knowledge the students have got. They also can judge the students' behavior and morals. Teachers rely on the tenet concepts as effective in preparing students to be righteously religious. They preach them, individually and in groups, facts about and rules (duties and responsibilities) of their religion; aiming to apply such principles as a behavior in their life. The tenets of worship endeavor to build up the Islamic character; a character committed to Allah's commands (Do's).

Besides, they attempt to get the students acquainted with some healthy values aiming at correcting the students' wrong health behavior, protecting them from diseases, providing them with a general vision about health, and acquainting them with how to avoid disease causes. All this is done through application of a tenet principle called "Cleanliness/Purification" (Taharah), whose concern tackles the following issues:

- 1- Cleanliness of the environment surrounding man. Tenet of worship call for keeping the following environmental components clean:

a) Houses and courtyards: Messenger of Allah (p.b.u.H) (Note 1) says:

"Allah is Good; He likes what is good.

He is clean; He likes cleanliness.

He is hospitable; He likes hospitality.

He is generous; He likes generosity.

So, clean ( as far as I (Note 2) remember) your

house courtyards; do not be like the Jews"

" إن الله طيب يحب الطيب،

نظيف يحب النظافة،

كريم يحب الكرم،

جواد يحب الجود.

فانظفوا - أراه قال - :

أفنيتم ولا تشبهوا باليهود.

(Narrated by Al Tirmithi).

- b) Streets and common places: The Prophet (p.b.u.H) urges us to move harmful things from streets; and never use as toilets places where people walk or take a shadow. He says:

"Protect thyself from either of the two cursives!"      **"اتقوا اللعنين ، قائلوا وما اللعنان يا رسول الله ! قال انذي يتخلى في طريق الناس وفي ظلهم.**  
 "What are the two cursives, Messenger of Allah?"      **رسول الله ! قال انذي يتخلى في طريق الناس وفي ظلهم.**  
 Asked they. He said " That who relieves (excrete) in the people's way or in a place where they shadow".      (Narrate by Muslim)

- c) Food, air and water. These should be protected from pollution: Messenger of Allah (p.b.u.H) indicates the necessity to specify one hand for eating and shaking hands and another to use (for washing, cleaning, ...) after relieving. Aisha (w.p.b.sh.) (Note 3) reports:

"Allah's Messenger's (p.b.u.H) right hand was for His wudoo' (Note 4); while the left hand was for cleaning the stuff after relieving".      **"كانت يد رسول الله — صلى الله عليه وسلم — اليمنى لظهوره وائيسرى لخلجه وما كان من اذى."**

The messenger (p.b.u.H) also says:  
 "When somebody yawns, he/she should **cover his yawn with his hand**".      **" إذا تآب أحدكم فليضع يده على فيه"**

(Narrated by Al Bukhari)

In respect to water cleanliness He assured that:

"One should never relieve in still / stored water that does not run; then use it for washing".      **"لا يبولن أحدكم في الماء الدائم الذي لا يجري ثم يغتسل فيه"**

(Hadeeth narrators agreed upon)

- d) Body health care. This is done within the following principles:

1. Giving each body organ its right (as literary interpreted); in accordance with the Messenger's saying:

**"عليكم بما تطيقون"**      **"Do (of your body clean) to the extremes you endure."**  
**( Hadeeth narrators agreed upon)**

2. A Muslim should not burden him/herself with tasks he/she can not stand. For our Prophet (p.b.u.H) says:

**"A strong believer is better than the weak one"**      **"المؤمن القوي خير من المؤمن الضعيف"**  
**(Narrate by Muslim).**

3. Strengthening the body with appropriate sports; in agreement with His saying (p.b.u.H):

"Look for and take what benefits you."      **"احرص على ما ينفعك"**  
 (Narrate by Muslim and Ibn Majah).

4. Good diet through developing a balanced food content. This coincides with Allah's sayings:

"And He is it Who has subjected the sea (to you) that you eat thereof fresh tender meat (fish).      **" وهو الذي سخر البحر لتأكلوا منه لحماً طرياً... "**

[Al-Nahl: 14]

"We give you to drink of that which is in their bellies, from between exertions and blood, pure drink, palatable to the drinkers."      **" نسقيكم مما في بطونه من بين فرث ودم لبناً خالصاً سائغاً لشاربين"**

[Al-Nahl: 66]

- e) Avoiding eating dangerous animals' meat: Islam forbids eating dead animals' meat, blood, pork, hyenas/wolves, kind of animals that feed on dirt and dirty things; since modern science (Al-Naseemi, 1998 for example) has shown that such animals and meat are ideal environment for huge

and dangerous gatherings of fatal microscopic bodies (bacteria, germs, ...) that can cause a lot of diseases such as:

- Rabies,
- kinds of Leishmaniasis,
- Hydatid Cyst, and
- diseases caused by a tape-worm called Echinococcus Granulosu.

#### Research problem and questions

Researcher, author of this study, noticed through their teaching experience in different contexts a lot of problems that encounter learning concepts included in "Tenet of Worship" as one of the university courses. These problems were embodied in the following aspects:

- Low student achievement in respect to the health concepts included in the course and, consequently, students' possession of alternative concepts.
- Students are unable to elicit, demonstrate or show characteristics of health concepts from the texts they are studying.
- Existence of a big gap between whatever religious concepts the students learn and the impact of this on their practical life and behavioral correction. This can be attributed to the students' acquisition of mistaken concepts that have led to negative behavior; or it could be due to the students' tough memorization without involvement of the mind in diverse processes in order to elicit religious regulations/principles.
- Most Religious Education teachers are not interested in using modern instructional strategies, like Meta Cognitive learning strategies. Most of them concentrate on the traditional method and do not use the modern teaching methods and techniques that help students enhancing their gain of religious concepts. They do not insure a condition where their students can use tools and strategies of thinking. All that generated a desperate need to look for an instructional strategy that helps students to improve their reading comprehension of texts of religious concepts. The study tended to investigate the impact of using Meta Cognitive Learning Strategies on Al-Hussein Bin Talal University Students' Achievement of and attitudes towards health concepts in "Tenet of Worship" course.

Hence, the research problem was formulated and stated in the following key question:

*What is the impact of using Met cognitive learning strategies on Al-Hussein Bin Talal University students' achievement of and attitudes towards health concepts in "Tenet of Worship" course?*

Two sub-questions emerge from this:

*1- What is the impact of using Meta cognitive learning strategies on Al-Hussein Bin Talal University students' achievement in health concepts included in "Tenet of Worship" course?*

*2- What is the impact of using Meta cognitive learning strategies on Al-Hussein Bin Talal University students' attitudes towards health concepts in "Tenet of Worship" course?*

Hypotheses of the study:

Based on the above research questions, the following hypotheses were formulated:

1. There are no statistically significant differences at 0.05 level in the achievement of Al Hussein Bin Talal University students that can be attributed to the teaching method used (the meta cognitive strategies or the traditional method).
2. There are no statistically significant differences at 0.05 level in the attitudes of Al Hussein Bin Talal University students that can be attributed to the teaching method used (the meta cognitive strategies or the traditional method).

Significance of the study

Significance of this research study lies in the following points:

1. It coincides with the educational concern in the Islamic Education domain; which calls for using new teaching strategies; strategies that get the students acquainted with the skills of: thinking, understanding, enquiring, organization, interpretation and employment of the logical knowledge such as: classification,

analysis, comparison, consideration and criticism; in order to face current challenges like globalization and oaths.

2. It responds to recommendations of *Conference for Teaching Islamic Fiqh at Universities (1999)*; held at Zarqa' Private University; which calls for founding real scientific awareness through more concern focus on the religious concepts and method of their presentation, applying modern teaching strategies (Dawood, 2000).
3. It copes with the increasing concern in developing Islamic Education teaching methods. This came as a result of considerable weakness in the Islamic concepts' teaching effects on the students.
4. This study helps develop the curriculum design. It directs the attention to the necessity of inserting "thinking" as a major component of scientific education and coliseum.
5. It can help updating the Islamic Education curriculum as to cope with the innovations in health requirements.

#### Definitions

**Meta cognitive learning strategies:** are a set of strategies the researcher used teaching the experimental group students concepts of "Tenet of Worship". These were: cleanliness vs. impurity, clean entities, impure entities, water, body wash and wudoo'. These strategies are embodied in students participation in three learning stages:

- a) Planning: in which the problem objective and nature, procedures sequence, potential obstacles and errors and methods of treating such difficulties and errors are determined.
- b) Monitoring and controlling: in which the objective is placed as concern focus; procedures sequence is maintained, the appropriate process in context is chosen and how to overcome the obstacles is determined.
- c) Assessment: in includes judgment on preciseness of results, assessment of appropriateness of the methods used and evaluation of effectiveness of the plan and implementation.

**Traditional method:** is a set of teaching procedures through which the control group students learn the subject material of "Tenet of Worship", content of which is demonstrate above. This is done by the course teacher's orientation following his ordinary traditional style of class management.

**Tenet of Worship:** is the subject taught to Al-Hussain Bin Talal University students in the first academic session 2008/2009; represented in their course book content of: cleanliness vs impurity, clean entities, impure entities, water, body wash and wudoo'.

**Health concepts in Tenet of Worship:** for the purposes of this study are meant to be the concepts related to human health, safety and environmental safety against pollution. These are: physical health, psychological health, ways of medical protection, moderate eating and drinking diet, health awareness education, balanced nutrition and gemy pollution/ infection.

**Achievement of Health concepts:** in this paper is the amount of Al-Hussain Bin Talal University students' outcome of the health concepts (related to human health, safety and environmental safety against pollution), as represented by the experimental group students' scores in the 25-item MC posttest (after meta cognitive style treatment). To be compared with their pre-experimental achievement.

**Students attitudes towards health conceptions in Tenet of Worship:** is meant to be the difference in Al-Hussain Bin Talal students' attitudes towards the health conceptions after they had been treated with meta cognitive teaching strategies, compared with the attitudes the had before. This is measured by a 30-item attitude scale dependent on Liker attitude scale.

**Al-Hussain Bin Tala students:** are first year regular students at the Educational Sciences College who are studying Tenet of Worship as a course in the first session 2008/2009.

#### Limitations of the study

This study was conducted within the following limitations:

- a) It is constrained as a subject material by:
  1. the concepts of: cleanliness vs impurity, clean entities, impure entities, water, body wash and wudoo'; and the health concepts included in (Tenet of Worship), a course studied at Al-Hussain Bin Tala University. These are: physical health, psychological health, ways of medical protection, moderate eating and drinking diet, health awareness education, balanced nutrition and gemy pollution/ infection.

2. the students sample. Regular first year students at Al-Hussain Bin Tala University, taking "Tenet of Worship" course at the Educational Sciences College.
- b) It is constrained partially by:
  1. characteristics of the instruments used; and their feasibility to explore variations in the students achievements in and attitudes towards the health concepts in the course.
  2. the teacher's proficiency to administer meta cognitive teaching strategies; and use it as directed to him.

### Literature Review

Reviewing literature, there found, to the researcher' information, only one paper relevant to the study in hand. Titled "The Impact of Computer-Assisted Teaching on Students' Meta Cognitive Memory Processes and Achievement in and Attitude towards Islamic Education", the paper tackles using a package of memorization strategies in teaching Islamic Education and its impact on developing students' meta memory processes. Also noticeable was the researcher' concern in utilizing meta cognitive strategies in teaching Science and Mathematics. Nevertheless, these studies were exploited in designing the instruments; and in the comparisons made and the discussions raised.

### Research studies that experimented meta cognitive teaching strategies and their impact on achievement and attitudes:

Olaywah's (2006) empirical research titled ' The Impact of Using Models of *Constructive Learning* and *Creative Problem Solving* on Students' Meta Cognitive Consciousness in Scientific Text Reading, and on their Ability of Problem Solving' consisted of (# 135) ninth graders – basic stage – in Ajloun educational district. The study indicated existence of statistically significant difference in the experimental group students' mean score in the meta cognitive consciousness posttest administered. This difference was attributed to the treatment the students had.

Al-Masha'lah (2004) studied ' The Impact of Computer-Assisted Teaching on Developing Students' Meta Cognitive Memory, Achievement and Attitudes Towards Computer-Assisted Learning'. The researcher experimented this on a sample of (#135) six graders in the fourth educational district, Amman. Conclusions of the study indicated statistically significant differences in developing meta cognitive memory due to the intervention represented in using Islamic Education computer-assisted teaching. Students' achievement was indicated as significantly higher with the treatment group. There was also a statistically significant difference in the students' attitude in favor of computer-assisted learning.

Arabiyyat (2004) experimented the 'impact of using cognitive and meta cognitive teaching strategies on the reading comprehension of the basic stage students". A sample of (#72) tenth grade girl students participated in this study which found statistically significant differences between the students learned through the cognitive and meta cognitive teaching strategies (the treatment group), on the one hand, and the students with whom the traditional method dependant on literal comprehension, eliciting and assessment was used (the control group). The experimental group showed better reading comprehension than the control group.

The Impact of Using Meta Cognitive Strategies on the Reading Comprehension' is a second study of its type conducted by Al-Sharrouf (2002). With (#65) participants of grade ten students selected from Al-Rusaifah educational district the researcher experimented the method and concluded with statistically significant differences in favor of the experimental group exposed to the treatment.

In his study 'The Impact of cognitive background on the English reading comprehension', Jahjah (2002) selected a sample of (#704) grade ten girl students from Irbid state schools. Results of the study have shown statistically significant differences in the reading comprehension that was attributed to the previous knowledge and to the linguistic competence.

Al-Eisawi's (2001) experimental research titled "The Impact of a Training Programme Using Meta Cognitive Thinking Skills on Ninth Graders' Achievement in Maths' used a sample of (#168) boy and girl students selected from UNRWA schools. Results of this study have shown statically significant differences in the students' achievement in Maths and mathematical concepts between the experimental group and the control group in favor of the experimental group with which meta cognitive thinking skills were used.

Reviewing literature relevant to the impact of using meta cognitive teaching strategies, the following notes have been concluded:

- 1- most relevant research studies were in the fields of general subject courses, Maths and the reading comprehension.



- 2- Previous studies investigated the impact of using meta cognitive teaching strategies on the direct achievement of students. See Olaywah's (2006), Al-Masha'lah (2004), Arabiyyat (2004), Al-Sharrouf (2002), Jahjah (2002) and Al-Eisawi's (2001).
- 3- All studies that tackled the impact of using meta cognitive teaching strategies indicated effectiveness superiority of meta cognitive strategy over the traditional method in terms of enhancing students' achievement and comprehension of the concepts they have studied.
- 4- No research (to the researcher knowledge) was conducted about the impact of using meta cognitive strategies on the students' achievement and comprehension of and attitudes towards the healthy concepts included in Tenet of Worship as a university course.
- 5- The study in hand comes to verify or refute the results claimed by using meta cognitive teaching strategies on the students' achievement and on developing positive attitudes towards the healthy concepts in the course.

Thus, what makes this study distinguished from all others is its focus on using meta cognitive strategies in teaching/learning health concepts. Another characteristic of this study is that it tackles abstract concepts which have not been studied before using this strategy, (to the researcher knowledge).

The theoretical framework on which this study has relied had a great influence on directing and orientating the research. This theoretical framework is embodied in the following principles:

- The necessity of giving sufficient time for training on testing knowledge via self discovery of the learner.
- Introducing the material to be taught in a way that copes with the learner's characteristics and growth stage.
- Putting the learners in a new learning environment that matches the nature of their behavior; and are built on basis of their needs and objectives.
- Introducing the concept as a situation or problem, which leads the learner to spend more effort in order to attain the new knowledge.
- Emphasis on social interaction, which releases the student from self centralization.

#### Method and Procedure

##### **Sampling:**

The sample consisted of (# 120) first year prospective teacher students, who are studying Tenet of Worship as a course at Al-Hussain Bin Talal University.

Purposive sampling described in Cohen, Mainion and Morrison (2000) was used to select the sample. This was viewed as more convenient especially in terms of access. Then the sample was distributed into tow groups: (# 60) students were assigned to the experiment group, and (# 60) students were assigned to the control group.

##### **Instruments:**

Two instruments were used in this study:

- 1-Achievement test of health concepts, and
- 2- Students' attitudes toward health concepts.

Here is a description of the two instruments.

##### **First, achievement test of health concepts:**

A test for measuring students' achievement in the health concepts was prepared depending on Bloom's six levels: knowledge, understanding, comprehension, application, analysis, construction and assessment. The test went in several stages before it was used:

- 1- Content of the course (tenet of Worship) material taught at Al- Hussain Bin Talal university in the first term of the academic year 2008/2009 was thoroughly analyzed in order to recognize and pick up what health concepts were included in the course (Tenet of Worship). These were: physical health, psychological health, ways of medical protection, moderate eating and drinking diet, health awareness education, balanced nutrition and germy pollution/ infection.
- 2- A list of teaching objectives for the selected concepts in Tenet of Worship was prepared aiming at measuring the university students' achievement at the six levels described by Bloom (knowledge,

understanding, comprehension, application, analysis, construction and assessment).

3-Test description table for students' achievement in the health concepts was prepared. This included the basic knowledge content of the key concepts mentioned above (physical health psychological health, ways of medical protection, moderate eating and drinking diet, health awareness education, balanced nutrition and germy pollution/ infection). These were distributed to Bloom's six levels (knowledge, understanding, comprehension, application, analysis, construction and assessment). Then the test items were phrases. They counted (50) MT items.

#### **Validity of the test:**

The whole test was handed to a jury of nine university teachers who have considerable experience in teaching university courses including Curriculum and Tenet of Worship. The jury was requested to review the test items and judge the test against the following issues:

- To what extent does the question measure the level of the desired objective?
- Clarity of the question,
- Does the question need refinement?
- Interrelation and independence of the answer choices,

Then, in response to the jury's suggestion the test was reduced to have (35) items instead of (50).

The test was implemented on (#40) students of different majors who haven't studied Tenet of Worship and they belonged to Al-Hussain Bin Tala University and other universities.

4- Students were divided according to their scores into two equal groups: an upper group and a lower group. Then, responses were analyzed and distinction coefficient between items was calculated. Items of a distinction coefficient lower than (0.20) were excluded. As a result the final test form of the test was designed including (25) question. See appendix (1).

To assure reliability of the test, the final version was experimented on a sample (#40) students from the research population non participants in this study. Results of the students were analyzed and reserved. Another test was administered with three weeks interval with the same sample; participants in the first test. Reliability coefficient of the test items was calculated using Pearson coefficient between the students' scores the first time and their scores at the second time. This was (0.81); which indicated that the test has a satisfactory level of reliability.

#### **Second, Students' attitudes toward health concepts:**

In the light of research questions and aims, a scale for measuring Al-Hussain Bin Talal students' attitudes towards health concepts was designed. The design of the scale went through the following steps:

1. Literature relevant to students' attitudes towards Islamic concepts and other scientific concepts, along with some references which detailed objectives of Islamic Education were reviewed. The fact that helped in determination, categorization and formulation of the scale items.
2. An attitude scale of (40) items was prepared. These items were distributed to two domains: the learner's characteristics and the content. The scale items were modeled according to Likert's model. Each item was given one to five marks; ranging among {strongly agree, agree, neutral, disagree, strongly disagree}.
3. The primary version of the forty-item scale was introduced to a jury of nine university teachers. They were requested to carefully consider the scale in order to reach the desired feasibility as to achieve its objectives through their judgment against the following issues:
  - 1-how appropriate the items classified under each domain of the attitude scale are,
  - 2-how comprehensive the items are to the suggested domains,
  - 3-any suggested modification of the items,

In response to the jury's comments the scale items were reduced to (30) items instead of (40). Thus, the scale attained validity of form and content. The scale included two domains:

1. First domain: ten items related to the learner's characteristics.
2. Second domain: twenty items related to the students' attitudes towards the content.

The final version of the scale was applied on a sample selected from the population of the study. This was (# 40) students who have never studied Tenet of Worship. After analyzing the results, the reliability of the instrument

using internal reliability (Cronbach Alpha) was calculated to be (0.87); which indicated that the instrument (the scale) was reliable and credibility of the results could be assured.

However, internal reliability for the two domains (mentioned above) were as follows:

1. For the first domain, items related to the learner's characteristics, internal reliability was (0.70).
2. For the second domain, items related to the students' attitudes towards the content, internal reliability was (0.84).

Accordingly, this instrument is considered reliable and appropriated to achieve the aims of this research study; see Appendix (3).

### **The teaching material:**

This has two types:

- 1- Teaching material for meta cognitive strategies;
- 2- Teaching material for the traditional method.

First, *'Teaching material for meta cognitive strategies'*:

It was carefully prepared according to the following steps:

- a. All subject material included in "Tenet of Worship" was analyzed and concepts were extracted.
- b. Topics of each module were subdivided so that each subdivision discusses a specific idea.
- c. In the light of the concepts general and specific objectives were derived. These objectives concentrated on the students' acquaintance of the high-leveled mental skills such as analyzing, classifying and constructing concepts.
- d. For each concept a number of lectures were allotted. The total number of lectures was (22) lectures.
- e. Lesson pamphlets were prepared according to the meta cognitive teaching strategies. There were (7) pamphlets covering both major and subsidiary concepts included within the chosen topics in the course mentioned above (in the *Definitions* section). They also included the behavioral form of the teaching objectives.
- f. Lesson pamphlets were introduced to a jury who have considerable experience in and writings on meta cognitive teaching strategies. They were requested to judge on how representative the pamphlets were to the meta cognitive teaching strategies. Amendments were made in accordance with their comments.

Second, *'Teaching material for the traditional method'*.

The following steps were followed:

- a. Subject material included in "Tenet of Worship" was analyzed and concepts were extracted.
- b. In the light of these concepts general and specific objectives were derived, concentrating on clarifying and explaining the concept.
- c. For each concept a number of lectures were allotted. The total number of lectures was (22) lectures.
- d. Lesson pamphlets were prepared according to the traditional method of teaching (lecturing, presentation). These covered both major and subsidiary concepts included within the chosen topics, subject of this study. They also included the behavioral form of the teaching objectives.

### **Design and Statistical Analysis**

This is a quasi experimental study conducted on a purposive sample. It investigates the effect the meta cognitive teaching strategy brings into Al-Hussain Bin Talal University students' achievement in and attitudes towards health concepts. Thus, the independent variable is the *teaching strategy*, in its two levels:

- a) the meta cognitive teaching strategy, and
- b) the traditional teaching method.

The group with whom the first strategy type was used was called the experimental group; while the group with whom the second method was used was called the control group.

However, the two dependent variables are:

- a) the students' achievement in the health concepts, and

b) the students attitudes towards the content and the subject as represented by their scores on the attitude scale.

To ensure equivalence of the two groups: the experimental and the control groups in regard to the two variables above, the students' average scores in each variable for each group was calculated. Then (ANCOVA) analysis was used to compare between the two averages of the posttests after subtracting the pretest impact.

### Results and Discussion

This study aimed at investigating the impact of using meta cognitive strategies of teaching on the students' achievement in health concepts included in 'Tenet of Worship'; and on Al-Hussain Bin Talal students' attitudes towards such concepts, compared with the traditional method of teaching. After conducting the experiment, the study concluded the following:

#### First, results related to the first hypothesis:

This hypothesis read: there is no statistically significant difference ( $\text{sig} < 0.05$ ) in the students' achievement in the health concepts that can be attributed to the teaching method used, the meta cognitive strategies or the traditional method.

To test this hypothesis score averages and standard deviations were calculated for both experimental group students and control group students.

Table (2) shows the descriptive data for both groups of the study.

Through the table above we can notice that the average score of the experimental and control groups has generally enhanced in the post-test than in the pre-test, but the amount of the increase was greater in the average score of the experimental group than that of the control group. The average score of the experimental group was (23.8667); and the standard deviation was (1.41980). While the average score of the control group post test was (18.4833); and the standard deviation was (5.1436).

To detect whether there is statically significant difference between using the meta cognitive teaching strategies and using the traditional method, (ANCOVA) analysis was utilized to test the first hypothesis; i.e. the impact of using the meta cognitive teaching strategies on the students' achievement in the health concepts.

Table (3) summarizes results of the (ANCOVA) analysis of the participants' achievement in the health concepts.

This ANCOVA analysis of the participants' achievement (scores) in the health concepts test (table 3 above) shows a statistical significance ( $> 0.0001$ ) of the F value (77.877) in relation to the impact of using meta cognitive teaching strategies on variance of the participants' scores in the achievement test in favor of the experimental group with an average of (23.8667) and a standard deviation of (1.41980). This can be explained in and attributed to many factors. The most important of which are:

1. The key characteristics of the meta cognitive teaching strategies, i.e. students' interaction, which adopted the experimental students' participation at the different learning stages. It started with the students' seeking and determination of the problem, making predictions about it, then formulating the problem in a logical way and detailing the concept learnt. The fact that contributed in consolidating the concept acquainted by the experimental group students; i.e. meaning, characteristics and levels of the concept are attained. It also helped the students achieve better through their considerably fast progress in the learning process; which was missing in the traditional method of teaching that depends mainly on the teacher as the centre of the teaching-learning process.
2. Meta cognitive teaching strategies' concentration on the importance of the students' awareness of the skills and strategies they use in learning; and the importance of controlling the attempts to use such skills and strategies. That made the experimental group students' learning type of organized strategic learning.
3. The meta cognitive teaching strategies' style of presentation which introduces the concept as a problem; which led the experimental group students to sense the problem they were incurred to and get more involved in solving it, giving ideas and suggesting innovative solutions; and consequently get higher achievement scores.
4. The meta cognitive teaching strategies style of content presentation which depends on the logical organization of the content from the easier to the more difficult. This led to facilitate the learning health concepts and higher scoring for the experimental group.

5. The meta cognitive teaching strategies' adoption of detailing the concepts learnt and introducing them gradually in a logical sequence with the due explanation. Which acquainted the experimental group students the ability to classify, construct and evaluate which demands higher thinking processes.
6. The students participation in problem solving led to adaptation of the concepts with the students' abilities; which led to higher achievement scoring.
7. The students' possession of the self control, self learning, verbal comprehension and reading skills enhanced their achievement of the concepts.
8. The students' possession of the abilities of modification, organization and controlling comprehension supported correct awareness and understanding of the concepts.
9. Regulating learning situations in recognition forms or new reorganization of the learning situations in helped realization of deeper, more evidenced and more applicable concepts to be implemented in new life situations and used in problem solving.

Reviewing previous studies we can see that results of the study in hand coincides with results of Arabiyyat (2004), Masha'elah (2004), Al-Sharrouf (2002), Jahjah (2002) and Al- Eisawi (2001).

### **Second, results related to the second hypothesis:**

This hypothesis read: 'there is no statistically significant difference (sig.,0.05) in Al-Hussain Bin Talal university students' attitudes towards health concepts that can be attributed to teaching method (the meta cognitive teaching strategy or the traditional method).

To test this hypothesis averages and standard deviations of the both experimental and control groups students' scores on the attitude scale in the two domains: the learners' characteristics and health concepts were calculated. Table (4) shows descriptive data for both groups, sample of the study.

Considering table (4), the following can be noted:

- The experimental group students' average score in the pre-test on the attitude scale, first domain 'learner's characteristics' was (39.000). This was more than the control group average which was (34.6667).
- The experimental group students' average score in the pre-test on the attitude scale, second domain 'health concepts' was (101.3333). This was more than the control group average which was (85.3500).

In order to detect whether there was statistically significant difference between the impact of using the meta cognitive teaching strategies and the traditional method on the attitude scale concerning the learner's characteristics and content domains (ANCOVA) analysis was used to test the second hypothesis connected to the impact of using meta cognitive strategies on the students' attitudes. Table (5) shows summary of the ANCOVA analysis for the participants' achievement on the attitude scale in the two domains: learner's characteristics and content.

The ANCOVA analysis of the participants' achievement (scores) on the learner's characteristics attitude scale shown in table (5) shows statistically significant difference (sig.=0.000). F value connected to meta cognitive teaching strategies impact variance in the students' scores on the attitude scale: first domain (learners' characteristics) was (23.692). This means that the hypothesis was refuted.

The ANCOVA analysis of the participants' achievement (scores) on the learner's characteristics attitude scale shown in table (5) also shows statistically significant difference (sig.=0.000). F value connected to meta cognitive teaching strategies impact variance in the students' scores on the attitude scale: second domain (health concepts) was (31.689). A result which also means that the hypothesis was refuted.

This can be interpreted in the light of, and attributed to the following facts:

1. Using the meta cognitive strategy gave the experiment group students an opportunity to learn so freely that availed an atmosphere of satisfaction and a feeling of security. It created a learning environment void of any worries; and supported student self responsibility for learning. The students felt they could control their learning process, which motivated them to work harder in order to achieve the educational objectives for each concept.
2. The meta cognitive teaching strategies are based on interaction and freedom to learn. Which means recognizing the experimental group students' right to participate and respond. This consolidated student

self confidence and supported a feeling of pride when they answer the teacher's questions. Consequently positive attitudes were established within themselves.

3. Meta cognitive teaching strategies helped experimental group students to want learning and enhanced their motivation to learn. It settled an atmosphere of freedom and liveliness; which positively affected their attitudes towards the content.
4. The meta cognitive teaching strategies' principle of 'Interaction' supported 'socialization' feature of learning; which released the students' centralization around themselves.
5. Providing the students with learning experiences through their initiating learning and defining concepts, using meta cognitive learning strategies lead possession of positive attitudes within the students.
6. 'Interaction' and 'freedom', as key characteristics of meta cognitive strategies, created 'enjoyment' in learning those concepts; a feature which does not exist in the traditional method of teaching.

### Recommendations

Base on the results and conclusions of the study, the following recommendations can be suggested:

1. Pre-service and in-service training for Islamic Education teachers on using non traditional teaching methods; more specifically meta cognitive teaching.
2. 'Tenet of Worship' teachers' care about helping students develop their abilities to achieve – acquire concepts – through adopting effective planning and implementation of teaching/learning situations within the meta cognitive teaching strategies.
3. Urging people in charge of preparation and development of 'Tenet of Worship' curriculum to insert meta cognitive teaching strategies, so that students: a) are encouraged to practice activities and communicate with each other, b) develop positive attitudes towards 'Tenet of Worship'. In addition to inclusion of some problems and activities in the curriculum that contribute to enhancing students' achievement.
4. Further research studies focusing on using meta cognitive teaching strategies and tackling different dimensions than those studied in this paper.
5. Conducting similar research studies on other Islamic Education modules to measure students achievement and attitudes towards them.

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**Notes**

Note 1. Peace be upon Him.

Note 2. Narrator of the Hadeeth.

Note 3. Well pleased be she.

Note 4. Washing for prayer.

Table 1. Achievement Test Description

Percent-age	No of Lectures	Total	Higher Levels				Under-standing	Recall-ing Know-ledge	Concepts
			assessment	construction	Analysis	Application			
22.72	5	7			1,2,4 18,23	19	8	Physical and psychological health	
9.1	2	2	25				24	Environmental balance	
22.72	5	6		7,5,3	20,12	17		Ways of medical protection	
4.54	1	1				22		Moderate eating and drinking diet	
13.64	3	3		9	14,15			Health awareness education	
13.64	3	3				21	11.6	Balanced nutrition	
13.64	3	3		10	16,13			germy pollution/ infection	
100%	22	25	1	5	11	4	4	<b>Total</b>	

Table 2. Average scores and standard deviations for experimental group students and control group students' scores in the pre- and post- achievement tests

Control				Experimental				Group
Post		Pre-		Post		Pre-		Test
Standard Deviation	Average	Standard Deviation	Average	Standard Deviation	Standard Deviation Average	Standard Deviation	Average	Effect indicator
5.1436	18.4833	2.7132	6.8333	1.4198	23.8667	2.7399	6.8667	<b>Achievement</b>



Table 3. Results of the ANCOVA analysis of the participants' achievement in the health concepts post-test

Level of Significance	F Value	Square average	D F	Square Total	Source of Variance
.000	34.725	384.478	1	384.478	Pre-test (concurrent) variable
.000	77.877	862.262	1	862.262	Teaching method
		11.072	117	1295.438	Error Factor
		1257.814	119	2542.178	Total

Table 4. Averages and standard deviations of the both experimental and control groups students' scores on the attitude scale towards the two domains: the learners' characteristics and health concepts

Group	Experimental				Control			
	Pre-		post		Pre-		post	
Effectiveness indicator	Average	Standard Deviation	Average	Standard Deviation	Average	Standard Deviation	Average	Standard Deviation
Attitude (1)	15.5167	4.24460	39.000	2.29959	15.2333	2.30965	34.6667	6.49293
Attitude (2)	48.1500	48.86052	101.333	41.94212	41.0833	3.66981	85.3500	14.07706
Total	63.6667	53.1098	140.333	44.24171	56.3166	5.97946	120.016	20.56999

Table 5. Results of the ANCOVA analysis for the participants' achievement on the attitude scale in the two domains: learner's characteristics and content

Level of Sig.	F value	Square Average	DF	Square Total	Variance	Domain
0.017	5.911	134.624	1	134.624	Pre-test (concurrent) variable	Learner's Characteristics
0.000	23.692	539.598	1	539.598	Teaching method	
		22.775	117	2664.709	Error Factor	
	1138.939	104723.080	119	3338.931	Total	
0.000	31.689	104723.080	1	104723.080	Pre-test variable	Content
0.000	31.689	2913.737	1	2913.737	Teaching method	
		91.948	117	10757.903	Error	
			119	118394.71	Total	

## Appendices

### Appendix 1. Achievement test of health concepts

**Circle the correct response:**

1. Wudoo' (wash for prayer) results in great benefits to the human body, such as lessening mental tiredness and renewing mental activity as a result of:
  - a) washing the feet and thoroughly washing the fingers,
  - b) wiping the head with cold water,
  - c) body wash with warm water,
  - d) washing the head, ears and neck with warm water.
2. The body's influence varies according to the characteristics of the water used for wudoo'; face protection against creases, physical fitness and power are results of:
  - a) recurring three times wash of the face and other Wudoo' organs with cool water,
  - b) using warm water for wudoo', washing the face and other organs.
  - c) using perfumed water or detergent (Dettol) -added water,
  - d) using the Dead Sea water in wudoo', washing the body organs.
3. The appropriate title under which the following concepts: (*existence of immunity armament within the Muslim, existence of physical fitness to cope with life pressure, satisfaction and emotional and affective settlement*) can be classified is:
  - a) Psychological Health,
  - b) Physical Health,
  - c) Social Health,
  - c) Health Considerations.
4. Wudoo' results in more than benefit to the human body; such as activating the blood circulatory system, activating and energizing some organs, and decreasing brain congestion. These can be attained by:
  - a) massaging the wudoo' organs,
  - b) using warm clean water for wudoo',
  - c) using sea water for wudoo',
  - d) using Zamzam water for wudoo'.
5. The appropriate title under which the following concepts (*seeking good food, avoiding rotten(wicked) food like the dead body, blood, and pork*) can be classified is:
  - a) Good Nutrition,
  - b) Quantitatively Balanced Nutrition,
  - c) Qualitatively Balanced Nutrition,
  - d) Healthy Psychological and Materialistic Nutrition.
6. Balanced Nutrition in terms of quantity as indicated by Allah's saying " ... and don't overdo" means balanced and non extravagantly:
  - a) eating,
  - b) drinking cool water,
  - c) eating and drinking,
  - d) sleeping and relaxing.
7. The appropriate title under which the following concepts (*hand cleanliness, nails cut, armpit hair removal, moustache cut, feet cleanliness*) can be classified is:
  - a) Objective Cleanliness,
  - b) Physical Appearance Cleanliness,
  - c) General Cleanliness,
  - d) Psychological Cleanliness.
8. Through urging Muslims to follow instructions of cleanliness/ purity, Islam aims at maintaining:

- a) physical, psychological and social health,
  - b) moral/abstract and materialistic health,
  - c) avoiding sickness or disability,
  - d) physical body health.
9. The appropriate title for the orientations indicated by the following texts (*want to eat, do wudoo'*, " and "... *and if you are in a state of janabah (after sexual discharge), purify yourself (bathe your whole body)* " [Al Maidah: verse 6] is:
- a) Body and Organs Health,
  - b) Psychological Health,
  - c) Moral Health,
  - d) Social Health.
10. The appropriate title under which concepts included in the Prophet's saying: "*Protect your self against the three cursives: relieving in the water sources, in the streets and in the shade*) can be classified is Preserving Healthy:
- a) Environment,
  - b) Man,
  - c) Animal,
  - d) Man and Animal.
11. Islam calls for balanced nutrition in order to preserve:
- a) a body void of extravagant eating or flab diseases,
  - b) the blessing of food, fearing to be removed,
  - c) the body against bad overeating and love for food habits,
  - d) the body against flab.
12. Having some kinds of animals in your home causes a lot of diseases, so Islam forbids rearing, inhabiting or living with dogs in an endeavor to protect the body from:
- a) Typhoid,
  - b) Tuberculosis,
  - c) Hydatid Cyst,
  - d) Cough.
13. Islam prohibits relieving in the shade because the shade is:
- a) a fertile place for bacteria,
  - b) a psychologically comfortable place,
  - c) a place for sitting and playing,
  - d) a place where fruits fall.
14. The Muslim's interest in the environment and environmental cleanliness indicates:
- a) purity of instinct,
  - b) purity of mentality,
  - c) heart purity,
  - d) both instinctive and heart purity.
15. Islam endeavors to establish a practical behavior within Muslims as a protective remedy for their health problems by means of:
- a) practical solutions,
  - b) partial solutions,
  - c) primitive solutions,
  - d) secondary solutions.
16. There are many sources for water pollution. Examples are:
- a) Dysentery,
  - b) Cough,
  - c) Bilharzias,

- d) Tuberculosis,
17. Preserving one's self is attained through all of the following except one:
- non exposure to diseases and accidents,
  - carefulness about protection against diseases,
  - carefulness about health preservation,
  - going for a weight loss diet.
18. Islam privileged securing drinking water for man and animal over acts of worship. This is because:
- of the importance of man and animal in Islam,
  - man is the one who is able to bring forth water,
  - the earth is inhabited by man and animals,
  - man and animals are both necessary for each other's life continuation.
19. Islam's judgment forbidding dead body's meat, blood, pork, and Its attitude towards man's urine and impure things is attributed to all except one of the following:
- these things are disgusting,
  - these things are a fertile place for growing germs,
  - these things are fast getting rotten,
  - these things involve deceived sale.
20. The reason behind the Messenger's (p.b.u.H) saying " *When sleeping, put out the candles /lights, close the doors, cover the drink jugs, cover the food and water pots with cloth*" is:
- to keep them out of reach of germs, dust and insects,
  - to protect them from theft,
  - to keep them fresh and flavored,
  - to protect them against evaporation by effect of the sun.
21. A nutrition system based on balance of the food content, indicated by Alla's Saying:
- "*And He is it Who has subjected the sea (to you) that you eat thereof fresh tender meat (fish).*" [Al-Nahl: 14]      "وهو الذي سخر البحر لتأكلوا منه لحماً طرياً..."
- and His saying:
- "*We give you to drink of that which is in their bellies, from between exertions and blood pure drink, palatable to the drinkers.*" [Al-Nahl: 66], is:
- "نسقيكم مما في بطونه من بين فرث ودم لبناً خالصاً سائغاً للشاربين"
- Proteins, carbohydrate, salts and vitamins,
  - animal and vegetarian proteins,
  - animal proteins,
  - vegetarian proteins.
22. All the following choices are correct except one. One's self is protected through:
- man's carefulness looking for good food,
  - keeping balance eating and drinking,
  - taking sports exercises that preserves his/her organs safety,
  - going for a weight loss diet.
23. One way of preserving animals' health is:
- non depriving animals from its necessary needs without which it can not live.
  - constraining it; so it is exposed to theft and fierce animals,
  - providing it with pure/clean water,
  - sparing some time for shepherding it, to keep its body organs safe.
24. Islam calls for preserving plants and animals lives:
- to maintain environmental balance,
  - to benefit from the plants' shade and animals' meat,
  - because these avail good vegetarian and animal food for man,

- d) because plant and animals help consuming Carbon dioxide.
25. The Messenger's (p.b.u.H) saying "*Never spend extravagantly, even if you are on a running river*" indicates that :
- a) extravagant expenditure is absolutely forbidden,  
 b) extravagant expenditure is religiously hated,  
 c) extravagant expenditure is forbidden when dealing with others' wealth,  
 d) overspending is forbidden for poor, not for rich people.

### Appendix 2. Attitude scale towards health concepts

Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Attitudes	Serial
					<i>First Domain: The Learner</i>	
					I think studying "Tenet of Worship" is a domain that has a low value.	1
					Studying this domain helps me understand many religious aspects.	2
					Studying this domain is a waste of time.	3
					I like to discuss with my classmates the issues treated in the course and their importance in people's life.	4
					Issues tackled in "Tenet of Worship" module contribute in improving my practical life.	5
					I would like to study more "Tenet of Worship" course-related modules.	6
					I would like to take this course because I fancy the teacher's character.	7
					What strengthens "Tenet of Worship" course is my belief that Islam is an integrated world system.	8
					'Tenet of Worship' makes me bored.	9

Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Attitudes	Serial
					<i>Second Domain: Course Content</i>	
					'Tenet of worship' contributes in preserving human being through alternatives.	10
					'Tenet of Worship' takes the tasks of first-aid and civil defense.	11
					'Tenet of Worship supports personal responsibility for the learner's health.	12

					Islam endeavors to maintain health of healthy people.	13
					'Tenet of Worship' provides the learners with the skills they need for health consolidation.	14
					Islam endeavors to recover sick people through medication and qualifying them.	15
					Physical body health is a purpose in the Islamic religion.	16
					'Tenet of worship embeds health values and evokes learners to keep healthy life.	17
					'Tenet of Worship' contributes in making an environmental protection health experiment concentrating on the healthy values	18
					'Tenet of Worship contributes in enhancing environmental education within learners.	19
					'Tenet of Worship' contributes in formulation of clear health policy for the learners.	20
					'Tenet of Worship' contributes in formulation of clear and healthy environmental policy for the learners.	21
					'Tenet of Worship' enhances the learners' awareness of healthy issues.	22
					'Tenet of Worship' enhances the learners' awareness of environmental issues.	23
					Islamic "Fiqqh" attempts principally to prevent harm.	24
					'Tenet of Worship' consolidates commitment to medical protection.	25
					'Tenet of Worship' endeavors to protect the environment from gemy pollution.	26
					Islam establishes the best curriculum/method to preserve man's health.	27
					Islam protects Its followers health through balanced eating/drinking programme.	28
					The Islamic system in the field of healthy training is a successful system.	29
					The Islamic system in the field of healthy training is based on the principle of "Moderation"	30