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Journal of Research in Curriculum, Instruction and Educational Technology (JRCIET)

Aims and Scope

The *Journal of Research in Curriculum, Instruction and Educational Technology (JRCIET)* is a regional quarterly refereed educational journal. It is one of the publications of the Association of Arab Educators (AAE), Egypt. JRCIET is published in English, French and German in January, April, July and October. It is issued both electronically and in paper forms. It accepts the publication of original high quality papers on both theoretical and empirical research in different areas of educational research related to curriculum, instruction and educational technology. In order for serving as a vehicle of expression for colleagues and/or for meeting university academic standards, or for promotion purpose, JRCIET publishes dissertation abstracts (M.A & PhD) in addition to reports on

symposiums, conferences and meetings held on topics related to its main concerns previously referred to.

JRCIET links everyday concerns of teachers, researchers and practitioners with insights gained from relevant academic disciplines such as applied linguistics, education, psychology and sociology (interdisciplinary research). The scope of JRCIET is deliberately wide to cover research on the teaching and learning in different disciplines. The primary aim of the JRCIET is to encourage research in curriculum planning, design, evaluation and development, teacher education, and approaches , methods, strategies, techniques and styles of teaching in the following disciplines: English, Arabic, French, German, Social studies, Science, Islamic studies, Mathematics, Agricultural sciences, Commercial sciences, Technical sciences, Home economics, Music, Physical education, Kindergarten, Any other related discipline, Educational technology, Special needs, Technical/ vocational education. JRCIET also encourages and dissiminates work which establishes bridges between educational sciences and other disciplines within or outside educational context.

The views , the opinions and attitudes expressed in JRCIET are the contributors' own positions, and not necessarily those of the Editor, Advisory Board, Editorial Panel, or the Publisher.

Contributions

Offers of contributions are welcome from researchers /academics interested in teaching, learning and educational technology. Contributors should consult the online "Instructions for Authors" on the AAE website: http://www.aae ducators.org/ or JRCIET website on http://jrciet. blogspot. com/ for manuscript preparation before submission. Submissions that do not fit with the "Instructions for Authors" will not be considered for publication.

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JRCIET welcomes manuscripts in English, French and German. Manuscripts should be written in a concise and straightforward style. Authors are advised to have their

manuscript proofread before final submission. A manuscript should not exceed 25 pages following JRCIET's formatting system (see section on formatting the manuscript). Submitted manuscripts should be written according to the APA style (for a brief manual of the APA style, consult the *Association of Arab Educators*' website on http://www.aaeducators. org/)

Manuscript Formatting

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Components of the research/article manuscript

Three copies of the research/article should be submitted. The manuscript should be typed, double-spaced on a A4 paper, on one side of the paper only. A cover page should contain only the research title, name(s) of author(s) and institutional affiliations on a separate page in order to preserve author anonymity on submission of the research/article to refrees. An abstract not exceeding 200 words should be included on a separate sheet of paper. The main components of the research/article are Introduction, Method, Results, Discussion, Conclusion(s), Acknowledge- ments (if any), and References. Diagrams and Figures if they are considered essential, should be clearly related to the section of the text to which they refer. The original diagrams and figures should be submitted with the manuscript.

Footnotes should be avoided. Essential notes should be numbered in the text and grouped together at the end of the research/article.

Research Title

The title should accurately reflect the focus and content of the research. The title should be brief and grammatically correct.

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Authors' names and institutional affiliations

This should include the full authors' names, affiliations (Department, Institution, City, Country), and email addresses for all authors.

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Acknowledgements (if any)

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Research-based Implications for the Enhancement of the EFL Teaching/Learning

Dr. Aly A. Qoura
Professor of ELT

T his paper reports a number of crucial implications for the profession of teaching and learning English as a Foreign Language (EFL). Based on his career as an EFL teacher educator, the author presents - in brief - the conclusions derived from six quasi-experimental researches conducted on the effects of some psycholinguistic variables (i.e. brain-hemisphericity; personality type; learning style; learning strategies; and multiple intelligences) on teacher and /or student performance, Language materials development, learning style-stretch, and language self-efficacy.

The first study highlights the dire need for utilizing the students' full potentials in learning EFL which has become the universally acknowledged means of knowledge production. Currently, most research suggests that we barely use 10% of our brain capacity, yet we can learn to plug in the other 90%. We can learn to tap the reserves of the mind. Language learning strategies enable us to take responsibility for our own learning by enhancing our autonomy and help us assimilate new information more effectively. Geared to this purpose this study had four major questions: 1) Are there significant differences in the frequency of language learning strategies (LLSs) used by secondary school students in relation to their sex , specialization , and achievement level? 2) Are there significant differences in the type of LLSs used by secondary school students in relation to their sex, specialization, and achievement level? 3) Are there significant differences in brain-hemispheric preferences of secondary school students with respect to their sex, specialization, and achievement level? 4) Are there significant differences among the means of the scores of brain- hemispheric preference groups in their use of LLSs with respect to their sex, specialization and achievement level?

Oxford's SILL and Torrance SLT scale were the major instruments used in this study to gather the data from the 642 student sample.

Results indicate - among other things - that there are significant differences in the frequency of the LLSs used in favor of female over male students and good over poor students. On the other hand, "cognitive", " metacognitive ", and "memory" strategies were found to be the most popular among Saudi students. The results also revealed that male students favor the left- hemisphere, females favor the integrated mode, and no differences were reported in reference to the right hemisphere. Good students tended to prefer to the left-hemisphere and the integrated mode. Other significant differences among the brain-hemispheric preference groups in their use of LLSs were reported. Results were analyzed, interpreted, and discussed.

Among the important conclusions and implications of this study is that:

- all students of all levels, abilities, specialization, and brain preferences use LLSs when working with EFL, but differences exist in how many and what type of LLSs they use. These differences seem to contribute to differing degrees of success in language learning . Effective use of LLSs appears to lead to more effective language learning .

- learning strategy instruction can be expected to increase the ability of learners to learn the complex skills of English as a foreign language.

- the expectations imposed by the traditional academic approaches to teaching and testing in Saudi secondary schools limit the motivation of most EFL students to try new, creative, communicatively oriented LLSs. In addition, they also limit their chances of using the functions of the whole brain.

- increasing teachers' and learners' repertoire of strategies could enhance students' learning by creating a broader context within which achievement would be maximized.

- the aim of training students in learning how to learn is not to direct students to use the same set of LLSs or to prescribe a right way to plan, manage, and assess performance, but to help each learner to explore consciously the effective options available; to consolidate and systematize those strategies that best fit his learning style and the learning task at hand.
- designing activities will motivate students to try new LLSs and will provide sufficient practice opportunities to enable students to internalize the new strategies.
- training students to use their whole brain could drastically enhance their language learning. This can be done by providing them with a plethora of learning activities that require them utilize the LH, RH, and the IM. Exercises that include brain teachers, problem solving, critical thinking, puzzles, visualization, imaginative storytelling, ideas sketching, kinesthetic concepts, will conflict mediation, brainstorming, ... etc. will definitely help EFL students do better.

The second research reiterates that success of EFL / ESL learners is due not only to cognitive factors such as language aptitude but also to affective, motivational, personality and demographic factors. Furthermore in order to provide effective, sensitive instruction, teachers of EFL need to learn to identify and understand their students personality type (PT) and language learning styles (LSs)

This study was set out to identify PT and LSs most common amongst prospective teachers in Mansoura FOE. It also investigated the relationship and correlations of PT and LSs on one hand with achievement in EFL, gender, age, and academic major (among other variables) on the other hand.

Kolb's LSI and Myers - Briggs Type Indicator (MBTI) in addition to an achievement test were used as basic instruments in the study . Statistical analysis (i.e. Chi2 , one way ANOVA , and correlation coefficient **)** revealed that neither PT nor LSs have

any significant effect on the teachers' achievement in EFL . It also showed that neither gender nor academic major relate to PT or LSs. These results contradict those of other studies because of differences that could be ascribed to culture, educational context and system , nature of academic courses and instrumentation and sample size.

In spite of the fact that different types of learners may approach language learning in different ways and through various LSs, the relationships between these approaches and styles and the learning outcome are not direct. We cannot say for example that Introverts succeed while Extraverts do not, nor can we say that Divergers outperform Accommodators in learning EFL. However, a great deal of educational and instructional bearings and connotations could be deduced from both LSs and PT theories in relation to the teaching and learning of EFL because without an understanding of LSs and PT, we will continue to operate in ways that are educationally ineffective, even counteractive.

Implications for EFL curricula and instruction are :

- In responding to students' different LSs, educational settings need to be modified to promote the students' learning. This study proposes several recommendations concerning the educational use of LSs:

1. Matching learning tasks to the students LSs. The danger with this expectation is that students could be denied the opportunity to learn the broad range of intellectual skills they need to function in society.
2. Developing cognitive flexibility . Teachers can help students acquire skills in different LSs. Then students can use the appropriate skills that are required by the intellectual task. Students must thus be encouraged to "stretch" their LSs so that they will be more empowered in a variety of situations. In this way, students will be able to shift from one style to another as the situation warrants.

3. Creating curriculum flexibility. Open education where the teacher provides alternatives gives the students the opportunities to select form those alternatives. They must expand their repertoire of techniques for accommodating the students diverse LSs.

4. Preparing a learning environment that welcomes many different LSs. The secret is variety. If the teacher varies the activities in an almost cyclical fashion, all the different kinds of LSs will find satisfaction. Not every student will love every activity but all students, no matter what their basic LS, will find activities that meet their needs. There are at least two benefits to this approach:

   a. All students will have some activities that appeal more to them based on their LSs and they are more likely to succeed in these activities . The feeling of success will be a motivating force in their studies.

   b. All students will get practice in learning styles they are not strong in and this broadens their LSs and the accompanying skills.

In order to solve the problem of teacher-student style conflict, research recommends changes in the curriculum where lessons can be organized as a series of episodes , each of which has a different objective and a different style with the teaching-learning style chosen that best matches the objective. For example in the language classroom, a grammar task might use an analytical style, but a listening task might require a global style.

Faculties of education should encourage other LSs as well (i.e. Accommodators and Convergers) since we need more effective people in specialist and technology careers as well as people who enjoy new and challenging experiences and cherish cooperating and interacting with other people for the sake of solving urgent problems.

Faculties of education should also cater for other personality types, for those who tend to be global learners , have

a natural flair for abstract thinking , and have tolerance for theory (N), those who have broad interests and interaction (E), and for those who like to live life in a flexible, spontaneous , and adaptable manner (P).

In one of the few studies that investigated the possibility of stretching students' preferred learning style to include other learning styles , the third study aimed to answer the following questions:

1. What are the language learning styles (LLSs) used by successful EFL field-dependent (FD) and field-independent (FI) students?
2. What are the components of a strategies- based program that helps in style- stretching for the English Language Center (ELC) students?
3. What is the effectiveness of the proposed program in enhancing ELC students' achievement?
4. What is the effectiveness of the proposed program in stretching students' learning styles?
5. What is the attitude of ELC students towards the proposed program?

In order to answer the research questions, five instruments were used (i.e. Cognitive Style Inventory, Language Learning Strategies Inventory, An Attitude Scale, The Embedded Figures test, and An English Language Achievement Test). Results of this research that was conducted on forty four female students revealed that language learning strategies provided by the proposed program had benefited the experimental groups, especially the FI in reading and the two groups, FI and FD in Writing. The proposed program also improved the experimental groups attitudes towards learning EFL.

As for stretching students' styles (i.e. helping the two experimental groups use the language learning strategies typical of their counterparts'), results indicated that some shift in style use was evident in general strategies (i.e. cognitive and compensation strategies).

Findings also showed that the two experimental groups used more of their typical language learning strategies but did not shift to use the language leaning style typical of their counterparts' .The F1 group was found to be more amenable to change than he FD although that change was not significant.

This study asserts that changing the learning style seems to be difficult. However, providing variety of learning and teaching strategies may lead to better learning in general and attitudes towards EFL learning in particular.

Bearing in mind that learning in general and EFL learning in particular is a complex process. Learning at times requires great effort and at other times, proceeds with relative ease. It compasses a multitude of competencies. The results of learning are often observable, but the process is less obvious. Numerous theories of learning exist in an attempt to explain learning. The theory of Multiple Intelligences (MI) offers one perception into the complexity and applicability in human learning. The fourth study investigated the gap between intelligences used by both students and teachers in EFL classrooms in pre-university education (N=977 students and 35 teachers) as well as correlations between MI, self-efficacy, and achievement. Specifically, the purpose of this study was to explore and describe pre-university EFL classrooms by examining four factors: (1) intelligences students report as their most highly developed or strongest, (2) intelligences that teachers report using in EFL classrooms, (3) relationship (if any) between MI in EFL classrooms and self –efficacy, and (4) relationship (if any) between MI in EFL classrooms and students' achievement scores.

Results of the fourth study revealed that about 62.5% of student and teacher intelligences do not overlap; they do not report preferences for using the same intelligences. In other words, teachers in this sample succeeded in catering for 37.5% only of the students' intelligences while the rest of the students ' intelligences were left behind. Therefore, teacher preparation programs should equip teachers with the necessary knowledge and skills in accommodating the various intelligences of their

students. Course-book writers must take students' preferences into consideration when writing their exercises, activities, content, and assessment devices. In light of this theory, effective EFL teachers are those who are highly prepared to deal with multi-level and mixed ability classes.

In order to determine whether students' intelligences differ according to their school level and/or gender results illustrate that interpersonal intelligence was reported by students at all school levels to be their highest strength superseded only by visual/ spatial intelligence at the secondary school level. On the other hand, verbal/linguistic intelligence was students' lowest intelligence at all school levels. As students move to a higher level (i.e. secondary school) their visual intelligence intensifies. They receive new knowledge more through reading than through listening. By that age they can read the lines, between the lines and behind the lines because most of their knowledge comes from the printed materials.

These findings seem to be plausible since learning a new language requires interpersonal intelligence that incites verbal interaction between students and teacher and among students themselves. The exclusive majority of language learning activities at these school levels involve group work, group projects, peer correction, dialogs, and language games that entail interpersonal interaction and team work.

Weakness in linguistic intelligence throughout pre-university stages could be due to the fact that English is a foreign language and reflect the facts of life when we address the TEFL profession in Egypt. A considerable number of schools are not well-equipped with technology that facilitates English language learning (ex. language labs, computer facilities, etc.). In addition, many course-books currently used in general education schools do not reasonably nurture students MI including the linguistic intelligence, and a considerable number of EFL teachers are not kept abreast with new advances in the field of TEFL and suffer from dealing with overcrowded classrooms. These conditions do

not support nor make provision for catering for students MI in general and linguistic intelligence in particular.

It can also be noticed that logical/mathematical and verbal/linguistic intelligences were almost constant across the three school levels whereas visual/ spatial was steadily growing stronger across school levels.

It can be concluded from this study that in order to be successful in educating all our students, we need to be aware of their individual MI. To be more effective, EFL teachers of the diverse students, need to use concise and efficient ways to learn more about their students' strengths and weaknesses. For example, students who have one area of intelligence which is more fully developed than the others should be encouraged to approach their learning using that particular intelligence as an entry point. Students in this study scored very high in interpersonal Intelligence. They should, therefore, be provided the opportunities to develop their knowledge of English using their interpersonal strength.

Teachers should not only observe the highest scores registered by each of their students in order to discover appropriate entry points for effective learning; they should also examine the lowest scores obtained by their students (i.e. natural, bodily/; kinesthetic and verbal/linguistic intelligences in this study) in order to discover which areas of intelligence need to be developed during the course. Some of these areas of strength and weakness might not normally be obvious in a traditional language learning classroom, but if teachers try to be flexible in their approach to the learning process and use as many different entry points as possible, then the students soon begin to appreciate that the best students have weaknesses and the apparently weak students have strengths.

It can also be concluded from this study that the gap that exists between students' and teachers' MI scores must be addressed and worked on. Teachers, as well as, course writers should think of all intelligences as equally important and not to

typically place a strong emphasis on the development and use of verbal and mathematical intelligences only.

The differences in MI in terms of gender and school level revealed by this study in addition to the results concerning the relationship between the application of the MI theory and the increase in students' achievement and self-efficacy scores make one concludes that students are more successful when they are taught the way that they are taught the way that they are naturally inclined to perform better.

Finally the positive and statistically significant correlations between students' **MI** scores and their **EFL** self-efficacy evidently demonstrate the importance of providing supportive feedback to our students during teaching and in assessment.

In the same line of investigating MI theory and its application in the EFL field, the fifth study aimed at evaluating the English language series "*Touchstone*" in terms of the MI theory in order to determine which of these textbooks topics, activities, and exercises cater to the Preparatory Year students' MI. In this process, students' MI were profiled; textbook topics, activities, and exercises were analyzed and evaluated. Suggestions for modifying this EFL textbook series in light of the MI were provided.

The two major questions of the study were: 1.What are the MIs that characterize the English Language Center (ELC) students? 2.How far does the EFL textbook "Touchstone" series cater to these MIs?

A number of 658 students constituted the sample of the study. Of them, 326 were male students (49.5%) and 332 were female students (50.5%) enrolled in the preparatory year at Taibah University in Al-Madinah Al-Munawwarrah. 219 were in the humanities track (112 males and 107 females), 292 were in the Medical track (214 males and 78 females) and 147 (all females, since the track is not open for male students) were in the applied track, representing 33.3 %, 44.4 % and 22.3% of the sample respectively.

For the purposes of this study, the researchers developed an MI inventory -based. This instrument was designed for the collection of MI type's profile that characterizes ELC students both males and females. In other words, to determine the MI most prevalent among Saudi ELC students, an MI-activities based Menu was developed and used to evaluate the textbooks in light of the MI theory. Based on this menu, an MI profile was formed for each of the four textbooks analyzed in this study.

Results showed that male students had the following order of preference for the intelligences: Linguistic (88.3%), Intrapersonal (76.1 %), Logical (75.8%), Visual (75.1%), Bodily (74.5%), Interpersonal (67.4%), Natural (58.6%), Musical (34.6%). On the other hand, female students had the following order of preference for the intelligences: Linguistic (86.7%), Logical (78.9%), Visual (77.7%), Intrapersonal (75.6%), Bodily (74.1%), Interpersonal (69.9%), Natural (56.4%) and Musical (30.7%).

Calculating the frequencies and percentages for each type of intelligence for each book, and for all the four textbooks were carried out. The profile of the four textbooks was predominantly a combination of the three intelligences: linguistic, interpersonal and logical. These intelligences were present in more than 85% of all the topics, activities, and exercises of the textbooks analyzed. The other intelligences were present in about 15% of the topics, activities and exercises. This result indicates that the *Touchstone* series do not provide for the majority of the MI preferred by the ELC students.

In view of these results, authors of *Touchstone*, and other courses taught in the preparatory year in Saudi Universities are advised to consider the different types of intelligences Saudi students prefer in the process of course development. Course instructors are advised to vary their teaching techniques to respond to the different types of intelligences preferred by their students even if the course does not cater for all the intelligences. They can do this by following different teaching techniques and active learning strategies to make their teaching a success.

Finally, paper six investigates the effectiveness of MI-based EFL materials in improving both students' achievement in EFL and their attitudes towards learning English. This study had aimed at:

1. Identifying the most prevalent MIs among 2nd year female secondary school students.
2. Identifying the extent to which learning activities in *English for Saudi Arabia-2* provide for students most prevalent MIs.
3. Investigating the effectiveness of a MIs- based unit designed by the researcher in improving both students achievement in EFL and their attitudes towards learning EFL.

The participants were 115 secondary female students (Scientific and Literary Sections) from EFL 2nd year from the 13th Secondary School in Al-Madinah Al-Munawarah.

Three instruments were used for collecting the data of this study : the MIs questionnaire to determine the students' preferred types of intelligences, pre and post achievement tests to compare between their level before and after the experiment, and a pre-post attitude towards learning EFL scale to explore their thoughts and feelings towards learning English . A MIs-based unit was designed and implemented in order to detect its effectiveness in improving the experimental group's achievement in English and their attitude towards learning it.

The findings indicated that logical followed by visual and interpersonal were the most popular MIs among the 2nd secondary students whereas bodily, intrapersonal and verbal were not so popular among the students. Furthermore, musical intelligence was the least preferred by the study sample. As for the extent to which the textbook *English for Saudi Arabia-2* addresses students' MI the profile of the sample units was predominantly a combination of the two intelligences: linguistic, and logical. These intelligences were presented in more than 59.18% of all the activities in the units analyzed. The other

intelligences were presented in about 11.7% of the activities. Broadly talking, the above table showed that the activities in the textbook of the series of *English for Saudi Arabia-2* did not match the MIs that preferred by the female secondary school students as 76.90% of them preferred logical intelligence whereas the activities in the book presented only 11.48% drills based on logical intelligence. Also, while 76.80% of students preferred learning via visual intelligence, the book gave them only 8.7% visual activities. Moreover, the book presented 47.7% verbal activities whereas 72.17% of the students preferred to learn by using verbal intelligences. From the above percentages, it was concluded that there was no doubt that the activities in the series of *English for Saudi Arabia – 2* did not fairly cover the eight types of MIs. Therefore, they stood short of matching the needs of all students learning EFL.

On one hand, the statistical analysis indicated that the MIs-based unit had a considerable effect on the students' achievement level in writing, reading, grammar and vocabulary on one hand. On the other hand, means for the pre and post attitude scale applications show that all differences were in favor of the post application which give a good momentum for the experimental MIs-based unit in enhancing students' attitudes towards learning English. It is also evident that all items that did not reach the significance level related to future plans, family support and study abroad which seem to be a distant goal for students at that age. Moreover, some parents do not necessarily encourage their children at that age (secondary school) to travel abroad. These significances in the exclusive majority of the scale items and in the total number of the items indicate the effectiveness of the experimental MIs-based unit in improving students' attitude towards learning English.

Based on the results, a number of implications have emerged:

1. EFL teachers as well as students should be aware of the MIs theory and its applications.

2. Teachers should build the activities based on MIs according to the students' abilities.
3. Text book activities, exercises should be built in the light of the MIs theory.
4. EFL teachers should be trained in lesson planning, according to MIs theory.

This author believes that affective and psycholinguistic variables are crucial in the teaching and learning of EFL.

Saudi Female Teachers' and Students' Understanding of the Role and the Importance of Feedback on Writing

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ABSTRACT:

*T*his quantitative study investigated Saudi female teachers' and students' understanding of the role and importance of feedback, the types of feedback Saudi teachers use and students' perceptions of each type using a rating scale questionnaire. The participants were 100 female Saudi undergraduate students and 20 teachers from one campus at King Abdulaziz university. The 100 students were recruited from three different levels (elementary, pre-intermediate-intermediate) based on a placement test conducted at the beginning of the year. The findings suggested that students value teachers' feedback more than feedback from their peers and that some types of teachers' feedback were preferred over others. Direct feedback, where teachers underline or circle the error and provide the correct word or structure is found to be the most effective type of feedback from both groups of participants. There was a variety of responses on what writing features are more important to receive feedback on; for instance, two groups of participants, elementary and intermediate level students, rated feedback on grammatical errors as the most helpful. However, for the pre-intermediate level, feedback on spelling errors came first. The results of this study suggest that teachers should vary their feedback practices and consider students' perspectives and needs.

INTRODUCTION:

The increasing spread of English and the need for communication in English in the world have led to a revolution in the field of writing English as a second language (L2). Choi (2013) maintained that "L2 writing is a more complex discipline involving composition as well as L2 language learning"(p. 188). Feedback is one form of assistance that students can use to improve their writing accuracy (McGrath, Taylor, &Pychyl, 2011). Winne and Butler (1994) contended that "feedback is information with which a learner can confirm, add to, overwrite,

tune, or restructure information in memory, whether that information is domain knowledge, meta-cognitive knowledge, beliefs about self and tasks, or cognitive, tactics and strategies" (p. 5740).

Feedback in the Saudi Context:

In the Saudi context, English writing is very difficult for Saudi university students due to the huge jump from basic writing skills (that are measured by grammar and spelling accuracy in high school) to the more advanced written communication skills required at the university level (Aljafen, 2013). However, the preparatory year is established as a way to bridge the gap between students' high school English education and the level of proficiency needed for the university level (Aljafen, 2013; Al-Hazmi &Scholfield, 2007).Unfortunately, the number of studies that discussed the importance of using different types of feedback and students' perceptions of feedback in Saudi context is very limited. These studies include: Garmi (2005), which was intended to elicit students' opinions about the importance and the effectiveness of teacher feedback; Al-Hazmi & Scholfield (2007), that focuses on the effect of using enforced revision with a checklist and peer feedback in EFL writing; Mustafa (2011), that was conducted to capture students' perceptions about the feedback they receive and what constitutes helpful feedback; Hamouda (2011), that aimed to identify the problems that Saudi teachers and students encounter through the feedback process. The results of these studies varied to some extent; for example: Garmi (2005) reported that Saudi students appreciate and apply corrections they get from their teachers, whereas Mustafa's (2011) study revealed that Saudi students do not value feedback . Moreover, the type of feedback they want is significantly different from what they receive. As mentioned earlier there are few studies about feedback in the Saudi context, especially female teachers and students. Therefore, this study is designed to explore the views of Saudi female teachers and students about the role and importance of feedback, teachers' current practices, and

students' preferences. The quantitative questionnaire of this study was designed to answer the following questions:

1. What are the Saudi female teachers' understanding of the role and importance of feedback?
2. What are the Saudi female students'' understanding of the role and importance of feedback?
3. What types of feedback do female Saudi teachers use?
4. How do female students perceive each type of feedback?

Sources of Feedback:

The question of *Who is responsible for giving effective feedback?* can be seen as an easy one; however, an extensive amount of work has been published about several sources of feedback including: teachers, peers, friends, tutors or writing centers (Simpson, 2006; Sugita, 2006; Liu and Hansan, 2005 and Ellis, 2009). The written feedback is a common method used by instructors and teaching assistants to help students to understand more about their weakness and strength points in writing assignments (Simpson, 2006). Teaches' feedback is still the most preferred type of feedback among L2 writers, even when they were provided with the appropriate training to use other sources of feedback including: friends, roommates, and writing center tutors (Garmi, 2004; Eksi, 2012; Séror, 2011).

Teacher Feedback:

It is widely known that the teacher feedback is the most trusted among L2 writers. Teachers use different ways to provide different feedbacks such as hand-written, electronic feedback, oral, direct, indirect, focused, and unfocused, (Sugita, 2006; and Ellis, 2009). Regarding this issue, teachers constantly ask questions like: What should we focus on: Language? Content? Organization? Should we use a red pen or another color? Should we correct all the mistakes or should we focus on one type of errors each time? Should we write the correct answer or should we just underline the mistakes? Should we grade students' drafts or not? Which type of feedback enhances students to make substantive revision? (Ur, 2012; Ferris, 2012; Casanave, 2012

&Rollinson, 2005). This part, therefore, examines a variety of feedback types, value of focused approach, and the teachers' comment types.

Apparently, the hand-written comments method is the most popular. For instance, Sugita (2006) investigated the impact of three types of teachers' comments: imperatives, statements, and questions, in developing students' writing skill. The study has revealed that comments in imperative form tend to be more effective and, eventually, lead to substantive revision more than questions or statements. Interestingly, students declare that imperative comments have provided them with clear directions on how to respond effectively to teachers' feedback without losing their feeling of authority over their writing. This notion was supported by Chandler's (2003) study entitled *The efficacy of various kinds of error feedback for improvement in the accuracy and fluency of L2 student writing.* Chandler pointed out that students' self-correction and underlining enhance their learning autonomy because they develop a sense of being independent writers rather than being passive recipients. Obviously, the above mentioned results clearly stress using more imperatives in giving feedback rather than questions or statements.

Yet, some researchers and teachers are still questioning feedback efficacy for L2 students' writing accuracy over years. While some researchers suggested that teachers should avoid overcorrecting students' writing, Simpson (2006) noted that some teachers feel obliged to do so claiming that they give students what they want and expect when submitting their work for teachers. Even though Hyland and Hyland (2006) argued that there are inconclusive answers on this constant debate, a considerable number of studies have explored the effectiveness of both common and less common approaches of providing feedback. For example, Ellis (2009) introduces five types of written feedback: Direct Correct Feedback (CF) and Indirect CF, Metalinguistic CF, Focused versus Unfocused feedback, Electronic feedback, and Reformulation. He pointed out that

direct corrective feedback is effective in helping students to eliminate errors such as grammatical mistakes in the second revised draft. However, there has been no sufficient evidence that they will avoid these errors in future work.

Thus, the teachers' feedback has a positive impact on students' writing, editing, revision, and rewriting. The studies of this part showed a variety of ways of giving feedback, subsequently a great range of perceptions on one method over the other. While some found corrective feedback is the ultimate solution for frequent errors, others found it discouraging. While some researchers think that teachers should correct each and every mistake, others argued about the benefits of targeting one type of errors in each draft. However, most studies focused on the importance of giving clear and timed feedback as if students do not understand teachers' feedback, they will stop trying to re-correct their errors. All in all, the studies revealed that there is no more "one size fits all." Having said this, teachers should use a variety of feedback strategies to help the students to learn better.

Peer Feedback:

Peer feedback, that is sometimes referred to as peer response or peer review, is the "use of learners as sources of information, and interactions for each other in such a way that learners assume roles and responsibilities normally taken on by a formally trained teacher, tutor, or editor" (Liu and Hansan, 2002). Peer response is one form of feedback that is powerfully supported theoretically and empirically in the fields of English as a Foreign Language (EFL)/ English as a Second Language (ESL) literature (Rahimi, 2013). According to Liu and Hansan (2005), peer feedback if implemented accurately, it "can generate a rich source of information for content and rhetorical issues, enhance intercultural communication, and give students a sense of group cohesion" (p.31). Considering it as a valuable alternative to traditional ways of feedback, peer feedback also has several significant benefits including: exposing learners to a larger range of comments about their writing; allowing more space for interactive and collaborative learning; generating positive

discussion among learners and enhancing the sense of an audience (Séror, 2011). This notion is strongly supported by Rollinson (2005) who highlighted the benefits of peer review. He states, "It may be that becoming a critical reader of others' writing may make students more critical readers and revisers of their own writing" (p.24).

METHODOLOGY:

Participants:

A purposeful sampling was made of 100 Saudi undergraduate female students from three different levels (elementary, pre-intermediate, intermediate) based on their grades in the placement test conducted at the beginning of each year, and of 20 Saudi female teachers with teaching experience that ranges from 2-10 years.

Instrumentation:

A rating scale questionnaire that consists of nineteen close-ended questions and one optional open-ended question was used for both groups of participants. Most of the items in this questionnaire are based on Ali (2011) and Susanti's (2013) studies with a few modifications to suit research questions and design. Other items were developed by the researcher, based on a previous EFL teaching experience in the Saudi context. The questions revolved around different types of feedback (Written, Oral, Grammar, Spelling, Punctuation, Vocabulary Choice, Content, Style, Organization, Direct, Indirect, Major, Minor, Feedback on the first draft, Feedback on the final draft). Teachers and students had two separate questionnaires with the same questions. The participants were asked to express their opinions by responding to the questionnaire intended using the Likert scale (Not Helpful at All 1 – 2 – 3 – 4 – 5 – 6 – 7 Very Helpful) (see Appendix A and B).

Procedure:

As this study was designed for participants at King Abdulaziz University , Jeddah, Saudi Arabia, one of the first steps to do this study was obtaining a letter of approval from the

English Language Institute at King Abdulaziz University, in which I work as a language instructor. After that, I got the approval from the institution's Vice Dean. The next step was recruiting the participants (teachers and students).Every effort was made to make sure that the students understood that they had to do to participate in the study and that not doing so would not in any way affect their position in the class and institution.

Data Analysis:

The data were analyzed by using the Statistical Package for Social Sciences (SPSS) (Version 20 software).In order to answer the research questions and to determine whether there are any significant differences among the groups, one-way ANOVA (analysis of variance) was used.

RESULTS:

This part provides the finding of the statistical analysis of the data collected from the questionnaire. The data were analysed to answer the two research questions:

1. What are the Saudi female teachers' understanding of the role and importance of feedback?
2. What are the Saudi female students'' understanding of the role and importance of feedback?
3. What types of feedback do female Saudi teachers use?
4. How do female students perceive each type of feedback?

In order to answer the four research questions mentioned above, the researcher used descriptive statistics in which the mean and standard deviation scores were analyzed to see how the participants rated each type of feedback. The research questions were answered based on the participants' position (students or teachers) and students' level (elementary, pre-intermediate, and intermediate), the types of feedback teachers use and students' perceptions of each type. Based on the participants rating for all different types of feedback, peer feedback was found higher on the surface level errors (Total Mean= 3.93), (Standard Deviation = 2.334), and for peer feedback on the content (Total Mean=3.93), Standard Deviation =

2.069). However, none of the teachers' feedback types received a low mean except question (9) which examines the participants' perspectives on circling or underlining the errors only as (Total Mean=2.48), Standard Deviation= 2.000).The feedback practices were divided into five categories: a) oral and written feedback, b) feedback on the writing features, c) direct and indirect feedback d) feedback on the first and final draft, and e) feedback from peers.

Table 1. Students' and teachers' ratings for different types of feedback

Feedback type	Elementary		Pre-intermediate		Intermediate		Teachers	
	M	SD	M	SD	M	SD	M	SD
Written feedback on students'	5.80	1.549	6.50	1.033	6.78	.428	6.45	1.191
Student-teacher conferences	5.64	1.881	6.76	.634	5.22	2.045	6.50	1.192
Correcting grammar	6.27	1.436	6.55	1.132	6.61	.850	4.80	2.353
Correcting spelling	6.16	1.462	6.66	.938	5.89	1.641	4.60	2.280
Correcting vocabulary choices	6.11	1.418	6.55	.891	5.94	1.349	5.10	1.889
Correcting punctuation	5.82	1.795	6.00	1.860	5.44	1.688	5.30	1.838
Comments on writing style	5.89	1.498	6.08	1.617	5.89	1.367	5.05	2.305
Comments on organization of ideas	5.61	1.807	6.13	1.339	5.94	1.474	5.65	1.565
Correcting the errors only by showing where they are	2.64	2.103	1.71	1.354	2.28	1.904	3.80	2.262
Crossing out the error and providing the correct answer	6.16	1.311	6.26	1.688	5.94	1.626	5.10	1.944
Showing the error and giving a clue on how to correct it	4.55	1.886	5.87	1.379	5.33	1.940	5.05	2.235
Crossing out errors and using codes for different types	4.27	2.084	4.00	2.337	3.94	2.508	5.80	1.704
Correcting errors mainly on the first draft	5.25	2.451	4.03	2.455	5.33	2.000	6.30	1.129
Correcting errors mainly on the final draft	2.93	2.276	4.34	2.374	3.61	2.227	4.65	2.183
Focusing on type of errors in each draft	2.57	2.214	2.47	2.037	3.72	2.396	3.60	1.930
Correcting with a red pen	5.07	2.150	4.18	2.437	4.33	2.521	4.45	2.395
Using supportive phrases	5.98	1.823	6.18	1.411	6.50	.985	6.85	.489
Using peer feedback on surface errors (grammar, spelling ,etc.)	3.64	2.363	2.87	1.848	4.33	2.449	6.20	1.196
Using peer feedback on writing style and content	4.27	1.933	2.68	1.526	3.72	2.052	5.75	1.773

Written and oral feedback:

As shown in table 1, the difference between the mean and standard deviation in the written and oral feedback was not a large one: for written feedback (Total Mean=6.27), Standard Deviation= 1.263), while for the oral feedback (Total Mean=6.07), Standard Deviation= 1.610). Still, two thirds of the student participants, particularly the elementary and intermediate levels, found written feedback is more effective than the oral one: elementary (Total Mean=5.80), Standard Deviation= 1.549) intermediate: (Total Mean=6.78), Standard Deviation= .428). Interestingly, teachers rating for both types (written and oral) were very similar, (M=6.45, SD=1.191) for written feedback and (M=6.50, SD=1.192) for oral feedback. So we can conclude that teachers believe that oral feedback is as effective as written feedback.

Teachers' Feedback on the Writing Features: Grammar, Spelling, Vocabulary, punctuation, Writing Style, and Organization of Ideas

There were four questions that were designed to investigate the students and teachers' perspectives on the effectiveness of feedback on grammar, spelling, vocabulary choices, and punctuation respectively. Two groups of participants, elementary and intermediate level students rated feedback on grammatical errors as the most helpful with (M=6.61, SD= .850) for Intermediate level and (M=6.27, SD= 1.436) according to elementary level. However, for the pre-intermediate level, feedback on spelling errors came first with (M=6.66, SD= .938). Vocabulary choice was perceived as an important feature that comes after grammar and spelling, pre-intermediate level considered feedback on vocabulary very helpful by rating it (M=6.55, SD= .891), elementary found (M=6.11, SD= 1.418), and intermediate (M=5.94, SD= 1.349). However, it was interesting to see that the three groups of students perceived feedback on punctuation as the least important, whereas feedback on spelling errors received the lowest rating by teachers with (M=4.60, SD= 2.280).

Feedback on the Writing Style and the Organization of ideas

Feedback on the writing style had the lowest mean score by teachers (M=5.05, SD= 2.305) while the highest mean score was given by the pre- intermediate level (M=6.08, SD= .1.617). The pre-intermediate level has also rated the organization of ideas as the highest in all the four groups with (M=6.13, SD= 1.339), whereas the lowest mean score for the organization of ideas were given by the elementary level with (M=5.61, SD= 1.807).

Direct and Indirect Feedback

As shown in table 1, all four groups preferred *direct feedback* where teachers show the students where the errors are, and provide the correct words or structures as the most effective type of feedback. All participants rated direct feedback as follows: pre-intermediate (M=6.26, SD= 1.688), elementary (M=6.16, SD= 1.311), intermediate (M= 5.94, SD= 1.626), teachers (M=5.10, SD= 1.944). Among all the three types of *indirect feedback*, showing only where the error is by crossing it had the lowest mean score by the four groups, elementary (M=2.64, SD= 2.103), pre-intermediate (M=1.71, SD= 1.354), intermediate (M= 2.28, SD= 1.904), teachers (M=3.80, SD= 2.262). The second lowest mean score was given to showing the type of errors by coding. All the three groups of students rated it as less effective than showing the error and giving a clue on how to correct it. Conversely, teachers rated coding the errors with (M=5.80, SD= 1.704) while showing the error and giving a clue to correction was given (M=5.5, SD=2.235).

Feedback on the first and final draft

Three groups of participants have agreed that feedback on the first draft is significantly helpful comparing to feedback on the final draft. Teachers ranked feedback on first draft by (M=6.30, SD= 1.129), intermediate Level (M=5.33, SD= 2.000), elementary (M=5.25, SD= 2.451). Nevertheless, the pre-intermediate level perceived feedback on the final draft slightly more helpful than feedback on the first draft (M=4.34, SD= 2.374) comparing to (M=4.03, SD= 2.455) for feedback on the first draft.

Peer feedback on surface level errors (spelling, grammar, vocabulary and punctuation) vs. peer feedback on writing style and organization of ideas

As shown in table 1, teachers believed that peer feedback on surface level errors is more helpful than peer feedback on writing style and idea organization, pre-intermediate and intermediate level students have the same view. Their rating is as follows: teachers (M=6.20, SD= 1.196), intermediate (M=4.33, SD= 2.449), pre-intermediate (M=2.87, SD= 1.848). Yet, the elementary level students have a different point of view; they believe that they need their peers to provide them with feedback on the writing style and ideas organization (M=4.27, SD= 1.933) more than spelling and grammar (M=3.64, SD= 2.363).

Miscellaneous types of feedback (general praise, using red-colored pen, and focusing on one type of error in each draft)

All four groups of participants perceived the teachers' use of "general praise": phrases like: "excellent", "well done" or "great", as a very helpful form of feedback. Teachers rated general praise as high as (M=6.85, SD= .489), intermediate (M=6.50, SD= .985), pre-intermediate (M=6.18, SD= 1.411), elementary (M=5.98, SD= 1.823). All participants' perspectives of using red pen was similar to a great extent; the same is true concerning focusing on one type of error in each draft. Elementary and pre-intermediate levels don't think that focusing on one error is helpful as they rated it (M=2.57, SD= 2.214) (M=2.47, SD= 2.037) respectively. The intermediate level and teachers rated it slightly higher by (M=3.72, SD= 2.396) (M=3.60, SD= 1.930), subsequently.

To add to the credibility and the validity of the results , one-way ANOVA comparing groups was used. Among the 19 questions, there were 13 questions in which the variation between and within the groups was significant, (see Appendix C).The participants' ratings for each type of feedback were processed by SPSS. As mentioned before, there were nineteen questions about a variety of feedback types. Participants were

asked to express their opinions by rating the level of effectiveness of each type on Likert scale(Not Helpful at All 1 – 2 – 3 – 4 – 5 – 6 – 7 Very Helpful). In order to compare the mean scores of more than one group, a one way analysis of variance was carried out (ANOVA). ANOVA investigates the variance in the level of effectiveness between the four groups (elementary, pre-intermediate, intermediate and teachers) (between groups) and the variability within the ratings of each type of feedback (within groups), as the table below shows:

Table 2. One way ANOVA of different feedback types

Feedback types		Sum of Squares	df	Mean Square	F	Sig
Written feedback	Between groups(combined)	17.205	3	5.735	3.852	.011
	Within groups	172.720	116	1.489		
	Total	189.925	119			
Oral feedback	Between groups(combined)	43.164	3	14.388	6.298	.001
	Within groups	265.161	116	2.286		
	Total	308.325	119			
Correcting grammar	Between groups(combined)	47.067	3	15.689	7.176	.000
	Within groups	253.600	116	2.186		
	Total	300.667	119			
Correcting spelling	Between groups(combined)	56.950	3	18.983	8.186	.000
	Within groups	269.017	116	2.319		
	Total	325.967	119			
Correcting vocabulary	Between groups(combined)	28.021	3	9.340	5.049	.003
	Within groups	214.571	116	1.850		
	Total	242.592	119			
Correcting the errors only by showing where they are	Between groups(combined)	59.158	3	19.719	5.488	.001
	Within groups	416.809	116	3.593		
	Total	475.967	119			
Showing the error and giving a clue on how to correct it	Between groups(combined)	36.465	3	12.155	3.689	.014
	Within groups	382.201	116	3.295		
	Total	418.667	119			
Crossing out errors and using codes for different types (G- grammar)	Between groups(combined)	49.720	3	16.573	3.490	.018
	Within groups	550.872	116	4.749		
	Total	600.592	119			
Correcting errors mainly on the first draft	Between groups (combined)	74.276	3	24.759	5.009	.003
	Within groups	573.424	116	4.943		
	Total	647.700	119			
Correcting errors mainly on the final draft	Between groups (combined)	59.291	3	19.764	3.782	.012
	Within groups	606.176	116	5.226		
	Total	665.467	119			
Using peer feedback on surface errors (grammar, spelling,..)	Between groups (combined)	152.601	3	50.867	11.903	.000
	Within groups	459.724	116	4.273		
	Total	648.325	119			
Using peer feedback on writing style and content	Between groups (combined)	131.168	3	43.723	13.407	.000
	Within groups	378.299	116	3.261		
	Total	509.467	119			

As shown above, the F ratio is greater than three in 13 out of 19 instances. This means that the group means in those instances are not equal. That is, there is more variability between and within these groups .More importantly, the *p* value (sig. value) is less than .05 which indicates that there is a significant difference somewhere among the four groups. However, ''an ANOVA provides information on whether or not the groups differ, but it provides no information as to the location or the source of the difference'' (Mackey and Gass, 2005, p.275).

DISCUSSION:

The findings of this quantitative study confirm many of the quantitative results presented by Bitchener and Knoch (2010). Particularly, all four groups showed great preference for *direct feedback* in which the teachers show the students where the errors are and provide the correct words or structures for revision. Whereas circling or underlining the errors only (*Indirect feedback*) received the lowest mean score. As Bitchener and Knoch (2010) noted in their study, all the treatment groups improved their L2 accuracy through the direct feedback. Though, those who received indirect feedback could not maintain what they had learned. In correspondence with Lee (2008); Grami (2005); and Mahfoodh's studies (2011), two groups of students (elementary and intermediate) showed more interest in written feedback over the oral feedback. Garmi's findings indicate that the Saudi university students expect and value teacher's written feedback rather than the oral feedback. Concerning feedback on surface level errors, the findings of this study are similar to Ashwell's (2000) study in which he contended that students value feedback on form more so than the feedback on content. This finding also aligns with the findings reported by Diab (2005). In correlation with Lin (2009), elementary level students, (the lower achievers) rated feedback on grammatical errors as the most important among the other writing features. Lin (2009) argued that lower achievers express a need for feedback on grammar as they believe they lack grammar skills. However, the results of the current study

contradict Bitchener (2008) and Bitchener & Knoch's (2009) results that highlighted the significance of focusing on one or two types of error as a way of improving students' accuracy. In this study, none of the four groups rated this technique as an effective one. Overall, students in the current study valued feedback on surface level errors (grammar, spelling, vocabulary, and punctuation) more than feedback on the content or writing style and treasured teacher's feedback over peer feedback.

CONCLUSION:

Feedback is considered as an important strategy for effective teaching and learning and the development of ESL writing skills. It is an essential part of teaching writing to make students aware what teachers want, value, and expect from students as this will help the students to know how are they going to be assessed, what do they need to do to be successful and therefore have greater motivation and confidence to write. Although the feedback is not the definite solution that will help students to avoid mistakes in the long term, still it is a valuable source of writers. It is indubitable that teachers play an important role in students' attitudes toward feedback through their own feedback and through guiding the process of peer feedback itself. An extensive number of studies referred to in the literature emphasize the importance of raising the students' awareness of the benefits of feedback as well as taking context into consideration when providing feedback. That is said, there is no better feedback technique that is applicable in every context. Therefore, it is the teachers' responsibility to learn new feedback strategies, utilize new techniques, and take students' perspectives on the type of feedback that they find most helpful and which writing features they need to improve.

References:

Al-Hazmi, S. H., & Scholfield, P. (2007). Enforced revision with checklist and peer feedback in EFL writing: The example of Saudi university students. *Scientific Journal of King Faisal University (Humanities and Management Sciences)*, *8* (2),1428H.

Ali, S. (2011). Rationale of remedial feedback in writing class at university Level. *Kashmir Journal of Language Research*, *14* (1), 49-62.

Aljafen, B. S. (2013). Writing Anxiety among EFL students in science colleges and departments at a Saudi university. Unpublished MA Thesis, Indiana University of Pennsylvania.

Ashwell, T. (2000). Patterns of teacher responses to students writing in a multiple-draft composition classroom: Is content feedback followed by form feedback the best method? *Journal of Second Language Writing, 9*(3), 227-257.

Bitchener, J. (2008). Evidence in support of written corrective feedback. *Journal of Second Language Writing, 17*(2), 102-118.

Casanave, C. (2012). Controversy and change in how we view L2 writing in international contexts. In L. Alsagoff., S. McKay & W. Renandya (Eds.), *Principles and practices for teaching English as an international language* (pp. 282-298). New York: Routledge.

Choi, J. (2013). Does peer feedback affect L2 writers' L2 learning, composition skills, metacognitive knowledge, and L2 writing anxiety? *English Teaching*, *68*(3), 187-213.

Diab, R. (2005). EFL university students' preferences for error correction. *TESL Reporter*, *38*(1), 27-51.

Eksi, G. Y. (2012). Peer review versus teacher feedback in process writing: How effective? *International Journal of Applied Educational Studies*, *13*(1), 33-48.

Ellis, R. (2009). A typology of written corrective feedback types. *ELT Journal, 63*(2), 97-107.Freedman, S. (1987). Response to student writing. Urbana Ill.: National Council of Teachers of English.

Ferris, D. (2012). Writing Instruction. In A. Burns. & J. Ritchard (Eds.), The Cambridge guide to pedagogy and practice in second language teaching (pp. 226-235). New York, NY: Cambridge University Press.

Grami, M. (2005). The effect of teachers' written feedback on ESL students' perception: study in a Saudi ESL university- level context. *Annual Review of Education, Communication   and Language Sciences, 2.*

Hamouda, A. (2011). A Study of Students and Teachers' Preferences and Attitudes towards   Correction   of Classroom Written Errors in Saudi EFL Context. *English Language Teaching*, *4*(3), 128-141. doi:10.5539/elt.v4 n3 p128

Hansen, J. G., & Liu, J. (2005). Guiding principles for effective peer response. *ELT Journal, 59*(1), 31-38.

Hyland, K. (2007). Genre pedagogy: Language, literacy and L2 writing instruction. *Journal   of second language writing, 16*(3), 148-164.

Lee, I. (2011). Feedback revolution: what gets in the way? *ELT Journal, 65*(1), 1-12**.**

Liu, J., & Hansan, J. (2002). *Peer response in second language writing classrooms*.   Ann   Arbor,   MI: University   of Michigan Press.

Lin, H. C. (2009). A case study of how a large multilevel EFL writing class experiences and perceives multiple interaction activities.   (Unpublished   dissertation).   Illinois.   Southern Illinois University Carbondale.

Mahfoodh, O. H. A., & Pandian, A. (2011). A Qualitative case study of EFL students'   affective   reactions   to   and perceptions of their teachers' written feedback. *English Language Teaching*, *4*(3).

McGrath, A.L., Taylor. A., & Phycyl, A. (2011). Writing helpful feedback: The influence   of   feedback   types   on students' perceptions and writing performance. *The Canadian Journal for the Scholarship of Teaching and Learning, 2*(2), 1-14.

Mackey, A., & Gass, S. M. (2005). Second language research: Methodology and design.   Routledge.

Mustafa, R. (2012). Feedback on the feedback: sociocultural interpretation of Saudi ESL   learners'   opinions   about

writing feedback. *English Language Teaching*, *5*(3), 3 15.doi:10.5539/elt.v5n3p3

Pallant, J. (2010). SPSS survival manual: A step by step guide to data analysis using SPSS.   McGraw-Hill International.

Rahimi, M. (2013). Is training student reviewers worth its while? A study of how training   Influences the Quality of Students' Feedback and Writing. *Language Teaching Research*, *17*(1), 67-89.

Rollinson, P. (2005). Using peer feedback in the ESL writing class. *ELT Journal,   59*(1), 23-   30.

Seror, J. (2011). Alternative sources of feedback and second language writing development in   university   content courses. *Canadian Journal of Applied Linguistics / Revue Canadienne De Linguistique Appliquee*, *14*(1), 118-143.

Simpson, J. M. (2006). Feedback on writing: Changing EFL students' attitudes. *TESL Canada   Journal, 24*(1), 96-112.

Sugita, Y. (2006). The impact of teachers' comment types on students' revision. *ELT   Journal, 60*(1), 34-41.

Susanti, R. (2013). Students' Perceptions Towards The Effective Feedback Practices in the   Large   EFL   Writing   Class Based on Participants, Gender and English Proficiency   Level. Unpublished MA Thesis, Indiana University of Pennsylvania.

Ur, P. (2012). *A course in English language teaching*. New York, New York: Cambridge University Press. ISBN: 978-1-107-68467-6

Winne, P. H., & Butler, D. L. (1995). Feedback and self-regulated learning: A theoretical synthesis. *Review of Educational Research, 63*(3), 245-281.

Developing life skills in the Egyptian curriculum at primary stage

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Abstract:

*T*his study aimed at evaluating primary stage English curriculum in light of life skills . The study identified the important and suitable life skills for primary stage students by a life skills list that was prepared by the researchers and validated by jury members . The list consisted of twelve categories of life skills and forty nine main skills.   The researchers also prepared a content analysis sheet that was conducted on English curriculum specified for fourth year of primary stage. The content analysis was done in the light of the life skills list . Sentence was used as the unit of analysis for investigating the extent of life skills availability in the curriculum . The results of the content analysis revealed that fourth grade primary English curriculum doesn't reflect life skills sufficiently. Thus , the researchers constructed a suggested framework for developing that curriculum and developed the second term six units of it to improve fourth graders' life skills .

In the light of the study's results, the researchers recommended that a lot of attention and interest should be paid for enhancing students' life skills as early as possible starting from the primary stage, enhancing students' life skills in all educational stages, integrating life skills in curricula , and training teachers on teaching life skills .
Key words : curriculum - curriculum development - life skills – primary stage .

1. Introduction:

Education is not an end but a means to an end . The ultimate goal of education is to prepare students for their future

life. Education commission (2000, p.2) mentions that recently, the concept of " education for life " has attended much interest among educators from all over the world. This concept is based on functionalism that illustrates the relationship between schools and society.   After schooling, students are expected to master a set of life skills to help them function better in various life roles , such as learner , friend , parent , worker ,and citizen. Khosravani , Motallebzadeh and Ashraf (2014, p.265) believe that English language classes and textbooks can be used as tools for improving learners' life skills. Moreovere, they assert that informative textbooks which foster learners' life skills are needed. Applied English Language Teaching (ELT) introduces the concepts and theories like English for life purposes (ELP) and life syllabi . It shows that people are to use English language as a means to improve the life skills of learners and one way to reach this end is enriching textbooks with necessary life skills which are suitable for each society and culture.   English Language teaching can be a good means for improving and developing life skills . Pishghadam and Zabihi (2012, p.97) say that " it is high time to shift the focus of ELT from the linguistic theories to a life – changing status , and one possibility is that life syllabi should be incorporated into the ELT curriculum."

Kagan (2003, p.10) states that nowadays educators are facing a catastrophe, which he referred to as a " life skills crisis ". In his opinion, this crisis resulted from the mismatch between what students acquire in the classroom and the demands placed on them outside the classroom . A lot is taught but little is learned or understood . Knowels (2013, p.6) assures that educators need to admit, face and address the life skills crisis for the happiness and success of students and productiveness and success of the society. Bailey and Deen (2002, p.10) mention that whether referred to as life skills or 21st century skills or soft skills, or social skills , life skills is a broad concept and cannot be defined in one specific category as functioning effectively in society requires a variety of skills . World Health Organization (WHO, 2001, P.1) mentions that life skills are various and implemented in many venues and the meaning of life skills

differs depending on the domain one is using . Life skills have been defined by WHO (2001, P. 3) as the " abilities for adaptive and positive behavior that enable individuals to deal effectively with the demands and challenges of everyday life i.e. communication /interpersonal skills, decision making and critical thinking skill , coping and self – management skills". UNICEF (2006, p.10) adds that through weaving life skills into the fabric of the educational systems , students will be equipped with necessary tools to cope with challenges and confidently make their own way in the world . (Yean 2007; Shea, 2011) support the view that there is a positive relationship between an individual's competence in life skills and one's emotional adjustment, and that deficits in life skills may lead to offender behavior . Accordingly , James (2010, p.3) believes that teachers should ready their students with life skills as foundations for future life and career skills .

Language teaching experts have argued that life skills can be taught in combination with language skills in language learning contexts. Benne(2013,p.5) highlights the fact that learning a language is not limited to learning how to read, write, listen and speak the language, through this process one is supposed to learn a lot about him/herself ; about who he/she is and what his/her values and opinions are .   Knowles (2013, p.6) puts it simple saying " far too often , teachers have sold their students short . They have given them a decent grasp of English grammar . They have given them a reasonably broad vocabulary and they have trained them to jump through the various hoops that examining boards put before them . And they have cast them adrift in the wider world without once considering the kind of flexible, transferable skills they need to really take advantage of the language they've acquired ".

O' Dwyer (2013, p.3) assures that pedagogical leaders in the three educational cycles : primary, secondary, tertiary, need to rethink the pedagogical base of their institutional language teaching practice with a view to reshaping conventional foreign language learning approaches so that the life skill needs of

students are met . Englander (2002, p.8) believes that the classroom language activities that emphasize interaction help students to use language in real contexts . Also, interaction and collaboration among students complement the effective factors in foreign language learning. Self –esteem, empathy, reduced anxiety, and improved attitude as well as motivation are all fostered when students are engaged in genuine interaction.

Botivn and Griffin (2004, p.211) claim that the life skills training process can teach young students how to use good behavior; how to make decision; and how to think critically; and teach them some skills that enhance personal and social competencies. Wanjama (2006, p.19) asserts that life skills empower individuals to think and behave constructively when dealing with issues affecting them as individuals and when they deal with issues of others in the school and larger society. Tukopamoja (2006, p.14) mentions that life skills, when rightly taught in schools, help learners to succeed and experience fulfilled lives in their individual families and the society in general. These skills form the pillars or foundations in one's life to equip students for societal change.   The Central Board of Secondary Education (CBSE) (2013a, p.4) illustrates that exposure to life skills education will:

a. develop a balanced and self – determined individual ;
b. enable an individual to relate successfully with others and the world in general in order to perform their tasks effectively at a given time , in a given situation and at a particular place in all areas of human development;
c. help individuals recognize and assess risky situations;
d. enable an individual avoid unhealthy and unbecoming behavior ; and
e. encourage people to be role models / exemplary with the right attitude to life.

Theron and Dalzell (2006,p.399) claim that life skills can be taught and learnt in a formal educational setting such as the classroom. Life skills education is therefore an important aspect of any learners' holistic education. For this reason, life skills

education has become an integral component of the learning area life orientation, which aims to quip learners with the necessary knowledge, skills, attitudes and values for successful and meaningful living.

1.2. Context of the Problem:

Ozmete (2008, p.5) mentions that the challenges children and young people regularly face are many, and require more than even the best numeracy and literacy skills . That is why 164 nations committed to   " Education for all " (EFA) have included life skills as a basic learning need for all children and young people . Uganda Ministry of Education and Sport (2011, p.5) assures that it has become increasingly clear that prioritization of knowledge at the expense of other aspects of human personality is a very inadequate way of preparing young people for the complex nature and challenges of life . Life skills education became a necessary and critical part of the broader education picture .   Kagan (2003, p.10) states that narrow curricula that focus exclusively on academic achievement and that ignore the traditional social skills and virtues will contribute to the life skills crisis. He said " People need to broaden their curricula to include life skills . The alternative can spell disaster of their students and for their society" . Life skills don't receive enough care despite their importance for daily life . This was proven by many studies that evaluated curricula in the light of life skills such as   Al- Sodany and Al-Masaudy (2011), Saad El-Deen (2007), and Weiss (2007).

Despite their appearance in some contexts , life skills have remained largely in the regality of theory.   They are not given enough time or attention while teaching English to fourth year primary stage students . This can be attributed , in the light of the researchers' experience to the shortage in curricula, the prevailing traditional methods of teaching that focus entirely on intellectual and ignore experiential learning . In a pilot study, the researchers conducted a questionnaire to 30 EFL primary school teachers concerning their opinion about the extent of life skills availability in primary stage English curricula, their students'

life skills, how they are reflected in the classroom and outside the classroom and their role in supporting these skills . They reported students' low level in life skills. They added   that such skills are not an element in the final exam thus it is not focused in their teaching and they are not reflected in the primary stage curricula . The researchers also interviewed a sample of fourth primary stage students (50). Participants were asked to define life skills in their own words. Also, they were asked about their usage of such skills. The results of the interview showed that these students are not aware of such skills and rarely use them . Holding another interview with a sample of students' parents , the results confirmed the same idea . There hasn't been any single study in dealing with developing primary stage English curricula to improve life skills in the Egyptian context . From that perspective, there seemed to be a gap in this field . As a result this study attempted to fill in the gap.

1. 2. Aims of the study:

The study aimed at identifying the most important and suitable life skills for the primary stage, designing an objective instrument to determine to what extent fourth grade primary English curriculum includes the life skills under consideration, investigating the presence of each life skill qualitatively and quantitatively throughout that curriculum and developing it to improve fourth graders life skills .

1.3. Hypothesis of the study :

The study sought to test the following hypothesis :

The fourth grade primary English curriculum doesn't sufficiently reflect the required life skills.

2. Review of Literature:

2.1. Life skills:

2.1.1. Life skills definitions:

Danish (2004, p. 38) stresses that the adoption of a definition is connected with the design and implementation of a life skill program. According to the United Nations Children's

Fund (UNICEF , 2006) life skills refer to " a behavior change or behavior development approach designed to address a balance of three areas : knowledge, attitudes and skills" . The United Nations Educational, Scientific and Cultural Organization (UNESCO, 2009) define them as " a group of cognitive , personal and interpersonal abilities that help people make informed decision, solve problems, think critically and creatively, communicate effectively, build healthy relationships, empathize with others, and cope with and manage their lives in a healthy and productive manner". Due to the varying definitions of life skills and the need for a concise definition for the purpose of this study, life skills are defined as : " a set of learned behaviors which fourth grade primary pupils learn in an organized and intentional way through a developed English curriculum. They aim at building pupils' integral characters and empowering them in a way that enable them to adapt positively in their surroundings and make them able to deal with every day demands and challenges. "

2.1.2 Life skills classifications:

There is no certain list of life skills ; they alter in importance and priority according to life situations, culture, age, position . Moreover , UNICEF assures that life skills are a synthesis.   There are many life skills that are used simultaneously in action e.g. problem solving and decision-making often involves critical thinking , values clarification and team work.

Reviewing many different initiatives for classifying life skills , it becomes clear that there are three dominant types : (a) categorization according to the three personal characteristics : cognitive, social and affective; (b) categorization according to the encountered life situations and the necessary skills to pass them successfully; and (c) categorization according to life roles that one held throughout his life stages as learner , worker , parent , citizen, friend.

UNICEF (2011) website on life skills provides three overarching categories within which the skills are placed : (a)

communication and interpersonal skills which incorporate interpersonal communication skills , negotiation and refusal skills, empathy, and cooperation and teamwork; (b) decision-making and critical thinking skills that include problem -solving and thinking critically; and (c) coping and self-management skills encompass increasing one's internal locus of control , skills for managing feelings and handling stress . The Iowa State University Extension Programs (ISUE, 2012) presents the targeting life skills (TLS) model. In this model, categories of life skills are identified and divided on the basis of the familiar four H's from the 4-H Clover that represent Head, Heart, Hands, and Health. These four "H's" are conforming with the four aspects of a psychologically mature person who is a problem solver (head), empathic (heart), acts on democratic values (hands), and is autonomous and self-directed (health).

2.1.3. Approaches to life skills curriculum:

Mugambi and Muthi (2013, p.5) assert that there are two approaches to life skills curriculum which are the infusion approach and the separate subject approach . Since this study is concerned with integrating life skills in fourth grade primary stage English curriculum, the infusion approach will be discussed in the following lines .

Cronin, Lord and Wendling (2000, pp 306-311) suggest two approaches to integrate life skills in curricula which are as follows :

a. The augmentation approach :

In this approach, life skills that are necessary for the students , and that are related to the topics included in the curriculum are identified . These skills are taught in a part of each period or in one period once a week or in a week dedicated to life skills.

b. The infusion approach :

In this approach, life skills which are necessary for the students are identified and integrated into the curriculum topics. This approach is used to teach life skills within the curriculum , in other words life skills are taught through the curriculum. A lot

of studies recommend the use of the infusion approach in developing life skills such as (Beshara 2009; Goudas and Giannoudis 2008; and Khan 2009). These studies recommend the importance and the effectiveness of teaching life skills within curricula in all academic fields such as science, social studies and Arabic.

Glick (2006, p. 2) describes the infusion approach as a process or a method of seamlessly incorporating real life issues across or within the curriculum. According to Carrim and Keet (2005, p.151) infusion can be categorized into two forms : the maximum infusion and the minimum infusion . The maximum infusion implies a situation in which curriculum speaks more directly or explicitly of an aspect or content in the classroom or as a part of the curriculum . However, the minimum infusion implies when an aspect or content of real life issues such as health promotion, social development and personal development are indirectly or implicitly spoken of a certain curriculum .

The current study adopted the infusion approach because of the following reasons :

a. The infusion approach is suitable for developing life skills through the curriculum , any curriculum , because it doesn't add any new burdens on the academic plan ;

b. The academic plans are crowded and teachers don't have extra time to teach life skills as a separate curriculum ;

c. The infusion approach doesn't add any burdens on the teachers such as extra   classes and teaching extra curriculum ;

d. This approach doesn't add any burdens on the students such as extra curriculum to be studied and extra exams ; and

e. It helps the Ministry of Education to type one book which includes the subject and the life skills included in it, and this saves money instead of typing two books.

3. Method :

3.1. Design of the study:

The study followed the descriptive and analytical design to devise the list of life skills important and appropriate for the

primary stage, to conduct a content analysis for the selected textbooks and to build the framework for the suggested developed curriculum.

3.2. Delimitations of the study :

The study would be delimited to the following:
1. Some life skills .
2. Fourth grade primary English curriculum .

3.3. Instruments of the study:

3.3.1 The life skills list :

The list aimed to determine the most important and appropriate life skills for primary stage students and to be the base for the content analysis checklist. The list included   49 main skills distributed under twelve main categories : skills of knowing and living with oneself (4 skills), social skills   (7 skills), daily routine skills (3 skills), leisure time, safety (11 skills), health (3 skills), cognitive (4 skills), Housekeeping (2 skills), study skills (10 skills), test taking (2 skills), environmental skills and work skills . Sources of the list were determined through reviewing previous literature and related studies concerned with improving life skills e.g. Al-Lolo (2005), Essa (2002), Rassool   and Sharifi (2008), Vajargah , Abolghasemi, and Sabzian (2009), WHO (2001), and WHO (2003) .

3.3.2. Content analysis instrument for analyzing life skills in fourth grade primary English curriculum.

The objectives of this instrument were to investigate the status of life skills in fourth grade primary English curriculum in Egypt. The researchers started with reviewing the related literature in order to develop the needed instrument . The researchers then constructed a content analysis instrument to cover the twelve life skills categories and their (49) main skills .

3.4. The suggested framework of the developed curriculum :

The suggested framework was done after several procedures which were :

1. Identifying the basis for the suggested framework in the light of :

- The list of the life skills necessary for primary pupils .
- The previous studies and researches related to the current study.
- Characteristics and needs of primary stage pupils development.
- The nature of the subject of English and its objectives in the primary stage .
- The nature of life skills and their classifications .
- The basis of life skills curricula.
- The content of the units .
- The results of the content analysis of fourth grade primary English curriculum.

2. Choosing the following (20) life skills   as the major basis for the suggested framework : Food management, safety skills(traffic safety, medicine safety and sun safety), negotiation skills, time management, decision making, problem solving, healthy habits, citizenship, health care emergencies, assertiveness, friendship, team work, communicative skills, leisure time skills, environmental skills, study skills, money management and housekeeping skills .

3. Keeping the current four lessons in each unit .

4. Reformulating the units to integrate the life skills intended.

5. Supporting the content with information , activities , songs and games to improve life skills .

6. Using assessment tools such as situation tests , observation sheets and scales to assess students' life skills .

In addition to the above, the following aspects had to be considered :

1. The philosophical base for the suggested framework ;
2. The objectives of the suggested framework ;
3. The content of the suggested framework ;
4. The teaching methods ;
5. The teaching aids and the learning resources ;
6. The educational activities ; and
7. The assessment tools.

4.4. Controlling the suggested framework and making sure of its validity :

After designing the suggested framework , the researchers presented it to (15) jurors to get their opinions concerning :

The framework's consistency with its objectives, the content suitability for primary stage pupils, the suitability of the teaching methods, teaching aids, suggested activities and evaluation tools to achieve the objectives of the suggested framework and the extent of validity of the suggested framework and its applicability.

Some jurors had some views that included omission of some parts and the addition of some others. The researchers took those views into their consideration in reforming the suggested framework.

4.4. 2. Building six units of the suggested framework:

The researchers developed six units for the course of the second term following the stages of building the suggested framework . Then the six units were offered to 15 jurors . They had some views that included omission of some parts and the addition of some others. The researchers took those views into their consideration in reforming the suggested framework.

5. Data analysis and Results:

Data analysis showed that the fourth grade primary English curriculum does not sufficiently cover the life skills important

for primary stage students. Skills of knowing and living with on self are slightly represented with the percentage of (2.4%). The four life skills in this category: self-awareness, assertiveness , coping with emotions and coping with stress are slightly represented. Self-awareness is represented with the percentage of (0.3%), assertiveness is represented with the percentage of (1.2%), coping with emotions is represented by (0.6%) and coping with stress is represented by (0.3%). The representation of life skills in this category is remarkably limited , superficial and do not help in improving the life skills for students .

With regard to social skills , they are generally represented with the percentage of (43.8%). Communication skills gain the highest representation among social skills (39.8%). Empathy and negotiation skills   come in the second place with the percentage of (1.3%) . Friendship skills come in the third place with the percentage of (0.7%). Family skills come in the fourth place with the percentage of (0.4%). Citizenship comes in the fifth place with the percentage of (0.1 %). Teamwork is not represented at all; i.e. it is totally ignored . The representation of life skills in this category is clearly limited , superficial and does not help in improving the life skills for students.

As for daily routine skills, they are generally represented with the percentage of (2.5%). Money management gains the highest representation among daily routine skills (1.2%). Food management comes in the second place with the percentage of (0.7%).   Time management comes in the last place with the percentage of (0.6 %). The representation of life skills in this category is limited, superficial and does not help in improving the life skills for students . Concerning leisure time skills they are represented with the percentage of (0.6%) .   The representation of life skills in these categories is obviously limited , superficial and does not help in improving the life skills for students.

With regard to safety skills they are totally represented with the percentage of (0.2%) . They represent just one sentence which deals with sun safety. The other safety skills including :

home safety , gas safety , kitchen safety, natural disasters safety , fire safety , internet safety , traffic safety , medicine safety , electricity safety and strangers safety are totally ignored. In other words they are not represented at all and their percentage is (0%).

Concerning the health skills, they are represented with the percentage of (3.5%). Emergency health care skills come in the first place with the percentage of (1.6%). Healthy habits skills come in the second place with the percentage of (1.03%). Personal hygiene skills come in the last place with the percentage of (0.9%). The representation of life skills in this category is limited , superficial and does not help in improving the life skills for the students.

With regard to housekeeping skills, they are represented with the percentage of (0.3%). Housekeeping cleaning skills is represented with the percentage of (0.3%). Housekeeping conserving skills are totally ignored . They are not represented and their percentage is (0%). As for the cognitive skills they are represented with the percentage of (1.5%). Decision making is represented with the percentage of (0.7%). Problem solving is represented with the percentage of (0.7%). Critical thinking skills and creative thinking skills are totally ignored . They are not represented and their percentage is (0%). The representation of life skills in these categories is limited , superficial and does not help in improving the life skills for the students.

Concerning the study skills , they are represented with the percentage of (0.3%). Organization skills are represented with the percentage of (0.3%). While the study strategies are totally ignored . They are not represented at all. Test taking skills are totally ignored and they are not represented at all . As for the environmental skills , they are represented with the percentage of (1.2%) . Work skills are totally ignored and they are not represented at all. The representation of life skills in these categories is limited , superficial and does not help in improving the life skills for the students .

The previous results show the lack of life skills in fourth grade primary English curriculum . Table (1)   presents these results .

Table (1). The results of the content analysis .

No.	Skills	percentage
1	Skills of knowing and living with oneself	2.4%
2	Social skills	43.8%
3	Daily routine	2.5%
4	Leisure time	0.6%
5	Safety	0.2%
6	Health skills	3.5%
7	Housekeeping skills	0.3 %
8	Cognitive skills	1.5 %
9	Study skills	0.3 %
10	Test taking strategies	0 %
11	Environmental skills	1.2 %
12	Work skills	0 %

6. Conclusion :

From the results reached, it can be said   that fourth grade primary English curriculum does not reflect the life skills that are necessary for primary stage students sufficiently. There are no objectives that are related to life skills in this curriculum, the content is limited and superficial and does not reflect the life skills appropriately , the activities do not foster improving fourth graders life skills and there are no assessment tools to assess students' life skills. The   representation of life skills in this curriculum is limited , superficial and does not help improve the life skills for students . With reference to the aforementioned results , the following conclusions can be drawn :

a. There is a need for developing EFL primary stage curricula to include the necessary life skills for primary stage students .
b. EFL curricula can be modified to play an active role in improving life skills for students .

5.1. Recommendations:

On the basis of the previous results, the following may be suggested:

a. A lot of attention and interest should be paid for enhancing students' life skills as   early as possible starting from the primary stage.

b. Life skills in all educational stages need to be enhanced .

c. EFL curricula should represent suitable life skills in a simple way and provide theoretical as well as practical life skills knowledge.

d. Teachers should be aware of the importance of life skills and how to teach them effectively.

e. Curriculum developers , designers , publishers and authors should take into consideration integrating life skills in curricula.

f. Providing orientation workshops on life skills.

g. Intensive research on life skills should be conducted.

References:

Al-Lolo , F. (2005). The life skills included in Palestine science curricula for first and second basis grades . A research presented at the conference of the Palestinian child and the future challenges . Faculty of education . The Islamic university . Gaza.

Al-Sodany , A. and Al-Masaudy, A . (2011). Analytical study of the biology books for the intermediate level in the light of life skills . Al- Kadeseya Journal Of Arts and Educational Sciences . 10 (3 &4) , 117-127.

Baily , S. J. and Deen , M.Y. (2002). Development of a web- based evaluation system : A tool for measuring life skills in youth and family programs . Family Relations . 51 ,pp.138-147.

Benne, R. (2013). Life skills in and beyond the classroom. Macmillan life skills : Language is a life skill newsletter. Retrieved March 25,2014, from http:// www. Macmillan english.com/ life skills .

Beshara , G. (2009). Including some current life skills in education curricula: Dialogue and acquiring its life skills. A

study presented at the conference of " Towards best investment of educational and psychological sciences in the light of age challenges ". Faculty Of Education, Damascus university .(25-27,October).

Botvin, G.L and Griffin , K.W. (2004). Life skills training : empirical findings and future directions . Journal Of Primary Prevention . 25(2),211-232.

Carrim, N. and Keet, A. (2005). Infusing human rights into the curriculum. The case of south African revised national curriculum statements . Perspective In Education . 23 (2).

CBSE (2013 a) . Teachers's manual life skills class VI . Central Board of Secondary Education , India .

Cronin, M.E., Lord, D. and Wendling, K.(2000). Learning for life: The life skills curriculum. Interventions In School And Clinic . 26 (5).

Danish, S. (2004). Enhancing youth development through sport . World Leisure. 46 (3).

Education commission . (2000) . Learning for life , learning through life : Reform proposal for the education system in Hong Kong . Hong Kong special administrative region of the people's Republic of China : Education Commission.

Englander, p. (2002). Communication skills and self –esteem in prevention of destructive behavior . Adolesence ,14.

Essa , E . (2002) . The effect of a suggested training program on developing some life skills among a sample of the primary school pupils . Unpublished master's thesis. Faculty of education. Al- Azhar university . Cairo , Egypt.

Glick, R. (2009). Network for dissemination of curriculum infusion, student handbooks: curriculum infusion of real life issues. North eastern IIinois university .

Goudas, M. and Giannoudis , G. (2008). A team-sports based life-skills program in a physical education context . Learning And Instruction. 18.

James , O . (2010). Awareness and application of life skills education in primary schools in post- conflict areas : A case of Kalaki County Kaberamaido District . Unpublished master's thesis . Makerere university , Kenya.

Kagan , S. (2003). Addressing the life skills crisis. San Clemente , CA: Kagan publishing .

Khan, S. (2009). The application of Quran and Hadith in the teaching of life skills in Muslim schools in South Africa . Unpublished master's thesis. University of South Africa.

Khosravani , M. , Motallebbzadeh , K and Ashraf , H. (2014). Designing a life skills questionnaire for analyzing the socio-cultural constructs of EFL text books . International Journal Of Language Learning And Applied Linguistics World (IJLIALW), 5 (1) , 265-273.

Knowel , S . (2013). Life skills: What they are and why we need to teach them . Macmillan life skills: Language is a life skill newsletter. Retrieved March 25, 2014, from http:// www.macmillanenglish.com/life_skills.

Mugambi, M. and Muthui , R. (2013). Influence of structural context on implementation of secondary school life skills curriculum in Kajiado County , Kenya . International Journal Of Education And Research . 1 (3) , 1-22.

Ozmete , E. (2008). Building life skills for empowerment of young people : A conceptual analysis . Faculty of health sciences . Ankara university.

O' Dwyer, S. (2013) . Resilience in family carers of people with dementia. A pilot qualitative study . Aging and Mental Health .17 (3).

Pishghadam , R and Zabihi ,R. (2012). Establishing a life language model of proficiency : Anew challenge for language testers. Iranian Journal Of Language Testing . 2(2) , 93-108.

Rassool , K and Sharifi , H . (2008) . Preparation and compilation of a life skills curriculum for students in the high school period . Quarterly Journal Of Education Innovation. N 24 , Spring 2008.

Saad El-Deen , H. (2007) . Life skills included in tenth grade technology course and the extent of students' acquisition to them . Unpublished master's thesis. Ain Shams university, Cairo , Egypt.

Shea , P. (2011) . Enhancing life skills development : Chinese adolescents' perceptions . Pastroral Care in Education. Hong Kong University. China.

Theron , L.C. and Dalzell , C. (2006). The specific life orientation needs of grade 9 learners in the Vaal Triangle region . South African Journal of Education . 26 (3) , 397- 412.

Tukopamoja , J.(2006). Adolescent reproductive health and life skills curriculum . Kenya : Path ,USAID and Population Council.

Uganda ministry of education and sport (2011). Life skills curriculum for primary teachers in Uganda . Ministry of education and sport . Republic of Uganda.

UNICEF (2006) . For every child : Health, Education , Quality , Protection , Advance , Humanity , which skills are life skills ? Module 7 : Life skills . Retrieved May 25, 2014, from http:// www.unicef .org / lifeskills /index _ which skills html/.

Vajargah , K . Abolghasemi , M and Sabzian , F. (2009). The place of life skills education in Iranian primary school curriculum . World Applied Sciences Journal , 7 (4) , 432-439.

Wanjama, L. (2006). Life skills : A hand book for parents and teachers. Nairobi : The Jomokenyatta foundation.

Weiss , M. (2007). Positive youth development through sport : comparison of participants in the First life skills programs. Journal of Sport and Exercise Psychology ,   29, pp. 212 - 228.

WHO (2001) . Regional framework for introducing life skills education to promote the health of adolescents: World Health Organization . Regional office for south –east Asia , New Delhi , India.

WHO (2003). Skills for health, Skills based health education including life skills : an important component of a child friendly health promoting school . WHO , Geneva.

Yousefzadeh , M., Naderi , E ., Shariatmadari , A and Seifnaraghi , M. (2011).Curriculum design of life skills for undergraduate

courses   from the viewpoints of curriculum planning experts .World Applied Sciences Journal , 12 (7) , 973- 978.

Yuen , M . (2007) . Life skills development among junior secondary school students in Hong Kong : Brief report on follow-up survey .   University of Hong Kong. Life Skills development project.

A Suggested Unit in Science for Developing Green Energy Concepts among the Prep Stage Second Graders and their Attitudes towards it

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Abstract:

*T**his study aimed at developing concepts of green energy among second graders at the prep stage and their attitudes towards it. The sample of the study included 50 female students in second grade of the prep stage. Instruments of the study included a test of green energy concepts and a scale of attitudes towards green energy and its applications. The instruments were administered to the sample, and then a unit on green energy was taught to them. After that, the instruments were administered to the sample again. The results of the study showed the effectiveness of the suggested unit "Green Energy" and that it had a great effect on the sample's acquisition of the green energy concepts and attitudes towards it. The study recommended that the role of the Science curricula should be activated in achieving the aims of green energy as a main goal of teaching Science at the different educational stages. The study also recommended providing the students with enough information and skills about green energy and its applications for developing awareness and attitudes towards it.*

Introduction:

There is no doubt that humanity is about to face a great crisis in energy that may start at any time and paralyze everything. Fossil fuel is consumed; the number of cars increases than before and lights are everywhere; cutting down forests and trees is much faster than before, not to mention the growing increase in the Earth's temperature, and the countries' and governments' conflict to seize the sources of energy or the duplication of energy cost much every now and then.

Energy is a basic pillar of economic, constructional, and social development since the world is facing the problem of the

increase of traditional energy sources, especially their lack in the future and their negative effect on the environment. Renewable and nuclear energy are the basic sources of the international energy. There is an international concern of these two sources as future sources of energy that will be alternatives for fossil energy which many countries, especially industrial ones, seek to replace (Emara, 2007).

Therefore, the young should be grown up in a way that is consistent with the requirements of the future, so that they would have a sound cognitive background about renewable, clean, green energy, good understanding of its applications in daily life and at the national level, and positive attitudes towards it. They should also be able to take decisions related to energy in the future.

Recent curricula represent an important component in the educational process because they are a reflection and representation of the content of this process. They, in their form and increasing renovations in the light of the technological society and the era of information revolution, aim at meeting the students' renewed needs, inclinations, attitudes and abilities in addition to their societies' needs. In addition, the educational problems cannot be solved in isolation of curricula which are related to most educational problems in a way or another and bear a part of the responsibility about inability of education to achieve the individuals' and society's goals. (Mousa, 2012: 2).

Therefore, Science curricula witness continuous movement for development, reformulation and reforming since the mid-twentieth in many countries of the world. Some of the most prominent and important international projects in the area of developing Science curricula are "Scope, Sequence and Coordination (SS&C)", "Science for All Americans (2061)", "Science, Technology and Society (STS)", and "National Science Education Standards (NSES)".

These new projects are concerned with developing the positive situations among the learners. This is because the

students' appreciation for Science may be higher when they realize the benefit of Science in their life, its effect on their food, clothes, the spare time they make use of and the level of life they live. All of this is due to Science and recent technology discoveries and innovations, and because all professions are affected by Science (Alhoweidy, 2005).

Scientific concepts are one of the most important learning outcomes through which scientific knowledge is organized in a meaningful form. They are the organizing and directing elements of any scientific information or knowledge introduced in the classroom or the lab. Forming and developing scientific concepts among learners is one of the aims of Science teaching in all different educational stages. It is also considered of the basics of Science and scientific knowledge which benefit in understanding its general structure and transfer of learning (Alnagdy, Abdelhady & Rashed, 2003; Moustafa, 2001).

Developing attitudes, modifying some of them or changing others do not happen merely by providing students with separate rigid facts. Although knowledge and facts are important for forming sound attitudes, they have to be meaningful and functional for the learner. On the other hand, this will not be achieved merely by training. It requires persistence and continuity in order to accomplish the aim of teaching Science in all educational stages (Albaghdady, 2003).

It is natural that our look at teaching, simplifying and disseminating Science changes since we educate the youth to cope with the age and become able to take the responsibility for the development and progress of society. We also prepare the youth to be able to face the individual and group problems in the style and way that suit the different discoveries they have to use and understand, and provide safety means so that they become useful tools that benefit and serve them, not to destroy them (Selim, 2006: 1).

In this respect, the conference of "Teaching Science, Technology and the Future Human Needs" was held in India in

1985. It was concerned with working beyond the traditional frame of the different branches of Science (Physics, Chemistry and Biology). It focused on eight interdisciplinary topics that were considered necessary and of importance to Science Education. They are health, agriculture and food, the environment, information and communication technology, mineral wealth, water and land, technology and industry, social responsibility and morals, and sources of energy (Shabara, 1998: 372).

Some studies were concerned with identifying the fields of the technological and scientific innovations. Others were concerned with identifying the effectiveness of teaching some recent scientific fields in Science and its branches such as Nasr (1997), Ismail (2000), Alzaaneen (2002), Alloulou (2004), Abdelhady (1999), Khalifa (2003), Alweseimy (2003), Aloleimy (2007), Abou Fouda (2010), Alhabahba (2011), National Center for Educational Research and Development (2011) and Lebad (2013). These studies identified the contemporary technological and scientific changes as environmental issues, energy and the future, agricultural sciences and food, medical sciences, medicine and medical industry, genetic engineering, geological sciences, new materials, agricultural technology, technology of education, information and communication technology, food production, population education, astronomy and space exploration, renewable energy, producing vital systems engineering and the technological development of production equipment.

There is no doubt that the issue of energy is an international one that should be integrated in the Science curricula since caring for them is a required matter at this stage in which the energy issue faces a real crisis at the Arab and international levels.

Energy is the main pillar of economy and an important indicator of the peoples' progress. Thus, development rates in every country are closely related to the available sources of energy in order to achieve the development programs where the demand for energy increases because of the technological and

scientific development in all fields. There are many fears about expectations of consumption of energy sources especially the traditional ones such as coal, petrol and natural gas. This fear urged many countries to search for alternative resources for energy. Visions were directed towards the permanent renewable sources such as the solar energy, the wind, waterfalls and tidal energy. Thus, the term "alternative sources of energy", "renewable energy" or "green energy" appeared (Shalaby, 2006: 9).

Based on this increasing importance of green and renewable energy during the last period, it should be paid due concern in Science Education at the national and the international levels. Therefore, some studies have been concerned with developing the students' awareness of the concepts and sources of green and renewable energy such as Kroll (1992) which presented a suggested curriculum that includes seven chapters which include concepts about renewable energy and solar energy. Weiskopf (١٩٩٧) introduced a CD to the sample of his study that included a definition of renewable energy, its sources and effects on society. Martin and O'Toole (2002) introduced presentations about renewable energy for the school students.

Other studies investigated the teachers' attitudes towards sources of green energy such as Liarakou, Gavrilakis and Flouri (2009) which aimed at identifying the secondary stage Greek teachers' attitudes towards sources of green and renewable energy especially the solar system and the wind. This was done through a questionnaire that included a group of open ended and closed questions. Results showed that the teachers do not show clear position towards many issues related to the solar system and wind energy. They also have a relatively low level of belief that sources of renewable energy may be sufficient for the future needs of energy. The study also indicated that such results can't show the extent of teachers' effect on the students' opinions and attitudes towards renewable energy.

Some studies identified the students' awareness of and attitudes towards green and renewable energy. Coker, Catlioglu and Birgin (2010) aimed at identifying the Turkish primary and secondary stage students' knowledge about sources of renewable energy using a group of open- ended questions. The study recommended the necessity of integrating the concepts of energy in different curricula. Alsamoraey (2011) aimed at identifying the extent to which the students in the Faculty of Education and the Faculty of Science in Baghdad acquired the concepts of renewable energy and its relationship to environmental awareness among them. The study showed that the students' acquisition of the renewable energy concepts reached 45% in addition to the environmental awareness acquisition. DeWaters and Powers (2011) assessed energy literacy among the secondary stage students in New York. The results showed that the students were concerned with the problems of energy. Yet, they poorly acquired the concepts and skills which contribute to solving these problems. The study showed a need for teaching that enhances the students' literacy about energy through a scientific content, and affects their attitudes, values and behaviors.

Zyadin *et al.* (2012) identified the students' knowledge, conceptions and attitudes towards renewable energy in Jordon which is a country that extensively depends on fuel energy although it owns sources of renewable energy. A questionnaire was prepared to better understand the role of education in increasing the students' awareness of renewable energy. It was distributed to students in rural and urban areas in Jordon. The results indicated the students' limited ability to discriminate sources of renewable energy from the non-renewable ones. The results also revealed that more than 50% of the students were not aware of biofuels. However, 87% of the students considered renewable energy the best choice in the future. They showed positive attitudes towards selecting renewable energy even if it is costly. In addition, the study showed that females were more knowledgeable about sources of renewable energy than males and those urban students were more aware and more supportive

to renewable energy than rural students. The study asserted the importance of teaching renewable energy as early as possible to encourage the development of renewable energy which is considered necessary for decreasing the danger of the environmental problems related to fossil fuel.

Table 1: Results of analyzing the Science textbooks at the primary, prep and secondary stages

The primary stage	The prep stage	The secondary stage
Grade: Fourth primary **Lesson: Forms and transformations of energy** ***Mentioning using solar cells for generating electric energy in about one paragraph.** **Lesson: Sources of energy** ***Mentioning the importance of the sun and that it is the main source of energy on Earth.** ***A paragraph about the benefits of the solar energy.** ***A paragraph about using solar energy for getting electricity.** ***A paragraph about windmills which control turbines for generating electricity.** ***A paragraph about using solar energy for warming.** ***Mentioning wind energy (in about one line), tidal energy (one paragraph), waterfalls' energy (in about one line) as examples of renewable energy.**	**Grade: First prep** **Lesson: Energy: its sources and forms** ***Giving some examples of sources of renewable energy such as the sun, wind and water movement only.** ***Showing an activity that includes mentioning sun cell, and wind turbines.** **Lesson: Thermal energy** ***Mentioning some examples for some technological applications of renewable energy which produce heat.**	**Grade: First secondary (Physics)** **Lesson: Work and energy** ***A paragraph about renewable energy** ***Mentioning a film on the book's electronic website about the different sources of energy and its environmental effects.**
Grade: Fifth primary **Nothing**	**Grade: Second prep** **Nothing**	**Grade: Second secondary** **Nothing**
		Grade: Third secondary (Physics) **Nothing**
Grade: Sixth primary **Nothing**	**Grade: Third prep** **Nothing**	**Grade: third secondary (Subject: Environmental and Geological Sciences)** ***Mentioning (in about two lines) the importance of using solar, wind and waterfall energy as alternatives for fossil fuel.** ***Mentioning (in about two lines) the necessity of manufacturing cars that work with electricity generated by solar energy.** ***Mentioning (in about one line) transforming animals' wastes to methane to be used as fuel.**

Pradipta *et al.* (2013) aimed at identifying the students' conception and attitudes towards bioenergy in the Finnish, Taiwanese, Turkish and Slovakian schools as indicators of their use of bioenergy in the future. The study showed that the students' intentions to use bioenergy are related to their conceptions of the social and environmental aspects of bioenergy and that the level of the students' knowledge about it significantly affects their intentions to use it in the future.

At the national level, Fouda and Ezzeddein (2015) analyzed the trends of the studies in the Journal of the Egyptian Society of Science Education and its conferences in light of the excellence fields of Science Education. The researchers reached six fields of excellence; recent scientific fields in Science and its branches are among them. The study pointed out the scarcity of the studies that paid concern to recent scientific fields in Science and its branches. The number of studies was five (only 0.81%) out of the total number of studies. In addition, the studies focused on suggesting programs or instructional units in the fields of nanotechnology, genetic engineering and biological war. Only one study focused on the outer space and the universe while no study was conducted on energy and its forms.

The researcher analyzed the primary, prep and secondary stage Science textbooks to identify the extent to which they tackle concepts of green and renewable energy. Table 1 presents the results of this analysis.

It is clear, from table(1), that the Science curricula of the primary fifth and sixth grades, prep second and third grades, the Physics, Chemistry and Biology curricula of the secondary second grade, and Biology and Chemistry curricula of the secondary first and third grades are devoid of the concepts of green and renewable energy. The analysis also showed that the concepts of green and renewable energy available in some Science curricula were mentioned very briefly. It also showed the absence of many of the areas and concepts of green and renewable energy in these curricula. None of these curricula showed the idea how the technological applications of green energy such as solar water

heaters, solar dryers, solar stoves, solar distillates, solar cookers and wind turbines. Pradipta *et al.* (2013) see that the students are the decision makers in the future and that they will play an important role in transferring the society from the style of living that depends on fossil fuel to that depends on green energy.

Therefore, this study attempts to provide the students at the second grade of the prep stage with concepts of green energy and practical applications. This is an attempt to provide the students with the suitable level of knowledge and literacy, develop attitudes towards green energy so that they can keep up with these developments and to prepare a generation armed with concepts and skills to face life, and practice their role positively in community service.

Problem of the study:

Results of analyzing the Science textbooks at the primary, prep and secondary stages showed that the second grade prep Science textbooks are devoid of the concepts of green energy. In the first term, the book dealt with periodic of elements and their characteristics, the atmosphere and protecting the Earth, and fossils and protecting species from extinction. The second term dealt with periodic motion, sound and light, reproduction and continuity of species. It is also completely devoid of the concepts of green and renewable energy. This result is consistent with Ismail (2000), Moustafa, Korany, Abouelez and Aboushama (2007) and Abderraouf (2008) which showed that the prep stage curricula do not include most of the novelties of the area of energy and green and renewable energy. In addition, the scientific material mentioned here and there is old and needs to be renewed to meet the massive development in these areas.

Many studies that evaluated the content of the Science curricula at different educational stages indicated the poor inclusion of the topics and issues related to scientific novelties, their inability to achieve the aims of Science Education and contemporary Science teaching, and scarcity of the studies concerned with the area of energy and its forms generally (Reyad, 2009; Azzam, 1995; Adly, 2010; Ismail, 2000; Hassan,

2006; Alghareeb, Alsadek and Shoeir, 2012 and Fouda and Ezzeddein, 2015).

Many studies recommended reconsidering the planning, organization and preparation of the Science curricula so that they keep pace with the scientific novelties to match the increasing scientific and information development. They also recommended the necessity of linking the Science curricula to the reality of the scientific, life, economic and universal issues and providing the students with the scientific , motor and mental skills which help them to live in a society which uses science and technology in its daily life (Alzaaneen, 2002; Khalifa, 2003; Alweseimy, 2003; Alloulou, 2004 and Ismail, 2000).

Zyadin *et al.* (2012) recommended the necessity that teaching green and renewable energy would take new paths because Science curricula should include the characteristics of green energy or introducing them in a separate curricula and integrating the recent technologies of renewable energy. In addition, the study recommended the necessity of setting a new teaching strategy for infusing the concepts of renewable energy throughout the pre-university stage.

Therefore, this study attempts to provide the second graders at the prep stage with the concepts of green energy and its practical applications through teaching a unit in Science that includes these concepts aiming at establishing a sound cognitive base about it among them, good understanding of its uses in the daily life and forming positive attitudes towards it. It also aims at making them able to take responsible decisions related to energy in the future.

Based on the aforementioned studies, the problem of this study is formulated in the following main question:

What is the effectiveness of teaching a suggested unit in Science in developing the concepts of green energy among the second graders at the prep stage and their attitudes towards it?

This question is divided into the following sub-questions:

1. What is the content of the suggested unit in Science which aims at developing the concepts of green energy among the second graders at the prep stage and their attitudes towards it?
2. What is the effect of teaching the suggested unit in developing the concepts of green energy among the second graders at the prep stage?
3. What is the effect of teaching the suggested unit in developing the prep second graders' attitudes towards green energy and its applications?

Aims of the study

This study aimed at:

1. Preparing a manual for teaching the suggested unit that can be used by the teachers and researchers as a guide.
2. Identifying the effect of teaching the suggested unit in developing the concepts of green energy among the second graders at the prep stage.
3. Identifying the effect of teaching the suggested unit in developing the prep second graders' attitudes towards green energy and its applications.

Importance of the study

The importance of this study lies in the following:

1. It is a response to the results and recommendations of many studies and literature in the field which recommended the necessity of linking the Science curricula to the reality of the scientific, life, economic and universal issues (Alzaaneen, 2002; Khalifa, 2003; Alweseimy, 2003; Alloulou, 2004 and Ismail, 2000).
2. Keeping pace with the increasing concern of green and renewable energy at the national and international levels.
3. Keeping pace with the contemporary international changes in developing positive attitudes towards green renewable energy.

4. Introducing a suggested unit in Science about green energy that may be a guide to the Science curricula designers.

Tools of the study

- Test of the Concepts of Green Energy.
- Scale of Attitude towards Green Energy and its Applications.

Delimitations of the study

This study is delimited to:

1. Preparing a suggested unit in Science about green energy.
2. Experimenting the unit on a sample of the second graders at the Kasem Ameen Prep School for Girls, Alexandria Governorate, Customs Educational Idara.
3. Measuring the students' achievement of the concepts and knowledge of green energy at three levels (knowledge, comprehension and application).
4. Measuring the students' attitudes towards green energy and its practical applications.

Hypotheses of the study

1. There is a statistical significant difference at $p < 0.05$ between the mean scores of the students in test of concepts of green energy before and after studying the suggested unit in favor of the post administration.
2. There is a statistical significant difference at $p < 0.05$ between the mean scores of the students in scale of attitudes towards green energy and its applications before and after studying the suggested unit in favor of the post administration.

Method of the study

This study depended on the descriptive analytic method in preparing the suggested unit and tools of the study. It also used the quasi- experimental design (pre-post one control group) for

identifying the effect of the suggested unit in developing concepts of green energy and attitudes towards it.

Terms of the study

An instructional unit: It is an attempt to organize the experiences of the curriculum, or rather a part of it, in an integrated form to enable the learners to achieve some aims in meaningful ways and significance for them (Addemerdash, 2001).

Green energy: It is clean renewable and environment- friend energy that comes from a natural inexhaustible source. All energy produced by this source can be transformed from one form to another such as the solar energy, the wind energy, waterfalls energy, tidal energy, geoenergy and biomass energy (Ahmad, 2007).

Attitudes: There are many definitions of attitudes, all of them agree that they are learned, i.e. the person can acquire them as a result of involvement and engagement in the situations and external stimuli that affect him in a way or another. As time passes, these attitudes become among the components of personality. An attitude can be defined as the person's general relatively stable feeling which identifies his responses towards a specific topic or issue regarding acceptance or refusal (Annagdy, Rashed and Abdelhady (1999).

Attitudes towards green energy and its applications: It is a situation that expresses the sum of the second grader prep stage student towards the topics of the green energy unit by acceptance, refusal, rejection or opposing.

Review of literature

We live today in a world of increasing change as we live the age of Science. The changes resulting from the scientific and technological development are qualitatively and quantitatively enormous and affect the individuals, societies and nations. Not all the changes happening in the world today are considered the reason of our happiness and welfare of our life. Many of them have severe harms on our health and life. Environment pollution

became a phenomenon we all feel that the environment is no longer able to balance its elements. The cities' atmosphere becomes polluted with the gases coming out of the cars and the factories' chimneys. The ratio of Co_2 in the air increased leading to an increase in the temperature. The ozone layer is affected leading to man's exposure to dangerous diseases. Besides, environmental pollution with petrol wastes leads to endangering the lives of man, animals and plants (Annagdy, Rashed and Abdelhady, 1999).

The studies showed that the rate of world consumption of energy is continuously increasing due to the increasing growth of population and economic growth as well as the increase of the rate of energy consumption per person. Nowadays, the rate of increase in the sources of fossil fuel matches the increasing demand on energy but in the future there will be a shortage. Continuing on the principle that fossil fuel is the main and sole source of energy, and due to burning it, fuel will lead to aggravation of CO_2 increase problem and the greenhouse phenomenon, thus leading to a significant increase in Earth's surface temperature and pollution of the environment (Emara, 2007).

Pradipta *et al.* (2013) assert what has beed said saying that developing the sector of recent bioenergy is an important step towards the society's call for limiting the emission of CO_2 and using environment- friend energy.

Consequently, Emara (2007) sees that the main motive of caring for renewable energy is the environmental motive to limit the emitted gases especially CO_2.

Traditional sources of energy receive a great pressure and an increasing decrease in a period after the collapse of the Soviet Union due to the increasing demand for it. The role of the sources of renewable energy is considered so important to meet the need for energy in the future especially in the population sector (Bahtiyor *et al.*, 2011).

Nigeria's government set a goal to become among the biggest 20 countries in economic in 2020. Therefore, it seeks to achieve sustainable economic growth through a green energy system and developing green energies in all regions in the country as one of the ways to be used for achieving green energy (Akinwale, Ogundari, Ilevbare & Adepoju, 2014).

Using the sun, as a source of energy, is considered among the alternative sources to petrol upon which future hopes are built because it is clean inexhaustible energy. Therefore, many countries are concerned with developing this source and consider it an aim to be achieved. Solar energy is currently used in heating water, warming and cooling as well as in desalination and producing electricity.

Green energy is characterized by some characteristics that distinguish it from other sources of energy. It is:

- Available,
- A national source that does not move, and is compatible with the reality of developing the remote and rural areas and their needs,
- Clean and does not pollute the environment and preserves general health,
- Economical in many uses and has a big economic return,
- Continuously and regularly available with a suitable cost,
- Does not cause any noise or leaves any harmful wastes that pollute the environment,
- Achieving environmental, social, industrial and agricultural development nationwide and
- Using uncomplicated technology and can be locally manufactured (Lehabeeb, 2014).

In Egypt, nonrenewable energy has the biggest ratio where petrol represents 95% of the sum total of the primary energy consumed. Egypt is considered a developing country and in an increasing need for energy to achieve the desired development in all fields: agricultural, industrial, etc. Although Egypt is a petrol

producing country, it is poor in sources of energy since the petrol it produces will suffice it for only tens of years and it does not have any coal supply.

Therefore, there is a need to search for alternatives for energy. These alternatives should be renewable and do not harm the environment and preserve it. Renewable energy such as solar energy, wind energy, biomass energy, tidal energy, and geothermal energy proved to be successful as alternative resources of energy in many studies on the Egyptian conditions (Shalaby, 2006: 14).

A symposium about green energy in Texas concluded that enlightening dialogue about alternatives of energy lead to concern about and support for these resources. In addition, the different kinds of alternative resources of energy such as the wind, biogas and biomass were discussed in addition to stations of energy generation and their effect on the citizens, noise, scent and danger of explosion, etc. (Bahtiyor *et al.* 2011).

Renewable energy includes the solar energy with all its kinds: using the energy of the sun rays through photovoltaic cells, the solar thermal, wind energy, biomass resulting from the plants and animals wastes, geothermal energy resulting from gases and the heat, hydropower, tidal power resulting from the seas' water and wave power (Emara, 2007).

Governments seek to widen the ability of generating electricity from resources such as solar energy stations, wind turbines, hydroelectric turbines and biomasses (Fast and McLeman, 2012). Egypt also seeks to develop the use of renewable energy resources. Organization of New and Renewable Energy was established in 1986 and a strategy for the renewable energy was prepared in 2008 aiming that renewable energy would contribute 20% of the total of the generated electrical power by 2020. The first station for generating electricity from the solar energy was established in Alkorimat

and solar cells were used in the remote areas far from the electricity network (Organization of New and Renewable Energy, 2014).

However, there are some difficulties that face the process of decision making related to renewable energy such as the negative conceptions and attitudes towards renewable energy as a result of lack of the individuals' awareness of information published about renewable energy and their lack of participation in the projects and alternatives of energy. Consequently, the society's awareness of this energy should be developed. Educational curricula are considered the most effective method for building integrated knowledge and encouraging critical thinking about renewable energy in the general and specific applications (Liarakou, Gavrilakis & Flouri, 2009: 120-121).

Therefore, some studies were concerned with identifying the citizens' knowledge and attitudes towards green energy such as Bahtiyor *et al.* (2011) which aimed at identifying the citizens' conceptions about green energy common in Khorezm, Uzbekistan. The study showed that the high cost of green energy and its inability to completely replace the traditional energy are hindrances against renewable energy. However, when financial fund and general awareness are available, they may be motives for this.

Fast and McLeman (2012) identified the citizens' attitudes towards renewable energy technology. An electronic survey was conducted at the beginning of 2011 in the rural eastern Ontario. Participation was high (n= 180, rate of response= 22%). The results revealed strong backup for pursuing the resources of alternative energy (89%). The citizens' backup for solar energy applications was high (87%), for wind turbines and hydroelectric energy was low (58%). The study also showed that rural residents had positive attitudes towards the alternative kinds of producing energy.

Akinwale, Ogundari, Ilevbare and Adepoju (2014) aimed at describing and analyzing the extent to which the citizens

understood the sources of green and renewable energy and their attitudes towards getting them easily and development in Nigeria. The study indicated that a great number of the citizens had knowledge about renewable energy but they didn't understand them deeply. Most of them backup using renewable energy instead of Benzene and they were ready to pay more for electricity supply from green clean energy.

Therefore, many countries prepared educational programs that aimed at developing the students' skills and awareness of the resources of renewable energy. Some of these programs are:

- The project "Green Research for Incorporating Data in the Classroom (GRIDC)" in the U.S.A. aimed at developing higher order thinking skills among the students through collecting comprehensive data about renewable energy (DeLuca, Carpenter & Lari, 2010).
- The program "Mathematics-Science-Engineering-Technology in Iowa on Applied Renewable Energy Areas (MSETI-AREA)" aimed at developing the prep and secondary stage students' understanding of the relationship between Science, technology, engineering and mathematics (STEM) through their applications in the areas of renewable energy (Pecen, Humston & Yildiz, 2012).
- The project "Wind for Schools" was in the U.S.A. about the benefits of wind energy (U.S. Department of Energy's (DOE's), 2007).

In addition, the American Energy Information Administration (EIA) prepared a group of books, films, educational videos, trips, interactive computer programs and workshops for raising the students' awareness of renewable energy (Leonard, 1998). It also prepared an educational program for New Mexico Solar Energy Institute that aimed at enhancing the teachers' ability to teach renewable energy resources (Morgil at al., 2006).

Secken (2006) prepared an instructional material for the primary stage in the form of a puzzle that aimed at teaching them sources of energy and the advantages and disadvantages of renewable energy. Malaysia established Center of Education, Training and Research in Renewable Energy and Energy Efficiency (CETREE) aiming at teaching and training renewable energy to Malaysians and raising their awareness about them (Ibrahim& Hilme, 2007).

Procedures of the study:

First: Preparing the unit:

1. Identifying the aims of the unit:

Educational aims identify learning outcomes the learners are expected to achieve after finishing studying a specific topic or a specific instructional unit. This means that we can identify through them kinds, levels and conditions of learning we want to achieve through the teaching and learning activity and on which we, finally, can identify the extent to which the learners achieved kinds of expected learning. Thus, identifying the instructional aims is a basic stage in the instructional learning process (Alhoweidy, 2005).

By the end of studying the green energy unit, the students will be able to:

1. Define the concept "green energy".
2. Name the different kinds of energy.
3. Distinguish between the energy polluting and destroying the environment on the one hand and green energy on the other.
4. Deduce the advantages of solar energy.
5. Identify the different forms of solar energy stations.
6. Infer the dangers of not using solar energy.
7. Relate using solar energy to preserving human life.
8. Recognize the future of solar energy.
9. Infer the international and national efforts for using solar energy.

10. Infer the factors that stimulate using wind energy as green clean renewable energy than fossil fuel.
11. Explain how to generate wind energy.
12. Identify the components of turbines.
13. Gives examples of the uses of wind energy.
14. Deduce the advantages of wind energy.
15. Identify the disadvantages of wind energy.
16. Distinguish the different kinds of wind turbines.
17. Identify the different applications of wind energy.
18. Explain methods of getting energy from seas and oceans.
19. Deduce advantages of wave and tidal energy.
20. Identify the advantages of electrical power generated from water sources.
21. Explain method of getting tidal energy.
22. Appreciate the efforts of science and scientists in searching for different kinds of green clean renewable energy.
23. Appreciate the country's efforts of using the different kinds of green clean renewable energy.
24. Appreciate the role of mass media of raising the awareness of the different kinds of green clean renewable energy.
25. Acquire a positive attitude towards using the different kinds of green clean renewable energy.

2. Preparing the content of the unit:

The content of the unit was prepared in the light of the identified aims with the help of the Arabic and foreign references and books that dealt with this topic. The content included a group of direct and indirect experiences taking into consideration the logical and psychological organization when organizing the content. The unit included the following topics:

Topic 1: Solar energy:

- Solar energy: A historical overview

- The solar cells.
- Advantages of solar energy.
- Uses of solar energy.
- Solar energy and agriculture.
- Crises that happens when not using solar energy.
- Solar energy in the Arab countries.
- The future of solar energy.

Topic 2: Wind energy
- How to generate wind energy
- Components of air turbine.
- Kinds of air turbine.
- Uses of air turbines.
- Wind energy and producing hydrogen for energy.
- Wind energy and the electric car.

Topic 3: Wave and tidal energy
- Seas and ocean's energy.
- Electric power generated from water.
- Advantages of hydroelectricity.
- Energy of seas and oceans' waves.
- Tidal energy.

3. Identifying the teaching strategies and instructional activities:

Teaching strategies are an important factor of the curriculum as they closely relate to the objectives and content. They also greatly affect the choice of the activities and teaching aids to be used in teaching Science. They highly contribute in achieving the aims of teaching Science as they identify the teacher's and learners' role in the educational process. They are also used in organizing information and the educational experiences to be introduced to the learners and identify the styles and steps to be followed, the aids to be used and the activities to be carried out (Moustafa, 2001).

A group of strategies that suit the topics of the unit such as discussion, brainstorming, inquiry, problem solving, cooperative learning and demonstrations were selected.

Some of the aids and instructional activities used in teaching the unit are:

- Using demonstrations.
- Showing a group of instructional films related to the topics of the unit.
- Making use of some pictures and drawings.
- Assigning some students to prepare posters that stimulate and encourage using green energy.
- Assigning some students to collect some articles that dealt with the topics of the unit from magazines and newspapers.
- Making use of some simplified Science books that dealt with the topics of the unit.

4. Validating the unit to make sure of its suitability

The unit was submitted in its initial form to a panel of jury members interested in Science Education to get their opinion concerning:

- The general form of the unit.
- The extent to which the unit is suitable to the students at the second grade of the prep stage.
- The extent to which the content of the unit relates to its aims.
- The extent to which the topics of the unit are sequenced and related to each other.

Some paragraphs in some topics were rephrased in the light of the jury members' opinions.

Second: preparing the teacher's guide

Teacher's guide is one of the factors of controlling the experimental variable since it presents a manual and guide to the

teacher to get some suggestions that benefit in teaching the unit. The guide included:

- Some teaching strategies from which the teacher can select when teaching the topics of the unit.
- Aims of the unit.
- Models of the lessons in the unit and how to teach them.

Third: Preparing the instruments of the study

1. Test of Concepts of Green Energy

Aim of the test: The test aims at measuring the scientific concepts and knowledge included in the unit "Green energy" among the second graders at the prep stage at the knowledge, comprehension and application levels.

Formulating test items: Test items were formulated as multiple choice with four responses paying attention that the items be distributed to the topics of the unit. The test in its initial form consisted of 50 items.

Test validity: The test in its initial form was submitted to a panel of jury members specialized in Science Education to give their opinion concerning:

- Correctness of the test items concerning phrasing and scientific content.
- The extent to which the test items are related to the topic of the unit.
- The extent to which the test items represent the cognitive level to which they belong.

Phrasings of some test items were modified and some items were omitted in the light of the opinion of the panel of jury members.

Piloting the test: The test was piloted on a sample of second graders at the prep stage (n=60) other than the sample of the study in order to:

- **Estimate test reliability:** Test reliability was estimated using Kudor Richardson (21). The reliability coefficient was 0.76 which indicates that the test has high reliability.
- **Estimate test duration:** The suitable time for all students to finish answering all test items was 50 minutes.

The final form of the test: After making the modifications and omitting some items in the light of the panel of jurors' opinions, the test included 45 items. One score was given to each correct answer and a zero to each wrong answer. Thus, the total score of the test is 45. Table 2 presents the test specifications.

Table 2: Specifications of the Test of Concepts of Green Energy

Cognitive levels / Topic	Knowledge	Comprehension	Application	Total	Relative weight
Solar energy	17،14،3،2،1 45،44،24،	13،9،8،7،4 22	،19،12،11،6 43	19	%42.22
Wind energy	40،21،20	،38،27،18 41،39	37،15،10،5 42	13	%28.89
Tidal energy	،32،26،23 34	،31،30،25 33	،29،28،16 36،35	13	%28.89
Total	15	15	15	45	
Relative weight of cognitive levels	%33.34	%33.33	%33.33		%100

2. Scale of Attitudes towards Green Energy and its Applications

Aim of the scale: Measuring the change that happened to the sample's attitudes towards green energy and its applications after finishing studying the suggested unit.

Dimensions of the scale: After reviewing some references and studies related to the topic of the study, the following three dimensions were identified:

- Attitude towards studying green energy.
- Attitude towards using green energy.

- Attitude towards protecting the environment.

Formulating statements of the scale: A group of statements about dimensions of the scale were formulated in a three – point Lickert Scale (agree, not sure and disagree). Half of the statements were formulated to measure positive attitudes and the other to measure negative attitudes. Three scores were given for the positive response, two for not sure and one for negative response. The total number of the statements in the scale in its initial form was 60 items.

Validity of the scale's statements: The scale in its initial form was submitted to a panel of jury members specialized in Science Education to give their opinion concerning the extent to which the statements represent the three dimensions comprising the scale. Some statements were reformulated, others were replaced and some were omitted in the light of the opinions of the jury members.

Piloting the scale: The scale in its initial form was administered to a sample of second graders at the prep stage (n=60), the same who participated in piloting the test of the concepts of green energy in order to:
- **Estimate scale reliability:** Reliability of the scale was estimated using Kudor Richardson alpha. The reliability coefficient was 0.78 which indicates that the scale was highly reliable
- **Estimate duration of the scale:** The suitable time needed for all students to respond to all statements of the scale was 30 minutes.

The final form of the scale: After making the modifications suggested by the panel of jury members, the final form of the scale included 50 statements. Thus, the maximum score of the scale is 150 and the minimum is 50. Table 3 explains specifications of the scale of attitudes towards green energy and its applications.

Table 3: Specifications of the scale of attitudes towards green energy and its applications

Statements Scale dimensions	Positive	Negative	Total	Relative weight
Being interested in studying green energy	46،44،22،20،17	42،39،37،21،18،9،1	12	%24
Using green energy	19،15،13،12،11،8،4 43،38،35،34،32،29،23،	36،33،28،27،24،7،6،5	22	%44
Protecting the environment	50،48،41،25،16،10	49،47،45،40،3130،26،14،3،2	16	%32
Total	25	25	50	100%

Fourth: selecting the sample:

Sample of the study consisted of 50 female students in Kasem Ameen Prep School for Girls, Custom's Educational Idara in Alexandria Governorate during the academic year 2014/ 2015.

Fifth: Administering instruments of the study

1. **Administering the instruments before the intervention:** The test of concepts of green energy and the scale of attitudes towards green energy and its applications were administered to the sample before teaching the suggested unit "Green energy".
2. **Teaching the suggested unit:** The suggested unit was taught to the sample by the classroom teacher with the help of the teacher's guide. Administering the instruments and teaching the suggested unit lasted for 15 periods during the first term of the academic year 2014/ 2015.
3. **Administering the instruments of the study after the intervention:** The test of concepts of green energy and the scale of attitudes towards green energy and its applications were administered to the sample after finishing teaching the suggested unit "Green energy".

Results of the study:

First: Results of administering the test of green energy:

1. To verify the validity of the first hypothesis which states "There is a statistical significant difference at p <0.05 between the mean scores of the students in test of concepts of green energy before and after studying the suggested unit in favor of the post administration", the sample's mean scores in the pre-posttest as a whole and for each level were calculated. Figure 1 presents a graphic representation of the means.
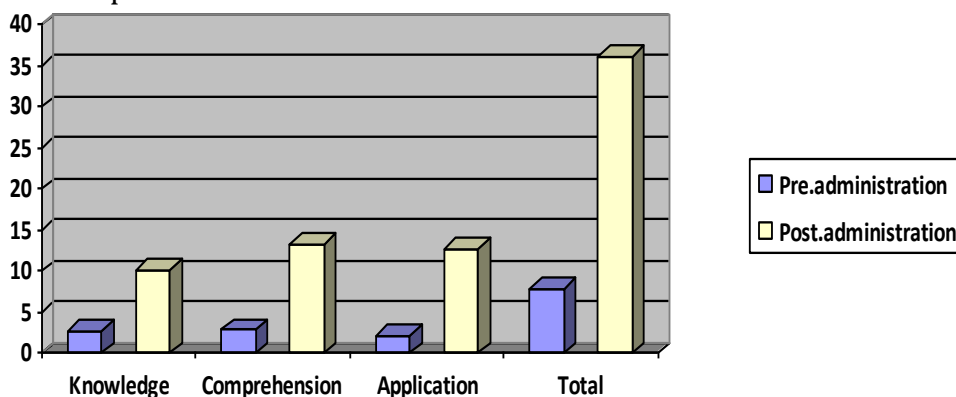
Figure 1: A graphic representation of the sample's mean scores in the pre-posttest as a whole and for the levels of the test

It is clear from graph 1 that:

- There is a difference between the sample's mean scores in the pre-posttest of concepts of green energy as a whole.
- There is a difference between the sample's mean scores in all levels of the pre-posttest of concepts of green energy.

To identify the significance of the differences, t-test was used. Table 4 shows t- value and its significance, 2 for the size of effect and Black's modified gain ratio for the results for the test of concepts of green energy before and after studying the suggested unit.

Table 4: Mean, standard deviation, t-values, size of effect (2) and Black's modified gain ratio for the test of concepts of green energy before and after studying the suggested unit (n=50 students)

Cognitive level	Pre-administration		Post-administration		t-value	Level of significance	Size of effect η2	Black's modified gain ratio
	Mean	SD	Mean	SD				
Knowledge	2.8	1.161	10.22	1.27	30.08	0.01		
comprehension	2.9	1.025	13.26	1.55	39.09	0.01		
Application	2.2	0.95	12.64	0.975	53.33	0.01	0.99	1.39
Total	7.9	1.65	36.12	1.99	76.26	0.01		

It is clear from the previous table that there was a statistically significant difference between the mean scores at the 0.01 of the sample in the pre-post- test of concepts of green energy as a whole and its three cognitive levels in favor of the post- test. This indicates that teaching the suggested unit in green energy had positive effects in developing the concepts of green energy among the sample of the study.

Thus, the first hypothesis of the study proved to be valid. Concerning the effect size of the suggested unit on developing the concepts of green energy, the value of 2 indicated that 99% of the variance between the sample's scores in the pre-posttest is attributed to teaching the suggested unit.

To investigate the effectiveness of the suggested unit, Black's modified gain ratio was calculated. It reached 1.39 which indicates that the content of the unit was effective, i.e. it achieved its aims.

Second: Results of the scale of attitudes towards green energy and its applications

To verify the validity of the second hypothesis which states "There is a statistical significant difference at p <0.05 between

the mean scores of the students in scale of attitudes towards green energy and its applications before and after studying the suggested unit in favor of the post administration", the sample's mean scores in the pre and post administration of the scale as a whole and its three dimensions were calculated. Figure 2 shows a graphical representation of the mean scores.
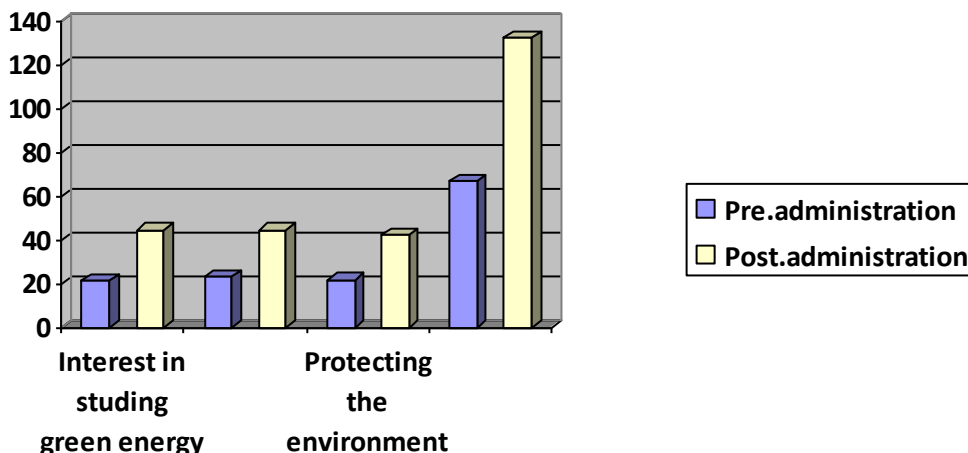

Figure 2: A graphical representation of the sample's mean scores in the pre- post administration of the scale of attitudes as a whole and its three dimensions

It is clear from the previous figure that:

- There is a difference between the sample's mean scores in the pre- post administration of the scale of attitudes as a whole.
- There is a difference between the sample's mean scores in the dimensions of the pre- post scale of attitudes towards green energy and its applications.

To identify the significance of the differences, t-value was calculated. Table 5 presents t-value and its level of significance and effect size using 2 for the results of the scale of attitudes towards green energy and its applications before and after teaching the suggested unit of green energy.

*Table 5: Mean scores, standard deviation, t-value and effect size η2
for the results of the scale of attitudes towards green energy and its
applications (n=50)*

Dimensions of the scale of attitudes	Pre-administration		Post-administration		t-value	Level of significance	Effect size η^2
	Mean	SD	Mean	SD			
Interest in studying green energy	21.6	4.323	44.8	3.64	28.87	0.01	
Using green energy	23.5	5.947	44.8	4.900	19.32	0.01	0.97
Protecting the environment	21.8	4.00	42.3	1.828	32.45	0.01	
Total	66.9	7.96	131.9	6.963	42.68	0.01	

It is clear from the previous table that there was a statistical significant difference at 0.01 level between the sample's mean scores of the total and three dimensions in the pre-post administration of the scale of attitudes towards green energy and its applications in favor of the post administration. This indicates that teaching the suggested unit in green energy had positive effects in developing the sample's attitudes towards green energy and its applications.

Thus, the second hypothesis proved to be valid. Concerning the effect size of the suggested unit on developing the sample's attitudes towards green energy and its applications, the value of 2 showed that 97% of the variance between the sample's scores in the pre-post administration of the scale of attitudes is attributed to teaching the suggested unit which indicates the effectiveness of the suggested unit in developing the attitudes towards green energy and its applications.

Discussion of the results:

Based on the previous presentation of the results, the following conclusions may be drawn:

The results proved the effectiveness of the suggested unit "green energy" and that it had a great effect on the students' acquisition of the concepts of green energy and attitudes towards it since results of the test of concepts of green energy and the

scale of attitude towards green energy and its applications revealed that the differences in the sample's mean scores before and after studying the unit were   28.22 and 65 respectively and that these differences were statistically significant at the 0.01 level in favor of the post administration.

This result agrees with the results of some studies that were concerned with developing the students' awareness of the concepts and sources of green and renewable energy such as Kroll (1992) which introduced a suggested curriculum consisting of seven chapters that included the concepts of renewable energy and solar energy. This result also agrees with Weiskopf (1997) in which the researcher introduced a CD which includes definition of renewable energy, its sources and effects on society to the sample and Martin and O'Toole (2002) in which the researchers presented demonstrations about renewable energy to the students. Besides, the result agrees with Alsamoraey (2011) which showed that the Faculty of Education and Science students' acquisition of the concepts of green energy reached 45% in addition to their acquisition of environmental awareness and Coker, Catlioglu and Birgin (2010) which recommended the necessity of infusing the concepts of green energy in the curricula. In addition, the results agree with DeWaters and Powers (2011) whose results indicated the students' concern with the problems of energy and showed the need for teaching that enhances the students' literacy about energy through the content and affecting students' attitudes, values and behaviors. Furthermore, the results are consistent with Zyadin *et al.* (2012) whose results indicated that 87% of the students consider renewable energy the best choice in the future and showed positive attitudes towards selecting renewable energy even if it is costly. The study also showed that the females were more knowledgeable about sources of renewable energy than males and that those from urban regions were more aware and more supportive to renewable energy than those from rural regions.

Recommendations of the study:

In light of the results of this study, the following is recommended:

- The necessity of activating the role of the Science curricula in achieving the aims of green energy as a main aim for teaching Science at the different stages.
- Providing the students with enough information and skills about green energy and its applications in order to develop awareness of and attitudes towards green energy.
- Developing the Science curricula at the prep stage in a way that achieves activating its role in supporting green energy and its applications.
- Enhancing cooperation between the stakeholders at the Ministry of Education and those concerned with green energy in order to plan and implement a comprehensive program in the field of green energy for all the stages of general education.
- Conducting training programs for the Science teachers aiming at deepening their understanding of the concepts of green energy and developing attitudes towards it.
- Enhancing coordination between the Ministry of Education efforts and those of mass media in the field of developing awareness of green energy and its applications.

References:

Abdelhady, M. (1999). The effectiveness of a program based on self-learning in developing understanding of some biological technological novelties, values and attitudes towards them among the student teacher (Biology Section) at the Faculty of Girls. *Journal of Science Education, 2*(1), 159-174.

Abderraouf, E. (2008, Dec.). Developing the content of Science curricula at the primary stage according to the scientific cores approach in the light of some international projects and standards of the Science curriculum content. *Journal of Science Education, 11*(4), 119-144.

Abou Fouda, H. (2010). Enriching the content of the Science curricula with biological novelties and its effect on developing technological literacy among the eighth grade female students of basic education. Published *M.A*. Faculty of Education, The Islamic University: Gazza.

Adly, F. (2010). *An analytic study of the pre-university policies since the nineties of the twentieth century till now in the light of requirements of knowledge economics.* Cairo: National Center for Educational Research and Development.

Addemerdash, S. (2001). *The curricula: The present and the future*. Kuwait: Almanar Islamic Bookstore.

Ahmad, A. M. (2007). *Clean environment- friend energy*. Cairo: Arrashad House.

Akinwale,Y.,Ogundari,I.,Ilevbare,O. & Adepoju,A. (2014). A descriptive analysis of public understanding and attitudes of renewable energy resources towards energy access and development in Nigeria, *International Journal of Energy Economics and Policy, 4(* 4), 636-646

Albaghdady, R.M. (2003). *The history of Science and the philosophy of Science Education.* Cairo: The Arab Thought House.

Alghareeb, W., Alsadek, M. & Shoeir, I. (2012, May). Evaluating the Science textbooks questions and their exams at the primary stage in the light of the requirements of the TIMSS project dimensions. *Journal of the Faculty of Education*, Mansoura University, 1(79), 520-557.

Alhabahba, T. (2011). The effect of teaching a suggested unit in biotechnology using individualized learning and case study on developing creative thinking among the secondary stage students and their acquisition of the concepts in this unit. *The Journal of Educational Sciences Studies, 38*(3).

Alhoweidy, Z. (2005). *Styles of teaching Science at the basic stage.* United Arab Emirates: University Book House.

Alloulou, F. 92004). Evaluating the content of the Palestinian Science curricula for the higher stage of basic education in the light of the contemporary scientific novelties. *A research presented to the First Educational Conference: Education in*

Palestine and the Changes of the Age. Faculty of Education: The Islamic University.

Aloleimy, S. (2007, June). The effectiveness of teaching a suggested unit in biotechnology using a model based on role play for developing some biosocial values among secondary stage students in Libya. *Journal of Science Education 10*(2), 33-90.

Alsamoraey, A. (2011). The concepts of renewable energy among the students at the Faculties of Education and Science and their relationship to environmental awareness among them. *Published M.A.*, Ibn Elhaitham Faculty of Education: Bagdad University.

Alweseimy, E. (2003, Dec.). The effectiveness of a suggested program in biological literacy in developing achievement, critical thinking skills and attitudes towards Biology among the students at the second grade of the secondary stage, literary section. *Journal of Studies in Curricula and Methods of Teaching, 91*, 207-261.

Annagdy, A.; Rashed, A. & Abdelhady, M. (1999). *Teaching Science in the contemporary world: The Approach in teaching Science.* Cairo: The Arab Thought House.

Annagdy, A.; Rashed, A. & Abdelhady, M. (2003). *Teaching Science in the contemporary world: Current methods, styles and strategies in teaching Science.* Cairo: The Arab Thought House.

Ashour, S. (2009). *Renewable and alternative energy and the horizons of using it in the Arab World.* (1st Ed.). Assuit: Assuit University.

Azzam, S. (1995). An evaluative study of the first cycle of basic education in the light of the basic scientific concepts that should be included in them. *Unpublished M.A*. Faculty of Education: Banha University.

Azzaaneen, G. (2002). The scientific and technological expected changes at the beginning of the twenty first century in the Palestinian society and the role of Science Education in facing them. *The Islamic University Journal*, *10* (2), 71-120.

Bahtiyor R., Mona G., Ruzumboy A., Sanaatbek K. & Uzbekistan, B. (2011). People's perceptions on renewable energy sources' penetration prospects in the Khorezm Province, Uzbekistan, Journal of Knowledge Management, Economics and Information Technology, 7.

Coker, B., Catlioglu, H. & Birgin, O. (2010).Conceptions of students about renewable energy sources: A need to teach based on contextual approaches. *Procedia Social and Behavioral Sciences, 2,* 1488–1492. Retrieved from, http://www.sciencedirect.com/science/article/pii/S18770 42810002636#

DeLuca,V. W., Carpenter, P. & Lari, N. (2010). GRID renewable energy data streaming into classrooms*. Technology and Engineering Teacher, 70* (3), 30-35.

DeWaters, J.E. & Powers, S.E., (2011). Energy literacy of secondary students in New York State (USA): A measure of knowledge, affect, and behavior. *Energy Policy, ERIC*, doi:10.1016/j.enpol.2010.12.049

Emara, A. (2007). *Wind energy and its applications in the field of agriculture.* Knowledge Garden Bookstore.

Emara, H. (2012). *Energy and the age of power.* (1st Ed.) Oman: Alghaida House Publishers.

Fast, S. & McLeman, R. (2012). Attitudes towards new renewable energy technologies in the Eastern Ontario Highlands. *Journal of Rural and Community Development, 7*(3), 106-122.

Fouda, I. & Ezzeddin, S. (2015, Jan.). An analytic study of the trends of Science Education studies for achieving excellence. *Journal of Science Education, 18*(1), 55-106.

Hassan, M. (2006). Evaluating the content of the Science curricula at the primary and prep stages in the light of the cognitive requirements of the TIMSS project. *Unpublished M.A.*, Faculty of Education: Mansoura University

Ibrahim, K. & Ahmad, H. K. R. (2007). Centre for education, training and research in renewable energy and energy efficiency (CETREE) of Malaysia: Educating the nation. *AIP*

Conference Proceedings. 941 (1), p164-174. Retrieved from, http://dx.doi.org/10.1063/1.2806082

Ismail, M. (2000). A suggested framework for the Science curricula at the prep stage in the light of the novelties of Science Education and teaching Science for the twenty first century. *The Egyptian Association of Science Education, the 4th Scientific Conference: Science Education for All,* Aug. 2, 525-563.

Khalifa, S. (2003, July). The effectiveness of a suggested program for teaching some argumentative topics and issues in genetic engineering and cloning in developing achievement, critical thinking and some values related to the ethics of Biology among the amateur students at the secondary stage in Sultanate Oman. The Egyptian Association of Science Education: *The 7th Scientific Conference: Towards a Better Science Education, 1,* 115-170.

Kroll, M. (1992). Mud, muck and other wonderful things: An environmental curriculum for five-to eight-year olds. *Environmental Stewardship*, National 4- H, Council.

Lebad, A. (2013). Enriching some topics of the Science curricula with nanotechnology applications and its effect on the level of scientific literacy among the eleventh grade students in Gaza. *Published M.A.*, Faculty of Education: Alazhar University, Gaza.

Lehabeeb, A. W. (2014). *Mauritania and renewable energy*. Desert Center for

Research and Consultations.

Leonard, B. (1998). *Energy education resources: Kindergarten through 12th grade.* DIANE Publishing, Retrieved from: http://files.eric.ed.gov/fulltext/ED458126.pdf

Liarakou, G., Gavrilakis, C. & Flouri, E. (2009). Secondary school teachers' knowledge and attitudes towards renewable energy sources. *Journal of Science Education Technology, 18,*120–129.

Martin, G. & O'Toole, M. (2002). Chicago's solar-powered schools, *Solar Today, 16(6),* 38-41

Morgil, I., Secken, N., Yucel, A. S., Oskay, O. O., Yavuz, S. & Ural, E. (2006). Developing a renewable energy awareness scale for pre-service Chemistry teachers. *Turkish Online Journal of Distance Education, 7* (1), 63-74.

Mousa, S. (2012). Evaluating the content of the Palestinian and Israeli Science textbooks for the fourth basic grade in the light of TIMSS standards: An analytic study. *Published M.A.,* Faculty of Education: Islamic University in Gaza.

Moustafa, A. (2001). *Current trends in teaching Science*. Cairo: Arab Thought House.

Moustafa, A.; Korany, Z.; Abouelez, A. & Abou Shama, M. (2007, July). A suggested model for developing Science curriculum at the primary stage in the light of the requirements of TIMSS project. *The Egyptian Association of Science Education: The 11th Scientific Conference: Science Education, to where?,* 141-231.

Nasr, m. (1997). The technological and scientific changes, contemporary and futuristic, and their reflections on Science Education and teaching Science. *The Egyptian Association of Science Education: The 1st Scientific Conference of Science Education for the Twenty First Century, 1,* 125-152.

Organization of New and renewable Energy (2014). *Future strategy and plan.*

Pecen, R., Humston, J. L. & Yildiz, F. (2012). Promoting STEM to young students by renewable energy applications. *Journal of STEM Education, 13* (3), 62-73.

Pradipta,H.; Janne,P.; SariHavu, N.; Paavo,P.;Chun-Yen,C.; Pavol,P. & Muhammet, U. (2013). Knowledge, perceptions, and attitudes as determinants of youths' intentions to use Bioenergy—A cross-national perspective, *International Journal of Green Energy, 10*(8), 797-813

Reyad, H.M. A. (2009). *Science and Mathematics curricula in Egypt and some foreign countries at the general secondary stage: A comparative analytic study.* Cairo: National Center for Educational Research and Development.

Secken, N. (2006). *A web- based puzzle for energy sources.* Retrieved from, http://files.eric.ed.gov/fulltext/ED494343.pdf

Selim, M. S. (2006). Science Education: Future perspectives in the light of the present and the future. *Journal of Science Education, 9*(4), 1-13.

Shabara, A. M. (1997). Tends of research in Science Education in the light of the twenty first century and their requirements from Science Education research in Egypt. *Egyptian Association of Science Education: The First Scientific Conference for Science Education for the Twenty First Century*, 1, 345-419.

Shalabu, A. (2006). New and renewable energy. (1ˢᵗ Ed.), Alexandria.

The National Center for Educational Research and Development (2011). *A suggested framework for infusing nanotechnology in the Science curricula in general education.* Cairo: The National Center for Educational Research and Development.

U.S. Department of Energy Wind (2007). *Wind for schools: A wind powering America project* ,www.windpoweringamerica.gov/ schools.asp

Weiskopf, J. L. (1997). *The sun's joules: What is renewable energy? An introduction to "the Sun's joules:" CD-ROM and energy education program*, Accession No:ED421361 Publication: U.S.; New York.

Zyadin, A., Puhakkab, A., Ahponen, P. , Cronberg, T. & Pelkonen, P. (2012). School students' knowledge, perceptions, and attitudes toward renewable energy in Jordan. *Renewable Energy, 45*,78-85. Retrieved from, http://www.Science direct. com/science.

A proposed perspective for designing a 3D Virtual Learning Environment Based on Artificial Intelligence for Teaching English Language for Medical Students at the University of Bisha

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Abstract:

*T**his study aimed to design a proposed perspective for designing a three-dimensional (3D) virtual learning environment based on artificial intelligence for teaching English language for the medical students. The researcher conducted a study on the faculty staff at the Faculty of Medicine at the University of Bisha. The researcher used a questionnaire for exploring the educational and technological requirements of the 3D virtual learning environments based on artificial intelligence.*

Introduction

This era witnessed many revolutionary developments and challenges. It is the age of information, communication and technology revolution. Its all characteristics require a type of individuals who have many basic and necessary skills for dealing and adapting with its giving and challenges. There is no doubt that preparing such a type of individuals were identified by the experiences, courses and instructional activities provided by the educational institutions. In addition, searching for suitable styles and techniques through which these experiences can be provided in a way that contributes to develop imagination, thinking and creativity rather than those focusing on the culture of memory, and maximizes lecturing and memorization. The new educational technology with all its potentials introduces new interesting techniques for constructive teaching.

Information and educational technology provided us with new technologies for preparing artificial computerized learning environment. These sometimes outperform the natural

environments such as simulation and virtual reality from which virtual communities are one of its products (Alhesan and Alabeid, 2009: 191).

Virtual reality occurred as a unique field of computer applications during the 1980's. Therefore, this technology is still at its early stage of development. Till now, the studies related to this technology are very few especially those related to educational applications. In addition, the novelty of this kind of technology made the researchers and educators exert a great effort for building a theory or a conceptual basis concerning this technology and its potentials (Berge & Clark, 2005: 10).

Rahhouma (2011) emphasizes that, through virtual communities, learners can acquire experiences they cannot learn in reality because of different factors such as danger, high cost, unavailability of enough devices or lack of time. This technology is based on blending reality and imagination by creating artificial imaginative environments capable of representing the reality so that they allow the individual to interact with them. In these virtual communities, the third dimension, or materialization, has played an important role in this technology since more than one sense is used to make the one using it completely engaged as if he is a part in the real environment itself.

On the other hand, intelligent educational technology relies on using and implementing theories and concepts of Artificial Intelligence and the Cognitive Sciences. Mixing Artificial Intelligence and the Cognitive Sciences in turn leads to designing and producing a new kind of educational systems characterized by intelligence and having traits and abilities that approach the behavior of the human being. This is because they help students in learning better and faster than the previous generations of traditional educational programs (Salem, 2002: 16).

Salem (2002:181) sees that to talk about the role of artificial intelligence in education, focus should be on the ways that enable us to use it in making intelligent ready-made educational programs. In addition, through the human

experiences, we could use it in making unique systematic methods of learning, reasoning, deductive thinking and reasoning from human experiences.

The current trend seeks to blend and integrate hypermedia with intelligent educational technology systems because their integration allows designing more powerful and effective educational systems, learners' self-management of learning, opportunities for inquiry and problem solving for learners that suit their abilities, including the human teacher (Abdennaser, 2010: 11).

Previous studies:

Previous studies that dealt with using 3D virtual learning environments in education were varied. Yufang & Jun (2010) revealed an increase in the social ability among autistic students in the 3D virtual learning environment. Hassan (2012) showed the effectiveness of 3D virtual learning environment in increasing achievement motivation among the students and that there were positive attitudes towards the 3D virtual learning environment. Almane (2013) and Waheed (2014) showed the effects of utilizing 3D educational environments on developing skills of designing databases.

Results of many studies revealed the effectiveness of utilizing artificial intelligence in education. Khairy (2008) showed a greater effect of the intelligent, cooperative e-learning environment on developing achievement among Educational Technology students in the faculties of specific education. Alaraby (2008) indicated a great effect of teaching problem solving using visual basic through a cooperative learning strategy based on artificial intelligence on creative solutions of problems and cooperative skills for second grades at the Educational Technology Department. Ibrahim (2009) showed the effectiveness of an intelligent educational system for the primary stage child and the existence of a great effect of the system on developing the child's creative thinking. Abdennaser (2010) revealed the effectiveness of utilizing artificial intelligence in designing e-learning websites and systems. Alnaggar (2012)

revealed the effectiveness of implementing intelligent programs in developing the skills of designing e-websites among Information Technology students in the light of total quality standards.

Considered by the above, this study characterized from previous studies by providing a proposed perspective for designing a 3D virtual learning environment based on artificial intelligence according to the learners' reaction. To engage them in a way that facilitates interaction and learning according to their needs for learning the medical language in a concrete way that may not be available in reality. Likewise, providing learners with a virtual teacher based on artificial intelligence will allow answering the learners' questions at any time. For sure, the educational process will be more interactive to change this teacher to a patient that the students can examine to answer the questions in their mind so that the medical English language in the students' mind will be acquired through practice not lecturing.

Thus, reaching a proposed perspective for designing a 3D virtual learning environment based on artificial intelligence for teaching English language for the medical students is considered a new method for the elimination of boredom and making learning the language interesting in the way the constructivist theory called for in a way that eliminates the students' fear of the subject and contributes to solving the problem of lack of faculty staff.

Problem of the study:

Many new studies explained that the students' lack of perception of the medical English language content they learnt may be attributed to the inefficiency of the used teaching style. Sarany and Saheby (2012) proved that the new strategies and methods of teaching have an effective role in teaching the professional English language in the medical English language courses. Abdullah (2013) pointed out the importance of relating the students' needs to the curricula and materials they study, in addition to calling the students' attention to the importance of

identifying their academic needs in learning the medical English language. Furthermore, lack of meeting the students' academic needs in learning the medical English language and not getting the meaning may be a decisive factor, especially in some specializations such as the medical or scientific ones.

Analyzing and following up the students' scores at the preparatory year at the University of Bisha, the low scores of some students in all academic subjects for that year were noticed. This is because of the difficulty of learning the new concepts taught in English, and the students' inability to apply the concepts they learnt in their specialization. To assure this, the researcher conducted an unstructured pilot study to identify the difficulties that face the preparatory year students. A questionnaire was distributed to a group of them who were enrolled in the Faculty of Medicine (n=43 students) at the University of Bisha, Second term of the academic year , 2014/2015. The study revealed the following:

- The medical students had a negative attitude towards learning the subjects in English.
- 90% of the students agreed on the difficulty of remembering the medical concepts in the English language.
- 94% of the students agreed on the difficulty of utilizing those concepts in practice.

The researcher conducted another pilot study directed to the faculty staff at the Faculty of Medicine at the University of Bisha to identify the extent to which they benefit from the potentials and tools of the 3D virtual learning environment in the instructional process. A questionnaire was distributed to a group of the Faculty of Medicine staff members (n= 29 faculty staff) at the University of Bisha by the end of the second term of the academic year 2015. The study revealed that the faculty staff poorly makes use of the potentials and tools available in the 3D virtual learning environments in the instructional process in addition to their poor prior knowledge about the existence of such environments in the internet websites.

Analyzing the review of literature and related studies in the field of the study, the following conclusions were reached:

- All previous studies agreed on the effectiveness of the 3D virtual learning environments in education.
- The traditional educational programs are not suitable for teaching the medical subjects in English as they need varied methods of teaching.
- Scarcity of the Arabic studies and research papers that dealt with linking the 3D virtual learning environments to the intelligent teaching systems and utilizing intelligent teaching systems in teaching the subjects of a special nature such as teaching English for medical students.

Thus, the importance of this study lies in an attempt to introduce a model that links the 3D virtual learning environments because of their many proved effectiveness and advantages in the instructional context in which artificial intelligence is practiced due to its unique characteristics, potentials and abilities.

Considering the aforementioned information, the problem of the study may be formulated in the following main question: What is the proposed perspective for designing a 3D virtual learning environment based on artificial intelligence for teaching English language for the medical students at the University of Bisha?

This question divided into the following sub-questions:
1. What are the educational needs of the 3D virtual learning environments based on artificial intelligence for teaching the English language for the medical students at the University of Bisha from faculty staff's point of view?
2. What are the technological needs of the 3D virtual learning environments for teaching English language for the medical students at the University of Bisha from faculty staff's point of view?

3. What are the technological needs of artificial intelligence for teaching English language for the medical students at the University of Bisha faculty staff's point of view?

4. What is the proposed perspective for utilizing artificial intelligence in 3D virtual learning environments for teaching English language for the medical students at the University of Bisha?

Terms of the study:

The perspective proposed:

The researcher operationally defines it as analyzing the reality of teaching English for the medical students at the University of Bisha reaching a solution for its problems by introducing a proposed perspective for a 3D virtual learning environment based on artificial intelligence.

3D virtual learning environments:

Zeineddin (2010: 2) defines 3D virtual learning environments as 3D environments that simulate the reality and the educational environment, with which users can interact by the computer monitor and the electronic games equipment. The programs allow their users to interact with each other and exchange ideas and experiences regardless of where they are. They also allow them to personify any character they like and any action they cannot do in their real educational environment without any fear or horror.

The researcher defines 3D virtual learning environments operationally in this research as 3D environments based on artificial intelligence that simulate the reality and allow the faculty staff and the students to create their content themselves. They also allow exchanging experiences and ideas among the faculty staff and the students, regardless of where they are by personifying of a 3D virtual character (an Avatar) that allows them to do what they want without fear or shame. They also make available 3D virtual learning platforms that interact according to the learner's psychological needs and the nature of the scientific material used. They allow making a dialogue with

the staff member and they are provided with a database of medical terms.

Artificial intelligence:

Zayed (2005: 150) defines it as the science capabilities of designing tools that perform tasks and require an amount of human intelligence when a human being performs them.

The researcher defines artificial intelligence operationally as one of the information branches that studies developing intelligent technology to be applied through the computer in a way through which the computer has an intelligent behavior in performing the tasks or solving the problems and blending artificial intelligence with the work environment. It allows students' interaction and making use of them. It also allows them to participate, receive immediate feedback and interact dynamically.

Procedures of the study:

Method:

This study depended on the descriptive method.

Population and sample of the study:

Sample of the study included all faculty staff at the Faculty of Medicine at the University of Bisha (n= 29).

Tool of the study:

This study depended on a questionnaire for analyzing the scientific, technological and educational needs for the 3D virtual learning environments based on artificial intelligence. This tool aimed at collecting data and information. It was prepared according to the following procedures:

Formulating the statements of the questionnaire:

To formulate the statements of the questionnaire, the literature related to the different variables of the study was reviewed and formulated in a five – points Lickert scale (strongly agree, agree, not sure, disagree and strongly disagree) to respond to the statements. The tool of the study in its first form consisted

of two dimensions: the educational needs (13 statements), and the technological needs (15 statements). Based on the opinions of the panel of jury members, a separate dimension dealing with artificial intelligence was added, it included 12 statements. Thus, the final version of the questionnaire consisted of three dimensions and a total of 40 statements.

Validity of the questionnaire:

Tool validity considered one of the important criteria for judging the tool's ability to measure what it supposed to measure. The validity of the questionnaire was established through:

a. **Juries validity:** The questionnaire was submitted to a panel of jury members to make sure of the clarity of the statements, their relatedness to the dimension it belongs to, coverage of the statements to their aims, comprehensiveness of the statements and their variety in addition to any remarks concerning additions, omissions and/ or modifications. The researcher modified the questionnaire in light of the panel of juries' opinions.

b. **Internal consistency:** Correlation coefficients between each statement and (1) the dimension to which it belongs and (2) the total score of the questionnaire after omitting the statement's score from the dimension or the total score, considering the rest of the statements as a criterion for the statement, were calculated. In addition, the correlation between the score of each dimension and the total score of the questionnaire were calculated. The results of the internal consistency are shown in Appendix 1. The researcher concluded that all the statements in the questionnaire have statistically significant correlations to the dimension to which it belongs and to the total score of the questionnaire indicating that the questionnaire has a high degree of internal consistency.

c. **Reliability of the questionnaire:** Reliability was estimated using Alpha Kronbakh after administering it to a sample of faculty staff (n= 29). The reliability coefficient

for the first, second and third dimensions were 0.551, 0.486 and 0.471alpha coefficient for the whole questionnaire was 0.906, which is high. Thus, the questionnaire in its final form is applicable.

Results of the study:

In this section, the researcher presents the sample's responses ~~on~~ to the questions of the study, its statistical treatment using descriptive statistics and its methods and, finally, the results, their analysis and interpretation.

The results of the first question: What are the educational needs of the 3D virtual learning environments based on artificial intelligence for teaching English language to the medical students at the University of Bisha from faculty staff's point of view?

The researcher used the mean scores, standard deviations and the general average for the statements in the first dimension of the questionnaire taking numbers 1 to 13 which measure the educational needs of the 3D virtual learning environments based on artificial intelligence for teaching English language to the medical students in Bisha from the faculty staff's point of view. The results were as in table 1.

Results of table 1 indicated that the general mean for the sample's responses was 4.78 which is an indicator that there is a high agreement on the educational needs of the 3D virtual learning environments based on artificial intelligence for teaching English language for the medical students at the University of Bisha from the faculty staff's point of view. The standard deviation of the mean score was .162 which is a value and an indicator of the high homogeneity in the sample's responses about the educational needs of the 3D virtual learning environments based on artificial intelligence for teaching English language to the medical students. The highest need in the first dimension was statement (3) which states "The virtual content of the environment is related to the aims" with a mean score 4.93 which was highly approved. The least needed was statement (2)

which states "The environment is suitable to the intended sample" which came in the 13ᵗʰrank with a mean score 4.55 and was also highly approved.

Table 1: Mean scores and standard deviations for the sample's responses to the first dimension, the educational needs of the 3D virtual learning environments based on artificial intelligence for teaching English language to the medical students

No. of statement	Statement	Degree of agreement			
		Rank order	Mean	Standard deviation	Response
3	The virtual content of the environment is related to the aims.	1	4.93	0.334	Very high
13	The environment presents a pre-assessment of the learners' prior knowledge and skills.	2	4.92	.279	Very high
1	The environment provides a presentation of the general aim and operational objectives of the material for the students.	3	4.89	.309	Very high
8	The environment takes flexibility and integration of presenting the content into consideration in a way that allows learners to use it in an integrated way in their lessons.	4	4.87	.364	Very high
6	The environment takes into consideration organization of presenting the content hierarchically to make it easy for the students to grasp.	5	4.86	.497	Very high
10	The environment provides a clear, specific and stable strategy of navigation into the content.	6	4.82	.385	Very high
12	The environment allows students' move freely and easily for discovering the structure of the content.	7	4.80	.402	Very high
4	The environment provides tools for presenting educational activities that enable the students to generate ideas and understand the content.	8	4.77	.472	Very high
9	The environment provides suitable, varied and comprehensive questions and exercises.	9	4.74	.488	Very high
7	The environment varies methods of presenting the content (lecture, discussion, etc.)	10	4.73	.471	Very high
11	The environment provides tools for designing activities that achieve the aims of learning.	11	4.68	.467	Very high
5	The environment encourages students' thinking, creativity, discussion and participation in learning.	12	4.60	.572	Very high
2	The environment is suitable for the intended sample.	13	4.55	.632	Very high
General mean			4.78	.162	Very high

The results of the second question: What are the technological needs of the 3D virtual learning environments for teaching English language to the medical students at the University of Bisha from the faculty staff point of view?

The researcher used the means, standard deviations and general mean for the statements in the second dimension "the technological needs of the 3D virtual learning environments" in the questionnaire taking numbers 14 to 28 and measuring the technological needs of the 3D virtual learning environments for teaching English language to the medical students— at the University of Bisha from the faculty staff's point of view. The results were as in table 2.

Results of table 2 indicated that the general mean of the sample's responses was 4.78 which is an indicator of high agreement on the technological needs of the 3D virtual learning environments for teaching English language to the medical students at the University of Bisha from the faculty staff's point of view. The standard deviation of the mean score was .150 which is a value and an indicator of high homogeneity among the sample's responses concerning the technological needs of the 3D virtual learning environments for teaching English language to the medical students.

The highest need in the second dimension "the technological needs of the 3D virtual learning environments" was statement (19) which states "The environment stimulates the student to effectively participate in the events of learning" with a mean score reaching 4.95 and which was highly agreed upon by the sample. On the other hand, the least need in the second dimension was statement 18 which states "The student can download the educational materials (photos, multimedia files, etc.), receiving the 15th rank, with a mean score reaching 4.55 and highly agreed upon by the sample.

Table 2: Mean scores and standard deviations for the sample's responses to the second dimension, the technological needs of the 3D virtual learning environments based on artificial intelligence for teaching English language to the medical students

No. of statement	Statement	Degree of agreement			
		Rank order	Mean	Standard deviation	Response
19	The environment stimulates the student to effectively participate in the events of learning.	1	4.95	.268	Very high
20	The environment allows using different patterns of interaction between the learner and the content (clicking the mouse, moving and objects, modifying object characteristics, using the keyboard for wandering).	2	4.94	.320	Very high
28	Subscription is free.	3	4.91	.294	Very high
25	The environment uses a clear sound.	4	4.91	.359	Very high
26	Cartoons are used in situations in which it is difficult to use the video.	5	4.87	.443	Very high
14	The environment interface is simple and void of complexity.	6	4.81	.490	Very high
23	The environment takes into account ease of movement in all its parts.	7	4.80	.497	Very high
17	The students select the 3D virtual character called Avatar and modify it in the environment.	8	4.80	.475	Very high
16	The environment includes functional search for surveying the information around the topic of learning.	9	4.80	.475	Very high
15	The environment provides ways for documentation and saving (Blog, Take Photos, Record Video and audio)	10	4.75	.583	Very high
27	The student can interact with the virtual creatures.	11	4.67	.573	Very high
24	The texts are written in easy, simple, common, and understandable way.	12	4.66	.612	Very high
21	The environment allows the student's control of sequencing presentation of the content (information, examples, applications and exercises).	13	4.63	.602	Very high
22	The environment allows different ways of navigation.	14	4.62	.568	Very high
18	The student can download the educational materials (photos, multimedia files, etc.)	15	4.55	.665	Very high
	General mean		4.78	.150	Very high

The results of the third question: What are the educational needs of artificial intelligence for teaching English language to the medical students at the University of Bisha from the faculty staff's point of view?

The researcher used the means, standard deviations and general mean for the statements in the third dimension "the technological needs of artificial intelligence" in the questionnaire taking numbers 29 to 40 and measuring the technological needs of the artificial intelligence for teaching English language to the medical students in the University of Bisha from the faculty staff's point of view. The results were as in table 3.

Results of table 3 indicated that the general mean of the sample's responses was 4.68 which is an indicator of high agreement on the technological needs of artificial intelligence for teaching English language to the medical students at the University of Bisha from the faculty staff's point of view. The standard deviation of the mean score was.187 which is a value and an indicator of high homogeneity among the sample's responses concerning the technological needs of artificial intelligence for teaching English language to the medical students.

The highest need in the third dimension "the technological and of artificial intelligence" was statement (31) which states "The system monitors the student's log in and his educational sessions" with a mean score reaching 4.92 and which was highly agreed upon by the sample. On the other hand, the least need in the third dimension was statement 32 which states "The system monitors the rate of the student's progress and gaining the knowledge step by step", receiving the 12th rank, with a mean score reaching 4.43 and highly agreed upon by the sample.

Table 3: Mean scores and standard deviations for the sample's responses to the third dimension, the technological needs of artificial intelligence for teaching English language to the medical students

No. of statement	Statement	Degree of agreement			
		Rank order	Mean	Standard deviation	Response
31	The system monitors the student's log in and his educational sessions.	1	4.92	.347	Very high
36	The system analyzes the kind of errors the student makes identifying the wrong way the student uses in solving problems.	2	4.91	.388	Very high
34	The system analyzes the student's answer using varied kinds of knowledge (knowing the field, knowing the questions and answers, knowing the student and his prior performance, etc.)	3	4.83	.453	Very high
39	The student's form marks the areas the student masters in a subject- matter semantic network or in a rule- based representation.	4	4.83	.429	Very high
35	The system responds more sensitively to the student's incorrect interpretations and his learning problems as they are symptoms to incorrect concepts.	5	4.77	.515	Very high
38	The student's form provides the teacher with a detailed report about the student's level and progress in which it identifies the student's mistakes and their kinds. It also indicates what the student knows and doesn't know.	6	4.73	.471	Very high
37	The system compares the student's knowledge to the knowledge in the expert system.	7	4.60	.642	Very high
40	The system identifies the pattern of learning style suitable for applying the best educational techniques and methods of teaching for this particular student.	8	4.58	.517	Very high
30	The system keeps a record of the student's learning progress.	9	4.55	.561	Very high
29	The student's form is based on the results of educational psychology, fundamentals of education, and cognitive psychology.	10	4.55	.615	Very high
33	The system assesses the student's prior knowledge to identify the best method of teaching and the most suitable subject for the student.		4.52	.666	Very high
32	The system monitors the rate of the student's progress and gaining the knowledge step by step.	12	4.43	.613	Very high
General mean score			4.68	.187	Very high

The results of the fourth question: What is the proposed perspective for designing a 3D virtual learning environment based on artificial intelligence for teaching English language to medical students?

Based on the previous results of this study, the proposed perspective for designing a 3D virtual learning environment based on artificial intelligence for teaching English language to the medical students is as follows:

a.Philosophy and bases of the perspective proposed

This refers to the factors and requirements that should be taken into consideration when implementing the perspective proposed. They are:

1. **The society's philosophy, ideology and characteristics**
   The educational system in any society has its own nature which reflects the society's philosophy and characteristics Therefore, curricula differ from a country to another, even if there are similarities in some subjects. Those responsible for the e-learning sector should be aware of and deeply understand the society's philosophy, goals and ambitions so that curricula would be an honest translation of these ambitions and effective means of achieving them.

2. **Nature and philosophy of school subjects**: There is no doubt that subjects differ in their nature and philosophy and, in turn, aims. Some subjects have a pure theoretical nature while others have a practical one. The nature of the subject, the selected content and the set aims differ according to the age and educational stage for which the curriculum is planned.
   Therefore, the researcher pinpoints that the nature of the subject and its philosophy are among the important bases. There should be an explanation about the nature of the subject and the dimensions of dealing with it in the educational stage for which it is planned. It should also include a description of the limits that should be adhered

to in selecting the content of the subject and ways of its evaluation.

3. **The nature of the learner and his growth characteristics**: This affects all the elements of the curriculum. Judging the quality of education is controlled through 3D virtual learning environments based on artificial intelligence and their integration in the light of how far each element meets these characteristics. It includes a description of the learner elaborating characteristics of his body and physical, mental and recognition abilities in addition to the most important characteristics in emotions, dispositions and attitudes.

4. **The nature of learning through 3D virtual learning environments based on artificial intelligence as a system**: one of the bases is the system perspective of education through 3D virtual learning environments based on artificial intelligence. Therefore, it explains the interaction, overlapping and reciprocal relationships among its elements and components, and how these relations reflect the philosophy of education through 3D virtual learning environments based on artificial intelligence.

b.The aims of the perspective proposed: There are some considerations that should be taken into account:

1. It is important that all plans set for developing a sector or another in the educational sector should be within a systematic thinking. Education is an integrated system in which development cannot be achieved for any of its components without considering the rest of the components. The educational system itself is a part of the whole society's total system that affects and is affected by it. It includes all the areas of life in this society and all the varied powers and cultural factors with which it interacts. Considering e-learning a sub- system and 3D virtual learning environments a sub-system of that sub-system, we can't expect success in developing education through

3D virtual learning environments based on artificial intelligence without success of developing education whether it is in its philosophy, policy, plans or institutions. Add to this development of the societal system.

2. The success of the strategy of e-learning expansion at the University of Bisha is proportional directly to the ability to attract many parties to support the orientation that this sector is based on.

3. The University of Bisha, expanding e-learning, doesn't look at expansion as an aim for its sake. Rather, it focuses on the outputs this sector provides.

4. The future vision for the e-learning progress in the Kingdom of Saudi Arabia, generally, and the University of Bisha , in particular, should be directed to overcome the current difficulties that this sector faces and the obstacles that hinder developing performance based on the results of the field studies.

c. The suggestions of the perspective proposed:

In this respect, the researcher points out the suggestions for development that should be included in the proposed perspective were formulated operationally, as possible, in a way that shows how to be applied. This is to change them from just unspecific statements to applicable ideas in reality. The following are the suggestions presented by the proposed perspective in three dimensions:

First: Facilities and technological background of students and faculty staff: The following should be taken into account:

1. Increasing the efficiency of the internet infrastructure which requires providing access to the rapid speed internet, security and safety on the network, and computer labs for the students.

2. Preparing training programs in the area of 3D virtual learning environments for developing the following skills:
    a. Skills of logging into the 3D virtual learning environments based on artificial intelligence.

b. Navigation inside the 3D virtual learning environments based on artificial intelligence.

c. Self- learning and self-acquisition of concepts. Problem solving and cooperative learning.

d. Communication and dialogue via 3D virtual learning environments based on artificial intelligence.

e. Distant searching through the 3D virtual learning environments based on artificial intelligence.

f. Publishing and increasing the efficiency of the educational materials presented through the virtual learning environments based on artificial intelligence.

Second: Concerning the obstacles of making use of 3D virtual learning environments based on artificial intelligence, the following practical procedures should be followed:

1. The educational system at the University of Bisha:
   a. Preparing the educational institutions to change to learning through3D virtual learning environments based on artificial intelligence.
   b. Getting rid of the educational system bureaucracy.
   c. Establishing a unit in the university to take over these tasks.

2. The student:
   a. Preparing training sessions for preparing the students psychologically for accepting learning through 3D virtual learning environments based on artificial intelligence.
   b. Promoting the students' technological skills and abilities.

3. The instructor:
   a. Counting teaching through 3D virtual learning environments based on artificial intelligence from the faculty staff's educational load which decreases the instructor's overload in addition to financially supporting him.

b. Preparing the faculty staff to design educational situations on the sites of 3D virtual learning environments based on artificial intelligence.

4. The virtual e-learning sector:
   a. Providing financial support from the buildings, facilities and equipment budget.
   b. Providing high level educational and technical experts to support teaching through 3D virtual learning environments based on artificial intelligence and carrying over its tasks.

Third: Considerations for the 3D virtual learning environments based on artificial intelligence. They should:

- Stimulates students' concern and motivation to self-learning.
- Helps meet individual differences among students.
- Guides students to think systematically.
- Allows the student to build the course according to his needs.

This requires building a student's form, faculty staff's form, the expert's form and an interface's from according to styles of artificial intelligence to achieve the previous tasks.

Fourth: The educational and technological requirements for designing a 3D virtual learning environment based on artificial intelligence for teaching English language to the medical students.

A. Providing some qualified specializations for working in developing 3D virtual learning environments based on artificial intelligence. They are:

1. The management team: This includes
   a. Project manager.
   b. Production coordinator.
   c. Students' registration services clerk.
   d. Copyright coordinator.
   e. Marketing coordinator.

2. The academic and educational team. This includes:

    a. A person responsible for assessment and evaluation.
    b. A psychologist.
    c. An editor for formulating the scientific content.
    d. A person responsible for implementing discussion through 3D virtual environments.
    e. A person responsible for making the scientific content available.
    f.   A person responsible for counseling and guidance.
    g. A sample of the instructors and the students.
    h. A person responsible for the library services.

3. Site examination and quality assurance team. This includes:
    a. A person responsible for quality assurance.
    b. A person responsible for conducting pilot studies.

4. Information and/ or program engineering team. This includes:
    a. Information engineer.
    b. Artificial intelligence expert.
    c. An expert in the subject matter.

5. **Design team.** This includes:
    a. Educational designer.
    b. Interaction interface designer.
    c. Drawings and monitors designer.

6. Designing and producing multimedia team. This includes:
    a. Graphics and production of educational diagrams team.
    b. Carton production team.
    c. Photos production team.
    d. Educational video production team.
    e. Sound production engineer.
    f.   Filming and editing engineer.

7. Development team. This includes:
    a. A system analyst.
    b. A programmer.
    c. A programmer for databases and web server.

8. Communication and information technology team. This includes:
   a. A person responsible for web management and engineering.
   b. A person responsible for technical and engineering support.

B. The necessity of blending instructional design models (IDM) and software engineering models (SWEM) in developing the intelligent virtual e-learning systems through 3D virtual learning environments.

C. The necessity of evaluating the quality of the intelligent 3D virtual learning environments using the available educational standards and agreeing on the list of suggested criteria in this study for assuring the quality of the intelligent 3D virtual learning environments.

D. The necessity of using tools and programming languages that may be useful in building 3D virtual learning environments based on artificial intelligence for teaching English language to the medical students in order to prepare its stakeholders. Among these languages are:

1. Ready- made specialized programs in site design such as:
- M.S. Front Page
- M.S. Web Expression
- Macromedia Dream Weaver
- Microsoft Office Publisher
- Web Page Maker

2. Internet server programs such as:
- Internet Information Server (IIS)
- Apache (PHP)

3. Programs that are useful in the area of artificial intelligence such as:
- Lisp
- Prolog

- Expert System Shells
- V C++
- M.S. Visual Basic .Net

4. Database management systems such as:

- Oracle
- My SQL
- M.S. SQL Server

5. Drawing programs such as:

- Corel Draw
- Macromedia Fireworks
- Adobe Illustrator
- Adobe Photoshop

6. Sound programs such as:

- Sound Forge
- DFX Audio Enhancer
- Adobe Audition SDK

7. Programs that are implemented at the client's side for programming the interactive pages such as:

- Java Script
- Visual Basic Script
- Java Applet

8. Programs implemented on the server side for programming the interactive page such as:

- ASP(Active Server Pages)
- ASP.net
- PHP (PHP : Hypertext Preprocessor)
- Java

9. Interactive and stable page design programs such as:

- HTML (Hyper Text Markup Language)
- XHTML (Extensible Hyper Text Markup Language)
- XML (Extensible Markup Language)
- DHTML

- CSS (Cascading Style Sheets)

10. 3D drawing programs such as:

- 3D Studio Max
- Maya
- 3D Photo Builder
- Poser
- VRML Virtual Reality Modeling Language

11. Video and animation programs such as:

- Adobe Image ready
- Macromedia Flash
- Adobe Premiere Pro
- Swish

12. Helping programs for site texts' editing such as:

- Microsoft Word
- Word Pad
- Notepad

E. The necessity of evaluating the 3D virtual learning environments based on artificial intelligence using different technological and educational methods through the suggested list of criteria. Some of these methods are:

- Revising language and spelling.
- Revision by external institutions.
- Getting feedback on the site from experts.
- Getting feedback on the site from the faculty staff and the students through questionnaires.
- Experimenting on a group of equipment on different conditions to know their compatibility.
- Experimenting on a group of students and identifying its effect and effectiveness.
- Revising the technical mistakes in sound, animation and image.

- Internal evaluation of the site itself before the students' use.
- Alpha test (the initial test of the product in the lab).
- Beta test (a test by the end users).

F. Designing 3D virtual learning environments based on artificial intelligence in all fields focusing on the fields in which it is difficult to prepare and teach through the internet. These systems have abilities that allow them to do so. Some of these fields are:

- The theoretical and educational fields.
- Fields that require simulation of reality.
- Fields that require educational interaction, such as teaching programming.

Recommendations:

Based on this study, it is recommended that:

- E-learning deanship at the University of Bisha adopts the suggested model for designing 3D virtual learning environments based on artificial intelligence and the criteria it included for quality of this system.
- It is necessary to care for utilizing and designing 3D virtual learning environments based on artificial intelligence in education either by integrating it with the traditional method or depending completely on it.
- Establishing a unit at the University of Bisha for adopting technology of artificial intelligence and programming engineering and utilizing them for producing high level intelligent virtual e-learning systems with a high level of effectiveness, in addition to making these systems available via the mobile. This unit would be called "Intelligent virtual e-learning systems' unit".
- Training those responsible for designing virtual e-learning sites on artificial intelligence technology and engineering programming **(OOSWE).**

Suggestions for further research:

- Conducting similar studies on other subjects and different educational stages.
- Investigating the effectiveness of 3D virtual learning environments based on artificial intelligence in achievement and other variables such as critical thinking.
- The effect of utilizing 3D virtual learning environments based on artificial intelligence on achievement among slow learners and the gifted students.
- Training teachers on utilizing 3D virtual learning environments based on artificial intelligence for developing the practical skills among students in different specializations.
- The effectiveness of utilizing 3D virtual learning environments based on artificial intelligence on developing virtual e-learning systems.

References:

Abdalla, A. (2013).*The needs and attitudes of Science students to ESP: A case study of TAIF University in KHURMA*, Ph.D. Faculty of Education, TAIF University, Saudi Arabia

Abdelnaser, G. (2010). Utilizing artificial intelligence for designing educational internet sites as an approach for developing distant e-learning university teaching. Ph.D. Faculty of Specific Education, Ain Shams University.

Alaraby, Z. M. (2008). The effectiveness of cooperative learning strategy through artificial intelligence in the Programming subject on creative solving of cooperative problems and skills. Ph.D., Faculty of Specific Education, Ain Shams University.

Alghedan, A. (2013). A suggested framework for M-Learning in the higher education institutions. The future of Arab education, 20(82), pp. 9- 58.

Almane, H. (2013). The effect of utilizing virtual worlds in developing skills of designing databases among the second

grade secondary stage female students. M.A. Thesis. Faculty of Education, King Abdulaziz University.

Alhesan, A. M. and Alebeid, A. A. (2009). The Science virtual learning environment in light of total quality criteria. *The 3rd conference for Science Education "The curriculum, teacher and book: an invitation for revision",* the Society of Science Education, Al-Morgan Hotel, Fayed, Ismailia, pp. 34-67.

Annagar, M. K. (2012). The effectiveness of a program based on artificial intelligence technology in developing the skills of designing educational electronic sites among Educational Technology students in the light of total quality standards. M.A. , Educational Studies Institute, Cairo University.

Ibrahim, N. M (2009). The effectiveness of an intelligent educational system for the primary stage child and its effect on developing creative thinking. *Ph.D.* faculty of Specific Education, Ain Shams University.

Berge, Z. L. &{lark, T.(2005). *Virtual schools: Planning for success.*NY:Teachers College Press.

Fiona, B. & Magnus, M. (2003). The VERTEX project: Designing and populating shared 3D virtual worlds in the primary (elementary) classroom‹*Computers & Graphics 27*, pp 353–359.

Hassan, M. (2011). Criteria of designing and building a 3D virtual learning environment in the virtual worlds. *Journal of Educational Technology: Studies and Research Papers.*67, pp 467- 486.

Khairy, E. B. (2008). The effectiveness of intelligent, cooperative learning of e-courses in developing achievement among Educational Technology students in the faculties of Specific Education. Ph.D. Faculty of Specific Education, Ain Shams University.

Rahouma, A. M. (2011). Developing some virtual communities: New success factors for web socio-techodevelopment. Retrieved: 5/4/2013. Available: http://www.astf.net/

Salem, A. M. (2002). The newest in educational technology. *The Egyptian Alahram Magazine*, 31 Jan. 2002.

Sarani, A. & Leila, S. (2012).*The impact of task-based approach on vocabulary learning in ESP.* English language and literature department, University of Sistan & Baluchestan, Zahedan, Iran.

Yufang, C. & Jun, Y. (2010). Exploring the social competence of students with autism spectrum conditions in a collaborative virtual learning environment – The pilot study. *Science Direct، Computers & Education، 54* (2010). 1068–1077.

Zeineddin, M. M. (2010). Constructivist criteria for the quality of educational virtual reality programs and the 3D environments. *Paper presented at the first seminar in applications of communication and information technology in education and training,* 12-14 April (2010), Faculty of Education, King Saud University.

Zayed, F. S. (2005). The computer note: 1000 questions and answers in computer and information systems. Cairo: The Knowledge House.

Waheed, M. (2014, April). The effect of the difference in introducing the patterns of feedback in virtual realities in developing the skills of designing and producing databases among Al-Azhar Institutes students. Journal of Arab Studies in Education and Psychology, 48 (3), 49-94.

An Analysis of the Sixth Grade Science Curriculum in Light of the levels of Cognitive Domain of the New Version of Bloom's Taxonomy

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Abstract:

T *he aim of this study was to analyze the 6th grade science curriculum in Saudi Arabia in terms of the levels of cognitive domain of Bloom's Taxonomy. The study was carried out in two units: the materials, and science helps human. The analysis of the textbook was through analyzing words and images. The analyzed data were divided into a number of categories 1- Objectives; 2- New Concepts and Definitions; 3- Illustrative Pictures and Descriptions; 4- Activities; 5- Evaluation. Then, the results of the analysis have been compared with Bloom's Cognitive Taxonomy in order to place them into an appropriate level in the Taxonomy. The findings show that the contents of the two units mainly concentrate on the first three levels in the Taxonomy; remembering, understanding, and applying. Unfortunately, there were limited of the two units' contents meet the advanced three levels of the Taxonomy; analyzing, evaluating, and creating.*
Keywords: Science Curriculum, Bloom's Taxonomy, Primary Schools, Gifted Education, Documentary Analysis

1. Introduction:

Saudi Arabia recognized the importance of meeting the needs of gifted children in the mid 20th century. In 1968, the educational policy in Saudi Arabia stated that, each student has the right to develop his/her talent, and his/her ability. However, no programmes or real educational services were adopted until 1995, when the Ministry of Education started a programme called "Talent Search" (Ministry of Education in Saudi Arabia, 1998).

In 1998, the Ministry of Education in Saudi Arabia established a number of gifted education centres around the country. Afternoon and Thursday programmes for the gifted are

the main task of the gifted centres during the school year, while summer camps are the biggest annual event for gifted students. For example, between 2003 and 2008, sixteen summer programmes were run yearly in several universities around the country (King Abdulaziz & His companions foundations for the Gifted, 2008). Other enrichment programmes have been held in computer science and engineering in King Fahd University (Atas and Twfeek, 2006). In 2006, about 760 students attended similar programmes around Saudi Arabia (King Abdulaziz & His companions foundations for the Gifted, 2008). Moreover, in August 2006, the first international conference on gifted children was held in Saudi Arabia. Scholars from 26 countries, such as the UK, the USA, Germany and China, were invited to the conference in Jeddah city. Programmes have been established in many cities in the country. A programme called "Gifted Education within Schools" was started by the Ministry of Education in 2002 which were pull-out programmes. Currently, the King Abdulaziz Foundation for the Gifted (KAGF) is establishing different programmes for gifted secondary, high school and university students. All these programmes are in science and technology (King Abdulaziz & His companions foundations for the Gifted, 2008). Saudi Arabia is therefore developing a broad range of programmes, designed towards nurturing gifted people within and outside schools.

However, there is still a need for more programmes to help the gifted in schools, because schools are the best place to provide extra programmes and give attention to gifted students (Aljughaiman, 2005). In addition, all gifted programmes in schools in Saudi Arabia are delivered outside regular classrooms.

2. Critical Background:

The picture of public education has changed considerably throughout the last three decades. The number of students - both boys and girls - has increased from 104,738 in 1960 to 5,019,007 in 2009. Moreover, the world requires education to be developed in quantity of students and quality of learning simultaneously.

This section will highlight some of the results of Arsheed *et al.'s* (2003) work on the science curriculum in Saudi Arabia that are pertinent to the study presented here. Arsheed *et al.'s* project studied the science curriculum in all primary and secondary schools in Saudi Arabia from 1988 to 2002.

Arsheed *et al.* (2003) analysed the contents of the science curriculum in the primary stage against several standard factors. However, only some of those factors have been highlighted here because they are particularly relevant to the current study in relation to one of its aims; that is to examine the current science textbook in 6th grade in its adequacy to meet the needs of gifted students. These factors are:

1. Attention to individual differences;
2. Meeting the pupils' needs, interests, tendencies and concerns;
3. Development of the capacity to research and survey;
4. Care of the environment and social problems.

2.1 Attention to Individual Differences:

As the scientific content in the primary stage is common to all students, this means that there is no formal interest in individual differences, which confirms the lack of optional subjects for the education of certain gifted students. Researchers, teachers and supervisors agree that the scientific content of the science curriculum at the primary level does not take into account individual differences among students and does not clearly specify what is to be taught to the gifted and to others.

Arsheed *et al.'s* (2003) results showed that the science curriculum at the primary stage in Saudi Arabia partly meets the needs and concerns and the tendencies of students. However the needs of gifted students do not seem to be specifically addressed. Therefore, educators and researchers in Saudi Arabia should undertake more studies about these factors for gifted students, and not just consider the needs, interests, tendencies, and concerns of average students.

2.2 Meeting the Pupils' Needs, Interests, Tendencies and Concerns:

Arsheed *et al.* (2003) stated that there is a need to develop the scientific content of the science curriculum, to take into account the individual differences between the various categories of students. As a result, developing the contents of the science curriculum will allow for more differentiation of scientific activities. In addition, Arsheed *et al.* (2003) recommended that the science curriculum should have some scientific activities that are specifically designed for gifted students.

2.3. Development of the Capacity to Research and Survey:

Research results showed that the scientific contents of the science curriculum of the primary stage is poor and it does not develop students' capacity to research and survey (Arsheed *et al.*, 2003). The majority of methods that are used in books and classes focus on memorization; this method is not appropriate for developing the ability to research and survey using scientific information. Moreover, in order to develop the ability in gifted students to research and survey, the science curriculum should be designed and built with consideration of the views of scientists, experts in education, teachers, as well as students. Arsheed *et al.* (2003) showed that there is a need to pay more attention to developing research and survey skills, especially for gifted students so that the science curriculum is designed to cater for the needs of this group. Thus, one aim of this research is to analyse the science curriculum to examine in detail whether the content of units provides sufficient opportunity for gifted students to engage in research and survey.

2.4 Care for Environmental and Social Problems:

Arsheed *et al.* (2003) showed that there is agreement from researchers, teachers and supervisors that the science curriculum in Saudi Arabia in the primary stage gives special consideration to the environment, while social problems are not

given the same attention. From the above, it seems that there is a need to increase the awareness of topics on social problems.

To sum up, the science curriculum for the primary stage in Saudi Arabia does not pay sufficient attention to several important factors discussed above. It would appear that the students' needs in terms of knowledge, development of attitudes and concerns are not adequately addressed in the science curriculum for the primary stage in Saudi Arabia. In addition, the topics of social problems are not adequately addressed, and the content lacks topics that can enrich the science curriculum to meet the needs of average as well as gifted students. If these were addressed the science curriculum would be enhanced not only for the gifted, but for all students. It could be said that there is a need to design a curriculum to meet that needs of gifted students that is based on empirical research conducted by specialists in this field.

3. Thinking and Research Skills :

There are many types of thinking addressed in the fields of psychology and education. Examples of these are: scientific, empirical, analytic, logical, critical, and creative thinking. The thinking skills of the gifted have been delineated by a number of researchers (Renzulli, 2000; Lipman, 2003; Cottrell, 2005). There are many thinking skills that tend to be used and practised by the gifted, not only those that can be taught. One of the most famous models, which has been used frequently to develop thinking skills in students, is Bloom's (1956) cognitive domain taxonomy (Maker and Nielson, 1995). The original framework of this cognitive taxonomy includes six categories of thinking skills: knowledge, comprehension, application, analysis, synthesis and evaluation. All categories were labelled as 'abilities and skills'. Later, Anderson *et al.* (2001) modified Bloom's cognitive domain taxonomy:

The original number of categories, six, was retained, but with important changes. Three categories were renamed, the order of two was interchanged, and those category names retained were changed to verb form to fit the way they are used

in objectives (Krathwohl, 2002:214). The categories in the Anderson *et al.* (2001) revision are remember, understand, apply, analyse, evaluate and create. Table 1 shows the details of the six new categories in the revision of Bloom's Taxonomy.

Table 1: Structure of the Revised Taxonomy

1. Remember – **Retrieving relevant knowledge from Long-term memory.**	*1.1 Recognizing* *1.2 Recalling*
2. Understand – **Determining the meaning of instructional messages, including oral, written, and graphic communication.**	*2.1 Interpreting* *2.2 Exemplifying* *2.3 Classifying* *2.4 Summarizing* *2.5 Inferring*
3. Apply – **Carrying out or using a procedure in a given situation.**	*3.1 Executing* *3.2 Implementing*
4 Analyze – **Breaking material into its constituent parts and detecting how the parts relate to one another and to an overall structure or purpose.**	*4.1 Differentiating* *4.2 Organizing* *4.3 Attributing*
5. Evaluate – **Making judgments based on criteria and standards.**	*5.1 Checking* *5.2 Critiquing*
6. Create – **Putting elements together to form a novel,coherent whole or make an original product.**	*6.1 Generating* *6.2 Planning* *6.3 Producing*

From Table 1 it could be said that the first two levels (remembering and understanding) are necessary for all students, and that all students should be encouraged to develop higher skills (Davis and Rimm, 2010). However, it is expected that gifted students will develop higher-level cognitive skills, including applying, analysing, and evaluation and creating. Taber (2007) suggests that curricula or teaching and learning programmes for gifted students should include extension in depth and enrichment in breadth, which means these programmes should provide additional support and challenge in the classroom and outside school. In addition, an important issue in challenging learners is to build activities based on the higher levels of thinking (Watts and Jesus, 2007). Taber and Corrie (2007) suggest that teaching of gifted students in science should emphasise questions and activities that enable the learner to apply, analyse, evaluate and create.

The study is guided by the following research question:

What are the contents of the current science textbook in the sixth grade at public schools in Saudi Arabia in terms of learning demand?

4. Methodology:

This study uses documentary analysis as a tool to analyse the textbooks of the science curriculum. This instrument has been selected to answer the research question. The goal of the analysis is first to look at the contents of the textbook and to examine the extent to which the textbooks match cognitive demand, as defined by Bloom's Taxonomy (David R. Krathwohl *et al.*, 1964). The methodology used to analyse the selected science textbook is quantitative. The steps in the analysis of textbook are:

1. Choosing the categories (Arsheed *et al.*, 2003);
2. Comparing the categories with Bloom's Taxonomy;
3. Presenting results.

4.1.Choosing the categories:

this step was undertaken by reading the textbook several times to develop an understanding of its form, structure and contents which gives the researcher a very good level of understanding of the content (Maslak, 2008) and the structure of the science curriculum.

The in-depth reading will enable the categories to be selected in the second step. The categories are derived from the analysis of the science textbook and from some studies which highlighted the principles of the components of a textbook (Arsheed *et al.*, 2003; VanTassel-Baska and Brown, 2007). The important issue here is that it should be possible for the categories to be used or applied by other researchers or readers who are looking at the same contents, such that they would obtain the same or comparable results (Berg, 2007; Devetak *et al.*, 2010). Thus, *this may be considered a kind of reliability of the measures and a validation of eventual findings* (Berg, 2007: 306).

The analysis of documents (e.g. textbook) should also be related to the literature and the research questions (Berg, 2007).

4.2 Comparing the categories with Bloom's Taxonomy:

Bloom's Taxonomy has been used as a guide to judge whether the textbook meet the six levels of cognitive demand. *Bloom's taxonomy has been widely adopted as a model for conceptualising higher level thinking skills for gifted learners* (VanTassel-Baska, 1994a:303). Thus, the current study has used Bloom's Taxonomy as a guide to judge whether the science textbooks meet the needs of gifted students. Intra-rater reliability is a type of reliability assessment in which the same assessment is completed by the same rater (www.medicine. mcgill.ca). To demonstrate intra-rater reliability, the researcher analysed two complete units of the science textbooks. After one month later, the researcher analysed the same units. The percentage of agreement was 90 %. These reliability indices adequately demonstrate dependability of the method in this study. The identified categories as a result of step 1 divide the science textbook into the following: 1- Objectives; 2- New Concepts and Definitions; 3- Illustrative Pictures and Descriptions; 4- Activities; 5- Evaluation. Then, the units (unit 5 and 6 of the science textbook of 6th grade) are compared with Bloom's Taxonomy of cognitive demand (Remembering, Understanding, Applying, Analysing, Evaluating and Creating (Taber, 2007) and (http://www.coe.uga.edu/epltt/bloom.htm) - see Figure 1 and Table 2).

5. Presenting results:

The results are presented thematically both quantitatively using descriptive statistics: numbers and percentages, and via qualitative descriptions

The science textbook in the 6th grade contains six units. Each unit has two or three chapters and each chapter has a different number of lessons. Five units of the textbook have been analysed. Then, two units were chosen as a sample for this study.

The selected units are Unit 5 ("Materials") and Unit 6 ("Science Helps Humans"). These units were selected based on the subjects covered. The content of Unit 5 is chemistry; this is the study area and background of the researcher. Unit 6 is about applications of science, within which the related subject is using chemistry in our lives (e.g. drugs); this also relates closely with the researcher's field of knowledge.

Table 2: Original and New Bloom's Taxonomies (www.iste.org)

Level	Original	New
1	(low) Knowledge	Remembering
2	Comprehension	Understanding
3	Application	Applying
4	Analysis	Analysing
5	Synthesis	Evaluating
6	(high) Evaluation	Creating
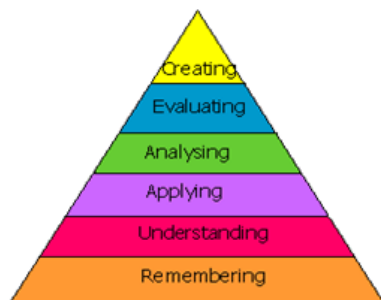
Figure.1: A new revision of Bloom's Taxonomy (Forehand ,2005)

Science textbooks are the primary sources used by science educators throughout the world to guide them in teaching the content and skills prescribed in curricula (Stoffels, 2005). In Saudi Arabian schools, there is a considerable emphasis on textbooks in science classes, not only by teachers but also by students (Arsheed *et al.*, 2003). Science textbooks are regarded by the Ministry of Education as the primary source of information in all schools.

The goal of the analysis is to look at the contents of the textbook and to examine the extent to which it matches cognitive

demand, as defined by Bloom's Taxonomy. In order to answer the research question, the study employed several steps: 1. Choosing the categories; 2. Comparing the categories with Bloom's Taxonomy; 3. Presenting results.

General Information about the Textbook

The nature of the Saudi grade 6 science textbook is discussed here to provide contextual information. The cover sheet contains one image, the title and the date of publication. The second page contains the names of the authors and the reviewers and the remainder of the divided into several components.

The introduction to the textbook includes four main parts. The first part includes the major aims of science teaching in primary schools in Saudi Arabia and the goals of the science textbook at this level. The second part is directed to science teachers and focuses on their role in classes. The third part is directed to the parents and provides some advice on how to help and support their children in their study of the science textbook. The last part is directed to the student and includes some advice to encourage them how to be researchers and scientists.

There are six units in the science textbook. Each unit has several different chapters. The units cover different subjects in science (e.g. physics, biology, and chemistry). Some of these units consist of two or three chapters. Each chapter consists of several topics, which form the sub-sections of the chapter

Table 3: The Subjects of each unit in the 6th grade science textbook

Unit	Chapter	Subject
(1) The Human Body	1	Skeleton
	2	Muscle and Movement
	3	Nervous System
(2) Reproduction	4	The Importance of Reproduction
	5	Reproduction of Birds and Mammals
(3) Our Environment	6	The Environment and Us
	7	The Effect of Humans on the Environment
	8	Relations between the Creatures in the Environment
(4) Electricity and Magnets	9	Electricity
	10	Magnets
(5) The Materials	11	Combined, Elements and Compounds
	12	Metals and Rocks
(6) Science Helps Humans	13	Science Helps Humans to Improve Telecommunication
	14	Science Helps Us to Save our Health

Table 4: General features of the science textbook

	Chapters		Topics		Pages	
	Chapters	**% of Chapters of the textbook**		**%**		**%**
Unit 1	3	21.5%	13	22%	21	16%
Unit 2	2	14%	10	17%	17	13%
Unit 3	3	21.5 %	9	15%	25	19%
Unit 4	2	14%	13	22%	33	25%
Unit 5	2	14%	9	15%	25	19%
Unit 6	2	14%	5	9%	11	8%
Total	14	100%	59	100%	132	100%

Table 4 summarizes the general features of the science textbook. Unit 4 consists of 33 pages of the textbook which accounts for 25% of the total text book, forming the biggest part of this book. Units 3 and 5 are the next biggest units, each consisting of 25 pages (22%). Unit 6 is the shortest unit at only 11 pages (8%). There are 59 topics: Units 1 and 4 each consist of 13 topics (22%). Unit 2 consists of 10 topics (17%), while units 3 and 5 each consist of only 9 topics (15%).

Units 5 and 6, on "Materials" and "Science Helps Humans" were chosen for analysis as they are the most relevant subjects to the researcher. These units are long enough to be representative as a sample of the whole textbook and this proportion is acceptable given the nature of this research.

The following paragraphs provide details of the steps that were used to analyse the Science Textbook (ST).

Step1: Choosing the categories: the science textbook was read several times to develop an understanding of its form, structure and contents. This gave the researcher a very good level of understanding of the content and the structure of the science textbook. In addition, it helped him to think about the categories that would be selected. Decisions were made about the categories of analysis. It is important that the categories used in the analysis are replicable: i.e. that they can be used again by any researcher to give the same results when analysing the same contents.

The analysis of Units 5 and 6 of the textbook was performed through analysing both words and images. All the contents in Units 5 and 6 were divided into a number of categories: 1- Objectives, 2- Definitions, 3- Illustrative and Description Pictures, 4- Activities, and 5- Evaluation.

Step 2: Comparing the categories with Bloom's Taxonomy: Bloom's Taxonomy was applied to the results of the analysis to identify the proximity of the units to this taxonomy. Later, because some of the contents did not fit into any categories, such as resources, learning independently, and using advanced technology, the study moved on to analyse these contents qualitatively. This step was chosen to cover all the materials and matters in the science textbook.

Step 3: presenting the results: the analysis of both Units 5 and 6 were presented against Bloom's Taxonomy.

5.1 Analysis of Unit 5

Table 5 (see Appendix A) shows the analysis of Unit 5 according to Bloom's taxonomy. Unit 5 consists of two chapters (11 and 12). There are 19 objectives, 9 definitions, 12 images, 21 educational activities and 7 evaluation questions. Comparison has been made between these results and the cognitive demand of Bloom's Taxonomy. The majority of the objectives involve "remembering" (57%), while the level of "understanding" is 31% and the level of Applying is only 10%. At the same time, no objective is related to the higher levels of analysis, evaluating and creating, in this unit.

The levels of remembering, understanding and applying all have the same percentages (33%) in the category of definitions, while the percentages of the levels of analysis, evaluating, and creating are 0%. The levels of understanding and applying have good percentages (50% and 41%) in the category of images and pictures, while remembering accounts for only 8% of images and pictures in this unit. Most of the educational activities in this unit fall into the level of applying (57%), followed by understanding (28%), while, remembering, analysing and creating each account

for only 5% of activities. The educational activities contain no cases at the level of evaluation. The evaluation element of this unit is focused only on the first two levels of Bloom's taxonomy, which are remembering and understanding (71% and 29% respectively). These are examples from the ST that will illustrate some level of thinking skills included;

Understanding: *What will be happened if we mix up the salt with water?*

Applying: *In our daily life, we use a lot of elements and mixtures, please fill the gaps with suitable answers in the Table below:*

Mixtures used in daily life		Elements used in daily life	
Name of mixture	Use area	Name of element	Use area

This indicates that most of the contents of unit 5 have been designed to meet the first three levels of thinking skills of Bloom's taxonomy. These levels are the lowest levels of thinking. Only two of the activities included in this unit meet the higher levels of thinking, namely analysis and creating. This suggests that unit 5 should be redesigned to give more opportunities for gifted students to expand their skills, especially in the higher levels of thinking. Furthermore, the unit does not include any content addressing the skills of evaluating.

Evaluation questions in this unit did not cover all the objectives, as some objectives were left without measuring some of these skills. For example, there are only 7 evaluation questions in unit 5, while there are 19 objectives.

5.2 Analysis of Unit 6:

Table 6 (see Appendix B) shows the analysis of unit 6 against Bloom's Taxonomy. Unit 6 consists of two chapters (13 and 14). There are 9 objectives, 6 definitions, 3 images, 15 educational activities and 4 evaluation questions. Most of the chapter's objectives are focused on the levels of applying and understanding (44% and 33% respectively), followed by remembering (22%). There are no objectives related to the levels of analysing, evaluating or creating in this unit. The definitions in

this unit meet only two levels of thinking, which are remembering and understanding (67% and 33% respectively).

The level of applying accounts for the largest percentage of material (67%) in the category of images and pictures, while understanding accounts for 33% of images and pictures in this unit. Most of the educational activities in this unit meet the level of applying (53%), followed by analysing (27%). Creating is third, with 13% of the activities falling into this category. Only 6% of the educational activities may be classed as meeting the level of evaluating.

The majority of the evaluation questions in this unit are focused on the lowest level of Bloom's Taxonomy, which is remembering (75%). The second level is applying, which accounts for 25% of the questions. None of the evaluation questions meet other levels of Bloom's Taxonomy.

These findings indicate that the majority of the contents of unit 6 have been designed to meet the first three levels of thinking skills of Bloom's taxonomy. These levels are the lowest levels of thinking. Some educational activities in this unit meet higher levels of thinking (e.g. analysis), which is represented in a reasonable number of activities. Moreover, the level of creating is found in two of the fifteen activities (13%), which is a good rate compared with other thinking skills in this unit. The results reveal that the unit's objectives do not include any thinking skills at the levels of analysing evaluating, or creating, although some of its activities give the students opportunities to practice these skills. This means that the objectives in this unit do not reflect the level of skills of the activities. For example, the textbook asks the student to:

"Discuss with older people about the diseases that affected people in the past, and how people were expected to deal with these types of diseases, and then write a report about what you find. Then, discuss your reports with your teacher and classmates".

This example contains some higher-order skills (e.g. applying, analysing and creating), which is good for the students.

On the other hand, the objectives of this unit do not include or meet these levels of skill. This suggests that the textbook authors must ensure that outcomes of the textbook reflect the objectives. Unit 6 should give more opportunities for gifted students to expand their skills, especially the higher levels of thinking. In addition, the unit does not include any content at the level of evaluating. For example, the objectives of the Unit 6 include three objectives which meet lower levels of thinking:

The students will be able to:
(Applying): *draw the shape of a wave;*
(Remembering):*remember how the sounds transfer throughout the air*
(Remembering and Applying): *remember how the sounds transfer throughout the TV, Radio, and phones.*

Overall, the quantitative analysis of Units 5 and 6 indicate that there are several important issues to be taken into account in designing a science textbook.

Both units have suitable numbers of activities that meet the first three levels of thinking (remembering, understanding and applying). Moreover, there are some activities that aim to develop higher levels of thinking (analysing, evaluating and creating). However, the numbers of tasks and activities are generally too low. Most of the activities entail direct application of knowledge. Thus, the units should be redesigned to improve all levels of thinking, not only the lowest levels. In addition, there is a clear need to increase the number of evaluation questions to cover all the learning objectives. For example, the total number of evaluation questions in both units is 11, while the total number of objectives is 28. In addition, most of these questions focus on the first two levels of thinking, except for one, which meets the level of applying. Moreover, the level of evaluation should be included for all activities and all levels of thinking.

The findings of the analysis of the ST showed that the majority of its contents only meet the first three levels of thinking skills of Bloom's taxonomy.

6. Discussion:

There was a clear picture across all the findings of the current study that the thinking skills contained in the ST do not exceed the lower order of Bloom's Taxonomy. This highlights the need to improve the ST to meet the higher level of thinking required by our gifted students. Halpern (2003:2) states *that the information explosion is yet another reason why we need to provide specific instruction in thinking.* Thomson (2006) emphasized that the development of gifted education is necessary to ensure that students have opportunities to develop their abilities and skills to become the future intellectual, social, economic and cultural leaders.

The findings from the analyses of the ST showed that the majority of the skills in the ST are focused on remembering, understanding and applying. The analysis of the ST showed that more than 50% of the materials are at the level of applying.

Unit 5 contains few materials that address the levels of analyzing, evaluating or creating. On the other hand, Unit 6 has a good level of material at the levels of analyzing and creating. This implies that the majority of skills are lower than the students require. This is in line with Purcell *et al.* (2002), who found that *the gap between current curricular units and learning needs of gifted and talented learners is immense*. Many programmes have been established to develop gifted students" thinking skills, but these aspects are not included in science textbooks (Purcell *et al.*, 2002; Adams and Pierce, 2008). VanTassel-Baska *et al.* (2007) examined eleven different programmes designed to meet the needs of gifted students. One of the main purposes of these programmes was to increase the level of thinking skills of all students, including gifted students. The programmes showed *some evidence of effectiveness with gifted learners* (VanTassel-Baska, 2007:351). Furthermore, Gady (2006) mentioned that there were many reasons to include and develop higher order thinking skills in gifted programmes, because these programmes would prepare students for their real life, improve learners" social lives and help students to cope with the complexity of life

and decision-making. Based on the above view, the importance of higher-order thinking skills is clear, and students should be enabled to participate in lessons and practical experiments that include a range of these skills (Gady, 2006).

References:

ALJUGHAIMAN, A. 2005. The School Programme to Foster the Gifted., Alriyadh, The Ministry of Education.

ANDERSON, L. W., KRATHWOHL, D. R., AIRASIAN, P., CRUIKSHANK, K., MAYER, R., PINTRICH, P., RATHS, J. & WITTROCK, M. C. 2001. A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives,(Abridged Edition). New York: Longman, 302.

ARSHEED, A., BASAHI, A., ALOWAIS, A., ALRWAISHED, M., ALRWAILY, M. & ALSUAIK, H. 2003. Study of Teaching science in both elementary and Middle schools stages in Boys and Girls schools in Saudi Arabi, Riyadh, King Abdulaziz City for Science and Technology.

ATAS, H. & TWFEEK, H. 2006. King Fahad University Experience of Apply Enrichment Programme in Summer 2004. Regional Scientific Conference For Giftedness. Jeddah. Saudi Arabia.

BERG, B. 2007. Qualitative research methods for social science., U.S.A, Pearson education.

COTTRELL, S. 2005. Critical Thinking Skills Developing Effective Analysis and Argument, Basingstoke, PALCRAVE MACMILLAN.

DAVID R. KRATHWOHL, BENJAMIN S. BLOOM & BERTRAM B. MASIA 1964. Taxonomy of Educational Objectives the Classification of Educational Goals Handbook: Affective Domain, Longmans, Green and coltd.

DAVIS, G. & RIMM, S. 2010. Education of the gifted and talented, Needham Heights, MA, Allyn and Bacon.

DEVETAK, I., VOGRINC, J. & GLAŽAR, S. A. 2010. States of matter explanations in Slovenian textbooks for students aged 6 to 14. International Journal of Environmental & Science Education, 3, 217- 235.

FOREHAND, M. 2005. Bloom's Taxonomy: Original andRevised [Online]. Available: http://projects.coe.uga.edu/epltt/ [Accessed 10. 05. 2010].

HTTP://WWW.COE.UGA.EDU/EPLTT/BLOOM.HTM. [Accessed 01.03. 2010].

KING ABDULAZIZ & HIS COMPANIONS FOUNDATIONS FOR THE GIFTED, K. 2008. Annual Report. Riyadh: King Abdulaziz & His companions foundations for the Gifted

KRATHWOHL, D. 2002. A Revision of Bloom's Taxonomy: An Overview',. Theory Into Practice, 41, 212 - 218.

LIPMAN, M. 2003. Thinking in Education, Cambridge, Cambridge University Press.

MAKER, C. J. & NIELSON, A. B. 1995. Teaching Models in Education of the Gifted, Texas, Pro-ed.

MASLAK, M. 2008. School as a site of Tibetan ethnic identity construction in India? Results from a content analysis of textbooks and Delphi study of teachers' perceptions. Educational Review, 60, 85 - 106.

MINISTRY OF EDUCATION IN SAUDI ARABIA. 1998. Ministry of Education. Available: www.moe.gov.sa [Accessed 03. 07.2007].

RENZULLI, J. S. 2000. Gifted Dropouts: The Who and the Why Joseph S. Renzulli. Gifted Child Quarterly, 44,, 261-271.

STOFFELS, N. T. 2005. There is a worksheet to be followed': a case study of a science teacher's use of learning support texts for practical work. African journal of research in mathematics, science and technology education, 9, 147-157.

TABER, K. S. 2007. Science education for gifted learners. In: TABER, K. S. (ed.) Science Education for Gifted and Talented. Oxon: Routledge.

VANTASSEL-BASKA, J. & BROWN, E. F. 2007. Toward Best Practice: An Analysis of the Efficacy of Curriculum Models in Gifted Education. Gifted Child Quarterly, 51, 342-358.

WATTS, M. & JESUS, H. P. D. 2007. Asking questions in classroom science In: TABER, K. S. & CORRIE, V. (eds.) Science Education for Gifted Learners. Oxford: Routledge

The Effectiveness of Reframing Strategy Based on Neuro Linguistic Programming (NLP) Principles in Modifying Alternative Thermochemistry Conceptions and Developing Achievement and Achievement Motivation among Low Achievers at the Secondary School

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Abstract:

*T*his study aimed at diagnosing alternative conceptions about Thermochemistry concepts among a sample of first grade secondary stage students. The study also aimed at identifying the effectiveness of reframing strategy based on Neuro Linguistic Programming (NLP) in modifying alternative conceptions about Thermochemistry concepts and developing achievement and achievement motivation among low achievers at the first grade of the secondary stage. The sample of the study included low achievers from Abdelmonem Wasel Secondary/ Prep School and Abdelwahab Motawe Secondary/ Prep School. The experimental group studied the Thermochemistry unit using reframing strategy based on NLP while the control group studied the same unit using the traditional method. The results of the study revealed that alternative conceptions in the diagnostic sample reached more than 20% where the highest was 80% and the lowest 22%, which is a high percentage showing a clear weakness in correct scientific understanding of Thermochemistry concepts among the participants. The results also showed the effectiveness of the reframing strategy based on NLP in modifying alternative conceptions in Thermochemistry, and developing achievement and achievement motivation among low achievers at the first grade of the secondary stage. The study recommended the necessity of paying attention to preparing diagnostic tests for identifying the patterns of scientific alternative conceptions among the Chemistry students at the different educational stages. It also recommended including a part on diagnosing alternative conceptions and their treatment in the teacher's guide. Training in-service teachers on

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diagnosing and using the reframing strategy based on NLP in modifying alternative conceptions and helping students to acquire the correct scientific concepts should also be paid more attention.
Key words: reframing strategy – Neuro Linguistic programming – alternative conceptions in Thermochemistry – achievement in Chemistry – achievement motivation

Introduction:

Recently, many recent discoveries have appeared in the area of research related to the brain, which crystalized the relationship between the structure of the brain and learning through understanding its structure. Throughout the last years, educators studied the relationship between classroom education and the new theories about how human beings learn. The exciting discoveries in Neurology and the conceptions of Cognitive Psychology, revealed new ways of thinking concerning the structure of the nervous system of the human's brain, perception and emotions which contribute to learning. Most neuroscientists believe that most brain connections result from experiences that individuals pass throughout the stages of their life. They also believe that Neuro-connections can be modified throughout the stages of life via new connections formed even at a late stage of the human age, the brain is not affected or developed by meaningless information and that the nature of the brain is linking the old to the new.

Neuro Linguistic Programming (NLP) is one of the sciences that depend on brain-based learning especially the formation of neural connections. Mahishika (2010) points out that NLP was founded by Bandler and Grinder (2010). Tosy and Mathison (2003) explain that NLP maintains that the individual is a system of mind and body together represented in neural, language and programming. In this respect, Boweiz (2010) mentions that NLP is the total of our abilities to use the language of the mind in a positive way that enables us to achieve our goals.

Shehata (2010: 24) sees that NLP consists of three factors: the first is Neuro which refers to all what happens in the brain and the nervous system, and the way through which the nervous system encrypts information, stores it in the memory, then

retrieves these experiences and information again when needed. The second is "linguistic" which refers to all kinds of speech, verbal or non-verbal, produced by the individual in his/ her communication with the others or with him/ herself.

The third is "programming" which means the representation it cares about the world, how it is in the mind, and how it affects our perception and behavior changing them into patterns of thinking and behavior which are the essence of our experience in life.

Alfiky (2009:16) explains that one of the basic principles of NLP is the "the map is not the territory ". This principle assures that everyone recognizes the world through his/her own map formed by the information we receive through the senses, the language we hear and read, and the values and beliefs. The principle "respecting and accepting the others as they are" pinpoints that everyone has a group of values and beliefs which identify his/ her pattern of behavior, and which make him/ her accept the differences rather than challenge the others. Besides, what a person does is the sum of his/her values, beliefs and experiences accumulated throughout the years. Another principle is "everyone has levels of conscious and subconscious communication". This principle asserts that the subconscious mind can be positively programmed through the conscious mind. There is no failure. Rather, there are results and experiences. Therefore, the past lessons should be made use of in paving the ways to success in the present and planning for the future.

The previous principles of NLP are consistent with the principles of constructivist teaching. Caine and Caine (1999) agree that the teaching that is compatible with the brain depends on the idea that the brain is a dynamic, complex system with a social nature, searching for meaning is inherent in the brain and happens through encoding and that emotions are important for the process of encoding.

In this respect, Thomposn (2002) points out that NLP science aims at helping the person to understand meanings and their connotations, controlling the thinking processes and creating positive changes in their lives. NLP gained momentum in education due to its effectiveness in helping the students use the way through which they learn. This is what Gardener's theory (1983) for multiple intelligences asserts. It explains that learning styles such as visual, auditory and kinesthetic learning play an important role in students' teaching. Thus, teachers are required now to make use of NLP techniques and each learner's pattern of learning in the classroom, and re-accommodate the curricula to suit the students' patterns.

Altekreity (2003) affirms that sensory recognition is performed by the access of the information to the brain through the five senses. The brain encrypts the information, interprets and understands it. The sensation resulting from each of the five senses represents a special pattern of recognition. There are several educational strategies that depend on NLP techniques among which are Visualization and Metaphors, Reframing, Anchors and Modeling.

Lyall (2002) explains that the relationship between the teacher and the student is a dynamic one rather than from one side. The students behave according to the way they understood what they learnt. This agrees with the principles of NLP which indicates that the map is not the territory and interprets the alternative conceptions that the students form during the teaching and learning processes.

One of the basic concerns of NLP is a mental representation of information through visual, verbal or kinesthetic images which help the person in representing and processing information. This interprets the uniqueness of each pupil from the other. NLP depends on the dynamic relationship between the pupil's experience, his language and behavior since the student's representation of the information and its processes in the brain appears in his language, behaviors, skills and beliefs; and all of them can be learnt and modified. The main point that Appelton

(1997) pinpointed in the constructivist philosophy, and on which the strategies of conceptual change depend is that the person will use the previous ideas (alternative conceptions) in understanding the new experiences and information. Learning happens through changing the previous ideas through the new ones.

Zaitoun and Zaitoun (2003: 49) indicated that the process of acquiring previous knowledge is an active continuous process through which a person's cognitive structures are modified. Peter and Linda (cited in Bandler, 1973), the founder of NLP, pointed out that sensory impressions contribute in forming the sequence of every person according to the way each one used in representing the information in the brain. For example, the correct understanding of the chemical elements is formed as a result of the correct visual conception of the atoms and the molecule, and the relationship between them. Thus, when the teachers train their students on using the visual conceptions of the atoms and the molecules, they help them to understand the chemical concepts more. This indicates that the programming techniques may contribute to correcting alternative conceptions of the scientific concepts.

Nowadays, there are some difficulties that face students while learning Science, in general, and Chemistry, in particular. This is because the previous knowledge in their cognitive structure is one of the prominent factors that negatively affect their learning of these concepts, especially when the teachers ignore the alternative conceptions those students have while studying these concepts.

Kesan and Kaya (2007) defined alternative conceptions as the wrong recognition, belief or understanding that the students have about the specific scientific method agreed upon for the concept. Sencar and Eryilmaz (2004: 606-607) pinpointed that alternative conceptions are consistent, stable and resistant to change through the traditional methods of teaching. Hewson and Hewson (2003: 88) indicated that alternative conceptions are not limited to a specific gender or age group as they exist starting

from the beginning of the basic education stage and extend to the university stage. In addition, Moustafa (2006: 215) explained that alternative conceptions are not changed through traditional teaching because they do not help identifying these conceptions or diagnosing them. Therefore, these conceptions gained the traits of stability and resistance to change.

Abdou (2000) explained that conceptual change is the process through which the students' prior or alternative conceptions are modified to become consistent with the scientifically accepted ones; i.e. it is a dynamic process that necessitates reorganizing the learner's cognitive structure aiming at making the desired changes. Appleton (1997) agrees with Smith, Blackeslee and Anderson (1993) that there are strategies that help making conceptual change and correcting the alternative ones such as cognitive conflict strategies, the use of analogies and analogical bridges, constrictive analytical– based strategies, the learning cycle and V-map.

Teaching strategies used in modifying the alternative conceptions agree with the constructivist philosophy. One of the NLP- based strategies consistent with the constructivist philosophy is the reframing strategy. Almashany (2006: 40) pinpoints that the reframing strategy is the strategy through which an individual evaluates an experience to make it gain meaning. According to the chosen frame, the way of dealing with the same event extremely changes.

Heizer (2003: 266) defines reframing as the change of the experiment or the event's meaning by adding another frame around it. Reframing will enable the person to see things in a different way. It is the way through which we describe the experiences to identify their meanings. The frame reflects the aims or the ideas; so, if we modify the frame, the meaning of the experience will change. When we recapture the meaning, our emotions towards what was framed usually change. Reframing will enable the person to see things differently, which helps reaching a new interpretation that will lead to a different result, evaluation or emotions (O'connor, 2001: 234-236).

Aldawash (2008: 70) indicates that the reframing strategy deals with the results of recognition. Recognition represents an interpretation, explanation or giving meaning to what was sensed or attended to. Heizer (2008:70) assures that the meaning of an event depends on the frame through which we recognized the event. Therefore, the philosophy of the reframing strategy lies in reframing both content and context so that they become different from those in which the alternative or incorrect behavior was formed so that the incorrect behavior or understanding will be corrected. The learner's and teacher's mental state, training students to see things differently, and enhancing relationships should also be taken into consideration.

Bandler and Grinder (1982) see that the six steps for the reframing strategy are the best application for modifying the incorrect behavior or conception. These steps are:

1. Identifying the problem, incorrect behavior or conception that has to be changed.
2. Diagnosing the reasons for the incorrect behavior or conception.
3. Identifying the main reason for the alternative or incorrect conception.
4. Explaining the correct behavior or conception using analogy and metaphors strategy.
5. Relating the new response or alternatives to the context that most relate to the correct behavioral change or understanding.
6. Examining the extent to which the person agrees with alternatives of the correct behavior or concept.

In the field of Chemistry, there are many studies that dealt with the difficulties of its teaching, the low level of its students, the misunderstanding of its topics and its misapplication in life. Ali and Yousef (1999) indicated that there are many difficulties in understanding the chemical equations and understanding one or more of the components necessary for solving the chemical problems. The reason is that teachers focus on memorizing facts without paying attention to the students' acquisition of the

scientific concepts using certain strategies for solving chemical problems. Yousef (2002) described the current state of teaching Chemistry which focuses on memorization and does not encourage research or inquiry. Sakr (2004) showed that teaching Chemistry theoretically is useless since the ultimate aim lies in teaching Chemistry for life, and the fragmented and disconnected information has no place in the age of globalization. Alshafey (2005) pointed out that Chemistry lacks educational units which are based on planning and design that aim at arousing scientific understanding among the secondary stage students, extending their cognitive basis and using them effectively in the different situations. Albanna (2001) recommended using scientific thinking, and analyzing and implementing what is studied. Albaz (2007) revealed that there are difficulties that hinder studying and applying the concepts of chemical equilibrium. He attributed that to the absence of a strategy for demonstration and teaching the topics in a way that arouses thinking and motivates students' learning and use of their mental abilities. Sadeque (2004) also revealed difficulties in learning Chemistry and a lack of desire to learn it because it includes many abstract concepts in addition to the chemical problems that require higher thinking skills. Fathallah (2009) indicated that most behaviors and styles of teaching followed by Science teachers do not help develop the students' thinking.

Some studies revealed a relationship between achievement motivation and academic achievement. Mcclelland (1976) revealed a significant positive relationship between GPA and achievement motivation. Besides, Rashed (1994) found out a positive relationship between achievement motivation and academic achievement.

Farrouga (2011: 128) explains that the studies revealed the relationship between the student's success in studying and motivation. This is because motivation is considered a motivator that urges the student to work and persist. Persistence is one of the most important conditions for learning. Therefore, recent education points out the necessity of stimulating the students'

motivation towards the educational situations by infusing experiences that stimulate the students' motivation and satisfy their needs into the lessons (Alesawy, 2004: 42).

Examining the reframing strategy, it becomes clear that it is in line with the Bybee Constructive Model which consists of five stages: engagement, exploration, explanation, elaboration and evaluation. Moreover, the six- stage reframing strategy depends on analogy and metaphors which are constructivist teaching strategies.

Reframing strategy is distinguished from the conceptual change strategies in that it takes the affective side into account. Abdou (2000) explained that there are points of criticism of the conceptual change model due to the negligence of the non-cognitive factors such as students' motivation and classroom environment which, in turn, affect the processes of conceptual change. To the best of the researcher's knowledge, there is no one study that dealt with implementing NLP strategies in teaching, in general, and alternative conceptions, in particular.

Problem of the study

The results of the previous studies revealed some difficulties in learning Chemistry, and they also revealed alternative conceptions among the students in Chemistry concepts. In addition, they indicated that the methods and styles of teaching used in the classrooms resulted in the low level of the students' motivation and achievement. The results of the pilot study conducted by the researcher with 12 Chemistry teachers in New Cairo, East of Nasr City and West of Nasr City Directorates during a training course at the National Center for Examination showed that many students had alternative conceptions that are different from the correct scientific ones in the textbook, especially those in the thermochemistry unit at the first grade of the secondary stage.

Thus, there is a problem in teaching Chemistry at the secondary stage, i.e. the alternative conceptions for thermochemistry concepts among the first secondary stage

graders which lead to their low level in academic achievement and motivation. This study seeks to use a new strategy based on NLP principles and combine some strategies to modify the alternative conceptions. The problem of the study can be identified in the following main question:

How can alternative conceptions about thermochemistry concepts among the secondary stage low achievers be corrected using the reframing strategy based on NLP?

This question may be divided into the following sub-questions:

1. What are the alternative conceptions about the thermochemistry unit in Chemistry common among low-achievers at the first grade of the secondary stage?
2. How effective is teaching using the reframing strategy based on NLP in correcting the alternative conceptions about thermochemistry concepts among low- achievers at the first grade of the secondary stage?
3. 3.   How effective is teaching using the reframing strategy based on NLP in developing achievement in Chemistry among low- achievers at the first grade of the secondary stage?
4. How effective is teaching using the reframing strategy based on NLP in developing achievement motivation among low- achievers at the first grade of the secondary stage?

Aims of the study:

This study aims at:
1. Diagnosing the alternative conceptions about thermochemistry concepts among low- achievers at the first grade of the secondary stage.
2. Studying the effectiveness of teaching using the reframing strategy based on NLP in correcting the alternative conceptions about thermochemistry concepts among low-achievers at the first grade of the secondary stage.

3. Investigating the effectiveness of the reframing strategy based on NLP in developing achievement in Chemistry and achievement motivation among low- achievers at the first grade of the secondary stage?

Importance of the study:

This study is important in:

1. Introducing a strategy that may help correcting alternative conceptions in Chemistry and developing the main scientific concepts and achievement motivation among secondary stage students.

2. Introducing a teacher's guide that may be used in teaching chemical topics using the reframing strategy for correcting alternative conceptions in Chemistry and developing the main scientific concepts and achievement motivation among secondary stage students.

3. Introducing samples of tools for measuring achievement motivation, diagnostic tests and achievement as guides for use when assessing the secondary stage students in Chemistry.

4. Calling the educators', curricula designers' and teachers' attention to the necessity of using approaches and strategies that suit the nature of the secondary school low-achievers in Chemistry.

Delimitations of the study:

1. A sample of low-achievers in Chemistry at Abdelmonem Wasel Secondary/ Prep School and Abdelwahab Motawe Secondary/ Prep School, New Cairo Directorate.

2. The thermochemistry unit in the Chemistry textbook for the first grade, secondary stage due to the students' frequent complaints.

3. Three dimensions of academic achievement motivation: taking the responsibility, competition and desire for excellence, and self-confidence and self-respect which were mentioned by many studies as the most variables saturated with academic motivation.

4. The first three levels of Bloom (knowledge, comprehension and application) in assessing achievement in the thermochemistry unit.

Method :

   The study followed the descriptive method in identifying the bases of developing the program proposed. It also used the quasi-experimental method concerning the procedures of the study and controlling the variables. The study used pre/ post two groups (experimental and control) design as follows:
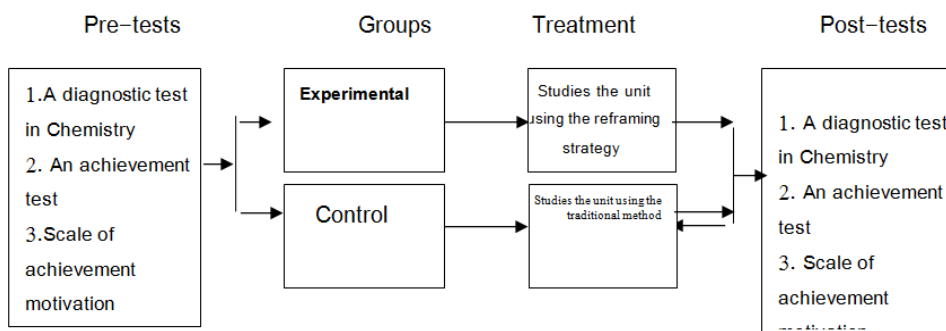
Figure 1: The experimental design

Hypotheses of the study:

1. There is a statistical significant difference between the mean scores of the students in the experimental and the control group in the post diagnostic test as a whole and its dimensions in favor of the experimental group.

2. There is a statistical significant difference between the mean scores of the students in the experimental group in the pre-post diagnostic test as a whole and its dimensions in favor of the post test.

3. There is a statistical significant difference between the mean scores of the students in the experimental and the control group in the post achievement test as a whole and its dimensions in favor of the experimental group.

4. There is a statistical significant difference between the mean scores of the students in the experimental group in the pre- post achievement test as a whole and its dimensions in favor of the post test .

5. There is a statistical significant difference between the mean scores of the students in the experimental and the control group in the post achievement motivation scale as a whole and its dimensions in favor of the experimental group.

6. There is a statistical significant difference between the mean scores of the students in the experimental group in the pre-post achievement motivation scale as a whole and its dimensions in favor of the post.

Terms of the study:

Alternative conceptions: They refer to " the conceptions, information and interpretations that are held by the secondary stage first graders and incorrectly related to thermochemistry concepts , and at the same time they are not consistent with the correct scientific interpretations of those concepts. They can be diagnosed by the score the students get at the diagnostic test of alternative conceptions in thermochemistry prepared for this purpose".

Achievement motivation: This refers to "the desire to perform well and achieve success. It is a personal aim that activates and directs behavior. It is also the score the student gains in the achievement motivation test including the three dimensions : taking the responsibility, competition and desire for excellence, and self-confidence and self-respect ".

Low achievers: In this study, they will be referred to as " the students having less than 60% of the total score in the Chemistry achievement test".

Neuro- Linguistic Programming (NLP): It is operationally defined as "the science which searches for helping people to

understand meanings and their connotations, controlling the thinking processes and making positive changes in their lives".

Reframing strategy: It is operationally defined as "the strategy that depends on changing the frame from which the alternative or incorrect conception resulted by changing the experience or the situation, or a part of it, to form a new conception that suits the correct concept".

Review of literature and related studies:

Neuro- Linguistic Programming (NLP):

NLP science is considered one of the helping means of changing the human being's behavior. It is the science of psychological engineering. This science is concerned with changing the self and affecting the others through developing thinking, refining the behavior, changing the habits and supporting the abilities. NLP is the group of our abilities to use the language of the mind in a positive way that enables us to achieve our goals (Alfeky, 2009). NLP is based on Bandura's Social Learning Theory (Bandura, 1989). Bandler and Greinder used modeling, as a part of this theory, for preparing the models. Their main focus was building bridges between the traditional theories and the cognitive theories of personality through assuring the concept of self-efficacy.

NLP is developing some theories with a positive disposition in their vision to the human beings and it provides them with the tools and techniques by which they can change their behaviors and achieve the goals they aim at .

NLP is the technology of success and excellence, and discovering the potential energy and the abilities hidden inside you. It mainly focuses on studying the state of excellence and creativity in the persons, identifying excellence and how to partition it into its initial elements, then applying it to others in order to enhance their practical performance. It provides us with a step by step recipe for excellence and getting rid of the difficulties of life (Soliman, 2007: 3).

NLP has more than one definition. Some define it as the art and science of making the person reach excellence by which he achieves goals and raises the level of his life. Others define it as a group of our thoughts, feelings and behaviors resulting from our habits and experiences which affect our communication with the others and on which our pattern of life is based (Soliman, 2006: 16). Joseph (2006) defines it as a behavioristic science that provides you with theory, practice and technique in order to change and affect.

NLP science or Neuro- Linguistic Modeling science appeared as a separate science in the mid-1970s by Grinder and Bandler when they published the first book in which they mentioned their discovery named "The Structure of Magic". Then, this science took wide steps in the 1980s. Its centers and training institutes spread in USA, Britain and some European countries. You do not find any of the industrial countries without a great number of centers and institutions for this new science (Salman, 2006: 17).

Mahishika (2010: 203) mentions that NLP goes to Richard Bandeler when he was a student at California in Santa Cruise, USA and John Grender, professor of linguistics at the same university. The two examined Freitz Berliz' work and analyzed the work of Verginia Sateier, a specialist in problem solving and family relations. Through this experience, both Bandeler and Gerender developed the basic process on which NLP is based, i.e. designing and preparing models.

Susie and Michael (2007:6) mention that NLP is based on the behavioristic cognitive trends and those focusing on problem solving. Both trends are based on explaining the aims, harnessing all energy and resources, and focusing on meaning, potentials and solutions rather than the problem. They also emphasize the importance of feedback, maximizing the value of the successful used strategies and replacing those that did not achieve success with other successful ones. Therefore, NLP focuses on helping the client to change and monitor his physiological, Neuro and emotional states directly. All the sensory representation systems

are used for this purpose. Thus, the attitude towards oral treatment rooted in the trends of treatment which focuses on problem solving decreases. Hall (2006), Dilts (2000: 577), Soliman (2014: 216), Halloul (2011: 164) Fayed (2013), Alshafey (2013: 31) and Heizer (2010,21) identified the assumptions upon which NLP is based as follows:

- **The map is not the territory**: All of us recognize the world through our own map formed by the information we receive through our senses, the language we hear and read, the values and beliefs we assimilate.
- **Behind every behavior is a positive destination:** Everyone has motives behind any behavior. It is a must to separate behavior from intentions and not to judge a person by one behavioral pattern. It is also important to realize the intention which justifies the behavior.
- **I control my mind, then I am responsible for the results of my acts:** A person's aptitude and acceptance to carry over the responsibility for his behaviors and acts make him capable of directing his potentials towards achieving his goals.
- **The mind and the body affect each other:** Internal representation or self-talk will affect facial expressions and body movement. Thus, it will affect the person's feelings and sensations. A person's understanding of himself makes him more controlling of his feeling status.
- **The person who is more flexible can control**: Flexibility is the power that leads to better results.
- **There is no failure but experiences and experiments:** We should make use of the lessons from the past in paving the way to success in the present and planning for the future.
- **People use their best choice:** What a person does at a specific moment is the total of his accumulating values, beliefs and experiences over time.

- **If a person is able to do anything, he can learn and do it:** Knowing what the specialists and distinguished do and modeling them leads to marvelous results. You have to follow the steps that led to their excellence. You have also to identify your aim precisely and have the desire to achieve it. You can reach faster if you model a person who has the same aim and could achieve it, and follow his way to reach the same aim.

- **We cannot do without communication:** A person's way of communicating his ideas identifies the kind of response he gains.

- **A choice is better than no choice:** variety of choices and availability of alternatives gives a bigger opportunity for controlling the results. Having one choice does not make chance for variation. Having two choices makes you at a loss. Having variety gives you more power. In case of not giving alternatives in the communication process, you break the rapport.

- **Respecting and accepting the others as they are:** Everyone sees things from his own perspective. We are different in recognizing things; therefore, we'd rather respect and accept the others as they are so that we can immediately communicate trustfully and respectfully. We then can help them and make a desired positive change. These principles are consistent with the principles of cognitive learning except the constructivist:

  - Learning is a constructivist continuous process.
  - The best conditions are created when the student faces a real problem.
  - The learning process includes a person's re-creation of his knowledge through a social negotiation process with the others.
  - The learner's previous knowledge is a basic condition for building meaningful learning.

The learner's previous knowledge is a basic condition for building meaning since interaction between the learner's new knowledge and his previous knowledge is important. Children build cognitive systems for themselves to use in interpreting phenomena and the events in the environment in which they live. This gives meaning to their experiences. These spontaneous cognitive or personal systems may contradict the prominent scientific perspective, i.e. they may contradict the current scientific data. This phenomenon is known as misunderstanding, misconception or alternative conceptions (Zaitoun and Zaitoun, 2003: 98).

Blackerby (2002) mentioned that NLP can be efficiently applied in enhancing the students' educational results. Using the principles of NLP, we can make use of the behavioristic flexibility to approach the educational process in new and exciting directions.

Proponents of NLP believe that students face difficulties in learning either because of following the representation systems badly (usually visual or auditory), use of inappropriate or ineffective learning strategies which limits beliefs/ expectations related to learning, or the inconsistency of teaching strategy with the student's learning pattern (Dilts, 1995). James (1996) assures that learning strategies are one of seven basic categories of the strategies identified by NLP in addition to memory, decision making, creativity and motivation.

Dilts (1995) points out that there is no single strategy that is always appropriate and that a series of specific representation systems tends to be more appropriate in learning tasks of Algebra or Organic Chemistry when it entails retrieving internal visual and auditory memory of formulas and graphs. Many studies showed the effectiveness of NLP in developing learning skills. Esterbrook (2006) investigated the effectiveness of NLP in enhancing learning skills among low achievers. The results of the study indicated a positive change in the experimental group in self-concept, social skills and achievement. Concerning the supervisors' skills, Alshereif (2008) studied the effectiveness of

NLP in enhancing supervisors' skills of observation, attention and speed of recognition, and reasoning abilities. The results of the study showed that there was a statistical significant difference in the pre-post scale of observation, attention, recognition and reasoning abilities in favor of the post administration for the experimental group.

Shehata (2010) examined the effectiveness of training in NLP in developing the level of ambition among a sample of hearing impaired adolescents. The study revealed the effectiveness of training in NLP in modifying the level of ambition among the experimental group. Emam (2011) investigated the effectiveness of a program based in NLP techniques in enhancing psychological and academic adaptation for slow learners. The results indicated a significant statistical difference between the mean scores of the experimental and the control group in favor of the control group in the post administration of the scale of psychological adaptation.

Concerning the use of NLP techniques, Fayed (2013) investigated the effectiveness of the reframing strategy based on the NLP techniques in increasing the level of self- control of some behaviors inside the classroom among a sample of the prep stage students. The results showed a statistical significant difference between the pre-post test of self-control for the experimental group.

There are many strategies of NLP. Reframing is a strategy that enables the person to see, evaluate or feel things differently (Heizer, 2000). Almashany (2006: 40) defines it as a strategy through which the person evaluates an experience to make it gain meaning. According to the frame chosen, the way of dealing with the same event extremely changes.

From the previously mentioned studies, the researcher can define the *reframing strategy* – operationally - as a strategy that depends on changing the frame from which the alternative or incorrect conception resulted by changing the experience or the situation, or a part of it, to form a new conception that suits the

correct concept. This is because the meaning of any event depends on the frame by which we recognized this event. Thus, the philosophy of reframing lies in reframing the content and the context to be different from those in which the incorrect behavior had been formed .This helps correcting the incorrect behavior or understanding.

Based on this, the steps of the reframing strategy for modifying alternative conceptions are:

1. Identifying the frame of the concept's prior conceptions.
2. Increasing motivation for changing the old frame.
3. Introducing the correct concept.
4. Forming an appropriate frame for the correct concept.
5. Deepening the correct concept.

Alternative conceptions:

Studies confirmed that the scientific concepts the students form are not sometimes consistent with the correct ones that may hinder acquiring new information. This phenomenon is known as the *alternative conception* (Alattar, 2003: 62). Zaitoun and Zaitoun (2002: 227) explain that the concept of the alternative conception was used to describe an unaccepted interpretation but not necessarily incorrect. Alsadany (1994: 50) defines alternative conceptions as conceptual knowledge or pictorial ideas that are not consistent with the scientifically accepted common terms.

Aldesouky (2003: 95) defines alternative conceptions as "the impressions that the students form about the different events and the natural phenomena as a result of their direct contact with them before receiving intentional continuous learning". Abdel-Meseih (2001: 95) defines them as "ideas, knowledge and interpretations about phenomena that exist in the person's mind and contradicts the accepted scientific interpretations reached by scientists". Moustafa (2001: 151) believes that the alternative conception is "the students' ideas and beliefs about scientific concepts and phenomena which have

contradictory meaning to that accepted by the specialists in teaching Science and Science Education".

In light of the previous definitions, alternative conceptions can be defined as "the conceptions, information and interpretations that are held by the secondary stage first graders and incorrectly related to thermochemistry concepts , and at the same time they are not consistent with the correct scientific interpretations of those concepts. They can be diagnosed by the score the students get at the diagnostic test of alternative conceptions in thermochemistry prepared for this purpose".

Moustafa (2001: 151) elaborates on the importance of identifying alternative conceptions about the scientific concepts and phenomena among the students as follows:

- Directing the appropriate approaches and styles for dealing with the children's concepts making the appropriate changes in the content of the Science curricula.
- Using current educational untraditional techniques that maintain the correctness of the scientific language and word meanings of the teacher as well as the students that might lead to correct understanding and assimilating correct scientific concepts.
- Identifying students' scientific background contributes to understanding the sources and reasons of alternative conceptions, and overcoming them through enhancing the rapport between the students and the teacher.
- Making sure of not adding the alternative conceptions to the scientific concepts prescribed in the course given lest the latter should be affected in a negative way. This requires making radical changes for students' conceptions.
- Identifying the differences between the daily language use of concepts common among the students and the scientists' conceptions may contribute to developing students' technical language that their language would be precise and have specific meanings.

- Many scientists (e.g., Moustafa, 2006: 151; Sencar and Eryilmz, 2004 and Hewson and Hewson, 2003: 88) maintained that alternative conceptions have many characteristics and attributes that can be identified as follows:

a. Alternative conceptions are not formed suddenly. The student needs time to form them. They develop as time goes on, and more alternative conceptions may be built on them.

b. Some patterns of alternative conceptions are not logical from the science perspective as they contradict and differ from the scientific interpretation. However, , they seem logical from the students' perspective as they are consistent with their cognitive structure.

c. Alternative conceptions are resistant and this makes them difficult to change, especially when using traditional methods of teaching.

d. Those conceptions are often acquired at an early age though their existence is not limited to a specific age.. Therefore, they exceed the age and educational level limits.

e. New strategies concerned with conceptual change can be used in modifying alternative conceptions inside the classroom.

f. The students' alternative conceptions may affect their thinking even after being taught those conceptions. Students continue to be persuaded with their previous thinking and concepts which affect their interpretations of the scientific phenomena.

g. Alternative conceptions negatively affect learning the correct concepts. They hinder the student' correct understanding and support the patterns of alternative understanding, thus, hinder subsequent learning.

How to modify alternative conceptions:

Modifying alternative conceptions or getting rid of them require that the students move through a stage of development

in which clear conformity between the alternative conception and the correct scientific conception appears and a cognitive conflict or mental unbalance happens. Consequently, students should be helped to move from the scientifically accepted concept which helps them to discuss their ideas and conceptions to reaching better interpretations which removes the cognitive unbalance state they experience.

Zaitoun (1988: 130) identified conditions for conceptual change to happen as follows:

1. The student should not be satisfied with his current concepts.
2. The student should have the least possible score in understanding the new concept, i.e. clarity of the new concept.
3. The reasonability and usefulness of the new concept should be made clear for the student.
4. The new concept's interpretive and predictive power should appear through introducing new discoveries and precognitions that the alternative conception did not introduce.

Many educators and researchers (e.g., Alkhalily, 1996; Sabry and Abder-Rady, 2010) suggested many strategies for getting rid of alternative conceptions and replacing them with the correct ones. These strategies and techniques are called conceptual change techniques. Some of them are: cognitive conflict strategies, use of analogies and analogical bridges, learning cycle, general constructivist teaching model, conceptual maps, v-diagram map, metacognitive strategies, and scaffolding strategies.

This study seeks to modify alternative conceptions in thermochemistry through the reframing strategy based on NLP. This strategy is distinguished in that it includes many of the aforementioned strategies. For example, the first and second steps, identifying the frame of the concept's prior conceptions and increasing motivation for changing the old frame, are done through cognitive conflict. The third stage, introducing the new

concept, is related to the constructivist model, discussion and practical presentations. The fourth step, forming an appropriate frame for the new concept, resembles the analogy strategy. The fifth and last step, deepening the concept, is related to the metacognitive strategies.

Motivation and achievement:

Concern in motivation and achievement is attributed to their importance in many practical and applied fields and domains such as the economic, administrative, educational and academic ones. Motives are an important factor in directing and activating a person's behavior and the people surrounding him. Achievement motivation is a basic component in a person's search for achieving and assuring himself through whatever aims he achieves and a better style of life he seeks.

What is achievement motivation?

Younis (2009: 149) defines achievement motivation as "a person's desire and inclination to overcome obstacles and strive to perform difficult tasks well and fast as possible. The continuous desire of excellence, seniority or performing tasks superiorly is a characteristic of unique people with a high level of achievement motivation," (Mathana, 2010: 17).

Abdullah (2011) defines achievement motivation as a person's aptitude to take the responsibility and seek for excellence to achieve certain goals, resistance to overcome obstacles he faces, mastery and perfection of work, self-confidence and independency, and direction towards the future.

From a similar point of view, Alamoudy (2012: 227) defines it as "the students' readiness to take the responsibility, show continuous desire for success, performing difficult work, and overcome obstacles efficiently, effortlessly and in the best level of performance".

Manifestations of achievement motivation

There are many manifestations of achievement motivation: level of ambition, risk taking, group mobility, persistence, task

stress, time recognition, direction towards the future, selecting the mate, recognition, and achievement (Yousef, 2011: 112). Persons with high achievement motivation are characterized by some characteristics: a)They prefer to work on tasks that challenge their abilities and that promise success. b) They do not accept tasks in which success is sure or impossible. c) They prefer tasks in which their performance is compared to others'. d) They choose more realistic tasks, works or professions., and e) They have more ability to match their abilities and the tasks they choose well (Alzayyat, 2004: 456). Also, those students can be characterized be the following: a)They prefer to choose tasks for which they realize the expected results and the effort to be exerted for completing them. b)   They are described as independent and having innate values. c)They tend to do their work desiring for achievement per se not for satisfying people. Thus, they are characterized as being independent and unique characters.

It is worth noting that a person's knowledge of his real direction of motivation helps him much to control, direct and monitor it. A person's knowledge of the motives of the others around him enables him to have good relationships with them (Alkabsy et al., 2000: 56).

Educationally speaking, motivation is one of the important educational aims. The educational process seeks to stimulate the students' motivation and direct it in a way to achieve the ultimate goals of this process. The school also tries to generate different concerns: cognitive, physical, or artistic, among the students so that they make use of them outside schools and be a support for them in their future lives in general (Saady, 2001).

Achievement   is success and speed of performance. Although there are many definitions for achievement motivation, Murray, Atkinson (1964) and Maccleland (1976) are the most famous. Murray (2005: 16) defined achievement motivation as doing things the others see difficult, controlling the physical and social ecology in thoughts, organizing and treating them well, speed of performance and independency, overcoming obstacles,

reaching the standard of excellence and exceeding the self, competing the others, self-esteem for the successful ability (Shehaza, 2005: 16).

Maccleland's theory (1976) maintains that achievement motivation is the response of expecting the positive or negative aims which are raised in situations that include seeking for a certain level of excellence or superiority where performance is evaluated as success or failure (Kashkoush and Mansour, 1979: 37).

Maslow's theory (1954: 35) is considered one of the greatest theories of motivation. It confirms that needs are arranged hierarchically from the psychological perspective and from physiological needs to more mature and humanistic needs. He assumes five levels of the basic needs system.

Concerning the relationship between NLP and achievement motivation, Halloul (2011) identified the effect of NLP in developing achievement motivation among a sample of students at basic education in Gazza. The results showed statistical significant differences between the mean scores of the pre-post scale of achievement motivation for the experimental group in favor of the post.

Achievement motivation is considered an indicator of the students' performance and academic achievement. Abdelsamei (2000) and Nelon (2003) revealed a positive relationship between academic achievement and achievement motivation. Abdelhamid (1995) also revealed a positive relation between them. Alsafy (2000) investigated the relationship between achievement motivation and aptitude among a sample of 180 excellent and slow learners in the literary and the scientific section. Results of the study indicated a significant relationship between achievement motivation and aptitude.

Concerning developing achievement motivation, Shehaza (2005) investigated the effectiveness of a program for developing achievement motivation among 78 second graders at the prep stage. Scales of achievement motivation, attitude

towards risk, and level of ambition were used. The results indicated statistically significant differences between the experimental group's scores in the pre-post administration in favor of the post in the three variables. Shawashra (2007) identified the effectiveness of a program for stimulating the students' motivation and developing academic achievement among low achiever students. The results showed the effectiveness of the program in stimulating motivation and developing academic achievement.

Thus, the teachers have to do their best for reinforcing the students' attitudes and increasing their motivation for learning. They have to use strategies for stimulating motivation and providing more opportunities for transferring experiences to new situations, and increase the tasks of purposeful learning.

Low achievement students

Shoeir (2003: 552) defines the low achiever as a student who failed before in the monthly tests in the first term, then at the end of the semester. Their IQ ranges from 75 to 90. Albalwashy (2007: 103) defines low achievers as the students who get less than 60% of the total score of the subjects they study. They are also defined as a category of students who enjoy all the abilities and potentials that the normal students enjoy except that they get less than 50% in the achievement test (Badr, 2012: 129). Consequently, a low achiever is the one who cannot achieve the desired level based on calculating the average and standard deviation.

Reasons behind low achievement

There are some reasons that lead to low achievement such as the low level of the students' mental ability, some problems in hearing and seeing in addition to some emotional reasons, lack and/or distraction of attention, and some familial or social problems (Alshehry, 2004: 53). Badr (2012) used a suggested active learning strategy for developing thinking skills and found out its effect among low achievement female students. Results of the study revealed the effectiveness of teaching using active

learning in developing higher order thinking skills among low achievement female students at the intermediate stage.

Procedures of the study:

To answer the questions of the study and check the validity of its hypotheses, the following procedures were followed:

1. Reviewing literature and related studies related to NLP, reframing strategy, modifying alternative conceptions and developing achievement motivation.

2. Selecting the scientific content which is a unit from the first grade, secondary stage textbook for the academic year 2014/ 2015. The unit is about thermochemistry and includes two chapters: the thermo content (enthalpy) and forms of change in the thermo content. This is because studies indicated the importance of having the thermochemistry concepts as they are included in the basic concepts in Chemistry. In addition, they represent the basis in Thermodynamics included in the university courses.

3. Identifying the aim of studying thermochemistry:
   a. Modifying the alternative conceptions of thermochemistry.
   b. Fostering the students' acquisition of achievement motivation represented in taking the responsibility, competition and desire of excellence, self-confidence, and self-respect.

4. Analyzing the content of the unit: Preparing the research instruments and the teacher's guide necessitated content analysis of the unit. Therefore, the content of the thermochemistry unit specified for the first graders at the secondary stage during the academic year 2014/ 2015 was selected because it includes basic concepts about the thermo content and its forms. They are among the basic bases for learning Chemistry. It also includes many practical experiments the students' conduct which increases their motivation for learning. However, the students find difficulty in identifying these concepts

accurately as revealed by the interviews with some teachers.

a. The aim of content analysis: Identifying and extracting the basic concepts through adhering to the operational definition of the content and the verbal connotation of each concept according to what is mentioned in the textbook.

b. Reliability of the content analysis: Content analysis was conducted twice with a three weeks interval using the same procedures and the principles of content analysis of the first one. Holsti's equation (1969: 140) was applied to find out the relationship between the results reached in the two analyses. The correlation coefficient was 0.82 which is an acceptable one and indicates reliability of the analysis and possibility of confidence in the results of the analysis.

c. Validity of the analysis: After finishing the content analysis of the unit, extracting the basic concepts and identifying the verbal connotation of each concept in a list, the list was submitted to a panel of Chemistry teachers and supervisors in addition to university professors (specialized in non-organic Chemistry) to judge the appropriateness of the concepts to the topics of the unit considering them the basic issues to use when teaching the unit using the reframing strategy. The jurors indicated the scientific correctness of the definitions. However, some of them recommended adding some concepts the students studied before as warming up for the new concepts. In light of the jurors' opinions, the concepts were put in their final form in the list with their verbal connotation (Appendix 1).

5. The teacher's guide: It was prepared for the teacher to follow while teaching the unit. It included:

a. An introduction: This included the aim of using the guide and some general guidelines for the teacher about how to implement the reframing strategy.

b. Aims of teaching the topics: The general aims for teaching the topics were identified and presented in the teacher's guide.

c. A time plan for teaching the topics: A timeline was prepared according to the time plan identified by the Ministry of Education which specified three weeks: five periods a week for teaching the unit.

d. Lesson plan: the lessons were organized so that each includes a title, operational objectives, the materials needed, procedure of teaching in light of the reframing strategy and lesson evaluation.

6. Validating the guide: the guide was submitted to a panel of jurors to get their opinion concerning the following:

a. Correctness of the objectives and appropriateness of the activities.

b. Appropriateness of the lesson plan according to the reframing strategy.

c. Suitability of the worksheets to the teaching activities.

d. Suitability of the evaluation tasks.

The jurors gave some comments, and the modifications related to the activities were carried out. The final form of the guide is in Appendix 2.

7. Preparing the student's book: The researcher prepared a student's book which included:

a. The lessons of the unit,

b. Learning outcomes for each lesson,

c. The activities for each lesson, and

d. Worksheets for the activities.

In light of analyzing the content of the unit and the aims, the teaching activities were prepared for the teacher to use while teaching the unit and give feedback. This reflects the philosophy of using the reframing strategy to help each student to correct the alternative conceptions he has.

- Activities for identifying the frame of the concept's prior conception.
- Activities for increasing the students' motivation for changing the old frame of the incorrect conception.
- Activities for forming a new frame for the correct conception.
- Activities for deepening the conception.
- Exercises after each lesson related to the learning outcomes.
- Self- evaluation activities.

After preparing the students' book, it was submitted to a panel of jurors to identify its appropriateness for achieving the desired aims of the current study, suitability of the educational activities, evaluation techniques and the language used.

The researcher modified the student's book either by omission, addition and/ or modification till the book appeared in its final form (Appendix 3).

8. Preparing the instruments of the study: To identify the effectiveness of the reframing strategy in modifying the alternative conceptions of thermochemistry, achievement and achievement motivation, three instruments were prepared: an achievement test, a diagnostic test and a scale of achievement motivation. The following procedures were followed:

The achievement test: This was prepared as follows:

Identifying the aim of the test

This test aims at measuring the achievement of first graders at the secondary stage of the thermochemistry topic presented in the two chapters about the thermo content and change in the thermo content, at three levels: knowledge, comprehension and application.

Content analysis of the unit: The content of the unit was analyzed according to Bloom's taxonomy for the cognitive domain and relative weights for the cognitive aims included in the two units according to the first three levels (knowledge, comprehension and application) were identified.

Formulating the test items: Test items were formulated in the form of multiple-choice followed by four different alternatives taking into consideration the criteria of preparing this kind of questions and phrasing the test instructions clearly and appropriately in a way that shows the students how to answer the test items.

Test validity: To check test validity, it was submitted to a panel of jurors specialized in methods of teaching Science to validate the comprehensiveness of the items, their suitability to the aims and content of the program, preciseness of their formulation, their relationship to the cognitive levels (knowledge, comprehension and application) and preciseness and clarity of instructions. In light of the jurors' opinions, modifications were made and the final version of the test included 30 items.

Piloting the test: The test was administered to a piloting sample that consisted of 25 first graders at the secondary stage at New Cairo Educational Directorate, Cairo Governorate, who finished studying the unit according to the traditional method. The following are the results of the pilot study:

Test reliability: Test reliability was calculated using Kudor Richardson formula (Allam, 2000: 164). Reliability coefficient was 0.77 which is an acceptable and suitable one and indicates validity of the test for application and measuring the first secondary stage graders' achievement in the thermochemistry concepts.

The time needed for answering the test: This was calculated by estimating the average of the time taken by the student who completed the test first and the one who completed it last. The average was 30 minutes.

In light of the previous results, the test in its final form consisted of 30 items distributed to the topics of the unit and the cognitive levels as shown in Table 1.

Table 1: Specifications of the achievement test

Level / content	Knowledge	Comprehension	Application	Total	Relative weight
Thermo content (enthalpy)	1،3،5	،،7،9،11،13،15،17 29،19	،23،25،27 21	15	%50
Forms of change in thermo content	2،4،6	،10،12،14،16،18،20 8	،24،26،28،0 22	15	%50
Total	6	15	9	30	
Relative weight	20%	50%	30%		100%

Thus, the test became in its final form ready for use and the results gotten from it can be trusted (Appendix 4).

The diagnostic test:

Aim of the test:

The aim of the diagnostic test is diagnosing the alternative conceptions about the concepts of thermochemistry. This was prepared following these steps:

- **Identifying a list of concepts included in the thermochemistry unit:** The content of the thermochemistry unit (the thermo content and change in the thermo content) specified for the secondary stage first graders was analyzed to identify the scientific conceptions. In turn, the alternative conceptions about these concepts were identified. The results of the analysis reached 13 basic concepts in the thermochemistry unit. After a period of time, the analysis was conducted again and the same concepts were reached. This indicates the reliability of the analysis. Validity of the analysis was ensured by reviewing previous studies that identified the basic concepts at the same unit. The list of concepts was submitted to a group of

experts and professors in curricula and methods of Science teaching. They suggested the omission of three concepts (specific heat, entropy and thermodynamics). Thus, the total number of concepts in the unit was 10: the system, the thermochemistry equation, exothermic reaction, endothermic reaction, enthalpy (thermo content), heat capacity, heat of melting/ fusion, mitigate heat, heat of combustion, heat of formation)

- Identifying the alternative conceptions: The alternative conceptions about the basic concepts were diagnosed through:
  - The researcher's experience in teaching Chemistry at the secondary stage.
  - An interview with supervisors and teachers of Chemistry (n=12) during their training for promotion in the teacher's cadre training.
  - An interview with a sample of secondary stage first graders (other than the sample of the study) who studied Chemistry during the first term. The interview started with an open question where each student was left to talk freely, at the time following the thread that will lead his thinking to deductions and trying to direct the way of his thinking by helping him to present what helped him to reach these deductions, reasoning, prediction or justifications. The interview included questions such as "What do you know about heat of formation? What do you know about the reasons for releasing heat when CO_2 is formed?".

The purpose of this was to find out the conceptual structure formed among the students and identify their conceptions in it. Each student had to write all he knows about each concept (total 10 concepts) separately in the list of concepts in details. Then, all students were interviewed for discussing interpretation of their responses.

- Leaving the students to talk freely, then, through analyzing the records of the interviews, many alternative

conceptions for each concept of the ten ones were identified.

- Reviewing literature, related studies and diagnostic tests of the alternative conceptions.

Preparing the test items:

The researcher made use of the list of scientific concepts and alternative conceptions for each concept in preparing the test items. It is of dual-multiple choice kind. The first part consists of multiple-choice question with four options including only one correct choice.

The total number of the items in the diagnostic test was 25. The test included two questions for each concept (10 $\times ٢$= 20 questions) in addition to a question that includes the relationship between each two concepts (5 questions).

Test instructions:

Test instructions included a simple idea about the aim of the test, number of its items, how to answer the test and mark the answers in the separate answer sheet and an example that illustrates how to answer a question.

Scoring the test:

The scores of the test as a whole ranged from zero as the minimum to 50 as the maximum. The student gets two scores for each question if he answers correctly to the both parts. However, if he answers the first part correctly and the second part inaccurately, he gets one score. If the answer for the first part is incorrect but correct for the second part, he gets nothing. He also gets nothing if he answers both parts inaccurately. This is because the first part of the question identifies the scientific concept to be acquired by the student accurately. Therefore, this part receives a great importance while the second part gives an interpretation for the student's choice of the scientific concept.

Test validity:

The test was submitted to a panel of professors specialized in curricula and methods of teaching Science and experienced

supervisors and teachers of Chemistry. Some of the items and/or options were modified in light of the opinions that the final form of the test included 25 items.

The pilot study:

The first version of the test was administered to a sample of students from Abdelmonem Wasel Secondary School at New Cairo Directorate (n=50). Reliability coefficient was calculated using Pearson Split- Half method. The reliability coefficient was 0.82 which indicates a high degree of reliability and that it is ready for use. The time needed for the test was calculated and was found to be 50 minutes.

In the light of the previous results, the test in its final form consists of 25 items, 20 of them are distributed to the 10 concepts in addition to five questions distributed to the relationship between each two of the 10 concepts as Table 2 shows.

Table 2: Specifications of the diagnostic test

Item \ concepts	Number	Total	Relative weight
System	12،1	2	8%
The thermochemistry equation	13،2	2	%8
Exothermic reaction	14،3	2	8%
Endothermic reaction	15،4	2	8%
Enthalpy	16،5	2	8%
Heat capacity	17،22	2	8%
Heat of solution	24،7	2	%8
Dilution heat	19،8	2	%8
Combustion heat	20،9	2	%8
Formation heat	21،10	2	%8
The relationship between the concepts	6،11،18،23،25	5	20%
Total		25	100%

Thus, the test became in its final form (Appendix 5) ready for use. Results gained from the test can be trusted.

Scale of achievement motivation:

A scale of achievement motivation for the secondary stage students was prepared as follows:

Identifying the aim of the scale of achievement motivation:

This scale aims at assessing achievement motivation to identify the effectiveness of the reframing strategy based on NLP in developing achievement motivation in Chemistry among a sample of low achievers at the first grade of the secondary stage.

Identifying the dimensions of the scale:

A group of achievement motivation scales such as Hermans' translated by Abdelfattah (2002), Barakat (2000) and Abdelaziz (2013) were reviewed. The dimensions of the scale were identified based on high frequency of dimension in the literature and previous studies. Three dimensions were identified: taking the responsibility, competition and desire for excellence and self-confidence and respect.

a. **Identifying the kind of the scale items and formulating them:** The items of the scale were formulated as situations the students face. The response was selected from a five-point Lickert scale (strongly agree, agree, don't know, don't agree and strongly don't agree). The students have to choose the response that matches their own opinions. The scale consisted of 30 items with 10 items for each dimension in the scale. Twenty items are positive while 10 are negative.

b. **Writing the instructions of the scale:** The instructions of the scale were written in clear language that makes it easy for the student to answer. It also included an illustrative example to help the student.

c. **Validity of the scale:** the scale was submitted to a panel of jurors for checking validity of the items, their preciseness, comprehensiveness and suitability for the intended dimensions of the scale, appropriateness of the language to the secondary stage students. The jurors gave their opinions and the scale was modified in the light of their opinions.

d. **Piloting the scale:** The scale in its first form was administered to a sample of 20 secondary stage first year

graders at Abdelmonem Wasel Secondary School, New
Cairo Directorate in order to:

- Assess the scale's reliability: Scale reliability was
  calculated using Kudor Richardson equation. The
  reliability coefficient was 0.83 which is an acceptable one.
  Thus, the scale is applicable.
- Duration of the scale: The average time for all the students
  to finish responding to all the items of the scale was 30
  minutes.
- Scoring the scale: The positive statements are given five
  scores for "strongly agree", four for "agree", three for
  "neutral", two for "don't agree" and one for "strongly don't
  agree". Scoring is reversed for the negative items. Thus, the
  total score for the scale was 150 scores.

The final version of the scale:

After making the required modifications, the final version
of the scale of achievement motivation was prepared.
Specifications are presented in Table 3.

Table 3: Specifications of the scale of achievement motivation

No.	Dimension	Positive items	Negative items	Total
1	Taking the responsibility	1،4،7،10،13،16،19	21،24،27	10
2	Competition and desire for excellence	2،5،8،11،14،17،20	22،25،28،30	10
3	Self-confidence and esteem	3،6،9،12،15،18	23،26،29	10
	Total	20	10	30

Thus, the scale in its final form (Appendix 6) consists of 30
items each of which is scored on a five- point Lickert scale. The
total score of the scale is 150.

The study:

1. Selecting the population of the study.

The study population was general education secondary
stage first graders. Two samples of the first graders were
selected: The first sample was diagnostic to diagnose and

identify the alternative conceptions about the scientific concepts and the natural phenomena in the thermochemistry unit most frequent and common among the students. The diagnostic sample consisted of 50 students randomly chosen from Abdelmonem Wasel Secondary/ Prep School and Abdelwahab Mutawe Secondary/ Prep School who responded completely to the test of alternative conceptions from six classes randomly selected from the two schools which finished studying the thermochemistry unit by the end of the second semester 2013/ 2014.

The second group is experimental. Two secondary schools at New Cairo Directorate: Abdelmonem Wasel Secondary/ Prep School to represent the experimental group (n=29 students) and Abdelwahab Mutawe Secondary/ Prep School to represent the control group (n=32 students) who got less than 60% of the midterm exam carried out by the school by the end of the first term 2014/ 2015. Table 4 presents information on the sample of the study.

Table 4: Specifications of the sample of the study

Group	Directorate	Class	No.
Experimental: Abdel monem Wasel Secondary/ Prep School for boys	**New Cairo**	**3/1**	**29**
Control: Abdelwahab Mutawe Secondary/ Prep School	**New Cairo**	**1/1**	**32**
Total	**61**		

Pre-administration of the instruments:

The instruments of the study (the achievement test, the diagnostic test and scale of achievement motivation) were administered to the experimental and the control groups before teaching the unit from 16/11/2014 to 18/11/2014 to get data related to homogeneity of the groups. Table 5 presents data on the results of the pre-administration of the instruments.

Table 5: Results of the pre-administration of the study instruments to the experimental and the control groups and mean scores, SD, t-value and its significance

Test	Total score	The experimental group (n=29)		The control group (n= 32)		t-value	Sig. 0.01
		Mean	SD	Mean	SD		
The achievement test	30	0.48	0.63	0.37	0.49	0.74	Not sig.
The diagnostic test	50	0.17	0.38	0.15	0.36	0.17	Not sig
Scale of achievement motivation	150	37.38	4.73	38.2	4.3	0.72	Not sig

The previous table shows that there were no statistically significant differences at the 0.05 level between the mean scores of the experimental and the control groups in the pre-administration of the study instruments (the achievement test, the diagnostic test and the scale of achievement motivation). This indicates that the two groups were homogeneous before conducting the experiment.

2.Teaching the experimental group:

The class teacher was asked to teach the experimental group. The class teacher was trained before conducting the experiment where the researcher explained the aim of the study, its importance, the philosophy on which it is based and the procedures of teaching using the reframing strategy based on NLP as explained in the teacher's guide. The teacher was provided with some worksheets of the activities related to the stages of the reframing strategy. This required that the teacher:

- Focuses on the stages of the reframing strategy (identifying the frame of the concept's prior conceptions, increasing motivation for changing the old frame, introducing the new frame – forming a new frame suitable for the correct conception and widening the correct conception).

- Identifies the frame of the concept's prior conceptions by introducing activities for the students that help them to predict, observe and interpret. These activities help identifying the frame which will help forming the alternative conception.

- Focuses on helping each student to form their portfolios one by one and encourages them to reflect on their work and rationales for adding them to the portfolios.

- Increases the students' motivation and attention to change the alternative conception's old frame by introducing conflicting events so that a cognitive conflict is formed. This conflict contributes at the beginning of changing the old frame accompanying the alternative conception and introduces evidences on the incorrectness of the alternative conception.

- Introduces and explains the new conception using active learning strategies.

- Forms the new frame of the new concept by using analogies and metaphors identifying the similarities.

- Helps the students, at the deepening stage of the concept, to generate different kinds of relations as a way for understanding Science through the relationships between the newly learnt concepts and the concepts previously learnt and the values, beliefs and experiences related to them through concept maps, diagrams, figures, drawings, demonstrations, etc…

- Uses the teacher's guide and widens his background knowledge from different resources.

- Encourages the students to use the student's book and deal with it as worksheets to be kept by the students which help the teacher to examine and follow the students' progress.

- Encourages the students to answer the exercises that measure learning outcomes of thermochemistry at the end of each lesson.

Teaching the unit "Thermochemistry" started in the first term on Sunday 23rd November, 2014 and ended on Thursday 18th December, 2014. The control group was taught the same content of the unit for the same period of time using the traditional method.

3. Post- application of the instruments of the study

After the experiment, the achievement test, diagnostic test and scale of achievement motivation were administered to the experimental and the control groups from 21/12/2014 to 24/12/2014. They were scored and data was statistically treated.

4. Statistical analyses used

- Non-paired samples t-test was used to identify significance of the differences between the mean scores of the students in the experimental and the control groups in the achievement test, the diagnostic test and the scale of achievement motivation.
- Paired samples t-test was used to identify the significance of the differences between the mean scores of the pre-post scores on the achievement test, the diagnostic test and the scale of achievement motivation of the experimental group
- Eita square ($\eta 2$) was calculated and the effect size (d) was estimated (Kiess, 1989: 446).
- Black's Gain Ratio was used to measure the effectiveness of using the reframing strategy based on NLP principles in developing achievement and achievement motivation and modifying alternative conceptions among secondary stage low achievers (Allam, 2000: 75).

Results of the study and their interpretations

This section presents results of the study concerning its four questions and the hypotheses related to them as follows:

The first question: What are the alternative conceptions about thermochemistry concepts common among the low achievers at the first grade of the secondary stage?

To answer this question, test of alternative conceptions was administered to the diagnostic sample. Percentages of the frequencies of alternative conceptions more than 20% were calculated. Table 6 shows these results.

Table 6: Most common alternative conceptions about thermochemistry concepts

Concept	Alternative conception	Frequency	Percentage
System	The part surrounding reaction	15	30%
	The open system is the one that doesn't allow transfer of energy or matter between the system and the medium	20	40%
	The isolated system is the one that allows transfer of energy or matter between the system and the medium	20	40%
	The closed system is the one that doesn't allow exchange of energy between the system and the surrounding medium	20	40%
	The glass in which reaction takes place.	20	40%
	In the open system, the total energy remains stable even if the system changes from one state to another.	12	24%
The chemical equation	Is the one that is not related to the law of conservation of energy	22	44%
	An equation that should not necessarily be weighted	32	64%
	A weighted equation that shows the thermo change regardless of the state of the matter.	38	76%
	It is like the chemical reaction equation	30	60%
	In which thermo change is not affected by the state of the reactants and the outputs.	40	80%
Exothermic reactions	That in which $H\Delta$ is positive.	30	60%
	That in which the energy of reactants is less than that of the output's.	31	62%
	That is accompanied by flame.	25	50%
	It is the same as heat of combustion.	17	34%
	Its plan of energy shows that the results are higher than zero.	31	62%
	In which heat transfers from the surrounding medium to the system.	16	32%
	Doesn't follow the thermodynamic law.	24	48%
	Reactions that do not happen spontaneously.	17	34%
Endothermic reactions	In which $H\Delta$ is negative.	20	40%
	Accompanied by decrease of heat that can be felt by touch.	29	58%
	Omission of the enthalpy for the maximum value from that of the minimum value.	35	70%
	In which the energy of reactants is more than that of the results.	2	42%
	In which plan of energy shows that the results are less than zero.	16	32%
	Hear transfers from the medium to the system.	26	52%
	Doesn't follow the law of thermodynamics.	15	30%
	Reactions that happen spontaneously.	25	50%
Enthalpy	The total of the potential energies in the mass of the matter.	39	78%

	Different from thermo enthalpy.	32	64%
	Similar in the different matters.	17	34%
	Easy to measure while thermo-change is difficult to measure.	24	48%
	Stored in the atom as energy of bonds.	23	46%
	Stored in the molecule as Vander-Val electrostatic forces	16	32%
	For the element more than the molecule's enthalpy in the compound	23	64%
	Doesn't contribute in the calculation of enthalpy	13	26%
Heat capacity	The heat required for increasing the temperature of one gram of the substance one percentage.	30	60%
	Different materials have the same heat capacity	16	32%
	The heat required for increasing the temperature of one mole of the substance one percentage.	35	70%
	The more the mass of the pot that contains the substance, the less the heat capacity.	30	60%
Heat of solution	The amount of heat released or absorbed when dissolving one mole of the dissolved in a specific amount of the solvent	32	64%
	The change in heat resulting from dissolving one mole of the dissolved to form one liter of the solution	27	54%
	The heat resulting from attaching the matter to the molecules of the substance	21	42%
	The amount of heat released or absorbed when dissolving any amount of the substance in water	20	40%
	That is accompanied by release of heat because of breaking the bonds in the results.	18	36%
	It is the same for the aqua materials and non-aqua materials.	29	58%
Dilution heat	The heat resulting from dissolving a solid substance in water.	16	32%
	The heat resulting from adding any amount of water to the solution.	12	42%
	The heat released for each mole of the dissolved when diluting the solution	34	68%
	The heat absorbed for each mole of the dissolved when diluting the solution	34	68%
	The heat released or absorbed for any amount of the dissolved when diluting the solution	23	46%
	The heat resulting from removing the ions away from each other	19	38%
	The heat absorbed as a result of linking molecules of the dissolved to the ions	16	32%
	The heat released or absorbed for each mole of the dissolved when diluting the solution	40	80%
Combustion heat	The heat resulting from burning any amount of a substance in oxygen.	25	50%
	Is the heat in which HΔ is positive in the equation.	15	30%
	It is the same amount of heat resulting from the caloric value.	40	80%
	The amount of heat resulting from the combination of the substance with a limited amount of oxygen.	35	70%
	The amount of heat resulting from the combination of one mole of the substance with a great amount of hydrogen.	41	82%

	Happens in the reactions which combine with oxygen and are not accompanied by release of heat or light.	16	32%
Heat of formation	The amount of heat released when forming an amount of a substance.	26	52%
	It is the one calculated directly in all cases.	21	42%
	For one mole of CO, it can be calculated through the combination of oxygen and carbon.	41	82%
	It is the same as heat of combustion for all substances.	21	42%
	The more it increases, the less stable the compound will be.	24	84%
	It can be measured regardless the measuring state of the reactants and the results.	39	78%

It is clear from the above table that there are alternative conceptions whose frequency among the diagnostic sample reached more than 20% and ranged from 80% as a maximum to 22 as a minimum.

The second question: What is the effectiveness of using reframing strategy based on NLP in modifying thermochemistry alternative conceptions among low achievers at the first grade of the secondary stage?

To answer this question, the validity of the first and second hypotheses were checked, effect size was calculated as well as Black's Modified Gain Ration. The results are as follows:

Checking the validity of the first hypothesis:

"There is a statistically significant difference between the mean scores of the experimental and the control groups in the post administration of the diagnostic test as a whole and all its dimensions in favor of the experimental group". To verify the validity of this hypothesis, mean scores and standard deviations for the scores of the experimental and the control groups in the post administration of the diagnostic test in addition to t-value for non-paired groups were calculated. Table 7 presents these results.

Table 7: Mean scores, standard deviation and t-value for the post administration of the diagnostic test to the experimental and the control groups

Variable	Group	No.	Mean	SD	Degree of freedom	T-value	Sig	η2	Effect size d
Modifying alternative conceptions	Ex.	29	32,9	4,78	59	19,61	Sig	0,87	5,17
	Cont.	32	15,31	1,6					

It is clear from Table 7 that there is a statistically significant difference at the 0.01 level between the mean scores of the experimental and the control groups in the post administration of the diagnostic test in favor of the experimental group. T-value was 19.61 which is significant at the 0.01 level. Effect size was more than 0.8 which indicates a great effect of the reframing strategy based on NLP on modifying alternative conceptions among low achievers at the first grade of the secondary stage. Thus, the first hypothesis is accepted.

Checking the validity of the second hypothesis:

The second hypothesis of the study states "There is a statistically significant difference between the mean scores of the experimental group on the pre-post diagnostic test as a whole and its dimensions in favor of the post administration. To check the validity of this hypothesis, mean scores, standard deviations for the experimental group's pre- post scores on the diagnostic test, and t-value for paired groups were calculated. Table 8 presents these results.

Table 8: Mean scores, standard deviation and t-value for experimental group's scores on the pre-post administration of the diagnostic test

Variable	Test	No.	Mean	SD	T-value	Sig	η2	Effect size d
The diagnostic test	Post-	29	32.9	4.7	19.61	Sig	0.98	9.89
	Pre-	32	0.17	0.38				

It is clear from Table 8 that there is a statistically significant difference at the 0.01 level between the mean scores of the experimental group on the pre-post diagnostic test of alternative conceptions in favor of the post- test. T- value was 36.75 which is significant at the 0.01 level. The effect size was more than 0.8 which indicates a great effect of the reframing strategy based on NLP in modifying alternative conceptions among first year low achievers at the secondary stage. Thus, the second hypothesis is accepted.

To find out the effectiveness of the reframing strategy based on NLP principles, Black's Modified Gain Ration was calculated. Table 9 shows this information.

Table 9: Mean scores of the experimental and the control groups in the pre-post diagnostic test and the Modified Gain Ratio

Test	Maximum score	Mean score (pre-	Mean score (post)	Gain ratio
The diagnostic test	52	0.17	32.9	1.27

It is clear from Table 9 that Black's Modified Gain Ratio for the diagnostic test is more than the minimum identified by Black (1.2) which indicates the effectiveness of the reframing strategy based on NLP principles in modifying alternative conceptions in thermochemistry among low achievers at the first grade of the secondary stage.

The third question: What is the effectiveness of using the reframing strategy based on NLP in developing achievement in Chemistry among low achievers at the first grade of the secondary stage?

To answer this question, the validity of the third and fourth hypotheses were checked and effect size and Modified Gain Ratio were calculated as follows:

Checking the validity of the third hypothesis:

The third hypothesis of the study states "There is a statistically significant difference between the mean scores of the experimental and the control groups in the achievement test as a whole and all its dimensions in favor of the experimental group". To check the validity of this hypothesis, mean scores, standard deviations for the achievement post- test of the experimental and control groups in addition to t- value for non-paired groups were calculated. Table 10 gives results of this hypothesis.

It is clear from Table 10 that there is a statistically significant difference at the 0.01 level between the mean scores of the experimental and the control groups in the post administration of the achievement test in favor of the

experimental group. The highest T-value was 7.74 for the comprehension dimension whereas the lowest was 3.73 for the application dimension which is significant at the 0.01 level. Effect size was more than 0.8 in the test's dimensions and the test as a whole which indicates a great effect of the reframing strategy based on NLP on developing achievement among low achievers at the first grade of the secondary stage. Thus, the third hypothesis is accepted.

Table 10: Mean scores, standard deviation and t-value for the post administration of the achievement test to the experimental and the control groups

The achievement test	Total score	Ex. group		Cont. group		T-value	Sig	η2	Effect size D
		Mean	SD	Mean	SD				
Knowledge	6	4.06	0.99	3.21	0.42	4.4	Sig.	0.25	1.16
Comprehension	15	9.6	1.56	7	.04	7.74	Sig.	0.51	2.04
Application	9	5.5	1.4	4.53	0.63	3.73	Sig.	0.19	0.97
Total	30	19.6	4.3	14.74	1.83	4.97	Sig.	0.29	1.2

Checking the validity of the fourth hypothesis

The fourth hypothesis states "There is a statistically significant difference between the mean scores of the experimental group's pre-post achievement tests as a whole and its dimensions in favor of the post- test". To check the validity of this hypothesis, mean scores, standard deviations for the experimental group's pre- post scores on the achievement test, and t-value for paired groups were calculated. Table 11 presents these results.

Table 11: Mean scores, standard deviation and t-value for experimental group's scores on the pre-post administration of the achievement test

The achievement test	Total score	Pre-		Post-		t-value	Sig 0.01	η2	Effect size d
		Mean	SD	Mean	SD				
Knowledge	6	0.34	0.48	4.57	0.99	9.44	Sig.	0.93	7.28
Comprehension	15	0.2	0.41	9.6	1.56	33.7	Sig.	0.97	7.28
Application	9	0.01	0.01	5.5	1.4	21.3	Sig.	0.94	7.9
Total	30	0.55	0.63	19.67	3.66	9.99	Sig.	0.97	11.37

It is clear from Table 11 that there is a statistically significant difference at the 0.01 level between the mean scores

of the experimental group on the pre-post achievement test in favor of the post- test. The highest T- value was 29.99 for the total score of achievement and the lowest was 19.44 for the remembering dimension which are significant at the 0.01 level. The effect size was more than 0.8 for the whole test and the three dimensions which indicate a great effect of the reframing strategy based on NLP in developing achievement among first year low achievers at the secondary stage. Thus, the fourth hypothesis is accepted.

To find out the effectiveness of the reframing strategy based on NLP principles, Black's Modified Gain Ratio (Allam, 2000) was calculated. Table 12 shows this information.

Table 12: Mean scores of the experimental and the control groups in the pre-post achievement test and the Modified Gain Ratio

Dimensions of test of scientific concepts	Maximum score	Mean score (pre-	Mean score (post)	Gain ratio
Knowledge	6	0.34	4.57	1.57
Comprehension	15	0.2	9.6	1.29
Application	9	0.01	5.5	1.23
Total	30	0.55	19.67	1.32

It is clear from Table 12 that Black's Modified Gain Ratio for the achievement test as a whole and for its dimensions are more than the minimum identified by Black (1.2) which indicate the effectiveness of the reframing strategy based on NLP principles in developing achievement among low achievers at the first grade of the secondary stage.

The fourth question: What is the effectiveness of using reframing strategy based on NLP in developing achievement motivation among low achievers at the first grade of the secondary stage? To answer this question, the validity of the fifth and sixth hypotheses were checked, effect size and Modified Gain Ratio were calculated as follows:

Checking the validity of the third hypothesis:

The fifth hypothesis of the study states "There is a statistically significant difference between the mean scores of the experimental and the control groups in the scale of achievement

motivation as a whole and all its dimensions in favor of the experimental group". To check the validity of this hypothesis, mean scores, standard deviations for the achievement motivation scale of the experimental and control groups in addition to t-value for non-paired groups were calculated. Table 13 gives results of this hypothesis.

Table 13: Mean scores, standard deviation and t-value for the post administration of the scale of achievement motivation to the experimental and the control groups

Dimensions of achievement motivation	Total score	Ex. group		Cont. group		T-value	Sig. 0.01	η2	Effect size D
		Mean	SD	Mean	SD				
Taking the responsibility	50	35.06	4.36	17.71	4.09	6.18	Sig.	0.82	4.26
Competition and desire of excellence	50	33.65	4.54	16.84	2.74	7.67	Sig.	0.84	4.58
Self-confidence and esteem	50	30.68	2.62	15.97	2.56	22.17	Sig.	0.89	5.68
Total	150	99.39	8.92	50.52	6.87	24.09	Sig.	0.91	6.36

It is clear from Table 13 that there is a statistically significant difference at the 0.01 level between the mean scores of the experimental and the control groups in the post administration of the achievement motivation scale in favor of the experimental group. The highest T-value was 24.09 for the scale as a whole whereas the lowest was 16.18 for the dimension of taking the responsibility which are significant at the 0.01 level. Effect size was more than 0.8 in the scale's dimensions and the scale as a whole which indicate a great effect of the reframing strategy based on NLP on developing achievement motivation among low achievers at the first grade of the secondary stage. Thus, the fifth hypothesis is accepted.

Checking the validity of the sixth hypothesis:

The sixth hypothesis states "There is a statistical significant difference between the experimental group's mean scores in the pre-post scale of achievement motivation as a whole and its dimensions in favor of the post administration". To check the validity of this hypothesis, mean scores, standard deviations for

the experimental group's pre- post scores on the achievement motivation scale, and t-value for paired groups were calculated. Table 14 presents these results.

Table 14: Mean scores, standard deviation and t-value for experimental group's scores on the pre-post administration of the achievement motivation scale

Dimensions of achievement motivation	Total score	Pre-		Post-		t-value	Sig 0.01	η2	Effect size d
		Mean	SD	Mean	SD				
Taking the responsibility	50	4.48	2.87	35.06	35.06	18.36	Sig.	0.92	6.78
Competition and desire of excellence	50	2.03	1.47	33.6	4.54	23.57	sig.	0.95	8.71
Self-confidence and esteem	50	0.86	0.95	30.69	2.62	39.94	Sig.	0.96	9.79
Total	150	37.37	4.73	99.35	8.92	31.96	Sig.	0.97	11.37

It is clear from the results of Table 14 that there is a statistically significant difference at the 0.01 level between the mean scores of the experimental group on the pre-post achievement motivation scale in favor of the post. The highest T-value was 39.94 for the self- confidence and esteem, and the lowest was 18.36 for the taking the responsibility dimension which are significant at the 0.01 level. The effect size was more than 0.8 for the whole scale and the three dimensions which indicate a great effect of the reframing strategy based on NLP in developing achievement motivation among first year low achievers at the secondary stage. Thus, the fourth hypothesis is accepted.

To find out the effectiveness of the reframing strategy based on NLP principles, Black's Modified Gain Ratio (Allam, 2000) was calculated. Table 15 shows this information.

It is clear from Table 15 that Black's Modified Gain Ratios for the dimensions of the scale of achievement motivation and the whole scale are more than the minimum identified by Black (1.2) which indicate the effectiveness of the reframing strategy based on NLP principles in developing achievement motivation among low achievers at the first grade of the secondary stage.

Table 15: The experimental group's mean score in the pre-post scale of achievement motivation and the Modified Gain Ratio

Achievement motivation	Maximum score	Mean score (pre-	Mean score (post)	Gain ratio
Taking the responsibility	50	14.48	35.06	1.57
Competition and desire for excellence	50	12.3	33.6	1.48
Self-confidence and esteem	50	10.86	30.69	1.33
Total	150	37.37	99.35	1.46

Interpretation and discussion of the results:

1. **Interpreting the results related to the alternative conceptions in concepts of thermochemistry:** Results of the first question indicates that there are alternative conceptions for the concepts in thermochemistry that reaches more than 20% of the diagnostic sample. The percentages ranged from 80% to 22% which is a big one that indicates a clear weakness among the students in the correct scientific understanding of the concepts of thermochemistry. This may be the main reason for low achievement. This result agrees with Abdou (2000), Albaz (2007), Sakr (2004) and Sadeque (2004). The researcher believes that the existence of a big percentage of alternative conceptions in thermochemistry may be that the connotations of the chemical concepts are unclear because of using traditional methods of teaching and the absence of the scientific dimension in teaching Chemistry, not to mention using traditional methods of evaluation that focus on memorization and the low levels of the cognitive levels in addition to not giving the students opportunities for practicing thinking and analysis. The researcher believes that knowledge should not be limited to one source, and teaching should not be limited to memorizing the chemical concepts without their connotations. Besides, practicing the experimental method and thinking skills during teaching and learning

Chemistry may decrease the chemical alternative conceptions in the students' minds.

2. Interpreting the results related to modifying alternative conceptions: Results of the first and second hypotheses showed significant statistical differences between the mean scores of the experimental and the control groups in the diagnostic test in favor of the experimental group. In addition, there was a statistical significant difference between the mean scores of the experimental group's scores in the pre-post diagnostic test in favor of the post. However, in the light of the scientific connotation, these differences do not necessarily mean the effectiveness for using the reframing strategy based on NLP in modifying alternative conceptions. Therefore, effect size was calculated. Its value was more than 0.8 in the results of the first and second hypotheses which indicate a great educational important effect of the reframing strategy based on NLP in modifying alternative conceptions of the thermochemistry concepts among first grade secondary stage low achievers. Besides, results of applying Black's Modified Gain ratio indicated that the ratio is more than the minimum identified by Black (2.1) which shows the effectiveness of the reframing strategy based on NLP in modifying alternative conceptions of the thermo-chemistry concepts among low achievers at the first grade of the secondary stage. These results are consistent with Sabry and Abderrady (2010), Alkhalily (1996) Emam (2011) and Hewson and Hewson (2003). The researcher believes that the effectiveness of the reframing strategy based on NLP in modifying alternative conceptions in thermochemistry concepts among low achievers may be due to the nature of the strategy which depends on the constructivist theory in paying attention to the students' prior knowledge about the concept. This is represented in the first step of the strategy, identifying ideas related to alternative conceptions of the concept. In addition, the reframing strategy is considered a comprehensive

strategy that includes in its steps many strategies for modifying alternative conceptions such as increasing motivation which depends on cognitive conflict theory. The second step, i.e. introducing the new concept relates to the constructivist model. The fourth step of the strategy, i.e. forming a suitable frame for the correct concept relates to the analogy strategy for modifying alternative conceptions. The fifth step, i.e. widening the concept relates to metacognitive strategies which help the students to form their cognitive structure correctly and achieve growth in knowledge.

3. Interpreting the results related to achievement: Results of the third and fourth hypotheses revealed statistically significant differences between the mean scores of the experimental and the control groups in the achievement test in favor of the experimental group. In addition, there was a statistically significant difference between the mean scores in the experimental groups' pre-post achievement test in favor of the post test. However, in the light of the scientific connotation, these differences do not necessarily mean the effectiveness for using the reframing strategy based on NLP in developing achievement. Therefore, effect size was calculated. Its value was more than 0.8 in the results of the third and fourth hypotheses which indicate a great educational important effect of the reframing strategy based on NLP in developing achievement among first grade secondary stage low achievers. Besides, results of applying Black's Modified Gain ratio indicated that the ratio is more than the minimum identified by Black (2.1) which shows the effectiveness of the reframing strategy based on NLP in developing achievement among low achievers at the first grade of the secondary stage. These results are consistent with Emam (2011) and Blackerby (2002). The researcher believes that the effectiveness of the reframing strategy may be because it helps diagnose alternative conceptions in thermochemistry. Consequently, it helps correct

comprehension of the thermochemistry concepts and provides the students with an atmosphere of freedom in which they present their ideas without fear or shame. They also have the chance to present the cognitive conflict around the concepts which helps interaction among them. The strategy's dependence on forming a new frame for the concepts through presenting analogies helps the students to retain the concepts, know their connotations and continue in learning the chemical concepts. In addition, the strategy's dependence on the learners' activity and constructing knowledge by themselves makes them the core of the educational process through the next step of the strategy which is introducing concepts through discussion, dialogue and focus groups.

4. Interpreting the results related to achievement motivation : Results of the fifth and sixth hypotheses revealed statistically significant differences between the mean scores of the experimental and the control groups in the achievement motivation scale in favor of the experimental group. In addition, there was a statistically significant difference between the mean scores in the experimental groups' pre-post achievement motivation scale in favor of the post test. However, in the light of the scientific connotation, these differences do not necessarily mean the effectiveness for using the reframing strategy based on NLP in developing achievement motivation. Therefore, effect size was calculated. Its value was more than 0.8 in the results of the fifth and sixth hypotheses which indicate a great educational important effect of the reframing strategy based on NLP in developing achievement motivation among first grade secondary stage low achievers. Besides, results of applying Black's Modified Gain ratio indicated that the ratio is more than the minimum identified by Black (2.1) which shows the effectiveness of the reframing strategy based on NLP in developing achievement motivation among low achievers at the first grade of the secondary stage. These results are

consistent with Alsafy (2000), Shehata (2010) and Nelon (2003). The researcher believes that the effectiveness of the reframing strategy in developing achievement motivation may due to the nature of the strategy and its steps. The second step is increasing motivation for changing the old frame through cognitive conflict which would lead to increasing motivation. Helping the students to correct their alternative conceptions for thermochemistry concepts helps them to get higher scores in the Chemistry tests which, in turn, increases motivation towards learning Chemistry and desire for more learning of chemistry concepts, not to mention the relaxing atmosphere of learning, respect for each learner and his capabilities and acknowledging individual differences in a way consistent with NLP principles such as respecting and accepting the others, the map is not the territory, and everyone has levels of conscious and subconscious communication. The strategy's encouragement of deepening the concept encourages the students for more learning and increases motivation for learning.

Recommendations:

- Diagnostic tests should be prepared for finding out different patterns of scientific alternative conceptions among the Chemistry learners at different educational stages, and making use of their results when reviewing the Chemistry courses for those educational stages concerning the scientific content and the accompanying figures.
- Teacher's guide should include a part on diagnosing the students' alternative conceptions and suggestions for tackling them correctly.
- Reframing strategy and the principles of NLP should be included in the Teacher's Guide of the Chemistry course.
- In-service teachers should be trained on how to diagnose alternative conceptions among the students and how to make use of the reframing strategy based on NLP in

modifying alternative conceptions in helping the students to acquire the correct scientific concepts and correct the alternative ones.

- Caring for the low achievers at the secondary stage by using a strategy that helps the students to modify their alternative conceptions, changing them from negative to positive active participants during the learning process.

Suggestions for further research:

- The effectiveness of a suggested unit in Chemistry based on the principles of NLP in correcting alternative conceptions in Chemistry and achievement among the secondary stage students.
- The effectiveness of a training program for developing teachers' skills in using the reframing strategy based on NLP in modifying alternative conceptions in thermochemistry among the secondary stage students.
- Developing the Chemistry curricula at the secondary stage in light of alternative conceptions in Chemistry and achievement motivation.
- The effect of NLP in teaching Chemistry and developing achievement and achievement motivation among secondary stage students.

References:

Abdelmaseih, A. (2001). Alternative conceptions for some environmental concepts among different categories of persons and modifying some of them among secondary stage students. *Journal of Education,* 25 (5),Faculty of Education: Ain Shams University.

Abdessalam, M. (2006). *Teaching Science and the era requirements.* Cairo: Dar Alfikr Alaraby,P.151

Abdou, F. (2000). Correcting alternative conceptions for some scientific concepts among primary stage pupils. *The Journal of Science Education,* 3, 129-164.

Abdullah, H. (2011). *Achievement motivation scale.* Riydah: Ashekry Bookshop.

Journal of Research in Curriculum, Instruction and Educational Technology

Alaasar, S. (1989). A program for developing achievement motivation. *Center for Educational Research*, 24, Qatar. 165-303.

Alamoudy, H. (2012). The effectiveness of Witly model in developing achievement and information generation skills in Chemistry, achievement motivation among third grade secondary stage students. *The Journal of Science Education*, The Egyptian Society of Science Education, 15(1), 219-262.

Alattar, M. (2001). The effectiveness of practical experiments in correcting alternative conceptions about some electricity concepts among the student teachers, the Egyptian Society of Science Education, *Journal of Science Education*, 41(3). 62.

Albalwashy, S. (2007). The relationship between creative thinking abilities, science processes and academic achievement in the different subjects among a sample of female good and low achievers at the ninth grade in Oman Sultanate, *The Educational Journal*, 82(21), 89-126.

Albanna, H. (2001). An analytic study of the cognitive levels in the Chemistry exams for the secondary stage certificate, The Egyptian Society for Science Education, *Journal of Science Education*, 4(1), 9-27.

Albaz, K. (2007). The effectiveness of using thinking maps in teaching chemical equilibrium in achievement of second graders at the secondary stage and their multiple intelligences, The Egyptian Society for Science Education, *The 11th Scientific Conference*, Ismailia, 29-31 Jan., 7-25.

Aldawwash, F. (2008) (1st ed.). *Neuro linguistic programming from vision to action*, Cairo, the Egyptian Alanglo.

Aldesouky, E. (2003). The role of analogies in modifying incorrect alternative conceptions among the fourth grade of the primary stage pupils about animal classification. *Journal of Educational research*. (1), The National Center for Educational Research and Development, 44.

Alemran, G.R. (1994). Achievement motivation and its relationship to academic achievement and some demographic variables among a sample of primary and

prep stage students in Bahrain. *Journal of Studies*, (22), 24-72.

Alesawy, A. (2004) (1st ed.). *Landmarks in psychology*. Dar Alnahda Alarabia: Beurot.

Alfiky, I. (2009) (1st ed.). *Neuro Linguistic Programmin*g. Egypt: Ajial for Publishing and Distribution.

Ali, M. and Yousef, M. (1999). The effectiveness of using information processing strategy in achievement and the ability of solving chemical problems among the first grade secondary stage students with different mental capacities. The Egyptian Society of Science Education, *Journal of Science Education*, 2, 13-71.

Alkabsy,w. and Eldahrawy,s. (2000). *Almenhal in educational psychology*. Jordon: Alkendy House.

Alkhalily,k.and Younis,M. (1996). *Teaching Science at the general education stages*. Dubai: Dar Alelm.P.438.

Almashany, A. A. (2006). The effectiveness of a training program in the NLP techniques: A study of some personality variables among university students in Oman Sultanate. Unpublished M.A., Cairo Educational Institute at Cairo University.

Appleton,K. (1997). Analysis and description of student learning during Science classes using a constructivist based model, *Journal of Research in Science Teaching* , 34, (3), 303-318.

Alsadany, A. (1994). The extent to which the Science courses treat the natural phenomena and the students' conceptions about them. *Studies in Curricula and Methods of teaching*, The Egyptian Society for Curricula and Methods of Teaching, (26), 50-65.

Alsafy, A. (2000). Attributing academic success and failure and its relationship to achievement motivation: A study on a sample of excellent and low achiever students at Abha City. Om Al Qura *Journal of Social and Educational Research*, 18 (2), 80-105.

Alshafey, S. (2005). The effectiveness of a suggested educational unit in Chemistry based on backward design in achieving scientific understanding for the general stage students. The

Egyptian Society for Science Education, *The 9th Scientific Conference: Hindrances of Science Education in the Arab World: Diagnosis and Solution*. Ismailia, 31 July-3 Aug. (1), 191-228.

Alshehry, A. (2004). Cognitive styles and their relationships to academic achievement among secondary stage students with and without learning disabilities at Altaef City. *Journal of the Faculty of Education*, 54(2), Almoansoura University, 53-90.

Alshereif, O. (2008). Using NLP techniques for enhancing the professional performance of the internal reviewer: An experimental study. Unpublished M.A., Faculty of Commerce.

Atkinson, J.W.(1964). *An introduction to motivation*, Princeton: Van Nostrand.

Attekreity, M. (2003) (5th ed.). *Horizons without limits: A research in human engineering*, Syria: Almoltaka for Publishing and Distribution.

Azzayyat, F.M. (2004)(2nd ed.). *Psychology of learning between the correlational and the cognitive perspectives.* Cairo: University publishing House.

Badr. B. (2012). The effectiveness of teaching using a suggested active learning strategy in developing higher order thinking skills in Geometry among low female achievers at the intermediate stage in Kingdom of Saudi Arabia, *Arab Studies in Education and Psychology*, 5(3), 115-143.

Bander,R. and Grinder, G. (1982). *Reframing neuro - linguistic programming and the transformation of meaning* , Bobby Matherne, Real People Press.

Bandura, A. (1986). *Social foundation of though and action.* Englewood Cliffs ,NJ: Prentice Hall.

Basha, S. A. (2000). The effect of motive, self- esteem and specialization on academic achievement among the secondary stage students. *The Educational and Psychological Journal*, (3), Faculty of Education: Elmenoufeya University, the 15th year, 31-59.

Blackerby, D.A. (2002). Help for troubled youth: Finding the missing piece to the puzzle. Retrieved: 14 June http:// WWW.new-oceans co.UK/ edent.

Boweiz, C. (2010). *Neuro linguistic programming*. Riyadh: Gareer Bookshop

Bundler, R. G. (1979). *Frogs into princes neuro linguistic programming*, Real People Press.

Caine,R.N. and Caine,G.(1999). Theory and practice brain / mind learning principles. Available at : http//www.Caine learning. com/ theory expanded. html.

Dilts,R. and Delozier ,J.(2000). *Encyclopedia of systematic NLP New Coding*. Capitola, California: Meta Publications.

Dilts,R., and Epstein,T.(1995). *Dynamic Learning*, Capitola, CA: Meta Publications.

Emam, H.M.A. (2011). The effectiveness of a program of using some NLP techniques in enhancing psychological and educational adjustment among low achievers, unpublished M.A., Faculty of Education, Helwan University.

Esterbook, R.L.(2006). Introducing Russian neuro-linguistic programming behavior modification techniques to enhance learning and copping skills for high-risk student in Community Colleges: An initial investigation, Ph.D. Dissertation, George Mason University , Fairfax VA.

Farrouha, B. (2011). Social psychological adjustment and its relationship to motivation towards learning among the experienced adolescent: A field study, Unpublished M.A., Faculty of Arts and Humanities, Mawloud Maamary University, Algeria.

Fathallah, M. (2009). The effect of thinking maps based on integration on developing achievement in Science, critical thinking and attitude towards cooperative work among the prep stage students. The Arab Gulf Message, (101), 53-101.

Fayed, M. (2013). The effect of a training program based on some NLP techniques in raising the level of self-control of some behaviors inside the classroom. Unpublished M.A. Faculty of Education, Tanta University.

Garnder,H. (1995). *Reflection on multiple intelligences: Myths an messages*, Delta Kappan, 77, 200-209.

Halloul, I. (2011). The effect of using NLP in developing the Palestinian teacher's achievement motivation. *Journal of Alquds Open University for Research and Studies,* (22), 163-201.

Harris, C. (2004). NLP is easier now, Riyadh: Gareer Bookshop.

Hassan, A. (1998). *Psychology of achievement and the cognitive and dispositional characteristics of the achieving character*. Cairo: Alnahda Almasreya Bookstore.

Heizer, H.A. (2003). *Neuro linguistic programming in 21 days*. Riyadh: Gareer Bookshop.

Hewson, M. and Hewson, P. (2003). Effect of instruction using student prior knowledge and conceptual change strategies on Science learning, *Journal of Research in Science Teaching*, 40 (2), 86-98.

James, T. (1996). *The Basic NLP training collection manual. Honolulu,* Hawai: Advanced Neuro Dynamics, Inc.

Kashkoush, I. and Mansour, T. (1979) . *Achievement motivation and its measurement*. Cairo: The Egyptian Anglo Bookstore.

Katamy, N. (2004). Cognitive strategies for the self-regulated learning among university students and their relationship to academic achievement, cognitive flexibility and motivation. the Arab Center for Education and Development, Egypt, *Journal of The Future of Arab Education,* 10, 32.

Kesan,C. and Kuya, D. (2007). Determination of misconception that are encountered by teacher candidates and solution propositions for relieving of these misconceptions*, Journal of Educational Technology*, (2), 23-56.

Khalifa, A. M. (2000). *Achievement motivation*. Cairo. Ghareib House Publishers.

Lyall, D. (2002). NLP in training: The power To Facilitate, *Training Journal*, Nov., 12-19.

Maclelland, D. C. (1976) (2nd ed.). *The achievement motive*. New York, Irington.

Mahishika, K. (2010). Neuro Linguistic, programming and application in treatment of phobias, complementary therapies. Clinical practice, 16*, Elsevier*, 203- 207.

Maslow, A.H.(1954) (2nd ed.). *Toward psychology of being* , N.Y.: Van, Nostrand Reinhold.

Mathana, E. K. (2010). Emotional intelligence and achievement motivation among a sample of regular and affiliated students at King Abdelaziz University: A comparative correlational study, Kafr Esheikh University, *Journal of the Faculty of Education*, (1), 1-51.

Moustafa, A. (2001) (1st ed.). *Current trends in Teaching Science. Cairo:* The Arab Thought House .

Moustafa, A. (2005). The effectiveness of a suggested constructivist model in correcting fifth grade pupils' concepts about energy. *The 9th Annual Conference for the Mathematics and Science Teachers.* Lebanon: The American University in Beirut, the Educational Center for Science and Mathematics, Nov. 1-21.

Moustafa, A. (2013). The effect of the positive thinking program and self-support in the light of NLP on academic performance in a sample of students at the second cycle of basic education. Unpublished M.A., the Faculty of Education: Tanta University.

Murray, H.A.(1938). *Explorations in personality*, New York: Oxford University Press.

Nelson, S. (2003). Learning of environments motivation and achievement in high school Science, *Journal of Research in Science Teaching,* 40 (4), 34-68

O'Connor, J. (2001). *NLP workbook : The practical guidebook to achieving the results you want*, Thorsons Edition, London.

O'Connor, J. and Seymour, J. (1990). *Introducing NLP* , Aqmarian Thorsons .

Peter, L. (2004). Using participatory story- telling, forum theatre and NLP concept and techniques to create powerful learning experience around issues of HVI prevention, support and positive living, Fourth International Entertainment Education Conference ,Cape town .

Saady, S. (2001) the ability of creative thinking and its relationship to achievement motivation and self-efficacy. M.A., Education, Algeria. Faculty of Art and Human Science ,Department of psychology .

Sabry, M.I. and Abderrady, N. (2010). The generative model for teaching Science and modifying alternative conceptions about the natural phenomena. *Journal of Arab Studies in Education and Psychology*, 4(3), 13-47.

Sadeque, M. (2004). The effect of using open-ended problem solving, deductive reasoning and critical thinking in Chemistry among first grade secondary stage students. The Egyptian Society of Science Education, *The 8th Scientific Conference: The Absent Dimensions in the Science Curricula in the Arab Country*, 2, 387-451.

Sencar, S. and Eryilmaz, A. (2004). Factors mediating the effect of gender on ninth - grade Turkish students' misconception concerning electric circuits, *Journal of Research in Science Teaching*. (41), 603-616.

Shawashra, A. H. (2007). The effectiveness of a program in educational counseling in stimulating achievement motivation among a student suffering from low motivation in achievement: A case study, Faculty of Educational Research, The Open University in Jordon.

Shehata, S. (2010). The effectiveness of training on NLP and cognitive behavioristic therapy on modifying the ambition level among a sample of hearing impaired adolescents and its effect on the adaptive behavior. Unpublished Ph.D., Faculty of Education, Kafr Esheikh University.

Shehaza, A. (2005). The effectiveness of the achievement program and its relationship towards risk taking, level of ambition, and achievement. Unpublished Ph.D. The Arab Institute of Research and Studies, Cairo.

Shoeir, I. (2003). The effectiveness of using the enrichment strategy in developing some science processes and academic achievement among low achievers in Science at the prep stage. *The Annual Scientific Conference for the Faculty of Education: General Education Curricula between*

Reality and the Requirements of the Third Millinium, Faculty of Education, Almansoura University, 22-26 March, 540-575.

Smith, E., Blackeslee,T. and Anderson, C. (1993). Teaching strategies associated with conceptual change learning in Science, *Journal of Research in Science Teaching,* 30(2), 11-26.

Soliman, A. (2007): Neuro Linguistic Programming: An accredited practitioner Diploma. The international Center for Neuro linguistic programming.

Solimany, F. (2004, April). Treating the classroom problems by applying NLP. *Journal of Social Research and Studies*, (6) Alwady University, 216-227.

Susie, L. and Michael, H. (2007). Sustaining change through emotional intelligence, *The Coaching Psychologist*, 13 (1), 6.

Thompson, J. E., Country, L. and Dickson, R. (2002, Aug.). The effect of neuro linguistic programming on organization and individual performance: A case study, *Journal of European Industrial Training* , 26(6), 292-298

Tosey,P. and Mathison, J. (2003). Neuro linguistic programming and learning theory: A response, *The Curriculum Journal*, 14(3), 361-378.

Younis, M.M. (2009). *Psychology of motive and emotions*, Oman: Almesiry House.

Yousef, M. (2002). The effectiveness of teaching Chemistry with computer assistance in achievement and developing attitude towards self-learning and academic achievement among first grade secondary stage students. *The Egyptian Society for Science Education, the 6th Scientific Conference*, 2, 401-403.

Yousef, S. G. (2011). The effectiveness of a suggested strategy based on cognitive conflict in developing achievement motivation in Science for the prep stage students. *Journal of Scientific Research in Education*, (12), 19-32.

Zaitoun, K. A. (1998). The effectiveness of constructivist analysis in correcting alternative conceptions about force and motion among the Physics students with different learning

styles. The Egyptian Society of Science Education, *Journal of Science Education*,1(4), 83-140.

Zaitoun, H.H. and Zaitoun, A. (2003), (1st ed). *Learning and teaching from behaviorist theory perspective.* Cairo: Alam alkotob.pp.49-52.