The Effect of using “Competencies Based Curriculum in Teaching” on Acquiring Tendencies towards Science Subjects Among Middle School Students, in the State of Kuwait

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Abstract

The present study aimed to investigate the effect of teaching using “Competencies based curriculum” on students' development of tendencies towards science subjects among middle school in the State of Kuwait. To achieve this aim, a convenient sample of (50) students from the 7th grade students in Jahra Educational Area were chosen. The study used the one-group semi-experimental approach, with pre-test and post-test. The study tools consisted of the tendencies' scales towards science. The study came out with the following results: There is no significant statistical difference ($\alpha = 0.05$) in the acquisition of tendencies towards science subject among middle school students in the State of Kuwait due to teaching using Competencies based curriculum. The study came out with a set of recommendations which include conducting more studies about the effect of teaching using “Competencies based curriculum” on the acquisition of other goals of science education.

Keywords: Competencies based curriculum - Tendencies towards Science subject.

Introduction

Achieving an effective and purposeful learning process is a major motivation for every new and modern approach in the field of education and through different stages of learner’s lives. One of the goals and objectives of teaching science which is acquiring and developing scientific tendencies (zaytoon, 2013). Achieving this goal may help learners to obtain scientific facts and concepts and acquire the appropriate skills to carry out the educational activities associated with the learning process. It is therefore necessary to study the appropriate curricula in teaching and teaching methods that follow in the direction of creating a generation of learners capable of meeting the challenges of the educational process. These challenges require the teacher to be a mentor and an instructor to the learner as well as a facilitator of the educational process. Teacher’s role should no longer be confined to teaching, as is currently the case with many teaching methods. Good education helps the learner learn but it does not have to be exclusively by direct instructing (Alhilah, 2012).

The most effective teaching methods that are based on the educational philosophy that focuses on the learner as the base of the educational process were a reaction to the traditional methods. Some traditional methods were content-based and practiced direct instruction as a teaching method. Some other traditional methods adopted behavioral approach in education which emphasizes on different aspects of the educational process, but neglects many other important ones, such as, the learner's interests, and his personal, psychological, and social needs. In order to correct this traditional trajectory in teaching, a series of studies were conducted to examine: the educational reality, find out the cause of the imbalance in educational performance and the low levels of educational outputs, and
the inability of learners to cope with the rapid changes around them in facing challenges of the twenty-first century.

The Study Problem
The curriculum competencies came as a reaction to the educational reality and the need to develop it. This study problem evolves around a main question:

- What is the impact of using the "competency-based curriculum in teaching" in acquiring tendencies toward science among middle school students in the State of Kuwait?
- In light of the main question, the current study attempted to answer the following sub-questions:
  - What is the level of students' tendencies towards science among middle school students in the State of Kuwait?
  - What is the impact of using the "competency-based curriculum in teaching" in acquiring tendencies toward science subjects among middle school students in the State of Kuwait?

Objectives of the study

- To identify the level of students' tendencies towards science among middle school students in the State of Kuwait.
- To identify the impact of using the "competency-based curriculum in teaching" in acquiring tendencies toward science subjects among middle school students in the State of Kuwait.

Significance of Study

First: The Theoretical Importance

- The study addresses competency-based curriculum in teaching, which is based on the constructivism hypothesis in teaching that considers the student the center of the learning process.
- The importance of this study emerges from it being one of the first studies, for the researcher best of knowledge, in this field. Besides, this approach is being implemented for the first time (the first semester of the academic year 2017/2018) among seventh grade students (the grade in question) in Kuwait.
- Investigate the effectiveness of using the "competency-based curriculum in teaching" in acquiring tendencies towards science among middle school students in the State of Kuwait.

Second: Implementation importance:

- Implementation procedures to examine the impact of competency-based curriculum in teaching, might provide opportunities to employ this method to improve positive tendencies towards science.
- Examining the compatibility of this curriculum with the aspirations of educational policy makers, and curriculum developers in leveraging the learning process.
- Enriching the educational literature with a relatively recent study that highlights the field of teaching and learning might contribute to connecting the student effectively to decision-making regarding the process of his learning as he is the focus of the learning process.

Boundries of the Study

- A sample of seventh grade students from public boys' school affiliated to Al-Jahra governorate in the State of Kuwait.
- The extent of teachers' application of competency-based curriculum in teaching in accordance with the curriculum competency guide of the Ministry of Education in Kuwait.
Hypotheses of the Study

• There is no statistically significant difference ($\alpha = 0.05$) in the acquisition of tendencies toward science subjects among students of the middle grades in the State of Kuwait due to the application of competency-based curriculum in teaching these students.

Study Terms and Definitions

In this study, special terms are defined conceptually and procedurally as follows: Study terms and definitions:

• **Competencies**: Conceptually defined as: "a set of knowledge, skills, tendencies and values that are developed through learning, and when acquired can help identify and solve problems in a particular or interrelated fields in a variety of contexts." Kuwait Ministry of Education - National Curriculum and Standards for Science (2014).

  Procedurally defined as: The extent of what competencies are practiced in the educational reality in the educational process of teaching and learning.

• **Tendencies towards Science subjects**: Osborne defines tendencies towards science subjects as "the feelings, beliefs and values the learner carries towards a subject that could be a scientific project, a science lesson, or the influence of science on society or on scientists themselves" (Osborn, et al., 2003).

Theoretical Framework:

There have been effective efforts to develop the appropriate pedagogical theories; each of these theories carried an appropriate solution to the process of teaching and learning from the perspectives of its developers. The evolution of theories happened sequentially from the twentieth century to the present time in a way that serves the educational process of learning. This evolution moved from the traditional theory through the experimental and behavioral theories to arrive to constructivism. Constructivism in education is the theory that came as a reaction to the concentration of traditional teaching on memorizing information without making sure that meaning is understood. This theory required preparing the learner to be able to construct his own perception of knowledge based on his previous learning and to qualify him to use that new knowledge in a functional way (Posner, 2004).

Constructivist theory considers knowledge as "an organized construction of facts and concepts that man finds, collects, classifies and organizes in his own new intellectual constructs" (Saadah & Ibrahim, 2011). Learners must use their new knowledge in meaningful activities that need decision-making, through which judgments are issued and problems are resolved. Constructivism was concerned with the individual's mind and how learning occurred through research that linked brain anatomy with mind theories. The theory also focused on cognitive structures and their development during the multiple stages of individual growth that Piaget formed in his research on mental structures and cognitive development. From a constructivist perspective, learning is the result of a new mental construction, by organizing and adjusting new information with those already in the mind of the learner; while learning process focuses on thinking, understanding, reasoning, and applying knowledge. All of this is done through personal mental processes, so it varies according to people and their experiences (Zaytoon, 2007).

Some educational researchers in the field of science teaching have stressed that "teaching learners the scientific facts is not as important as developing their science acquisition skills so that they can acquire knowledge themselves, (Young, 1995, as cited in Mei, G., Kaling, C., Xingi, C., Sing, J., and Khoon, K., 2007). Learner's acquisition of knowledge by using the appropriate skills will enable him to maintain the knowledge. The self-learning means active participating in the learning process, which fulfills the principles that are advocated by the constructivism; "learner is the focus of the learning process and learning gives a special meaning to the learner needs and interests". Philipp Perleoud, (1999), (as cited in the National Workshop on Curriculum Requirements, Damascus, 2013), defined competencies as "the ability to employ a set of knowledge resources..."
(knowledge, information, or abilities) to deal with a range of situations wisely and effectively. He also defined it as: "the ability to work effectively against a range of situations that we can control because we possess both the necessary knowledge and the ability to employ them in a timely manner to identify and resolve real problems." The Commission of Culture and Education in the European Union has defined lifelong learning as "all activities aimed at improving individual, social and functional knowledge, skills and competencies"; and defined lifelong learning competencies as: communication skills in native language and foreign languages, sports, Science, technology, digital computing, social and civic competencies, as well as entrepreneurial spirit, and cultural and expression awareness (Adabas, kaygin, 2016.)

The definition adopted by the Kuwaiti Ministry of Education for Competencies is: "A system of knowledge, skills, tendencies and values that are developed through learning, and can be developed to identify and solve problems in a particular field or in interrelated fields in a variety of contexts." Competencies were classified by the Kuwaiti Ministry of Education (the National Standards for Science, 2014), into three types:

First: Basic competencies:
- Generally defined as: Integrated systems of knowledge, skills, values, tendencies, beliefs, and personal / social attributes that all individuals need to acquire in order to achieve their personal interests, development, integration and employment.
- Psychologically and socially defined as: "The expected educational outputs to be completed by learners at the time of graduating high school (grade 12). These outputs are interrelated and reciprocal (non-specific), transferable and multifunctional curricula, and all curricular subjects contribute to their development"

The basic competencies are as follows:
- Competencies of the Islamic religion and moral competencies.
- Communication competencies in Arabic.
- Cultural and across-cultural communication competencies related to English and other foreign languages and cultures.
- Social and local competencies (ie, competencies related to identity, values, social and local issues).
- Mathematical competencies (related to math).
- Scientific, technological and digital competencies
- Competencies of personal development and learning.
- Life and work, entrepreneurship, economic and financial competencies

Second: General competencies:
Defined as: "competencies that define integrated knowledge, skills, tendencies, and more general and material-based values with respect to the expected outcomes of learners at the end of grade 12". General competencies (as stated elsewhere in the above document) are developed "through a range of realities (knowledge acquisition), processes (skills acquisition) and personal considerations (tendencies and values), and linked with learning in other relevant areas, such as language development, social studies, mathematics and communication and information technology.

The general competencies of science as determined in the above document are as follows:
- Searching for phenomena, methods and changes in living and non-living organisms using appropriate tools, models, simulations and presentations.
- Interpretation and analysis of the attributes, behavior, phenomena and processes of living and non-living being through observation and guided explanation.
- Linking scientific ideas and attempts using technological processes and products to protect, elevate, enhance and sustain the natural and societal environment.

Third: Special Competencies:
Defined as: Sub-sections of general competencies, and they represent stages of acquiring competencies. They are created and developed by learners during the school year. Special
Competencies define more specific systems of integrated knowledge, skills, tendencies, and values. They can give specialized and topic-based competencies that the learners must demonstrate at the end of each class. The special competencies indicate the following dimensions (ranges):

- A set of specific facts about the material (knowledge) - the domain of facts.
- A set of specific knowledges and skills (skills and strategies) that domain the material - scope of operations.
- A range of social and personal responses (tendencies, values, beliefs) driven by knowledge and skills in a particular subject - the domain of tendencies and values.
- A range of communications with materials and other fields - domain of connectivity.

General competencies are not limited to a specific number of special competencies per lesson, because the number is determined by the special competencies that meet the criterion that determines the learning expected in that lesson. In order to determine the level and quality for each specific competencies standard are used. Standard is defined in the Teacher's Guide for Effective Education (2015) issued by the National Center for Educational Development in Kuwait as "determining the quality levels that learners must achieve in developing their competencies at different stages during the learning process."

There are two types of standards:

- Curriculum standards: the level of quality achieved by the learner in acquiring special competencies at the end of each grade.
- Performance standards: the level of quality achieved by the learner in acquiring public competencies at the end of each grade.

**Tendencies towards Science**

Osborn, et al., (2003) defines tendencies towards science subjects as "the feelings, beliefs and values the learner have towards a subject that can be a scientific project, a science lesson, or the influence of science on society or on scientists themselves". Adesoji, (2011) believes that students' tendencies and interests play a key role among students in science classes. Kirikkaya, (2011) says that the way science is taught has a direct impact on students' tendencies, which are key determinants of students' achievement and success in science.

There are several factors that lead to the formation of students' tendencies towards learning science, including: the relationship between the characteristics of students' perception and their academic achievement. The most important perceptions are behaviors such as: persistence, effort, attention, and feelings such as motivation, positive values of learning, enthusiasm, and pride in success. Students with high motivation and positive tendencies learn more, maintain more information, and enjoy learning activities significantly compared to their low-motivation peers (Salta, Tzougraki, 2004).

Mansour, (2001) stated that the main functions of tendencies can be summarized as follows:

- Tendency determines the direction and orientation of the behavior.
- Tendency organizes motivational, emotional, and cognitive processes about some of the topics in the area in which the individual lives.
- Tendencies are reflected in the behavior of the individual and his words and actions.
- Tendencies facilitate decision-making in different situations while providing some unity and consistency.
- Is the basis for the emergence of semi-static patterns of behavior towards things, subjects, and people.
- Is a reflection of the extent to which the individual agrees with the criteria of the group to which he belongs and to their values and beliefs.
- Makes the individual feels, thinks, and behaves in a specific way or manner.
The present study attempts to measure the effect of the proposed method of "Competencies based curriculum in teaching" on the acquisition of students' tendencies towards science. There are several tools for measuring tendencies towards science for researchers (Patrice, Abdelkrim, 2014) such as:

- ATSS (tendencies towards Science) (Germann, 1988)
- CSCS (measuring children’s curiosity towards science) (Harty, Beall, 1984)
- MATSI (List of tendencies Towards Science) (Weinburgh, Steele, 2000).
- SMTS (Student motivation towards learning science) (Tuan, Chin, Shieh, 2005).
- TOSRA (Testing tendencies Towards Science) (Fraser, 1997).

These measurements revolve around several points: the feelings of the learner towards the conditions surrounding the learning environment of science, the people responsible for delivering the process of learning, the scientific material itself, and the future that the learner expects for himself in the field of science.

A further scale of tendencies toward science is consistent with most of the points raised by the previous scales that prepared by Towes (1983) and translated into Arabic by (Zaitoun, 1993). The scale consists of 33 paragraphs, rated by the author as a five step scale according to Renis Likert pattern. This latter scale will be the proposed measurement tool for tendencies in this study given its comprehensiveness and compatibility with the objectives of the study.

Previous Studies

First: Studies Related to Competency-Based Curriculum

Bushnaq, (2017) conducted a study to identify the importance of necessary competencies for teachers of social and national studies in the administration of education in the province of “Namas” from the perspective of teachers. The descriptive analytical method was used on the study sample that consisted of (50) teachers. The results of the study showed the importance of necessary competencies for teachers of social and national studies in the administration of education in the province of “Namas” from the perspective of teachers was high.

Al-Fadl and Hasan (2016) conducted a study aimed at investigate the importance of training on the basic educational competencies that Arabic language teachers need in middle school teaching from their perspective. The descriptive approach was used in this study. The study sample consisted of (110) teachers. The results of the study showed that the basic educational competencies are of great importance to teachers of Arabic language and that there is a great need for training on the basic educational competencies in light of modern educational trends.

Mongor (2017) conducted a study to determine the effectiveness of the training program for the preparation of science and math teachers at the Moroccan College of Teachers, in training them to use the basic science processes in the competency-based education. The qualitative research was used in this study, where the method of interviews and group discussions was used. The study sample consisted of (32) trainees. After the data collection and analysis, the results showed that the trainee students were not qualified enough to apply and teach competency based basic science processes.

Grubstead, Harms and Mulh, (2016) conducted a study on the impact of the professional competencies of teachers on the performance of students. The study attempted to highlight the pedagogic skills of teachers (Pedagogical Content Knowledge PCK). The study sample consisted of (48) middle school teachers in Germany. The results of the study showed that there is a clear effect to the extent of teachers’ cognitive competencies on the performance of learners. The study recommended the need to provide suitable opportunities for teachers to develop this type of competencies, especially in teacher training colleges.

Yusuf (2015) conducted a study to identify the basic educational competencies among teachers of national education, the degree of practicing these competencies and the need for teacher’s training. Study sample consisted of (57) teachers. The results of the study showed that teachers' evaluations were greatly adequate to the extent of their practicing of the basic educational competencies. There was
also none statistically significant correlation between the importance of the competencies of the teachers and the degree of practicing them.

Kobridi (2014) conducted a study on the teaching competencies among teachers in teaching practical chemistry. The study was conducted on a random sample of 234 chemistry teachers in Riau, Indonesia. The results were analyzed using multiple regressions, and they showed that all levels of competency such as lessons design, planning, implementation, and evaluation were on average level and that efforts were needed to raise teachers' qualifications.

Qarara (2014) conducted a study to reveal the educational competencies possessed by classroom teacher students at the University of “Tafila. The sample of the study consisted of (43) students. The results showed that the students' estimations of the educational competencies they possess reached an arithmetic medium of 3.12 at an average level, where the lowest educational competencies possessed by students were the competencies related to the development of thinking in its different forms, self evaluation, Providing feedback, developing attitudes, tendencies and values, and evaluation strategies.

Steller, Nehering, and Tyman (2013) conducted a study on the competencies of obtaining information among trainee teacher in teacher training colleges. The study sample consisted of (89) university students.

Suleiman (2011) conducted a study on teaching competencies available to students of educational Rehabilitation diplomain light of the national standards curriculum of public education. The study sample consisted of (48) male and female students. The study used the semi-experimental method. A questionnaire consisting of (137) teaching competencies distributed to public and private competencies were applied. The results of the study showed the presence of teaching competencies in a medium level in the research sample.

Barakat and Hassan (2011) conducted a study on the extent of acquiring educational competencies among teachers and the level of their practice and their relationship to motivation for achievement. The sample consisted of (279) male and female teachers. The study showed that there is a lack of students’ ability to actual practice of educational competencies. And their ability to acquire educational competencies was within acceptable limits according to the purposes of the study.

Abu Al-Haj (2012) conducted a study to identify the degree of educational competencies that students of practical education course at Al-Quds Open University achieved after the end of practical training from their perspective. The study sample consisted of (220) students of the practical education course in the branch of Ramallah and Al-Bireh for the first semester of the academic year 2011/2012. The results of the study showed that the evaluations of students’ degree of their acquisition of educational competencies after practical training were high in all of their study fields.

Another study was conducted by Lesley et al. (2012) to investigate the impact of educational competencies on science teachers design competencies in applying educational materials in the Context-Based Curriculum. The study sample consisted of (25) teachers with previous design experience; and (8) teachers with no experience in designing. The study showed that the teachers with design experience were able to implement the curriculum based on competencies more effectively.

Previous Studies

Second: Studies Related to Tendencies towards Science

Ayash and Zahran (2013) conducted a study aimed to identify the effect of using the 4MAT model on the achievement of the sixth grade students in science and their tendencies towards it in UNRWA schools in Jordan. The study sample consisted of (72) students divided into two groups an experimental and a control group. The experimental group studied the light unit in a formatical way, while the control group studied the unit in the traditional way. The study found the following results: There were statistically significant differences at the level of (0.05) between the experimental group and the control group means on the achievement test for the benefit of experimental group that studied the format.
model. The use of the formatical model contributed to improving the tendencies of the experimental group towards science.

The study by Tek and Ruthven (2009) examined the effectiveness of smart school education in acquiring tendencies toward science. The results of the study showed that the students’ tendency toward science is usually low when implementing the usual methods of teaching; and that modern methods usually increase the students’ tendency towards science positively.

Al-Wahr’s (2008) study investigated students’ achievement in science, their current attitudes towards them, and their awareness of their ability to succeed in them, as indicators to students’ future tendencies towards science. The study sample consisted of (653) eighth and ninth grade students. The study found that eighth graders with higher awareness of their abilities, or their current attitudes toward science were more positive; tend to have more positive future tendencies toward science than their peers with less awareness of their abilities.

The study of Zaanin (2007) aimed to investigate the effectiveness of computer lessons in science subjects in developing educational achievement of the ninth grade students in Palestine and their attitudes toward computer education. The sample of the study was composed of (72) ninth grade students. The results of the study showed that teaching computer program has been able to influence the attitudes of students towards learning science by using computer.

Al-Khawalda (2007) conducted a study aimed at identifying the impact of two teaching strategies based on the constructivist approach in the achievement of students in tenth grade in biology, and their tendencies towards biology compared to the traditional method of teaching biology. A secondary boys school was chosen in the city of Mafraq. Three 10th grade classes corresponding in academic achievements were selected for the study, and randomly assigned to one control group and two experimental groups. The first experimental group (43) students was taught using the learning cycle. The second experimental group (34) was taught using “Woods” strategy, while the control group 32 students was taught using the traditional method. The educational material was the vertebrate unit of the biology curriculum of 10th grade in public schools in the Hashemite Kingdom of Jordan. The three groups were taught by a qualified teacher. The trial lasted about eight weeks. Statistical analyzes of the study data showed the following results:

- There were statistically significant differences in the achievement of 10th grade students in biology due to the teaching strategy (the learning cycle, the Woods strategy, and the traditional method); achievement was in benefit of students who learned by the learning cycle strategy and the Woods strategy compared to their peers who studied by the traditional way. And the impact of the learning cycle strategy was compatible with Woods’ strategy’s impact.

- There were statistically significant differences in the attitudes of 10th grade students towards biology due to the teaching strategy (the learning cycle, the Woods strategy, and the traditional method); achievement was in benefit of students who learned by the learning cycle strategy and the Woods strategy compared to their peers who studied by the traditional way. And the impact of the learning cycle strategy was compatible with Woods’ strategy’s impact.

Ahmed (2006) conducted a study aimed at investigating the impact of learning science using scientific investigation activities in students’ understanding of scientific concepts, beliefs and attitudes towards science. The study sample consisted of (351) 7th grade students who were enrolled in (8) classes from four UNRWA schools in Amman. Two classes were selected from each school, one experimental and one control and assigned randomly to traditional activities or investigation activities. The results showed that the method of investigation activity learning was more effective than the traditional activity learning on students' understanding of scientific concepts, and the structuralism of students' epistemological beliefs about science increased; but did not have any impact on students' tendencies towards science.
Hjazin (2006) conducted a study aimed at investigating the effect of using a teaching strategy based on scientific activities in the achievement and development of scientific tendencies among students in middle schools in Jordan. The sample of the study consisted of (49) students in 7th grade, distributed in two groups: 23 students studied using the activity-based strategy and the other 26 students studied using the traditional method. The results showed that students in the experimental group surpassed the students in the control group in achievement and in the development of the scientific tendencies.

The Lee study (2005) tried to examine the impact of teaching using the science-based curriculum and teachers’ characteristics on student’s tendencies towards science. A sample of (1063) of the 5th and 8th graders was used in this study. This study found learners using the new method, had less positive tendencies toward science than the group that did not learn using the same way. The study found that this may be due to lack of teachers’ competencies. The study recommended that curriculum developers take into account the appropriate training of teachers before using modern methods of teaching.

In the study conducted by Berg (Beg et al., 2003), the results of an open survey was compared to exploring chemical experiments among (190) university students. The study aimed to investigate which method gives different results depending on students' attitudes towards learning. Researchers used questionnaire and interviews during laboratory work to identify students' attitudes toward learning prior to testing. The study found that the open survey method showed positive results for learning outcomes, laboratory preparation time, and students' perception of experiments. As for low tendency students, they need more support to face the challenge of an open inquiry.

Chang & Mao (1999) conducted a study on a sample of 557 students. The researchers developed two units in astronomy and metallurgy using a survey program and applied them to the experimental group of 284 students, while the control group which consisted of 273 students studied in the traditional way. The study lasted 8 weeks, and the researchers used two tools for collecting data: an achievement test and a scale to measure students' tendencies towards geology, applied before and after intervention. The result was an increased achievement in scientific concepts among students of the survey activities program than their peers in the control group, in addition to the experimental group having more positive attitudes toward geology.

**Comments on Previous Studies**

Through the presentation of previous studies, it is noted that:

Previous studies indicate that relatively modern methods and approaches of teaching based on structural philosophy in education may contribute in some way to the development of the learning process so that it becomes an effective process for students to acquire positive attitudes and tendencies toward science. Previous studies have used different strategies and methods to develop tendencies towards science among learners. These studies have found that these strategies are effective in developing tendencies toward science. These strategies include (intelligent school education) by (Tek, Ruthven, 2009), exploring methods by (Al-Wahr, 2008) (2007), teaching science with computers (Zaanin, 2007), two teaching strategies based on structural approach (Al-Khawaldeh, 2007), learning science with Scientific inquiry Activities (Ahmad, 2006), teaching strategy based on scientific activities (Hijazin, 2006), Method of science-based curriculum (kit-based), teachers characteristics (Lee, 2005), Open exploration and discovery (Beg et al., 2003) (Chang, Mao, 1999). Curriculum based on competencies is a curriculum based on structural philosophy in education; we expect that this approach will affect the tendencies and attitudes towards science in the desired positive form. The current study is concerned with the impact of competency-based approach on the acquisition of tendencies towards science in middle school students in the State of Kuwait.
Study Procedures

The current study used the semi-experimental one-group approach with pre and after application on the study sample. The design contains the following variables:

1. **Independent variable:**
   - Competency-based approach

2. **The dependent variable:**
   - Acquiring tendencies towards science

Thus, the design design of the study (design of one group with pre and after application) in symbols as follows:

\[ \text{EG: 01 X 01} \]

**Time**

whereas:

- EG: experimental Group
- 1: Testing the acquisition of tendencies towards science.

Study Population and Study Sample

The study population consists of middle school students in public education in the State of Kuwait. The study sample consisted of 50 students from the 7th grade in Al-Jahra educational district.

Study Tools

The study tools consisted of the scale of tendencies towards science, prepared by the researcher after reading the educational literature on measurement tools for measuring tendencies towards science, which are as follows:

- ATSS (tendencies towards Science) (Germann, 1988)
- CSCS (measuring children’s curiosity towards science) (Harty, Beall, 1984)
- MATSI (List of tendencies Towards Science) (Weinburgh, Steele, 2000).
- SMTS (Student motivation towards learning science) (Tuan, Chin, Shieh, 2005).
- TOSRA (Testing tendencies Towards Science) (Fraser, 1997). The scale is in the final form of (24) items. Each item has five levels of response: I strongly agree (5 points), I agree (4 points), Not applicable (3 points), Disagree (two points), Strongly disagreeable (1 point).

Scale Validity

The validity and stability of the scale were ascertained as follows:

Scale was validated by using:

A) The veracity of the arbitrators: The scale was presented to a group of evaluators specialized in the field of education. The scale is in its final form consisted of (24) items.

The agreement of the evaluators is considered a statement of the validity of the scales’ content.

Teacher's Guide

As for teachers' guide for competency based curriculum, the researcher used the teaching manual prepared and approved by the Curriculum Department in the Kuwaiti Ministry of Education on the mechanism of applying competency based curriculum in the required steps for the 7th grade students; and for teaching science to 7th graders for the first semester 2017/2018.
Statistical Processing

Data were entered into the computer through the Statistical Package for Social Sciences (SPSS) and the following statistical processing’s carried out to verify the validity of the study hypotheses:

- Mathematical mean
- Standard Deviation
- t Test

Results and Discussions

Results Related to the First Question

What is the degree of students' tendencies towards science among the middle school students in Kuwait?

In order to answer this question, the statistical means, standard deviations and the degree of tendency towards science were obtained for middle school students in the State of Kuwait. The following table shows these results:

Table 1: The arithmetic mean, standard deviations and the degree of the tendency towards science among middle school students in the State of Kuwait, in descending order

<table>
<thead>
<tr>
<th>Rank</th>
<th>Number</th>
<th>Paragraphs</th>
<th>Arithmetic Mean</th>
<th>Standard Deviations</th>
<th>Degree of Tendency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15</td>
<td>For a better future my country needs more scientists</td>
<td>4.18</td>
<td>1.257</td>
<td>High</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>I find it fun to watch scientific programs</td>
<td>4.12</td>
<td>1.023</td>
<td>High</td>
</tr>
<tr>
<td>3</td>
<td>17</td>
<td>There are many scientific facts in science</td>
<td>4.04</td>
<td>1.384</td>
<td>High</td>
</tr>
<tr>
<td>4</td>
<td>9</td>
<td>The school library should contain more scientific books</td>
<td>3.94</td>
<td>1.268</td>
<td>High</td>
</tr>
<tr>
<td>5</td>
<td>11</td>
<td>We live a better life because of scientific discoveries</td>
<td>3.86</td>
<td>1.552</td>
<td>High</td>
</tr>
<tr>
<td>6</td>
<td>21</td>
<td>Dialogue in science subjects is fun</td>
<td>3.84</td>
<td>1.361</td>
<td>High</td>
</tr>
<tr>
<td>7</td>
<td>13</td>
<td>I like to know more about the scientific explanation of things</td>
<td>3.80</td>
<td>1.385</td>
<td>High</td>
</tr>
<tr>
<td>8</td>
<td>14</td>
<td>I understand the information given in the science lesson easily</td>
<td>3.80</td>
<td>1.088</td>
<td>High</td>
</tr>
<tr>
<td>9</td>
<td>7</td>
<td>Most industries are the products of scientific discoveries</td>
<td>3.78</td>
<td>1.234</td>
<td>High</td>
</tr>
<tr>
<td>10</td>
<td>19</td>
<td>Science appreciates new ideas</td>
<td>3.74</td>
<td>1.468</td>
<td>High</td>
</tr>
<tr>
<td>11</td>
<td>1</td>
<td>I use science subjects in my daily life</td>
<td>3.58</td>
<td>1.126</td>
<td>Medium</td>
</tr>
<tr>
<td>12</td>
<td>8</td>
<td>Research in science is based on scientific method</td>
<td>3.58</td>
<td>1.279</td>
<td>Medium</td>
</tr>
<tr>
<td>13</td>
<td>3</td>
<td>I want to practice scientific activities</td>
<td>3.56</td>
<td>1.445</td>
<td>Medium</td>
</tr>
<tr>
<td>14</td>
<td>6</td>
<td>Science contributes to solving humanitarian issues in general</td>
<td>3.50</td>
<td>1.199</td>
<td>Medium</td>
</tr>
<tr>
<td>15</td>
<td>23</td>
<td>I want to discuss and participate in science classes</td>
<td>3.46</td>
<td>1.528</td>
<td>Medium</td>
</tr>
<tr>
<td>16</td>
<td>16</td>
<td>Science satisfies my scientific interest</td>
<td>3.44</td>
<td>1.387</td>
<td>Medium</td>
</tr>
<tr>
<td>17</td>
<td>18</td>
<td>I want a deeper study of science</td>
<td>3.36</td>
<td>1.336</td>
<td>Medium</td>
</tr>
<tr>
<td>18</td>
<td>20</td>
<td>Science is boring</td>
<td>3.10</td>
<td>1.460</td>
<td>Medium</td>
</tr>
<tr>
<td>19</td>
<td>22</td>
<td>I invest my spare time reading science non-textbooks</td>
<td>3.02</td>
<td>1.478</td>
<td>Medium</td>
</tr>
<tr>
<td>20</td>
<td>4</td>
<td>Science study does not need intelligence</td>
<td>3.00</td>
<td>1.690</td>
<td>Medium</td>
</tr>
<tr>
<td>21</td>
<td>10</td>
<td>I study science only for the purpose of testing</td>
<td>2.96</td>
<td>1.538</td>
<td>Medium</td>
</tr>
<tr>
<td>22</td>
<td>24</td>
<td>I feel comfortable when I miss a science class</td>
<td>2.82</td>
<td>1.769</td>
<td>Medium</td>
</tr>
<tr>
<td>23</td>
<td>12</td>
<td>Science classes are very complex</td>
<td>2.43</td>
<td>1.633</td>
<td>Medium</td>
</tr>
<tr>
<td>24</td>
<td>5</td>
<td>I want to specialize in science when I finish my studies</td>
<td>2.28</td>
<td>1.471</td>
<td>Low</td>
</tr>
</tbody>
</table>

| Total Mean of Tendencies | 3.47 | .553 | Medium |

Table (1) shows that the degree of tendencies towards science came to a total average of (3.47), and in a medium mean. The mathematical averages for paragraphs ranged from (2.28 to 4.18) to a low, medium and high level. Where the paragraph (For a better future my country needs more scientists) was the highest mathematical mean and in the first rank (4.18), while the paragraph (I want to specialize in science when I complete my study) was in the last rank with the lowest mean (2.28).
Results Related to the Second Question
The impact of using "curriculum based on competencies in teaching" in the acquisition of tendencies towards science among middle school students in the State of Kuwait? In order to answer this question, the arithmetic mean, the deviations and the T test were extracted for the interrelated samples between the preand post measurements of tendencies towards science among middle school students in the State of Kuwait. The following table shows these results:

Table 2: Mathematical Means and Deviations and T Test for pre and post measurements of tendencies towards science among middle school students in the State of Kuwait

<table>
<thead>
<tr>
<th>Scale</th>
<th>Measurement</th>
<th>number</th>
<th>Mathematical mean</th>
<th>Standard deviation</th>
<th>Value of T</th>
<th>Independence degree</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tendency towards science</td>
<td>Premeasurement s</td>
<td>50</td>
<td>83.14</td>
<td>13.228</td>
<td>-1.319</td>
<td>49</td>
<td>.193</td>
</tr>
<tr>
<td></td>
<td>Postmeasuremen ts</td>
<td>50</td>
<td>85.56</td>
<td>13.377</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table (2) shows that the value of “T” was (-1.319), which is not statistically significant at 0.05 level. This indicates that there are no differences in the degree of students' attitudes towards science between the pre and post measurement on tendency scale according to use of Curriculum based on competencies in teaching; and it was noted from the table that the arithmetical mean of post measurement on the scale of tendencies was (85.56), which is higher than the pre measurement (83.14) and this indicates an increase in tendencies towards science, but these differences are not statistically significant.

Discussion of the Study Results
The results of the study questions were presented in the previous section. Results for each one are discussed below:

The present study showed that there is no statistically significant difference (α = 0.05) in the acquisition of tendencies and attitudes toward science subjects among students in middle schools in Kuwait due to the application of competency curriculum. The results are not consistent with the results of many studies on the effectiveness of the method or strategy used to develop tendencies towards science. Some of these studies are: Tek, and Ruthven (2009), Al-Wahr (2008), Zaanin (2007), Khawaldeh (2007), Ahmed (2006), Hijazin (2006), and Lee, 2005, Beget al, 2003, Chang, Mao, 1999. These studies used the following strategies in the following order: Intelligent school education, exploring methods, teaching science with computers, two teaching strategies based on structural approach, learning science with Scientific inquiry Activities, teaching strategy based on scientific activities, Method of science-based curriculum (kit-based), teachers characteristics, and Open exploration and discovery. The reason for lack of an impact on the application of the curriculum could be due to the lack of effective application of the competency-based curriculum, or due to the failure to implement the activities accompanying this approach in a way that focuses on the students’ interests.

Study Recommendations
Through the findings of the current study, the researcher recommends the following:

- The effective application of curriculum based competencies in teaching science for all grades in public education.
- Training teachers to apply the curriculum based on competencies in teaching.
- Extending the application of the Competencies based curriculum in teaching and linking it to online resources and to the evaluation of students and their academic achievement.
Giving more attention to the emotional side of students by improving their attitudes, behaviors and scientific tendencies by considering the methods they prefer to learn better and enjoy being involved in science processes.

**Suggested Research**

As an extension of the findings of the current study the researcher suggests the possibility of the following studies:

- Conducting other studies to demonstrate the effectiveness of applying the competencies based curriculum in teaching the development of tendencies towards science in other samples that differ from the sample of the current study.
- Conducting other studies to demonstrate the effectiveness of applying the competencies based curriculum in teaching to achieve other objectives in science subjects.
- Conducting other studies to demonstrate the effectiveness of using the application of competencies based curriculum in teaching on other subjects.

**References**

1. **Arabic References**


