

**CREATIVE THINKING LEVEL AND ITS RELATION TO
ACHIEVEMENT IN ENGLISH, ATTITUDE TOWARDS SCHOOL AND
LEARNING MOTIVATION FOR BASIC NINTH GRADE STUDENTS
IN JERUSALEM AREA**

By

Sana' Abdul-Salam Abdul-Ghani

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By

Student Name: Sana' Abdul-Salam Abdul-Ghani

Registration No: 20120172

Supervisor: Prof. Ahmad Fahim Jaber

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The names and signatures of the examining committee members are as follows:

- | | | |
|----------------------------|-----------------------|------------------------------------|
| 1- Prof. Ahmad Fahim Jaber | Head of the Committee | Signature <u>Ahmad Fahim Jaber</u> |
| 2- Dr. Taisir Abdullah | Internal Examiner | Signature <u>Taisir Abdullah</u> |
| 3- Dr. Raghad Dweik | External Examiner | Signature <u>Raghad Dweik</u> |

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Declaration

I Certify that this thesis submitted for the degree of Master is the result of my own research, except where otherwise acknowledged, and that this thesis (or any part of the same) has not been submitted for a higher degree to any other university or institution.

Name: Sana' Abdul - Salam Abdul - Ghani

Signed.....

Date: ...15.6.2005.....

DEDICATION

I dedicate this thesis, with pleasure and humility, to all creative Palestinian pupils, teachers, educators and thinkers.

To Palestine, my country, that nurtured me and taught me to think, create, and be positive.

To everybody who participated and helped in the preparation of this work.

To my family, to whom I owe the greatest debt of gratitude, especially my father for encouraging me to get the master degree in education, and to my dear husband.

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INTRODUCTION

The dominant characteristic of modern life is that it is subject to rapid change. Millar (2002) states that as the world becomes more of a global village through technological advances, people will become more aware of problems and will need to use creativity to deal with them (p.6). Martinsen (2003) makes the same point stating that one may imagine that the capacity to create and to solve complex or novel problems will become more and important in an increasingly regulated, technology oriented and complex world (p.227). Thus, he adds that school authorities these days, at least in some countries, seem to have as a primary aim that schools should be an arena for competition, efficiency, and productivity (p.228). Simonton (2000) (in Martinsen 2003) indicates that creativity is a capacity that makes us productive, adaptive and efficient when facing uncertainty and unexpected problems. Popov (1992) states that when necessity arises, however, a person starts creating. Edgar F. Robers (in Mehr, et al. 1996) makes the same point stating that “Every human mind is a great slumbering power until awakened by a keen desire and by a definite resolution to do” (p. 77)

Therefore, creative people began to be seen as the vital resource needed to rapid economic and social development especially modernization. Cropley (2001) points out that people need to adapt to a changing world through developing skills that can be employed in the future such as thinking autonomously, solving problems, coping with the unexpected, ... etc. Martinsen (2003) states that people will need to restructure their understanding, find new solutions, new challenges and new ideas frequently during their lifetime. Ford and Harris (1992) emphasize the importance of stimulating children's abilities to see beyond the norm, to imaging, to create. They state that society should begin to accept the critically important role that creativity plays in our everyday existence. “Instilling creativity in children creates possibilities for solving future problems – problems that educators may not have even begun to envision”. (p.194)

In fact, what teachers desire are students who have purposes for learning, know how and when to question, who value knowledge and recognize the type of knowledge which is required, know how to find information, and who can generate and evaluate a number of alternatives to human problems. As Joussement & Koestner (1999) (in Cropley, 2001), put it, teachers and children need a clearly defined concept of creativity that specifies what behaviors are necessary in order to be creative, and what aspects of personality, attitudes, and motivation are facilitating as well as

blocking such behaviors. And since knowledge and skills needed in the future may not even be known at the time a person attends school or university. As a result, a number of studies emphasized the importance of the kind of skills, abilities, attitudes, values and motives in order to help people to cope with the challenges of life and the rapid change (Cropley, 2001). Other studies concerned with developing types of thinking which can be described as qualities of “good thinking” or “effective thinking” Some researches indicate that critical and creative thinking are interrelated and complementary aspects of thinking. Critical thinking is necessary for analyzing arguments and for rational decision making, while creative thinking is necessary to develop alternatives to ways of life. The importance of having students develop good critical and creative thinking abilities has to do with the foundations needed for a democracy and with the tools needed for independent and life-long learning (Klenz, 1987).

Accordingly, throughout the years, many programs and projects have been generated seeking to develop and teach thinking skills. The “Inventive Thinking Curriculum Project” is one of the many projects that promote critical and creative thinking and problem – solving skills. It provides a unique opportunity for children of all ages to develop and practice higher – order thinking skills.

(<http://www.uspto.gov/web/offices/ac/ahrpa/opa/projxi/invthink/invthink.htm>)

As a result fostering creativity began to be seen as part of the preparation of children to engage in a process of lifelong flexibility and adaptation (Cropley, 2001). Martinson (2003) states that in order to foster creativity we need curricula with an emphasis on creativity, parents with an understanding of their children’s needs, and politicians with an awareness of their limitations. And since all people are capable of developing their abilities, knowledge, skills, attitudes and personal properties in a creative direction, then, it will be possible for schools and institutions to reform their educational practices, so that they promote creativity. Miller (2002) points out that schools need to be committed to teaching creatively and valuing student expressions of creativity. Thus, he states that a person must believe that creativity is important and be committed to it in order to

embrace it as a “Behavioral Style”. Cohen (2000) (in Miller, 2002) makes the same point stating that creative expressions foster positive feelings that prompt a positive outlook and sense of well-being. Therefore, it seems that creativity research has paid attention to some non-cognitive aspects such as feelings and attitudes toward creativity (e.g. placing a high value on new ideas, believing that creative thinking is “normal”, admiring creative people

in one's immediate environment and not just in the abstract (Cropley, 2001, p.69). As Sternberg (1995, 1996) states that "creativity is not just a matter of thinking in a certain way, but rather it is an attitude toward life" (p.333).

Obviously, the task of educational institutions, teachers, parents and other educators who wish to foster creativity apparent in promoting the growth of both kinds of cognitive (i.e. fluency, originality, flexibility, ... etc) and non-cognitive factors (i.e. patterns of personality traits, values, interests, attitudes, which have strong correlation with creative behavior).

Treffinger (in Open Education Program, 1992) pointed out that creative thinking is an important necessity for lifelong learning, since it works on stimulating the child possibilities to solve the problems in the future and to use probably what is being learned by the person in the practical life. However, a review of research indicates that educational institutions are far away from teaching creative thinking skills. A recent Palestinian study by Ikhlayel (1999) investigated creative thinking level and its relation to achievement and attitude towards Mathematics for tenth grade students in Bethlehem, revealed that students tended to have low levels of creative thinking skills. However, the study revealed that there was a positive relationship between creative thinking skills and both achievement and attitude toward Mathematics. Unfortunately, no effort was made to determine the level of creative thinking skills in English language classroom and the relationship between creative thinking skills and achievement in English language, attitude toward school and motivation. Given the limited number of studies in the filed, it would appear entirely appropriate to pursue a study whose purpose is to identify creative thinking and its relation to achievement in English language, attitude towards school and motivation. In other words a study that combines cognitive and non-cognitive aspects of creativity. An investigation of the relationship among these aspects could prove valuable to the students, to English language teachers, and to educators who would like to foster creative thinking in English language classroom.

THEORETICAL FRAMEWORK

Theories of Creativity

Creativity as a human phenomenon seemed to present a special challenge for theorists and psychologists, and many well-known theorists have made attempts to incorporate an explanation for creative behavior within their theoretical positions. Accordingly, there is a great divergence across theories with regard to explanation of creativity. Woodman & Schoenfeldt (1990) explains this divergence to fundamental differences in perspective regarding the nature of human beings and their behavior that exists within various streams of psychological thought. Some of these theories are:

1. The Behavioral Theory: One of the behavioral theories upon creative thinking is Mednick's theory that can be thought of as theory that explains the mechanisms underlying divergent thinking. Mednick (1962) defines creative thinking in associative terms. That is, creativity consists of making new combinations of associative elements which are useful. He argues that any condition that increases the likelihood of bringing together the associative elements needed for creative solution will increase the probability of that creative solution being discovered. He proposes three ways by which these associations may occur:

1. "Serendipity" refers to any chance contiguity of associative elements in the environment that leads one to a creative insight.
2. "Similarity" of associative elements or if the stimuli that evoke those elements.
3. "Mediation" of common elements, typically through the use of symbols.

Mednick states that there are individual differences in the probability of discovering or producing creative solutions, and he advances five factors that may account for these differences:

1. Domain – specific knowledge is essential.
2. The total number of associations that one makes.
3. Differences in cognitive or personality style.
4. The selection of the creative combination from the many possible associations
5. The associative hierarchy that refers to how an individual's associations are organized whether steep or flat.

(Baer, 1993, p.18-22; Kutami, 1997; & Open Education Program, 1992, p. 84-87)

2. The Analytical Theory: Theorists within the psychoanalytic tradition (e.g. Freud, Jung, and Kubie) typically view creativity as stemming from the unconscious or of preconscious (Woodman & Schoenfeldt, 1990, p.11). Psychoanalytic theory places great emphasis on the critical role of “primary process thinking” in creative behavior. Suler (1980) describes the creative act as a “special form of interaction between primary and secondary process thinking in which a novel idea or insight is generated by the loose, illogical, and highly subjective ideation process into a context that is socially appropriate and meaningful to others”. (p.14)

Arieti (1976) (in Cropley, 2001, p.33) makes the same point stating that creativity involves ‘tertiary process’ in which primary and secondary process thinking are combined to yield effective novelty.

Cropley (2001) makes a distinction between primary process and secondary process thinking:

1. Primary process thinking takes place in the unconscious. It is concrete and irrational and not restricted by the rules of the conscious mind. In other words, primary process thinking produces novelty.
2. Secondary process thinking is conscious, rational, logical and oriented to reality.

3. The Humanistic Theory: Humanistic theorists (e.g. Murray, Maslow, Rogers) relate creativity to the individual’s striving for self-actualization. (Woodman & Schoenfeldt, 1990). It seems that humanistic theory places great emphasis on internal determinants of creativity, but much less emphasis on external determinants. This includes much consideration of creative persons, but little appreciation for “creative situations” or circumstances that might be conducive to creative behavior (Kutami, 1997; Abdul-Hameed, 1995).

4. The Cognitive Theory: Piaget (1962) whose theory of cognitive development relates directly to the creative process concludes that creativity which he referred to as “creative imagination” is gradually reintegrated in intelligence as children age. And that both intelligence and creativity synergistically encourage each other to generate more productive activity. Thus, Piaget notes that the nature of the creative process is “malleable”; that is it changes as the child progress through the developmental stages (Ford & Harris, 1992, p.188).

5. The Social - Psychological Theory: The most comprehensive social psychological explanations for creative behavior have been advanced by Amabile (1983). She has proposed a number of social and environmental influences on creative behavior including: social facilitation, modeling, motivational orientation, evolution expectations, use of rewards, task constraints, and opportunities for behavioral choices (Woodman & Schoenfeldt, 1990. p.15). In other words, the social psychology of creativity seeks to understand and explain how particular social and environmental conditions might influence the creative behavior of individuals, this includes much appreciation for “Creative Situations” that might be conducive to creative behavior.

Definitions of Creative Thinking

Like other terms in the social sciences and psychology as “intelligence” and “achievement” the concept of “creativity” remains elusive, but such elusiveness has finally begun to gain the attentions of many educators and psychologists who attempt to define the concept of creative thinking. Young (1985) (in Ford & Harris, 1992) describes creativity as a “honorific” term because of the difficulty associated with finding a universally accepted definition for it. He shows that the initial problem in defining creativity reflects the fact that our society respects creativity less than intelligence and academic ability, which is a bias that is particularly evident in our schools.

Perhaps the best known definition of creative thinking is Guilford’s (1950) distinction between convergent and divergent thinking. In a seminal address to the American Psychological Association, the psychologist Guilford argued that “conventional concepts of intellectual ability that focused too strongly on speed, accuracy, correctness and logic are aspects of what he called “convergent” thinking, should not be allowed to dominate the conceptualization of mental functioning at the expense of branching out, generating alternative answers, seeing possibilities are aspects of what he called “divergent” thinking (Cropley, 2001, p.2.) Guilford (in Cropley, 2001) made a crucial distinction between convergent and divergent thinking:

1. Convergent thinking is oriented towards deriving the single best or correct answer to a given question. It is effective in situations where a ready – made answer exists and needs simply to be recalled from stored information. It needs logical research, recognition and decision – making strategies. Convergent thinking with its emphasis on accuracy, correctness and the like seems to be necessary for effectiveness but thus does not produce novelty.
2. Divergent thinking involves processes like shifting perspective transforming, or producing multiple answers from the available information, and thus favors production of novelty.

Millar (2002) states that convergent thinking involves specific abilities that predict success especially in a school environment, while divergent thinking involves abilities that relate to success in careers and life.

Guilford (1967) describes different skills of divergent thinking underlying creativity:

1. Fluency: is the ability to produce a large number of ideas.
2. Flexibility: is the ability to produce a wide, variety of ideas.
3. Originality: is the ability to produce unusual ideas.
4. Elaboration: is the ability to develop or embellish ideas and to produce many details to “flesh out” an idea (Bear, 1993, p.14).

What follows are different discussions of the concept of creative thinking and its characteristics and components:

Rhodes (1961) states that there are four main facets to creativity (Four P's of creativity):

- Creative Person.
- Creative Product
- Creative Process
- Press (environment) (Abdul Hameed, 1995; Mehr, et al. 1996 & Martinsen, 2003).

Torrance (1977) (in Shaughnessy, 1998) defines creative thinking as “the process of sensing difficulties, problems, gaps in information, missing elements, something askew; making guesses and formulating hypotheses about these deficiencies, evaluation and testing these guesses and hypotheses, possibly revising and re-testing them, and finally communicating the results” (p.442). Torrance (1979) proposes that creativity is a combination of skills (e.g. critical thinking, divergent thinking, special problem solving tactics), abilities (e.g. concentration, imagination, problem finding) and motives such as curiosity, willingness to take risks or persistence (Cropley, 2001, p.9). Relative to *ability*, Torrance proposes that we are born with abilities that tend to be specific to a domain, Consequently, some people may be more talented in art, music, writing, dancing, or a number of other creative areas. Because he viewed creativity as a *skill*, Torrance argues that it is teachable, when children are taught creativity: they learn to perform creatively. Finally, he asserts that *motivation* is essential for creative behavior. Therefore, children who are uninterested in performing creatively cannot produce creative products (Ford & Harris, 1992).

Young (1985) provides the following description of Creativity: “Creativity is those attitudes by which we fulfill ourselves ... Creativity is the actualizing of our potential ... It is the integration of our logical side with our intuitive side ... Creativity is more than spontaneity, it is deliberation as well. It is divergent thinking for it converges on some solution: It not only generates possibilities, but also chooses among them. It is more than originality which may only express the bizarre ... Creativity is an advance and change as well as an expression of continuity with the past” (Ford & Harris, 1992 : 187).

According to Vernon (1989), creativity means “a person’s capacity to produce new or original ideas insights, restructuring inventions, or artistic objects, which are accepted by experts as being of scientific, aesthetic, social, or technological value” (Russ, 1993, p. 2).

Ford & Harris (1990) defines creativity as a modifiable (can be learned), deliberate process that exists to some degree in each of us. It proceeds through an identifiable process and is verified through the uniqueness and utility of the product created”. (p.187)

Hannoura (1995) states that creativity is not just a result of cognitive abilities such as: fluency, flexibility, originality,... etc. However, it results from interactions among abilities and knowledge, personal properties, motivation and the properties of the surrounding social environment.

Cziksztentmihalyi (1988, 1999) proposes that creativity is “a process resulting from an interaction among three main forces: the *culture*, which stores and transmits the selected ideas, values and beliefs to the next generation; the *social system*, which selects which behaviors, values and information are worth preserving; the *individual*, who brings about some transformation to the social and cultural domain (Rudowicz, 2003 : 274).

Sternberg & Lubart (1995, 1996) define creative thinking as “thinking that is novel and that produces ideas that are of value”. (p326) They state that sources of individual differences in creative performance include not only process aspects, but aspects of knowledge, thinking styles, personality, motivation and the environmental context in which the individual operates (Sternberg, 2003).

Treffinger, Sortore & Cross (1993) (in Cropley, 2001) stress the importance of what they called the “full ecological system” of creativity. This involves recognition of creativity’s interaction with other

psychological properties of the individual, aspects of the creative process, effects of situation, characteristics of the task itself and the nature of the desired product.

Accordingly, many models of creativity have been generated seeking to describe the essential elements and components of creative thinking.

One of the models is the interactionist model of creative behavior. According to the interactionist perspective, creative behavior is viewed as a complex person-situation interaction. This model provides a comprehensive view of individual differences in creativity that incorporates important elements of the personality, cognitive, and social psychology explanations of creativity as can be shown in figure (1) (from Woodman & Schoenfeldt, 1990. p.16)

Figure (1)

An Interactionist Model of Creative Behavior				
Antecedent Conditions	Person	Situation	Behavior	Consequences
Where:				
A = Antecedent conditions to current situation examples: Past reinforcement history early socialization biographical variables – sex, family position, birth order				
B = creative behavior				
C = consequences				
O = “organism” (person) - gestalt of attitudes, values, intentions to behave, motivational orientation, individual differences				
CS = cognitive style / abilities Examples: cognitive complexity, divergent thinking, verbal/ ideational fluency, problem solving style/approaches, perceptual openness, field independence/dependence				
P = personality dimensions/traits examples: focus of control, dogmatism, autonomy, self-esteem, narcissism, intuition				
CI = contextual influences examples: physical environment, culture, group/organization ‘climate’, task & time constraints				
SI = social influences examples: social facilitation, evaluation expectation, rewards/punishments, role modeling				

Amabile (1983) (in Gerrard et al., 1996) generates a componential model of creativity. She proposes that there are three major components that make up creativity; each of which is considered essential for the production of creative work:

- Domain – Relevant Skills
- Creativity – Relevant Skills.
- Task Motivation.

The explanation of Amabile’s componential model of creativity can be shown in figure (2) (from Conti et al., 1996, p.386)

Figure (2)

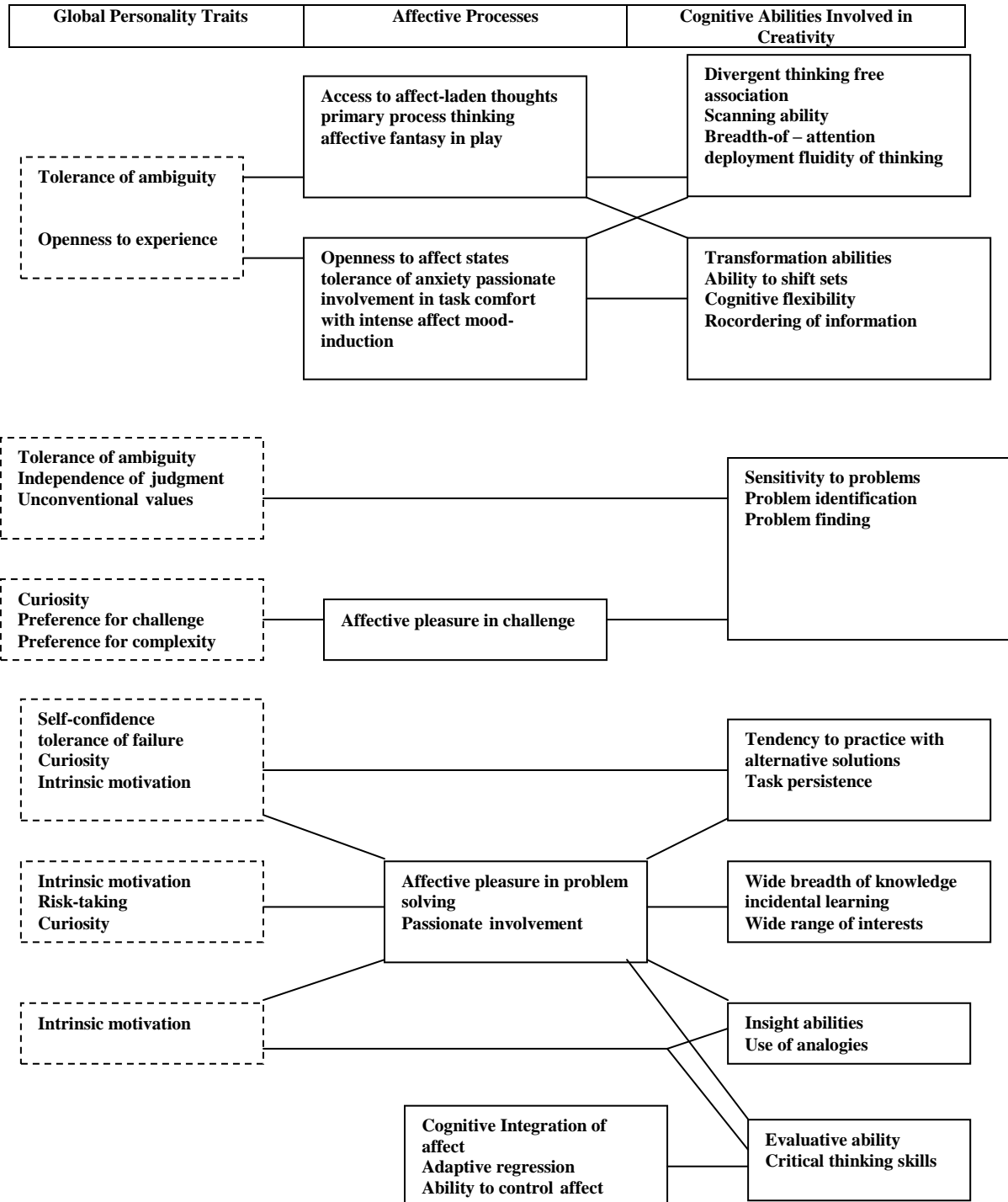
Amabile’s Componential Model of Creativity

1	2	3
<p><u>Domain Relevant Skills</u></p> <p><u>Includes:</u></p> <ul style="list-style-type: none"> ▪ Knowledge about the domain. ▪ Technical skill required ▪ Special domain relevant talent <p><u>Depends on:</u></p> <ul style="list-style-type: none"> ▪ Innate cognitive abilities ▪ Innate perceptual and motor skills ▪ Formal and informal education. 	<p><u>Creativity Relevant Skills</u></p> <p><u>Includes:</u></p> <ul style="list-style-type: none"> ▪ Appropriate cognitive ▪ Implicit or explicit heuristics for generating novel ideas ▪ Conducive work style <p><u>Depends on:</u></p> <ul style="list-style-type: none"> ▪ Training ▪ Experience in idea generation ▪ Personality characteristics 	<p><u>Task Motivation</u></p> <p><u>Includes:</u></p> <ul style="list-style-type: none"> ▪ Attitudes toward the task ▪ Perceptions of own motivation for undertaking task <p><u>Depends on:</u></p> <ul style="list-style-type: none"> ▪ Initial level of intrinsic motivation toward the task. ▪ Presence or absence of salient extrinsic constraints in the social environment ▪ Individual ability to cognitively minimize extrinsic constraints

The model of affect and creativity is another model that represents creative thinking. The assumption of this model is that specific affective processes and personality traits facilitate creative cognitive abilities. This model is represented in figure (3) (from Russ, 1993. p.10)

Figure (3)

A Model of Affect and Creativity



While reviewing the previous definitions of creative thinking, it seems that it is not difficult to see the consistent themes that involve them all:

1. Psychologists have focused on creative people and creative process rather than creative product (e.g. Ford & Harries, 1992; Torrance, 1977)
2. Psychologists have demonstrated that motivation is a basic component that makes up creativity (e.g. Sternberg & Lubart, 1995; Hannoura, 1995; Amabile, 1983; Torrance, 1979; Treffinger, Sortore & Cross, 1993)
3. Psychologists have argued that creative behavior is influenced not only by individual creative abilities, but also by contextual or situational influences (e.g. Csikszentmihalyi, 1988,1999; Hannoura, 1995; Rhodes. 1961; Sternberg & Lubart, 1995; Treffinger, Sortore & Cross, 1993)

The Creative Process

According to the creative process – the sequence of thoughts and actions that leads to a novel, adaptive production – has been one of the key topics of creativity research during the past century.

Throughout the years, many creative thinking skills models have been generated, seeking to develop a systematic approach to teaching thinking as part of the school curricula by focusing on how creative thinking proceeds and how creative ideas emerge over time. Some research dismiss the notion that creativity can be described as a sequence of steps in a model, however, many researches point out that the act of creation does not occur at fixed point in time but as an extended process.

The first well-known attempt to conceptualize the creative process was by Graham Wallas. Wallas (1926) (in Russ, 1993, Freeman, et al. 1971; Kutami, 1990) proposes that creative thinking proceeds through four phases:

1. Preparation (definition of issue, observation and study)
2. Incubation (laying the issue aside for a time)
3. Illumination (the moment when a new idea finally emerges)
4. Verification (checking it out)

Wallas' model is represented in table (1) (from Russ, 1993, p.16)

Table (1)
Stages of the Creative Process and Cognitive - Affective Process

Wallas' Stages	Cognitive Abilities	Affective Processes	Personality Traits
Preparation	Sensitivity to Problems Wide breadth of knowledge Master knowledge base	Affective pleasure in challenge	Curiosity Tolerance of ambiguity Risk taking Intrinsic motivation Preference for Challenge and complexity
Incubation	Divergent thinking Transformation abilities Tendency to practice with alternative solution	Access to affect-laden thoughts Primary process Openness to affect states	Openness to experience Tolerance of ambiguity Self-confidence Preference for challenge
Illumination	Evaluative ability Insight abilities	Access to affect-laden thoughts Openness to affect states Affective pleasure in problem solving	Self-confidence
Verification	Evaluative ability	Affective pleasure in problem solving Cognitive integration of affect	Intrinsic motivation

Rossman (1931) (in Kutami, 1990) examines the creative process and expands Wallas' original four steps to seven:

1. Observation of a need or difficulty.
2. Analysis of the need.
3. A survey of all available information.
4. A formulation of all objective solutions.
5. A critical analysis of these solutions for their advantages and disadvantages.
6. The birth of the new idea – the invention.
7. Experimentation to test out the most promising solution, and the selection and perfection of the final embodiment.

Taylor (1975) (in Kutami, 1990) proposes that creative thinking proceeds through four stages:

1. Mental Labor.
2. Incubation Period.
3. Illumination Period.
4. Elaboration Access. (p.665).

Alex Osborn (1953), the developer of brainstorming, outlines seven steps in his model:

1. **Orientation:** pointing up the problem.
2. **Preparation:** gathering pertinent data.
3. **Analysis:** breaking down the relevant material.
4. **Ideation:** piling up alternatives by way of ideas.
5. **Incubation:** letting up, to invite illumination.
6. **Synthesis:** putting the pieces together.
7. **Evaluation:** judging the resulting ideas.

[http://www.directedcreativity.com/pages/#Osborn Ref.](http://www.directedcreativity.com/pages/#OsbornRef.))

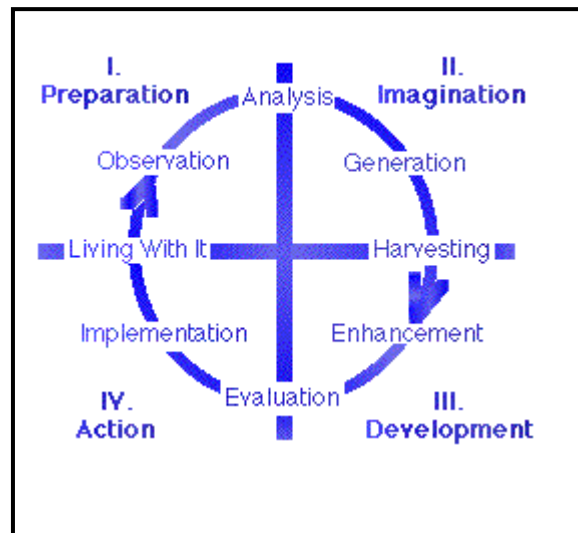
Parnes (1992) and Isaksen & Trefflinger (1985) outline six steps in their popular creative problem solving model (CPS)

1. Objective finding.
2. Fact finding.
3. Problem finding.
4. Idea finding.
5. Solution finding.
6. Acceptance finding.

The “Directed Creativity Cycle” is a synthesis model of creative process that combines the concepts behind the various models proposed over the 80th years. It simply means that we make purposeful mental movements to avoid the pitfalls associated with our cognitive mechanisms at each step of this process of searching for novel and useful ideas. This model is represented in figure (4)

[\(http://www.directedcreativity.com/pages/\)](http://www.directedcreativity.com/pages/)

Figure (4)
The Directed Creativity Cycle



This model makes it clear that creativity does not just require imagination of new ideas, but also, working to make these ideas concrete realities.

Common Themes behind the Models of Creative Process:

1. Creative process involves purposeful analysis, imaginative idea generating, and critical evaluation – the total creative process is a balance of imagination and analysis.
2. The total creative process requires a drive to action and the implementation of ideas.

The Characteristics of the Creative Thinkers:

The study of personality and cognitive characteristics associated with creative behavior has been an active area of research for some time. Creative thinkers are often characterized by a special pattern of traits that distinguish them from the less creative and the uncreative thinkers. Some of the personality characteristics are positive (that seem to inhibit production of effective novelty), while others are negative and can be thought of as blocks to creativity. Cropley (2001) has paid attention to the responsibility of schools to foster the fullest development of all positive aspects of the personality of all children. Table (2) represents the characteristics of creative and uncreative students as listed by some teachers (from Chan, et al. 1999, p. 189-190).

Table (2)

Creative Attribute Category	Uncreative Attribute Category
Always Questioning *	Conventional *
Imaginative *	Timid *
Quick in Responding *	Lack of Confidence *
Active *	Conforming *
High Intellectual Ability *	Uninitiative
Unique of Original	Unwilling to Think
Good at Observation	Dependent
Willing to Express Ideas or Opinions	Imitative
Cheerful	Introverted
Likes or Willing to Think	Obedient
Assertive	Slow in Responding (Awkward)
Curious	Dull
Independent	Easily Influenced or Persuaded
Initiative or Spontaneous	Shy
Artistic	Unenterprising
Attentive	Unwilling to Express Ideas or Opinions
Confident	Inattentive
Intelligent or Clever	Lazy
Nonconforming	Unimaginative
Opinionated	Inflexible
Talkative	Non Serious at Work
Enterprising or Challenging	Poor Intellectual Ability
Likes Reading	Conservative
High Verbal Ability	Dislikes Talking or Talks Little
Open or Open – Minded	Easily Gives Up
Rebellious	Inactive
Self – Centered	Lack of Curiosity
Sensitive	Poor Expressive Power
Arrogant	Poor Learning Ability
Daring	Showing No Interest in New Things
Exploratory	Unquestioning
Has a Lot of Ideas	Without Leadership
High Expressive Power	Inartistic

Interested in Something New Unconventional Attention Seeking Eager to Learn Flexible Clear thinking Energetic Innovative	
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* The most common reported traits

Torrance (in Shaughnessy, 1998. p. 446) has conceptualized the main abilities of the creative thinkers as follows:

1. Finding problems.
2. Producing many alternatives.
3. Being flexible.
4. Elaborating.
5. Producing original ideas.
6. Highlighting the essence.
7. Keeping open.
8. Being aware of emotions and using them.
9. Putting ideas into context.
10. Combining and synthesizing.
11. Visualizing richly and colorfully.
12. Enjoying and using fantasy.
13. Giving ideas movement and sound.
14. Looking at problems and solutions in many ways.
15. Visualizing things internally, below the surface.
16. Extending boundaries by cutting through them or going beyond.
17. Letting humor flow.
18. Glimpsing infinity.

Sternberg (2003) describes the dispositions of creative thinkers as being able to:

1. Redefine problems.
2. Analyze their own ideas.
3. Sell their ideas to the public.
4. Be knowledgeable.
5. Surmount obstacles.
6. Take sensible risks.
7. Willingness to grow.
8. Believe in themselves.
9. Tolerance of ambiguity.
10. Find what they love and do it.
11. Allow time.
12. Allow mistakes. (p.334, 335).

Ford and Harris (1992) identified the most frequently characteristics of the creative thinkers as the following:

- prescience
- curiosity
- intuition
- risk taking
- non-conformity
- persistence
- altruism
- sensitivity to beauty
- self – awareness
- temperament
- independence
- sense of humor (p.192)

Dellas & Gaier (1970) describe some traits that would generally be regarded as positive:

- independence (both in attitudes and in social behavior);
- dominance;
- introversion;
- openness;
- breadth of interests;
- self – acceptance;
- intuitiveness;
- flexibility;
- social poise (Cropely, 2001. p. 60).

According to Dacey (1989) there are nine traits that characterize creative thinkers:

- tolerance of ambiguity;
- stimulus freedom;
- functional freedom;
- flexibility;
- risk taking;
- preference for complexity;
- androgyny (possession of both male and female characteristics);

- acceptance of being different (i.e. self-acceptance);
- positive attitude to work (Cropley, 2001, p.60).

Woodman & Schoenfeldt (1990) set the following core characteristics of the creative thinkers:

- attraction to complexity
- high energy
- self – confidence
- intuition
- autonomy
- ability to resolve or accommodate opposite or conflicting traits in one’s self concept.
- A firm sense of self concept.
- A firm sense of self as “creative”. (p.13)

According to researchers, Eysenck (1997) concluded that researchers typically emphasize on:

- autonomy;
- non-conformity;
- openness to stimulation;
- flexibility;
- tolerance of ambiguity;
- inner directedness;
- ego strength.

McMullan (1978) describes creativity as a result of a paradoxical personality, which requires an integration of seven polarities:

- (a) openness versus the forming of good gestalts.
- (b) acceptance of the unconscious into the conscious.
- (c) a distanced attitude versus being strongly engaged.
- (d) a critical, questioning attitude versus constructive problem solving.
- (e) ego centeredness versus altruism and empathy.
- (f) self – criticism and self – doubt versus self – confidence; and
- (g) relaxedness versus concentration (Runco, 1997. p. 95).

Teachers' Role

It has been shown through some researches that teachers' behavior may be of crucial importance for the development of creativity in pupils. Cropley (2001), notes that some teachers are good at promoting students' creativity. They provide a model of creative behavior, reinforce such behavior when pupils display it, protect creative pupils from conformity pressure and establish a classroom climate that permits alternative solutions, tolerate constructive errors, encourage effective surprise and do not isolate non-conformers.

Udall & Daniels (1991) (in Litterst & Eyo, 1993) state that "if teachers become facilitators, not authorities of knowledge. Students will become self – motivated and disciplined thinkers."(p.273)

Klenz (1987) states that what is required is that teachers be authentic individuals, who are striving to improve their practice through the use of critical and creative thought. He suggests that teachers should attempt to:

- analyze their own thinking processes and classroom practices and provide reasons for what they do;
- be open – minded, encouraging students to follow their own thinking and not simply repeat what the teacher has said;
- change their own positions when the evidence warrants, being willing to admit a mistake;
- consistently provide opportunities for students to select activities and assignments from a range of appropriate choices;
- exhibit genuine interest, curiosity and commitment to learning;
- undertake the organization and preparation required to achieve learning goals;
- seek imaginative, appropriate and ethical solutions to problems;
- be sensitive to others' feelings, level of knowledge and degree sophistication;
- show sensitivity to the physical elements which contribute to a stimulating learning environment through the physical arrangements and displays they provide or facilitate;
- allow for student participation in rule setting and decision making related to all aspects of learning, including assessment and evaluation . (p.4)

Torrance (1964) (in Furman, 1998) identifies conditions to enhance creativity in pupils:

1. rewarding creative thinking.
2. teaching tolerance toward new ideas or supporting initiative.
3. developing skills to criticize.
4. creating problem situations
5. enhancing creative atmosphere.

Amabile's (1983) conducts some recommendations for teachers based on her worked and the literature:

1. Help the child look for cues in the environment.
2. Help develop the Childs talents.
3. Help the child make positive constructive evaluations of his or her work.
4. Recognize and tolerate the unusual.
5. Help the child resist peer pressure toward conformity.
6. Give a lot of choice.
7. Reduce the amount of evaluation (Russ, 1993, p. 94).

According to Runco (1997), teachers should strive to promote in their students:

1. Possession of a fund of general knowledge.
2. Knowledge of one or more special fields.
3. An active imagination.
4. Ability to recognize, discover, or invent problems.
5. Skill at seeing connections, overlaps, similarities, and logical implications (convergent thinking).
6. Skill at making remote associations, dissociating, accepting primary process material, forming new gestalts, etc (divergent thinking)
7. Ability to think up many ways to solve problems.
8. A preference for accommodating rather than assimilating.
9. Ability and willingness to evaluate their own work.
10. Ability to communicate their results to other people.

Cropley (1982) points out that "Creativity fostering" teachers are those who:

1. Encourage students to learn independently.
2. Have a cooperative, socially integrative style of teaching.
3. Motivate their students to master factual knowledge, so that they have a solid base for divergent thinking.

4. Delay judging students' ideas until they have been thoroughly worked out and clearly formulated.
5. Encourage flexible thinking in students.
6. Promote self-evaluation in students.
7. Take students' suggestions and questions seriously.
8. Offer students opportunities to work with a wide variety of materials and under many different conditions.
9. Help students to learn to cope with frustration and failure, so that they have the courage to try the new and unusual.

Cropley (1992) suggests that teachers should value and promote in their students properties such as:

1. Task commitment, persistence, and determination.
2. Curiosity, adventurousness, and tolerance for ambiguity.
3. Independence and nonconformity.
4. Self-confidence and willingness to take risk being wrong.
5. Drive to experiment and willingness to try difficult tasks (Runco, 1997, p.97).

- **Using Methods and Activities that Encourage Creative Thinking**

Sternberg (1988), states that both the curriculum and teaching methods in our schools have emphasized a largely convergent thinking approach that involves considerable memorization, rote learning, and quite strict conformity to the expectations of teachers. Little opportunity has existed for the manifestation of creativity that would encourage divergent thinking involving originality, flexibility, fluency ... etc.

And since memorization and recognition of learned materials are considered as contradictory activities to those that foster creativity. Torrance (1992) and Michalko (1998) provide some procedures for fostering creativity which consist of specific techniques that can be learnt and then applied in many different situations, usually in order to get ideas (e.g. brainstorming, synectics, creative problem-solving, morphological methods, bionics, imagery training, mind maps, ... etc) (Cropley, 2001. p. 138) However, Cropley (2001) notes that fostering creativity is not inconsistent with traditional school goals such as acquisition of knowledge and skills. But it has been shown through some researches that emphasize branching out, finding out, or inventing such as discovery learning under play like conditions and learning with the help of fantasy can be more effective than traditional methods as lecturing or rote learning (p.136)

Torrance (in Shaughnessy, 1998) notes that all of the above procedures and methods are successful, if they just done competently. In other words, much depends upon the competence of the teacher or trainer than upon the methods used. According to Parker (1990) (in Litterst & Eyo, 1993) effective teaching is not techniques; It comes from the integration of the teacher, from his or her relation to subject and students, from the capricious chemistry of it all.”

- **Developing a climate Conducive to Creative Thinking Skills**

Renzulli (1994) has stated that “every child is special if we create conditions in which that child can be a specialist within a specialty group.” As a result, much research has been emphasized on the influential role of teachers on the conditions present in their classrooms. Cropley (2001) point out to the appropriate learning conditions that can promote at least some elements of creativity in many if not all children. Mansi (in Kutami, 1990) makes the same point by emphasizing on the possibility of fostering creativity of children by preparing the appropriate environment at home and in the different educational institutions.

Pagans (1979) specifies various conditions suitable for the development of creativity one of them was the concept of an “Open environment”, that seems to represent such environmental factors which may be used by teachers in the process of developing classroom structures supporting expression of pupils ideas and emotion (Furman,1998).

Toth and Baker (1990) state that the open – structure learning experiences are characterized by a process orientation, emphasis on the individual child, a democratic and flexible teaching style, independent learning activities, and opportunities for divergent thinking.

Urban (1995, 1996) (in Cropley, 2001, p. 150) describes the open learning environment as the following:

- offering meaningful enrichment of the children’s perceptual horizons;
- enabling self-directed work, allowing a high degree initiative, spontaneity and experimentation without fear of sanctions against incorrect solutions, errors, or mistakes;
- encouraging and accepting constructive non-conformist behavior;
- encouraging and accepting original ideas;
- providing for challenging and stimulating learning materials;
- creating organizational and structural conditions that allow open and reversible distribution of roles, themes and problems, as well as sharing of activities;
- providing support and positive feedback for questioning and exploring behavior and problem finding and not just problem solving;
- fostering identification of the child with school (learning) activities by allowing self-determination and joint responsibility;
- supporting development of positive self-assessment and a favorable self-concept;
- increasing autonomy in/of learning by recognition and self-evaluation of progress;
- making it possible for children to experience social creativity and the creative plus’ during group interactions and through joint projects with self selected partners;
- reducing stress on achievement and avoiding negative stress by introducing playful activities;
- fostering intense concentration and task commitment through high motivation and interest in self-selected topics;

- creating an atmosphere free from anxiety and time pressure without abandoning sense of responsibility;
- establishing psychological security, openness and freedom;
- establishing psychological security, openness and freedom;
- nurturing sensibility, flexibility and divergent thinking.

It seems that fostering creativity demands an unconventional learning environment that can facilitate active learner participation and involvement.

Udall & Daniels (1991) (in Litterst & Eyo, 1993) provide several ways for teachers, which can contribute to a positive and imaginative classroom climate:

1. Strive for qualities that spark imagination: inspiration, enthusiasm for the subject and for teaching, humor, flexibility, and energy.
2. Maintain a position of participant-observer. Learn to scan the classroom environment and take advantage of magic moments.
3. Be sensitive to barriers to the imaginative process (e.g., needing to be practical, avoiding ambiguity, needing to be logical, needing to show expertise, etc.) and point them out when you witness them.
4. Get control of the class by giving up some of the control. Strive for partnership in leading learning, and reduce some of the “teacher talk.”
5. Reduce the amount of material you are covering by 80% Focus on the most important 20% of the material and let the textbook, cases, discussion, problems, and tests fill in the other 80%.
6. Course assignments and assessments should encourage and reward imagination, discovery, display of student growth, and vision.
7. Eschew the expected and embrace the unexpected. Obvious material and presentation of such promotes boredom.
8. Alternate between the activities of “freeing” and “focusing.” There are times when unbridled imagination breeds frustration and when direction aids learning.
9. Fit the technique of instruction to the content. As Swenson notes, “you don’t learn the word ‘dream’ by being shown a dream the way you learn ‘apple’ by being shown an apple (1991).”
10. Discuss with your students how climate is facilitating (debilitating) learning.
11. Create power words and phrases as tools that help students visualize what they need to do or learn. Remember that learning is 50% inspiration.

12. Encourage student interaction, refrain from offering opinions and value judgments, and after allowing sufficient time for reflection, accept a variety of student responses.

Popov (1992) submits some recommendations for language teachers:

1. Select reading materials considering the students' interests, using encyclopedias, popular books on science, and similar sources.
2. Select five or seven texts on the same subject. Each will illuminate the subject from a different viewpoint and the students often enjoy the comparison.
3. Engage the students' guessing skills. Let them study the titles of the texts and hypothesize about the subject matter of the selection. Ask them to list all the possible key words (in native language).
4. From the previous list of key words, ask the students to select the most information.
5. Ask the students to group the words into semantic classes for better memorizing. This divergent problem allows many versions. Discuss the outcomes with them to choose an optimal one.
6. Study polysynaptic words. Ask the students to write all the meanings of the word from a large dictionary.
7. Before starting to read the text, ask the students to hypothesize about the contents. This forms the initial text concept. If it does not match the author's, a problematic situation will occur during reading. A false hypothesis may be allowed to develop purposely.
8. Caution: do not abuse translation. Ask the students to do drawings, sketches, and diagrams.
9. Encourage students to comprehend the text without translating it.
10. The most puzzling phrases (from the linguistic point of view) should be translated to avoid miscomprehension.
11. Ask the students to formulate the author's main ideas.
12. One of two texts should lack titles. Ask the students to invent those titles themselves. Discuss the many outcomes.
13. Ask the beginning students to reproduce the contents of the text in native language.
14. Ask the students to put questions not to the text but to the situation described.
15. Occasionally, before the students start reading the texts on the subject chosen (five to seven), give them an assignment to write an essay on one of the topics. At the end, when all the texts of the selection have been read, discuss the essays.

Urban and Cropley (2000) provided some recommendations for teachers who wish to stimulate creativity in their classrooms:

1. Stimulate and maintain a creative group atmosphere that allows learners to speak, think and work free of stress and anxiety and without fear of sanctions.
2. Avoid group pressure and factors such as envy associated with competition but allow and support a co-operative climate.
3. Try to avoid and prevent negative reactions or sanctions by classmates.
4. Provide for adequate alternation of periods of activity and relaxation that foster reflection.
5. Demonstrate and appreciate humour.
6. Stimulate and support free play and manipulation of objects and ideas (e.g. 'what if...?').
7. Support self-initiated questioning and learning.
8. Provoke and provide for situations challenging, stimulating, or requiring creative behavior.
9. Be careful with/hold back (excessively) rapid feedback promoting rigid or stereotyped patterns of behavior or solutions.
10. Act as a model for and support constructive questioning of rules or seemingly indispensable facts or patterns.
11. Try to avoid as much as possible 'suggestive' questions or questions that require a simple 'yes/no' answer.
12. Instead of questions, try to formulate statements that may stimulate or provoke questions by the students.
13. Do not provide strategies for finding solutions too quickly but instead give hints step by step in order to stimulate independent thinking.
14. Allow errors and mistakes (as long as they are not physically or psychologically harmful to the child or to others).
15. Interpret errors as signs of individual and constructive effort towards a self-detected solution.
16. Try to discover the strategy that led to an error (qualitative error analysis).
17. Try to make students sensitive to stimuli from different aspects of the environment (material symbolic, social).
18. Support interest in and acquisition of knowledge in a broad variety of different areas.
19. Give stimulation and examples for systematic investigating, redefining, altering of ideas, stories, statements, presentations, etc.
20. Demonstrate tolerance and appreciation of unusual thoughts, original ideas, or creative products.

21. Teach students to accept, acknowledge and appreciate their own creative thinking behavior and production as well as that of others.
22. Provide manifold and stimulating material for the elaboration of ideas.
23. Support and attach importance to the full elaboration or-realizaiton (of all implications) of creative ideas.
24. Develop and demonstrate constructive criticism not just criticism.
25. Make students sensitive to possible implications and consequences of solutions (Cropley, 2001. p. 151: 152).

Teachability of Creative Thinking

Ford & Harris (1992) define creativity as “a modifiable, deliberate process that exists to some degree in each of us. It proceeds through an identifiable process and is verified through the uniqueness and utility of the product created”. (p.195) This definition of creativity emphasizes that creativity is a process of thinking which is modifiable, that it can be learned and that creative people are made, not born.

Torrance (1971) theorizes that creativity is a combination of ability, skills and motivation. And since he views it as a skill; this means that creativity is teachable. He states that “when children are taught creativity, they learn to perform creatively.” However, he states that the elements of a creative solution can be taught, but the creativity itself must be self-discovered and self disciplined (Shaughnessy, 1998. p. 443). Also, he states that hundreds of experiments have indicated that training in creative problem solving, experience in any of the visual arts, creative dramatics media and reading programs, and certain methods and procedures help people to be more creative.

Sternberg & Williams (1996) (in Sternberg, 2003. p.333) also stated that creative thinking skills can be taught and they have devised a programme for teaching them. Sternberg draws attention to the teachability of creative thinking through his work with Davidson (1984). They divided (86) gifted and non-gifted fourth grade children into experimental and control groups. All children took pre-tests on insightful thinking. Then some of the children received their regular school instruction whereas others received instruction on insight skills. After the instruction, all children took a post – test on insight skills. The results revealed that children taught how to solve the insight problems gained more from pre-test to post-test than did students who were not so taught. Sternberg (2003) concludes that teaching for creative thinking in schools can improve children's academic performance “It helps the more creative children to capitalize on a strength at the same time that it helps the less creative children to compensate for or correct a weakness”. (p. 335).

Several researchers have studied the effects of various training programs on creativity. Parnes & Brunella (1967) (in Freeman et al. , 1971) report that approximately 90% of studies on evaluating programs for teaching students to improve their sensitivity, fluency, flexibility, originality and elaboration, indicated that subjects creative production levels were significantly increased by educational programs. Another research by Bear (1993) shows that creativity-training programs that

emphasize divergent thinking can lead to substantial increases in scores on the Torrance Tests of Creative Thinking, especially the verbal tests, which showed significantly larger increases after training than the figural tests. Also, Martinsen (2003) draws attention to the importance of the creativity – training programs by stating that such training in creativity may give more students increased self – efficacy and confidence and make them more capable of developing novel solutions to challenging problems.

Since Torrance and other researchers point out that creative thinking can be taught to anyone, and for any subject matter (Open education program, 1992). Many programs have been generated seeking to develop and enhance creative thinking skills as part of the school curricula. Cropley (in Runco, 1997, p.86, 87) introduces in his article some of the better known programs for fostering creativity (as shown in table 3):

Table 3: Main Characteristics of Well-Known Creativity Programs

program	Age Level	Material	Aimed at Promoting
Imagi/Craft	Elementary School	Dramatized recordings of great moments in the lives of famous inventors and discoverers	<ul style="list-style-type: none"> • The feeling that their own ideas are important • Widened horizons • Career aspirations of a creative kind
Creative Problem solving	All levels	No special material-makes great use of brainstorming	<ul style="list-style-type: none"> • Problem finding • Data collection • Idea finding • Solution finding • Implementing of solutions
Talents Unlimited	All levels	Workbooks based on idea of “inventive thinking,” aimed at problem solving-emphasis on brainstorming	<ul style="list-style-type: none"> • Productive thinking • Communication • Planning • Decision making • Forecasting
Productive Thinking Program	Fifth – and Sixth-grade pupils	Booklets containing cartoons	<ul style="list-style-type: none"> • Problem-solving abilities • Attitudes toward problem solving
Purdue Creative Thinking Program	Fourth-grade pupils	Audiotapes and accompanying printed exercises	Verbal and figural fluency, flexibility, originality, and elaboration
Osborne-Parnes Program	High school and college students	No special materials	<ul style="list-style-type: none"> • Getting many ideas • Primary emphasis on brainstorming, with separation of idea generation and idea evaluation
Myers-Torrance Workbooks	Elementary school pupils	Workbooks containing exercises	Perceptual and cognitive abilities needed for creativity
Khatena Training Method	Adults and children	No special materials; Simple teacher-made aids are employed	<ul style="list-style-type: none"> • Ability to break away from the obvious • Transposing ideas • Seeing analogies • Restructuring information • Synthesis of idea

The Importance of Creativity

Cropley (2001) puts forward some reasons to argue for the need for creativity:

1. Creativity seems to be an inherent part of childhood: children are in a sense engaged in the creative process of building their own internal map of the external world.
2. Creativity in children is necessary for society; Society needs creative people who look at things differently and find new approaches to old problems.
3. Creativity helps children learn and develop. It offers classroom approaches that are interesting and thus seems to be a more efficient way of fostering learning and personal growth of the young.

According to Treffinger (in the Open education program, 1992) teaching creativity is an important necessity since it works on stimulating the child possibilities to solve the problems in the future and to use probably what is being learned by the persons in the practical life.

Creativity & English Achievement

During the adolescent period, English language learners emphasis on memorizing vocabulary and verb forms, manipulating grammatical constructions, reading orally and silently, writing answers to questions or grammatical exercises, directed compositions and summaries. However, at this stage in learning a language, learners should become proficient in using the language. Kabilan (2000) pointed out that learners can only become proficient language users if they display creative and critical thinking through the language. In his article "Creative and Critical Thinking in Language Classrooms", Kabilan explained what is needed for language teachers in order to develop creative and critical language learners through the following points:

- 1- To change their views of themselves (as teachers); they need to believe that their major roles are to think, guide, initiate, and facilitate the learners.
- 2- To change their pedagogical views and adopt a more flexible attitude towards their teaching and not to be too concentrated and dependent on textbooks and their schools aspirations, which are usually exam-oriented.
- 3- To change their attitude toward students by listening to the learners opinions and beliefs, developing a mutual relationship with their learners that involve respect, and focusing on collaborative learning where learners learn from the teacher and the teacher learns from the learners.
- 4- To use problem-solving and decision making methods to develop creative and critical language learners.

By reviewing the literature, it seemed that much research have discussed the relationship between creativity and academic achievement (e.g. Freeman, 1991; McCabe, 1991; Kim & Michael, 1995; Ikhlayel, 1999; Ai, 1999; Seaki, et al, 2001; ...etc). However, a limited number of research have been directed towards explaining the effects of creativity on performance in specific subject matter areas, particularly in English.

The results of most of these studies revealed that there is a positive correlation between creative thinking and academic achievement. This means that high creative thinking students are the high achievers. A study by Tamir (1993) provided a typical profile of the high achievers:

- 1- Having a very low preference for memorization, and a very high preference for critical thinking and for application
- 2- A small family
- 3- Parents who have more formal education and have a science related career
- 4- Having more than 500 books in their home
- 5- Most of them use computers
- 6- Intend to study in the university and to continue their studies beyond a BA degree

However, underachievement have been evaluated by Joen & Feldhusen (1993) where they highlighted few social-psychological factors as potential causes:

- 1- Parents attitude toward education
- 2- Feeling of rejection by their parents
- 3- Unfavorable family environment
- 4- Divorce or separation of parents
- 5- Lack of parent-child communication
- 6- Parental overprotection
- 7- Emotional instability
- 8- Low self-concept

Therefore these factors should be well appreciated by language teachers and parents, to overcome the underachievement of English language learners. They also need to keep in mind that the goal of education is to generate academically motivated and successful students, since motivation has a direct influence on academic achievement and is considered as a basic component that makes up creativity. Street (2001) pointed out some motivational factors considered as conducive to achievement as well as creativity, which are:

- 1- Personal pleasure in achievement
- 2- Long-term goals
- 3- The nature of competitive environments
- 4- Positive links with at least one teacher
- 5- Having the ability to control over the nature of the task

Creativity & Motivation

Educators and psychologists have long discussed the impact of motivation on creativity. Many studies have demonstrated that motivation is a basic component that makes up creativity. Perkins (1981) (in Cropley, 2001) points out that creativity is the result of the six elements of which four are closely related to motivation: the drive to create order out of chaos, willingness to take risks, willingness to ask unexpected questions and the feeling of being challenged by an area (p.62). Torrance (in Shaughnessy, 1998) states that motivation is basic to any creativity. He asserts that “if you don’t have motivation, you don’t have any creativity” (p.445). However, he states that some people see dangers in too strong motivation. Torrance (1979) in his definition of creativity gives most weight to skills (e.g. critical thinking, divergent thinking, special problem-solving tactics) and abilities (e.g. concentration, imagination, problem finding), and also emphasizes motives such as curiosity, willingness to take risks. (Cropley, 2001). Sternberg (1988) states six “facets” of creativity: knowledge, insightful thinking, intrinsic motivation, self – confidence and facilitatory aspects of personality and willingness to take risks. Hannoura (1995) goes on to make the same point by stating that creativity is not just a result of cognitive abilities such as fluency, flexibility, originality,... etc. However, it results from interactions among abilities and knowledge, personal properties, motivation and the properties of the surrounding social environment (p.29).

Amabile (1983) formulates an “Intrinsic Motivation Hypothesis” which argues that intrinsic motivation is conducive to creativity, whereas extrinsic motivation is detrimental (Shalley & Oldham, 1997; Russ, 1993; Hennessey & Zbikowski, 1993). As a result, a number of studies have examined the effects of external or contextual factors on creative performance. Much of this research has followed the “intrinsic motivation (i.e. the individual engages in the task for the sake of the task itself) is a necessary ingredient of creative performance. Sternberg (1988) states the same point by asserting that people will be most creative when they feel motivated primarily by interest, enjoyment, satisfaction, and challenge of the work itself – not by external pressures. In other words, people are more creative when the reason they do something is its intrinsic interest. Doing things for rewards or for any other kind of extrinsic motivation, results in decreased creativity. Amabile (1983) (in Runco, 1997) points out that obsession with a task is considered a motivational characteristic of highly creative individuals which requires a fascination with the field, that is when motivation is intrinsic. Beirman (1985) (in Cropley, 2001) also shows that fascination with the subject matter and consequent extreme motivation was

one of the most important characteristics of creative mathematicians of the 17th to 19th centuries. Shaw (1989) (in Runco, 1997) drew attention to the role of feelings and emotions in the process of finding effective novel solutions. He demonstrates the importance of a number of feelings: fascination for the task, self – confidence, frustration when progress was blocked, excitement at the moment of illumination, and satisfaction upon successful verification. These feelings are all aspects of what might be called “the joy of creating” (p.95). Thus, Deci & Ryan (1985) (in Sternberg, 1988) state that when people are intrinsically motivated, they will seek situations that interest them and that require the use of their creativity. Further more, Bear (1997) points out that since intrinsic motivation is associated with creativity, decreasing the level of intrinsic motivation (by increasing the level of extrinsic motivation) does in fact decrease creativity.

Although evidence continues to support the importance of intrinsic motivation in creativity and the detrimental impact of extrinsic constraints. Amabile (1996) qualifies her earlier theory and formulates the “Intrinsic Motivation Principle of Creativity” which states that “informational or enabling extrinsic motivation can be conducive, particularly if initial levels of intrinsic motivation are high.” Bear (1997) states that extrinsic motivation is also important for building skills that we might use more creatively in the future. According to him, what is important is not how to increase and maintain intrinsic motivation, but also how to use extrinsic motivation creatively.

A number of studies have examined the effects of external or contextual factors (i.e. rewards, competition, external evaluation, ...etc) on creative performance. Shalley & Oldham (1997) indicate that when a contextual factor serves as a constraint, it is expected to cause individuals to shift their attention away from the task to the contextual factor, resulting in lowered intrinsic motivation and creativity.

Lepper, Greene & Nisbett (1973) (in Joussemet & Koestner, 1999) find that children who made pictures for an expected reward produced a significantly greater number of pictures than children who were not promised a reward, but that these pictures were rated as significantly lower in quality. (p. 231). Amabile, Hennessey & Grossman (1986) (in Bear, 1997) make the same point stating that receiving an unexpected reward is quite different from engaging in a task for the purpose of earning a reward and can have exactly the opposite effect on creativity. Condry (1977) (in Joussemet & Koestner, 1999) goes on to point out that “individuals given rewards seem to work harder and produce more activity, but the activity is

of lower quality, contains more errors, and is more stereotyped and less creative than the work of comparable nonrewarded participants working on the same problems” (p.231). However, there are of course exceptions to this general rule: for example, extrinsic motivation may keep one working on a difficult task that may otherwise have been abandoned (Bear, 1997). Koestner & Joussemet (1999) point out that reward would increase one’s readiness to put effort into a task, whether it is creative, force, or speed task. This ensures Eisenberger & Cameron (1996) conclusion that the detrimental effects are easily avoidable and that rewards can have positive effects on generalized creativity if they are properly administered (Koestner & Joussemet, 1999).

Competition is one of the contextual factors that several researchers have argued serves as an external constraint that reduces intrinsic motivation and subsequent creativity. The basic argument here, as Deci et al. (1981) suggest that when individuals are competing with others, they are likely to focus their attention on the goal of winning the competition rather than on the task itself. As a consequence, motivation is expected to shift from intrinsic to extrinsic, resulting in lowered levels of creative performance. On the other hand, other studies demonstrate positive effects of competition on creativity. This necessitates research on motivation to examine goal orientations as motives for academic achievement. Giota’s study (2002) reveals that the pupils who are most successful in school are those who take into consideration the perspectives of other people (i.e. who try to fulfill their wishes or demands and expectation) plus those who try to prevent their own fear – for situations becoming reality and pupils who try to pursue multiple goals. Mehr & Shaver (1996) make the same point stating that a person’s goals are one of the best predictors of creative performance. People, including creative one’s, are often motivated by multiple goals in a given situation. Thus, they state that the two most important features of a person’s goals are: content (what the goals are about) and intensity (how they are prioritized). Furthermore, Sternberg (2000) States that creative people are creative, in large part, because they have decided to be creative.

Another researches pointed out to the motivational factors that foster creativity:

1. Overcoming the fear of creativity

One effective method for reducing the fear of creativity is to minimize evaluation. Amabile (1983) found that subjects who expected their performance to be judged showed reduced creativity.

2. Creating intimacy

Levine (1987) pointed out that “intimate engagement” is an important prerequisite for successful problem solving. He found that the basic idea is that one needs to become deeply committed to and involved with a problem in order to solve it effectively and creatively.

3. Encouraging playfulness

Lieberman (1977) examined the role of various forms of play, including combinational play, in creative thinking. According to him, playfulness consists of spontaneity, joy, and sense of humor. He found that these playfulness traits were related to various measures of divergent thinking.

4. Inherent joy of creative discovery

The most important motivator for creative thought is the joy of discovery; that people can be inspired by the pleasure of knowing that they are able to discover something new within their own creative thoughts.

5. Evaluating creative products (Finke, Ward & Thomas, 1992).

According to motivation, researches suggest that teachers should seek to foster in students:

- A concept of creativity and a positive attitude to it.
- Curiosity.
- Willingness to risk being wrong.
- Willingness to try difficult task.
- Drive to experiment.
- Readiness to accept a challenge.
- Task commitment, persistence and determination.
- Desire for novelty.
- Freedom from domination by external rewards.
- Readiness to risk taking (Cropley, 2001: 148).

Creativity and Intelligence

Educators and psychologists have long questioned the relationship between creativity and intelligence. This has led to attempts to define intelligence and creativity and to develop new theories of creativity. Guilford (1967) (in Woodman & Schoenfeldt, 1990) defines intelligence as “a collection of abilities or functions for processing information. He notes that these intellectual abilities are organized along three dimensions: *content* (refers to the kinds of information contained in or used by the mind), *product* (refers to the form of the information) and *operations* (refer to the basic processes performed on information by the mind) (p. 14). Sternberg (1985) (in Ford & Harries, 1992, p.189) defines intelligence as a “purposeful, goal-oriented, relevant behavior that consists of the ability not only to learn from experience but also to adapt to the environment.” And that intelligence depends on information processing skills and strategies. Thus, he proposes that intelligence cannot be understood outside of a sociocultural context. More recently Cropley (2001) tries to make a distinction between conventional intelligence and creativity. According to him, conventional intelligence is heavily dependent on recognizing, recalling and reapplying, and requires among other things substantial knowledge of facts, effective acquisition of new information, rapid access, accuracy in finding the best answer, and logical application of the already known. Creativity, on the other hand, involves departing from the facts, finding new ways, making unusual associations, or seeing unexpected solutions. (p.23). These differences between creativity and intelligence are represented in table (4)

Table (4)
Examples of differences between creativity and intelligence

Psychological Domain	Intelligence	Creativity
Function	Acquiring factual knowledge perfecting the already know (producing orthodoxy)	Developing new ways changing the known (producing novelty)
Abilities	recalling problem solving	imagining problem finding
Skills	convergent thinking memorizing	divergent thinking critical thinking
Cognitive Processes	recalling the known recognizing the familiar reapplying set techniques	inventing linking disparate domains branching out
Desirable Properties of Thinking	logic accuracy speed	novelty surprisingness variability

The earlier theories in the 1950s and 1960s have demonstrated that creativity and intelligence are separate. Getzels & Jackson (1962) and Torrance (1962, 1974) find creative skills to be somewhat different from intelligence. They claim that above certain minimal level of intelligence, being more intelligent does not guarantee a corresponding increase in creativity. Also, Weinstein & Bobko (1980) suggest that creativity is not related to intelligence (McCABE, 1991.p. 116). In contrast, later theories have emphasized that the two work together. Kurtzman (1967) (in McCABE, 1991) find that intelligence and creativity are directly related. Sternberg (2002) in his article "Raising the Achievement of All Students: Teaching for Successful Intelligence," provides a new psychological theory, the theory of successful intelligence. An important foundation of the theory of successful intelligence is the importance of analytical, creative and practical abilities to intellectual functioning. In other words, this theory is quite different from traditional theories of intelligence, which posit that intelligence is just a single construct, sometimes called "general intelligence" and sometimes known in terms of the IQ measure. Likewise, Gregory (1981) (in Kaufmann, 2003, p. 239) claims that "successful novelty" should be seen as the basic defining characteristic of intelligent behavior. He states that there are two features of intelligent behavior:

1. An intelligent solution must have some novelty.
2. An intelligent solution must be in some degree successful.

But the main question is that "Are children who are high in "general intelligence" the same ones who are high in creativity?"

Studies investigating the relationship between intelligence, creativity and academic performance have produced various results. Torrance (1984) asserts that creativity points to academic achievement as well as intelligence (McCABE, 1991). Studies for Hudson (1968) and Sierwald (1989) of achievement at school or university level show that the highest achievers display both creativity and intelligence (Cropley, 2001). However, Edward & Tyler (1962) declare that intelligence is a more predictor of school performance than creativity. Likewise, Hall (1985) find that intelligence is a better predictor of achievement than creativity (McCABE, 1991).

Statement of the Problem

In general, students study what they need to pass tests which take priority over goals such as creativity. Their success is reflected in high marks but these grades may be a poor reflection of creativity. After reviewing the literature, it was noted that much research has been conducted to understand the impact of creativity on general academic performance (McCabe, 1991; Freeman, 1991; Kim & Michael, 1995; Ikhlayel, 1999; Ai, 1999; Seaki, et al., 2001,...etc). However, very little of the research has been directed towards explaining the effects of creativity on performance in specific subject matter areas, especially in English. This necessitates an investigation to examine the relationship between creative thinking levels and achievement in English Language. Thus, to examine the relationship between creative thinking levels and both attitudes toward school and learning motivation, since most psychologists and educators considered them as non-cognitive aspects of creative thinking. So, it seemed entirely appropriate to pursue a study that combines cognitive (e.g. achievement) and non-cognitive (e.g. attitudes toward school and learning motivation) aspects of creativity.

Furthermore, the problem of the study is to examine if there were any significant differences in creative thinking levels, English achievement, attitudes toward school and learning motivation due to gender. Since both males and females face sex-role stereotyping that may be related to the different opportunities for freedom and independence in the Palestinian culture, particularly during their adolescent period. In which females face more pressure and have less freedom than males. So, this necessitates an investigation to examine the effect of gender on creative thinking levels, English achievement, attitudes toward school and learning motivation.

Significance of the Study

Some researchers stated that many creative people who aren't discovered early suffer from behavioral problems at home and school, and their accomplishments become lower. Accordingly, the significance of the study seems to exist on being emphasized on measuring and discovering creative thinking potential of the pupils of the ninth grade. In addition to specify the areas of strength and weakness in the creative thinking skills of the pupils. The researcher also hopes that this study will provide support for the importance of fostering the development of creativity in our educational system, and provide guidelines to help teachers review their

own practices in order to evaluate how far their teaching is fostering development of children's creative thinking.

Furthermore, this study sheds the light on the effect of gender on creative thinking, English achievement, learning motivation and attitudes toward school particularly during the adolescent period. Finally, the researcher hopes that this study will be a stimulus for new studies which imply the measurement of creative thinking and fostering it extensively in English language and other areas in all academic levels.

Purposes of the Study

The following are the purposes of the present study:

1. To examine the level of creative thinking skills for the ninth grade students.
2. To discover the nature of the relationship between creative thinking levels and school achievement in English language for the ninth grade students.
3. To discover the nature of the relationship between creative thinking levels and the students' attitude toward school.
4. To discover the nature of the relationship between creative thinking levels and motivation.
5. To find out the effect of gender on creative thinking levels, achievement in English language, attitude towards school, and motivation.

The Research Questions

The study attempts to answer the following questions:

1. What is the nature of the relation between creative thinking level (Fluency, flexibility, originality, and elaboration) and academic achievement in English language?
2. What is the nature of the relation between creative thinking level (fluency, flexibility, originality, and elaboration) and students' attitude towards school?
3. What is the nature of the relation between creative thinking level (fluency, flexibility, originality, and elaboration) and learning motivation?

4. Are there differences between creative thinking levels for target students in terms of gender?
5. Are there differences between the means of academic achievement in English language for target students in terms of gender?
6. Are there differences between the means of attitude towards school for target students in terms of gender?
7. Are there differences between the means of learning motivation for target students in terms of gender?

Hypothesis of the Study

The previous research questions can be translated into the following null – hypotheses:

Hypothesis (1): There is no correlation at the significant level ($\alpha = 0.05$) between the means of creative thinking and the means of students achievement in English.

Hypothesis (1:1): There is no correlation at the significant level ($\alpha=0.05$) between the means of fluency and the means of students achievement in English.

Hypothesis (1:2): There is no correlation at the significant level ($\alpha=0.05$) between the means of flexibility and the means of students' achievement in English.

Hypothesis (1:3): There is no correlation at the significant level ($\alpha=0.05$) between the means of originality and the means of students' achievement in English.

Hypothesis (1:4): There is no correlation at the significant level ($\alpha=0.05$) between the means of elaboration and the means of students' achievement in English.

Hypothesis (2): There is no correlation at the significant level ($\alpha = 0.05$) between the means of creative thinking and the means of attitudes to school.

Hypothesis (2:1): There is no correlation at the significant level ($\alpha=0.05$) between the means of fluency and the means of attitude to school.

Hypothesis (2:2): There is no correlation at the significant level ($\alpha=0.05$) between the means of flexibility and the means of attitudes to school.

Hypothesis (2:3): There is no correlation at the significant level ($\alpha=0.05$) between the means of originality and the means of attitudes to school.

Hypothesis (2:4): There is no correlation at the significant level ($\alpha=0.05$) between the means of elaboration and the means of attitudes to school.

Hypothesis (3): There is no correlation at the significant level ($\alpha = 0.05$) between the means of creative thinking and the means of motivation to learn English.

Hypothesis (3:1): There is no correlation at the significant level ($\alpha=0.05$) between the means of fluency and the means of motivation.

Hypothesis (3:2): There is no correlation at the significant level ($\alpha=0.05$) between the means of flexibility and the means of motivation.

Hypothesis (3:3): There is no correlation at the significant level ($\alpha=0.05$) between the means of originality and the means of motivation.

Hypothesis (3:4): There is no correlation at the significant level ($\alpha=0.05$) between the means of elaboration and the means of motivation.

Hypothesis (4): There is no difference at the significant level ($\alpha= 0.05$) in creative thinking skills due to gender.

Hypothesis (5): There is no difference at the significant level ($\alpha= 0.05$) in the academic achievement in English language for target students due to gender.

Hypothesis (6): There is no difference at the significant level ($\alpha= 0.05$) in the attitude towards school for target students due to gender.

Hypothesis (7): There is no difference at the significant level ($\alpha= 0.05$) in learning motivation for target students due to gender.

Limitation of the Study

The study is limited to investigate the relationship between creative thinking skills with students' English achievement and attitudes toward school. It also investigates the relationship between creative thinking skill and students motivation to learn, for a sample of male and female students at governmental schools in Jerusalem district during the scholastic year 2003-2004.

The results of the study are based on:

- Students' achievement according to their English Cumulative average.
- Learning Motivation Scale.
- Attitude toward School Scale.
- Torrance Test of Creative Thinking (Figural Form).

Definition of Terms

Creative Thinking: Based on Torrance Test of Creative Thinking (Figural Form). Torrance (1977) defined creativity as:

"A process of sensing problems or gaps in information, forming ideas or hypotheses, testing and modifying these hypotheses, and communicating the results. This process may lead to any one of many kinds of products verbal and nonverbal, concrete and abstract." (Smith, Kher & Gifford)

In this study, the students' sum scores of the cognitive skills (fluency, flexibility, originality and elaboration) in Torrance test of creative thinking represents the students overall ability in creative thinking.

Achievement in English: In this study, it's the students' achievement in English language depending on their cumulative average of the two semesters.

Attitude towards School: Al-Mughrabi (2003) defined the attitude towards school as the students' feelings, thoughts, and attitudes toward school. In this study, it is represented by the students' sum scores on the attitude scale.

Learning Motivation: Touq & Adas (1984) (in Al-Mughrabi) defined learning motivation as a specific condition of general motivation which sign an internal motivation of the learner , this leads him/her to pay attention to the educational position and to approach it with enthusiasm and persistence till learning is reached.

In this study; learning motivation is indicated by the students' sum scores on the learning motivational scale.

Creativity Skills: The students' sum scores on Torrance test of creative thinking (figural form) which involves the following cognitive skills:

1. **Fluency:** the ability to generate a large number of ideas.
2. **Flexibility:** the ability to generate a wide variety of ideas.
3. **Originality:** the ability to generate unusual ideas.
4. **Elaboration:** the ability to generate many details to expand and enrich one's ideas (Bear, 1997,p.22).

REVIEW OF LITERATURE

The focus of this review of the literature is on four different types of studies:

1. Studies that investigated the relationship between creativity and academic achievement.
 2. Studies that examined the effects of (intrinsic & extrinsic) motivation on creativity.
 3. Studies that examined the relationship between creativity and different kinds of attitudes.
 4. Studies that investigated the impact of gender on creativity.
- **Studies that investigated the relationship between creative thinking and academic achievement.**

Yamamoto (1964) in (Ai, 1999) aimed in his study to investigate the relation between creativity and academic achievement. The sample comprised (272) students, grades 9 through 12. The researcher divided the sample into two groups, a high – creativity group (top 20%) on the measure of creative thinking and a low – creativity group (lower 20%). The results showed that regardless of the subject – matter, highly creative students performed better than low- creative students did when the effect of intelligence was controlled.

Smith, Kher & Gifford aimed in their study to explore the relationship between creativity and mathematics achievement in gifted adolescents. The sample comprised (254) junior high school students who were participating in a summer residential program in Louisiana for creative, gifted, and talented youth. Students were administered the Torrance Test of Creative Thinking (TTCT) and Meekers' Structure of Intellect – Learning Abilities Test (SOI-LA). The researchers divided the sample into high and low creativity groups on the basis of scores on the (TTCT) (students scoring above the 90th percentile were in the high creativity group and students who scored below the cut off were in the low creativity group). The results of the study revealed that:

1. Creativity does impact academic performance in mathematics.

2. The ability to think creatively enhances performance in some specific mathematics tasks.
3. Creativity enhancement strategies may be useful in fostering an understanding of mathematical concepts.

Toth & Baker (1990) investigated a study to examine the relationship of creative ability and learning styles to scholastic success among students scoring either above or below their predicted levels of achievement. The sample comprised (116) public school students from six, eight, and ten grades. The students were administered the Torrance Tests of Creative Thinking (Figural Form A), Renzulli Learning Styles Inventory, Otis-Lennon Intelligence Test and the Metropolitan Achievement Test (MAT). Groups of overachieving and underachieving students were formed: the overachieving group of subjects was comprised of (13) male and (16) female, the underachieving group of subjects consisted of (10) male and (14) female students. The results indicated that:

1. There was no significant difference between the groups of overachieving and underachieving male students on the creativity measure: the underachieving male subjects achieved higher mean scores than the overachieving males on all of the creativity subscales of fluency, originality, elaboration, resistance to closure, and abstractness of titles.
2. There was a significant difference between the group of overachieving and underachieving female students: the underachieving female subjects achieved higher mean score than the overachieving females on all of the creativity subscale of fluency, originality except elaboration.
3. There was a significant difference between the groups of overachieving and underachieving male students on the instructional style preferences: the group of overachieving males achieved significantly higher mean scores than the underachieving males on all of the instructional style preference scales of (simulation, peer teaching, discussion, and programmed instruction).
4. There was a significant difference between the groups of overachieving and underachieving female students on the instructional style preferences of simulation and teaching games: the overachieving females achieved significantly higher mean scores than the underachieving females.

McCabe (1991) in his study “Influence of creativity and Intelligence on academic performance” tried to determine the effects of creativity on academic achievement of females in three subject areas: English, Mathematics and Art. The participants in the study were (162) year 7 (ages 12-13) and (84) year 9 (ages 14-16) females from high schools. Students were administered Torrance Test of Creative Thinking (form B) which yielded seven different scores on creativity. These were *Figural*: fluency, flexibility, originality and elaboration; *Verbal*: fluency, flexibility and originality. And ACERML and MQ tests of intelligence.

The result revealed that:

1. There was a strong relationship between both measures of intelligence and all aspects of creativity in English. Female adolescents who achieve in English were more likely to score high on tests of creative thinking, obtained high IQ scores.
2. There was a strong positive correlation between both measures of academic performance in English and all verbal measures of creativity. In all areas of creative thinking, those females who showed high levels of creative thought achieved better in both English mark and English assessment than those with low levels of creative thought.

Freeman (1991) (Al-Harithi, 2001) aimed in his study to examine the relation between creativity and academic achievement. The sample comprised (169) students from Britain. In his longitudinal study that took (14) years, Freeman followed up the students through interviews and research in their educational stages. The results of the study revealed that:

1. There were significant differences between high creative thinking students and high achievers. It showed that high creative thinking students got lower average level of achievement on the final tests, while the high achievers got higher average levels.
2. Students' personality was changed from open – mindedness and curiosity to closedness, sadness, and carelessness of what happened in the world, in spite of their high scores on tests.

Jean & Feldhusen (1993) aimed to investigate teachers' and parents' perceptions of social – psychological factors of underachievement among the gifted in Korea and the United States. A survey instrument of 21 items was developed and distributed to (288) teachers and parents: 80 ATG, 110 APG, 28 KTG, and 70 KPG. A Likert Scale ranging from 5 (strongly agree) to 1 (strongly disagree) was used with each item of the scale. In addition, interviews were undertaken with three teachers and three parents of underachieving gifted with regard to underachievement of their own gifted youngsters. The survey items were divided into four subsections: 1) parental family causes 2) psychological causes 3) sociological causes, and 4) peer relationship causes. The data were analyzed using one-way analysis of variance (ANOVA) and orthogonal contrasts. The results showed that:

1. The most important factors for ATG and APG and APG as causes of underachievement were:

- emotional instability*
- low self -concept
- neutral or uninterested parental attitude toward education*
- feelings of rejection by their parents
- unfavorable family environment.

2. The most important factors for KTG and KPG as causes of underachievement were:

- emotional instability*
- neutral or uninterested parental attitude toward education.
- parental overprotection
- divorce or separation of parents
- lack of parent – child communication.
- The most important social-psychological factors for all four groups.

Tamir (1993) conducted a study to find out the differences between the top 5% and the whole population of students in grades 9 and 12 in their achievement in various science disciplines as well as in the following variables:

1. Gender (male, female).
2. Home background (e.g. parents' education, number of books at home, ...etc).
3. Achievement in science in school.
4. Achievement in Mathematics in school.

5. Liking of school science.
6. Liking of school mathematics.
7. Attitude toward science.
8. Cognitive preferences (e.g. memorization, principles, critical questioning and application).

The subjects were (1942) 9th grade students from 74 schools and (2277) 12th grade students from 68 schools who were selected randomly. The top sub-samples included (85) students in grade 9 and (104) students in grade 12. All the subjects responded to the following tests:

- The core science test
- The background questionnaire: a) home background.
b) School related information.
c) Future intentions.

The 12th grade students responded to two additional instruments:

- The attitude Inventory.
- The Combined Cognitive preference Inventory.

The results were analyzed using frequency distributions, means, standard deviations, standard differences, t-test and analysis of variance. The results revealed the following:

1. Substantial differences were found between the 5% top achievers in science and the remaining 95% 9th and 12th grade students. While girls constitute 55% of the 9th grade population only 18% of the high achievers are girls, a ratio of 1:3. In the 12th grade the corresponding ratio was 1:8 for physics, 1:5 for non-science, 1:2 for chemistry and 3:4 for biology.
2. The high percentage of boys among high achievers is an indication of their higher level of achievement, motivation, and aspiration.
3. A typical profile of a higher achiever is: A small family, parents who had substantially more formal education, a higher percentage of their parents have science related career, have more than 500 books in their home, their performance in science and mathematics in school is higher, more of them use computers, like science and mathematics more than other school projects, intend to study science in the university, and to continue their studies beyond a bachelor degree as a future intention.

4. In biology and in chemistry girls in the 12th grade achieve as well as boys, while in physics boys achieve better than girls.
5. There were no statistical significant differences between the top 5% and the remaining science majors either in attitudes toward school or toward science.
6. High achievers are characterized as having a very low preference for memorization, and very high preference for critical questioning and for application.

Kim & Michael (1995) investigated the relationship of creativity measures to school achievement. The sample comprised (193) students, ((92) were males and (101) were females from the 11th grade high school students). The results of the study revealed that:

1. Measures of creativity translated from the Torrance Tests of Creative Thinking demonstrated little, if any, relationship to school performance.
2. Females may be expected to demonstrate higher average levels of performance on creativity tests than males.

Ikhlayel (1999) aimed in his study to investigate the relationship between creative thinking, and both achievement and attitudes towards mathematics. He also aimed to investigate the effect of sex on creative thinking. The sample comprised (196) students (100 males & 96 females) from the tenth grade in Bethlehem area. The researcher constructed a special achievement test; he also constructed an attitude scale to mathematics and used creative thinking instrument prepared by Habahbeh. The results of the study revealed that:

1. There was a positive correlation between creative thinking and achievement in mathematics ($r = 0.598$).
2. There was a positive correlation between creative thinking and attitudes to mathematics ($r = 0.49890$).
3. There was no significant difference ($\alpha = 0.05$) between the mean score of male and female students on the creative thinking test.
4. There was no significant difference ($\alpha = 0.05$) between the mean score of male and female students on attitude scale to mathematics.
5. There was no significant difference ($\alpha = 0.05$) between the mean score of male and female students on the achievement test.

Ai (1999) aimed in his study to investigate the possible relation between creativity and academic achievement, in particular, to see if this relation might be different for boys and girls. The research questions were as follows:

1. What is the relation between different aspects of creativity and different subject areas of academic achievement?
2. Are there any differences for boys and girls in terms of the relation between different aspects of creativity and different subject areas of academic achievement?

The sample comprised (2,264) students from (68) schools, (38%) were boys and (62%) were girls. The ages of the students ranged from 13 to over 18 years old. Students were administered three creativity batteries which are the Torrance Test of Creative Thinking, the Abedi – Schumacher creativity test, and the "Villa – Aimered creativity test. Teachers were also asked to rate students' creativity. Academic achievement was operationalized by students' self – report of their achievement in (6) subjects areas. The results of the study revealed that:

1. According to the 3 measured (TTCT, CT and VAT) creativity was barely related to academic achievement.
2. According to the teachers' ratings, creativity was related to academic achievement for both genders. For *boys*, flexibility was the predominant factor that related to all (6) academic subject areas (Spanish, Basque, English, social science, mathematics, and natural science). *Girls* tended to have higher achievement in all six academic subject areas except for English and Spanish. All four aspects of creativity were related to their academic achievement with fluency and elaboration being most related, elaboration rated to (4) of the academic subject areas (Spanish, Basque, English and social science) and fluency related to natural science and mathematics.

Garcia & Hughes (2000) aimed in their study to answer two central questions:

- (a) Is there any relationship between learning styles and thinking styles?
- (b) Can the students' academic achievement be predicted by the thinking styles?

The subjects were (220) college students (168 women, 42 men). The age range of the sample was from 18 to 24 years, with a mean age of 19.13 years. The Learning Styles Inventory (LSQ) and the MSG Thinking Styles Inventory were administered by the college students. The results showed that:

- Thinking and learning styles were interrelated.
- Students' academic achievement was related to students' thinking styles. More specifically, those students who prefer to work individually (Internal), do not enjoy creating, formulating, and planning for problem solution (Legislative in a negative sense), and those that have adherence to existing rules and procedures (Executive), were those who obtained higher academic achievement.

Seaki, et al. (2001) examined cross-cultural differences in creative thinking among American and Japanese college students. Participants were (51) American and (54) Japanese college students who were majoring in a field of education. All the participants were administered Torrance Test of Creative Thinking (TTCT) – Figural form. The results of the comparative study revealed that:-

- The American college students showed statistically significant higher scores on the creativity test than the Japanese college students.
- There were no gender differences identified in either culture.
- There is no correlation between performance on the (TTCT) and performance on broad academic aptitude / achievement measures for either culture.
- American college students majoring in education were more creative than Japanese college student majoring in education. In particular, the American student showed more synthesized and organized elaboration in their thinking process.

- **Studies that examine the effects of (extrinsic & intrinsic) motivation on creative thinking.**

Hennessey and Zbikowski (1993) aimed in their study to investigate the effect of intrinsic motivation and children's subsequent motivational orientation and creativity in an expected – reward situation. Subjects in this study were (41) students from the fourth grade. Their ages ranged from 8 to 10 years. Subjects were randomly assigned to one of four conditions: intrinsic motivation focus / reward, intrinsic motivation focus / no reward, control / reward, and control / no reward. Subjects were administered Creativity and Intrinsic Motivation Measures: Harter Scale of Intrinsic versus Extrinsic Orientation in the Classroom, Coopersmith Self-Esteem Inventory, and story-telling activity as a creative measure. The results revealed that:

- There was a significant effect of training on childrens' creativity; Children who had received intrinsic motivation training produced more creative stories under both reward and no – reward conditions than did subjects in the control / reward and control / no-reward groups. However, children who were exposed to intrinsic motivation training and offered a reward produced the most creative stories.

Landau, Weissler & Golod (1996) in their study explored the relationship between motivation and giftedness. The two main questions posed by the study were:

- 1) Is motivation a significant and independent factor in predicting giftedness?
- 2) How does the relationship between motivation and giftedness vary with age?

The subjects consisted of (97) students from fifth through ninth grades. They were divided into two groups: (60) “younger” students (grades 5 and 6), and (37) “older” students (grades 7, 8, and 9). All participants were administered IQ Tests (Milta test of verbal intelligence and Matrix test of non-verbal intelligence), and a 15 – item questionnaire designed by the authors to measure aspects of motivation. Three types of analysis were performed: Cronbach α , one-way analysis of variance, and a discriminate analysis. The results revealed that:

1. There was a significant difference in motivation score among the three groups: those who were accepted into the Institute as gifted, those who were not accepted, and those accepted with special consideration.
2. For the younger students, there is a significant difference among the three groups in motivation score. While for the older students, there is no significant difference among the three groups in motivation score.
3. The weight of motivation as predictor is especially stronger among the younger group than the older group.
4. The discriminate analysis shows that IQ and motivation are two distinct factors, each of which is positively linked to giftedness.

Gerrand, Poteat and Ironsmith (1996) aimed in their study to investigate the effects of reward on intrinsic motivation training on the creativity and self – esteem of elementary school students. Participants were (103) third-grade children from five classrooms in a public school. Their ages ranged from 7 to 10 years. The sample consisted of (52) girls and (51) boys. For the creativity task, participants were asked to make paper colleges, and the Coopersmith Self-Esteem Inventory was used to assess self – esteem. The children were randomly assigned to 1 of 4 groups: intrinsic motivation training / reward, intrinsic motivation training / no reward, Control training / reward, and control training / no reward. Two sets of judges (3 artists and 21 schoolteachers) rated the creativity of the colleges using a consensual assessment technique. The results indicated that:

- Creativity ratings of artist judges revealed a significant main effect of reward, but no main effect of training and no interaction effect. The most creative group was the control training / no reward group, and the least creative was the control training / reward group.
- Ratings by the teachers revealed a marginally significant effect of training. The most creative group was the intrinsic motivation training / reward group, and the control training / reward group was rated as the least creative.
- There were no significant changes in self-esteem scores.

Shalley & Oldham (1997) examined the possibility that the relative salience of the controlling and informational aspects of competition determines its impact on creative performance. The salience of these aspects was manipulated by varying competitor presence and visibility. Three components of creative performance were measured: fluency, flexibility, and overall creativity. The sample comprised (75) undergraduates enrolled in an introductory business administration course. Participants were assigned to one of three conditions: no competition, competition with present others, or competition with absent others. They were also assigned either to an open or a partitioned work area. Participants were administered a questionnaire items after the experimental period measured the effectiveness of the manipulation, and a 7-point scale that measured their attention on the task itself. The results showed that:

- scores on three creativity measures (fluency, flexibility, and overall creativity) were higher in two conditions when the informational aspect of competition should be high (i.e., when individuals were in competition with present others but not visible to them and when individuals were in competition with absent others and were visible to noncompetitive others) than in a condition when the controlling aspect was expected to be high (i.e., when individuals were in competition with present others and visible to them) and in no competition conditions.

Bear (1997) aimed to examine gender differences in the effects of anticipated evaluation on creative performance. The sample comprised (128) eighth-grade students ((166) girls and (62) boys). All participants wrote two poems and two stories, one of each under conditions that were conducive to intrinsic motivation and one of each under conditions that emphasized extrinsic motivation. These poems and stories were later judged for creativity by experts. A 2x2x2 analysis of variance (ANOVA) was performed, with one between – subjects variable (Gender) and two within – subject variables (Motivational Condition and Task). The results revealed that:

1. There was a highly significant Gender * Motivational Condition effect which was concentrated in Female subjects. Girls' creativity decreased markedly under extrinsic constraints, but boys' did not.
 - For the boys. There was hardly any difference between the mean creativity rating under conditions favoring either intrinsic (M= 2.64) or extrinsic (M=2.66) motivation.

- For the girls, the differences were considerable. Under conditions favoring intrinsic motivation the mean creativity rating was (3.01), but under conditions favoring extrinsic motivation the mean creativity rating was only (2.62)

2. There was a statistically significant difference in the creativity of work produced under the two motivational conditions (extrinsic and intrinsic).

Vosburg (1998) examined the effects of positive and negative mood on divergent – thinking performance. The sample comprised (188) arts and psychology students, age 19 to 50. The university participants were 82 general psychology students (19 men, 63 women), 77 organizational psychology students (21 men, 56 women), and 29 art students (all women). Participants were administered an Adjective Checklist that was specifically designed to assess positive and negative mood, and Real-life divergent-thinking tasks which consisted of two types of tasks: problem finding and problem solving. The results indicated that:

- Persons in elevated moods may prefer satisfying strategies, which would lead to a higher number of proposed solutions.
- Persons in a negative mood may choose optimizing strategies and be more concerned with the quality of their ideas, which is detrimental to performance on this kind of task.

Bear (1998) conducted a study to investigate the differential efforts of anticipated evaluation on the creativity of middle school girls and boys colleges. The subjects were (70) seventh and eighth – grade students (35 girls and 35 boys). There were a total of four art classes, all students were taught by the same teacher. Two of the four classes were randomly assigned to be the Expecting Evaluation group and two to be the Not Expecting Evaluation group. Students were given materials and asked to make in interesting, imaginative design. A 1.0 (low creativity) to 5.0 (high creativity) rating scale was used, and judges were encouraged to use the full scale. The mean rating of all judges was used as the creativity rating of each college. The results revealed that:

- The overall effect of task motivation was not statistically significant.
- There was a significant effect for task motivation among girls.

Bear's second study investigated the differential effects of reward on the creativity of middle school girls' and boys' colleges. The subjects were (49) eighth-grade students (23 girls and 26 boys). There were a total of four art classes; all students were taught by the same teacher. Two of the four classes were randomly assigned to the Reward group and two the No Reward group. The No Reward group was given no choice regarding participation and received no reward. The reward groups were given a choice whether or not to participate in the activity. The results revealed that:

- There is a statistical significant impact of rewards on creative performance among girls, with a smaller overall effect and no effect among boys.
- The No Reward group was more creative.

Bear's third study aimed to investigate the differential effects of anticipated ungraded feedback on creative performance. The subjects were (60) seventh – grade students (27 girls and 33 boys). There were a four art classes, all taught by the same teacher. The assignment of two classes to each condition (experimental and control) was done randomly. Two of the four classes were randomly assigned to be the Expecting Feedback group and two to be the Not Expecting Feedback group. The results revealed that there is no statistical significant impact of anticipated feedback on girls' creativity. However, it appears that girls' creativity was influenced negatively by the anticipation of feedback, but this effect did not quite reach statistical significance.

Bears' fourth study aimed to investigate the differential effects of anticipated evaluation on the creativity of second – grade girls' and boys' colleges. The subjects were (81) second – grade students (41 girls and 40 boys). Unlike Studies 1-3, each class of students had a different teacher. There was no control in this study for possible differences in classroom climates and expectations other than random assignment of two classes to each condition (experimental and control). The results revealed a positive impact of anticipated evaluation on the second – grade boys that was marginally significant statistically.

Joussement & Koestner (1999) aimed in their study to examine the effects of expected rewards on children's creativity. The sample comprised (61) female gymnasts (ages 4 to 17), they were randomly assigned to a no-reward or expected reward conditions. All participants completed both a training task that required divergent thinking through generating new themes and topics, and a transfer task that required making as many pictures as possible (using circles to make drawings). The reward contingency was in effect only during the training task. Creativity was assessed by:

- a) Consensual judgment of (5) rates.
- b) Determining the statistical rarity (originality) of a given response for this sample.

The results revealed that:

- According to the training task:
 - a) older participants wrote more themes ($M=7.57$) than younger participants ($M=4.03$)
 - b) older participants produced themes that were less original (less rare) yet judged to be more creative than those produced by the younger participants.
 - c) older participants produced themes that were rated as much more appropriate than those of younger children.
- According to the transfer task:
 - a) older participants ($M=8.43$) were more productive than younger ones ($M=6.19$)
 - b) older children drew more creative pictures ($M=2.27$) than the younger children ($M=2.05$)
- The consensual judgment measure of creativity was more sensitive to the age of children than was the rarity measure.

Street (2001) conducted a qualitative investigation to determine, in part, the role of motivation in academic achievement by gifted secondary students. In this study, the effects of both intrinsic and extrinsic motivation were examined across a range of secondary schools in Australia. The participants attended a variety of schools, including a single sex Catholic secondary school, two large state coeducational schools and two secondary departments of central schools from year 7, 8 and 9. Two case studies were developed and followed a comparative analysis. Data were collected over a twelve month period utilizing qualitative research methods including: small group interviews with students, individual interviews with teachers, observations of lessons and school activities, and analysis of relevant schools documents. All participants were nominated by their schools based on academic achievement across most subjects over an extended period. The findings of this investigation indicated that:

1. Motivation has a direct influence on the academic achievement of gifted students in secondary schools.
2. All nominated students levels of motivation were found to be high.
3. As students spend more time in school, there is a greater likelihood of the intrinsically motivated maintaining their high achievement than of the extrinsically motivated continuing to achieve at high levels.
4. Not all schools were providing a conducive environment in which motivation could be nurtured and sustained.
5. There was a number of motivational factors that remained constant in contributing to academic achievement while some factors were specific in individual schools:

- Personal pleasure in achievement and long-term goals were the most significant motivational factors for academically successful secondary students.
- Positive links with at least one teacher were found to be a high occurrence factor at all sites and can be considered significant in maintaining academic achievement among gifted students.
- Very few students had control over the nature of tasks, or the speed at which such tasks were completed.
- The nature of competitive environments played a role in maintaining motivation and in contributing to academic achievement.

- **Studies that investigated the relationship between creative thinking and different kinds of attitudes (e.g., students attitudes toward school, subjects, teachers; teachers' attitudes toward creative children and creativity; and parents' attitudes toward creative children).**

Davis et al. (1872) investigated a study to test the program for training creative thinking. The training materials seek to teach attitudes which predispose an individual to behave more creatively and techniques for producing new combinations of ideas. The sample comprised (198) inner-city students. Two sixth-grade classes (one from a low – and one from a medium – ability school) and two eighth – grade classes (one low – and one medium – ability) served as experimental groups. Four similar classes comprised the control groups. Students were administered Torrance Test of Creative Thinking which yielded fluency, flexibility and originality, a 20-item attitude questionnaire for all students, a supplementary questionnaire for students in experimental classes and a follow-up questionnaire for teachers of experimental classes. The findings indicated that:

- Most Students had benefited from the creativity training experience.
- Two experimental classes (Sixth – grade low – ability, and eighth – grade medium – ability) showed modest gains in Torrance Test scores.
- Students in all four experimental classes displayed more creative attitudes on a number of items in the 20-item attitude survey.

Tuli (1985) aimed in his study to explore the relationship of mathematical creativity to aptitude for achievement and attitude towards mathematics among boys. The sample comprised (476) students of the ninth grade of High / Higher Secondary School of the Punjab State drawn by employing of multistage randomization of cluster at the district, the block and the school level. Each subject was administered:

- The Creative Ability in Mathematics Test (CAMT).
- Numerical Ability (NA).
- Verbal Reasoning (VR) and Abstract Reasoning Tests (AR).
- Mathematics Attitude Scale (MAT)

The marks obtained by the student at the Punjab School Board's Examination were the criterion of achievement in mathematics.

The criterion variables were fluency, flexibility and originality while the predictors were: attitude towards mathematics, achievement in mathematics, and aptitude for mathematics. The results indicated that:

- There was a positive correlation between aptitude for mathematics and a composite score of fluency, flexibility and originality at the significant level (0.01).
- There was a positive correlation between achievement in Mathematics and a composite score of fluency, flexibility and originality at the significant level (0.01)
- There was no significant correlation between academic achievement and attitude towards mathematics, and the criterion variables.

Orth (1988) investigated the relationship of creativity in young children with their parents' attitudes about childraising. The sample comprised (30 mothers, 25 fathers, and 38 gifted preschoolers). The parents reported their attitudes and expectation about childrearing and specific child behaviors using Storm's (1984) Parent As A teacher Inventory (PAAT), Children's creativity was measured by Torrance's creativity test for preschoolers, Thinking Creatively in Action and Movement. The results revealed that:

- There was a significant positive correlation between children's fluency and originality scores and parents' reported tolerance level for frustration on the (PAAT).
- There was no significant correlation with children's creativity scores among other four (PAAT) subsets: Creativity, Control, Play, and Teaching – Learning.

Larsson (1990) aimed to examine teachers' attitudes and perspectives on educational provisions for gifted and talented children in two countries. A questionnaire was developed and distributed to (100) teachers in Sydney, New South Wales and to (100) teachers in Essex, England. Both groups represented a range of primary and secondary schools. Teachers had between 5 and 20 years experience and most were aged between 30 and 40 years. Teachers participated in a questionnaire and interview sessions, and a follow-up study was conducted. General responses to the questionnaires revealed a high correlation between educational practice and ideological or philosophical beliefs. Relevant school experience of teachers was an important factor too. Change in practice tended to come as a result of direction, e.g. from a head teacher. Increasingly, however, teachers were prepared to recognize that gifted pupils existed in their classrooms and that

some provision should be made for them. Specific responses to the questionnaire indicated the following points of agreement:

- a. Recognition of giftedness / talent was essential otherwise pupils would perform below their ability level.
- b. Pupils should be given positive reinforcement by teachers and needed to be kept interested.
- c. Recognition that teachers had a responsibility to the community to help pupils to adopt socially and relate to their peers.
- d. Favored approaches in school were an enriched curriculum which would probably include extension work, use of community resources and provision of resource teachers in schools.
- e. There is a common agreement on teacher education in the field of "gifted" and "talented" education. It was considered that there should be pre-service and in-service training in teaching methods for gifted education for all teachers.

A follow-up study of teachers who participated in the questionnaire and interview sessions indicated that there was an increased awareness of the existence of gifted pupils and the need to cater for them. The next most frequently reported change was in actual classroom practices, that is, curriculum content and teaching strategies. In addition, schools have increasingly developed their own policies in establishment of school – based activities for the talented.

Reis, et al. (1994) conducted a study to examine the attitudes of gifted boys and girls toward education, achievement, and the future. The sample comprised (144) gifted girls and (140) boys equally distributed in grades six, seven and eight and who recently attended a summer program for gifted students at the university of Virginia. The participants responded to a questionnaire that was developed by Callahan and Reis for this study and included (59) questions related to three factors: future education, career and family, beliefs about school and school achievement, and concepts of gender differences. Chi square analyses were applied to the data to address differences between boys and girls. The results indicated that:

- Boys were much more likely to spontaneously mention a specific career goal than girls, and most of the boys also believed that their parents had a specific career goal in mind for them. While, girls who generally did not mention specific career goals, said their parents would support any choice they made.

- Boys and girls were similar in their confidence in their ability to do almost anything and their belief that they are smart and work hard.
- Some of the girls, but very few of the boys attributed their learning faster than others, not to their own skill or work, but to the fact that others didn't work hard.
- Boys' responses indicate a traditional belief that they believe women not only should but also want to stay home with children.
- Both boys and girls were similar in their self assessment about their achievements and why. (91 %) girls and (94.3%) boys believed that if given both directions and time they could do anything.
- Boys and girls were both proud of their grades.
- Girls and boys like math about equally (girls=56.9% boys= 59.3%), and more boys say they dislike it (girls = 24.3% boys=30%). A greater percentage of the girls (29%) dislike science than boys (10.7%). The largest percentage of boys (44.3%) dislike English as compared to (27.1%) of the girls.
- Both sexes indicated that they didn't answer questions in class because they didn't want to be embarrassed, they wanted to give others a chance, or they were bored, sick, or tired. A few boys, but not girls mentioned a fear of being teased.
- Motivations included: wanting good grades (girls = 30.4%, boys= 26.4%), liking to work (girls=19.4%, boys=20.7%) and the importance of learning.
- Both girls (90.3%) and boys (84.3%) believed that men and women should be paid equally.

Shaughnessy et al. (1996) examined gifted children's, teachers', and parents' perceptions of influential factors on gifted development. Two gifted programs in two separate southwestern states were asked to participate in a survey. Students placed all had an I.Q. of 130 or above based on an individually administered I.Q. test given by a school psychologist. (28) parents, (9) teachers, and (59) gifted students were administered a 6 point Likert Scale. A second experiment was conducted in England with (31) professional personnel. The results revealed that there is an agreement on some factors and a lack of agreement in other areas:

- The highest factors thought to be influential by teachers were: early stimulation, being read to at an early age, nutrition, genetics, and the influence of mother.

- The highest factors thought to be influential by students were: "God", effort, motivation, own interests, and the influence of mother.
- The parents' indicators were that early stimulation was primary, followed by being read to at an early age, the child's own interests, the influence of mother, and last, by motivation.
- The British Professionals gave the following five variables as being of importance: early stimulation, motivation, pre-school/nursery, mother, and own interests.

Shillor (1997) in a previous paper looked at how gifted mathematicians in primary school responded to the study of non-Euclidean geometries. In this study children in the secondary school are asked to construct their own Non-Euclidean Geometries. This study looked at two groups of secondary school pupils, 12 to 14 years old. The groups were quite small, 6 to 7 children in each. The pupils in each group were chosen by the schools on the basis of high ability in mathematics, as perceived by their teachers. Using Taxi-Cab Geometry as the starting point, children were asked to focus on the non-Euclidean elements of this geometry, and consider the differences between Euclidean and Non-Euclidean geometries. This involved the two groups in a number of discussions. Then they were asked to construct their own geometry, and consider the non Euclidean elements within it. The results revealed that:

- The new knowledge the children acquire has an immediate effect on their attitude towards geometry in particular and mathematics in general.
- Pupils learned that it is possible for them, too, to be creative and come up with their own ideas. In a word, pupils became Mathematicians.
- Pupils said it had been interesting and they had enjoyed the work. They used words such as "confusing" and "annoying" to describe some of the feelings while working. Clearly, these negative attitudes contributed to the challenge and the desire to grapple with these "confusing" and "annoying" concepts was part of the motivation.

Reuterberg (1998) aimed in this study to investigate the impact of different factors, i.e. school marks, Support from teachers and parents, attitudes to school, self evaluation of achievement, and economic factors on entrance into higher education. The total sample includes (9.104) individuals followed up from age of 13 to the age of 26. Individual is defined as gifted if he / she belongs to the top tenth of the total sample according to the combined score on three intelligence tests (verbal, spatial and reasoning). The Longitudinal data were collected within the frame of the ETF-project (Evaluation Through Follow – up). Two main categories of data have been collected: Administrative data from school offices (these data are collected at the end of each school year), and Project data that were obtained directly from the students and their parents. The results revealed that:

- Entrance into higher education is dependent not only on the choice of program in upper secondary school. Among those who have finished a theoretical program further education is influenced also by the marks received, the students' attitudes to school and satisfaction with their own performance in school.
- Support from parents and teachers also has an influence, but only among the males. On the contrary, the females seem to be unaffected by such support.
- The future economic paying of higher education seems to be most important for the males' educational choice.
- The financial aid system is of equal importance for both sexes.
- The students' perception of their possibilities to do well in higher education is one factor that did not differentiate between the educational groups.

Scott (1999) conducted a study to measure teachers' perceptions of children's classroom behaviors, and to investigate teachers' attitudes toward creative children versus children of average creativity. Students were divided into four groups: a high-creative boy, a high-creative girl, a low-creative boy, and a low-creative girl. (144) elementary school teachers aged from 25 to 60 years old, and (133) undergraduates predicted how each child was to engage in creative and disruptive classroom behavior through responding to the Scott Teacher Perception Scale (STPS). The results indicated that:

- There were significant correlations between Disruptiveness and Creativity for teachers' ratings of boys ($r = 0.24$) and for girls ($r = 0.23$)
- There was a significant difference between the Disruptiveness ratings assigned to highly creative children by teachers and college students.
Teachers rated average creative children with a mean of (3.59) for disruptiveness, and high-creative children with a mean of (4.00). College students rated average creative children with a mean of (3.63), but rated high-creative children with a mean of (3.75). In other words, high creative children were more disruptive than average children.
- There was a significant interaction between sex and creativity. Highly creative boys received a mean creativity rating of (5.52), and for highly creative girls it was (5.50). However, average creative boys received a mean creativity rating of (3.17), whereas average creative girls received a mean rating of (3.46). In other words, average creative girls were generally seen as more creative than average creative boys.

Al-Austath & Amleh (1999) in their study aimed at investigating the effect of sex, academic qualifications and years of teaching experience on the attitudes of science teachers at middle stage in Gaza Strip schools toward creativity in science classes. The sample of the study consisted of (77) science teachers (46 males and 31 females). The researchers constructed an attitude scale toward creativity. The results were analyzed using t-test and Pearson's (r) correlation coefficient. The results indicated that:

- There was a significant difference in teachers attitudes toward creativity related to years of experience and academic qualification.
- There was no effect on their attitudes toward creativity related to sex.
- There was a weak correlation between teachers' attitudes toward creativity and the means of their students' achievement in science.

Kobayashi (2002) aimed in his study to identify Japanese high school students' attitudes towards the long – term learning of English. The main purpose of this qualitative, preliminary study is to place an exclusive focus on gender and its role in Japanese students' attitudes towards English learning. The study was conducted at two university preparatory high schools, involving (555) students (242 males and 313 females, aged 15 to 17). Students were administered a large-scale questionnaire consisted of two sections: the first section composed of items designed to examine students' perceptions about English learning, and the second section consists of multiple-choice questions concerned with students' personal English learning activities. The following nine scales were created from the questionnaire:

1. Attitudes toward long-term English learning.
2. Interest in culture and communication.
3. Perceptions about studying English in a school context.
4. Images associated with English.
5. English learning activities.
6. Self-rated four English skills (speaking, understanding, reading, and writing).
7. Self-reported academic English grade.
8. Exposure to English outside school.
9. Identification of English role models.

The results revealed that:

- There were statistically significant differences between the male students' means and female students' means which were significantly higher than male students' means in the first five scales.
- Young Japanese women's attitudes towards English are affected by a composite of Japanese social and educational elements.

- **Studies that examined the impact of gender on creative thinking.**

Raina (1980) in this study investigates whether the adoption of a democratic constitution some thirty years back and the change in theoretical value-systems, had an impact on the measured creative thinking of boys and girls in India. The participants were (110) ninth grade science students (68 males and 42 females). The mean ages of the boys and girls were (13.80) and (13.77). Students were administered two activities each of the verbal and non-verbal forms of the Torrance Tests of Creative Thinking, yielding scores for fluency, flexibility and originality. The results indicated that:

- There was no significant differences between the sexes on any of the three dimensions or the total creativity score on the verbal form (Product Improvement and Unusual Uses).
- There was no significant difference between the sexes on any of the three dimensions or the total creativity score on the figural form (Figure Completion and Circles Test). Though the boys' scores edged the girls' in originality, while the girls' were a shade higher than the boys' on flexibility.

Gupta (1981) investigated a study to explore sex differences in verbal and nonverbal creative abilities. The sample consisted of 401 pupils (235 boys and 166 girls) studying in ninth grade in the four higher secondary schools in India. Students were administered the MIER Tests of creativity. The results indicated that there were significant differences between boys and girls on verbal and nonverbal creativity:

- The boys scored significantly higher than the girls on verbal dimensions such as fluency, flexibility and transformation.
- The girls scored significantly higher than the boys on nonverbal dimensions such as originality, complexity and productive designing ability.
- There were no significant differences between the two groups on verbal originality.

Richardson (1986) designed to gain insights into sex differences in creative performance among a sample of Jamaican adolescents. The sample comprised (320) adolescents (101 males and 219 females, selected randomly from grade eleven of eight urban high schools. Participants were administered five creativity tests: Word Association, Unusual Uses, Fables, Circles, and Remote Association. These tests were administered to the subjects in a relaxed classroom atmosphere, without the pressure of time limits. Fluency and originality dimensions were considered for the Circles, Unusual Uses and Word Associations tests, while only the originality dimension was considered for the Fables test and the fluency dimension for the Remote Associates test. The results indicated that:

- There was statistical significant sex differences in favor of the females only represented in the Remote Associates test.

Solimans' (1989) study aimed to find out whether males and females have different styles of thinking by studying sex differences of Kuwait University students. The sample comprised (200) female and (200) male students. The difference between the mean age of females ($M = 19.29$) and the mean age of males ($M = 18.29$) was not statistically different. The participants were administered (SOLAT) "Your Style of Learning and Thinking" Form A. It consists of a 36 – item self-report multiple choice questionnaire which provides scores for left and right cerebral hemispheric functions and integrated functioning. The results showed that:

1. Males scored significantly higher than females on the right hemisphere scale.
2. Males scored significantly higher than females on the left hemisphere scale.
3. Females scored significantly higher than males on the integrative scale.

Jeon, et al (1992) aimed in their study to determine the perceptions of teachers and coordinators of the gifted toward characteristic behaviors of gifted females in rural schools. The sixty identified characteristic behaviors of gifted females from the literature were condensed to the most common 25. From these (25) characteristics, a survey was developed and distributed to all teachers and coordinators, which asked them to respond to each item on a scale from strongly agree (4) to strongly disagree (1). The results from

the surveys were analyzed using a frequency distribution for all four levels of the likert scale, a percentage distribution, and a Chi-square analysis to determine differences in response frequency.

The results indicated that several of the characteristics yielded significant among the teachers and coordinators. While, they agreed to the six following characteristics:

1. Gifted females worried as much about success as they do about failure.
2. Gifted females are more self-confident than their peers.
3. Gifted females have more nontraditional career plans
4. Gifted females tend to experience a deeper sense of satisfaction from their talents than do their peers.
5. Gifted females have a greater interest in science and mathematics than their peers.
6. Gifted females are more global types of learners who problem solve more than their male peers.

Maitra & Kumari (1996) examined the perceptions of gifted boys and girls about the choice of subjects pertaining to science and to explore the reasons responsible for their choices of specific subjects. It also examined whether there exists any significant gender differences in their academic achievements in subjects like science, biology and mathematics, and their attitude towards science/math. The sample comprised (60) students who were administered C.I.E. Intelligence tests, Schedule A (to explore qualitatively the students' attitude to different science subjects, attitude to teachers / methods, and perception of factors responsible for their subject choices), Schedule B (Students' perception of choices of subjects), and Schedule C (achievement test scores in different subjects like science and Mathematics). The analysis of statistical data reflects that:

1. There is no gender difference in IQ (verbal), IQ (non-verbal), and spatial test scores.
2. There is gender difference in perception about subject choices among more able boys and girls and this difference is quite significant.
3. There is no gender difference in science (biology) among more able students but there is a difference in math's scores.

Khaleefa, et al. (1996) investigated the differences between males and females in creativity among a Sudanese sample. (300) students participated in this study (149 males and 151 females), their age ranged between 15 to 20 years. The average age for boys was 17.80 years and 17.08 years for girls. All the subjects were administered four creativity tests:

- 1) Consequences Test (Form A) (COT)
- 2) Alternative Uses Test (Form B & C) (AUT)
- 3) Creative Activities List (CAL)
- 4) Creative Personality Test (CPT)

The results were analyzed using means, standard deviations and t-test for both males and females in each test. The results of t-test showed that:

- There was no significant interaction between gender and education.
- There was a significant difference between males and females on creativity scores in two tests (AUT) & (CPT), both favoring males.
- There was a significant difference between males and females on creativity scores on (CAL), favoring females.
- There was no significant difference between males and females on one test (COT).

Qashoo (2001) investigated in her study the role of science teachers in developing creative thinking according the perception of the eighth grade students. The research questions were the following:

1. Do eighth grade students perceive the role of teachers differently according to gender?
2. Do eighth grade students perceive the role of teachers differently according to scientific achievement level?
3. Do eighth grade students perceive the role of teachers differently according to the interaction between gender and scientific achievement level?
4. Do eighth grade students perceive the role of teachers differently according to teacher qualification?
5. Is there discrepancy between the scores of students on the creative thinking ability test and their perception of the role of teacher in developing students' creative thinking?

The sample consisted of (441) students (252 female and 189 male). Students were administered a 45-item creative thinking scale according to the perception of the 8th grade students, and a creative thinking ability test. The results revealed that:

- Gender significantly impacted on students' perception in favor of females.
- Scientific achievement significantly impacted on students' perception in favor of high achievers.
- There were no significant results due to the interaction between gender and scientific achievement.
- There were significant differences in favor of middle community college certificate group.
- There were significant results to indicate that a discrepancy exists between science teachers' role in developing creative thinking scales scores and students' scores on the creative thinking ability test.

Al-Mughrabi (2003) aimed in her study to discover the nature of the relation between motivation for learning and each of the scholastic achievement and attitudes toward school among the 8th and 10th grades students in governmental schools of Jericho. It also aimed to investigate whether there were any significant statistical differences at the level ($\alpha = 0.05$) in learning motivation and attitudes toward school among students due to sex, grade level, economic status, educational level of each parent and the interaction between the educational levels of the parents. The sample comprised (263) students (131 male and 132 female). They were administered the Learning Motivation Scale and the Attitudes toward School Scale. Students' school average was taken as indicator of his/her achievement level. The results revealed that:

1. There were significant correlations at level ($\alpha= 0.05$) between:
 - a. Learning motivation and attitudes toward school among student.
 - b. Learning motivation and achievement level among students.
 - c. Attitudes toward school and achievement level among students.

2. Both sex and grade level were not significant factors in learning motivation and the students' attitudes toward school at level $\alpha=0.05$.
3. Learning motivation was significantly influenced at level $\alpha=0.05$ by the educational level of the father but not by that of the mother nor by the interaction of the educational levels of both parents.
4. Attitudes toward school were not significantly influenced at level $\alpha=0.05$ by the educational levels of any of the parents or by the interaction of the levels.
5. Learning motivation among students as well as their attitudes toward school were significantly influenced at level $\alpha=0.05$ by the economic level of the family.

In light of the previous studies, the following conclusions can be recognized:

- According to the relationship between creative thinking and academic achievement, most of the studies have pointed out to a positive correlation between creative thinking levels and academic achievement in different subject matters (e.g. Yamamoto, 1964; McCabe, 1991; IKhlayel, 1999; Gracia & Hughes, 2000;etc). However, just one study by Seaki, et al. (2001) has revealed that there is no correlation between creativity and achievement.
- The review of literature have demonstrated a limited number of studies that examined the relationship between creative thinking and academic achievement in specific subject matters, especially in English
- Most of the studies have examined the effects of intrinsic and extrinsic motivation on creativity (e.g. Gerrand et al. 1996; Bear, 1997; Vosburg, 1998; Joussement & Koestner, 1999). They have demonstrated the effects of different external factors (i.e. reward, mood, evaluation, competition and feedback) on students' creativity.
- A few number of Arabic studies has been directed toward explaining the effect of motivation on creativity (e.g. Al-Mughrabi, 2003)
- A limited number of studies have been conducted to examine the relation between creativity and attitudes toward school. However, much research has been directed toward exploring the effects of different kinds of attitudes such as:
 - Students' attitudes toward subjects, achievements, education and future.

- Teachers' attitudes toward creative pupils and creativity
 - Parents' attitudes toward child raising and creativity in their children
 - Students', teachers' and parents' attitudes and perceptions of influential factors on students' performance.
-
- Research findings about gender differences in creativity were varied. Some studies have revealed that there are significant differences between males' and females' performance on creativity (e.g. Gupta, 1981; Richardson, 1986; Kim & Michael, 1995 and Scott, 1999). On the contrary, other studies have indicated that there are no effects for gender on students' creativity (e.g. Rania, 1980 & Ikhlayel, 1999)
 - Finally, it has been noted from the review of literature that, the effect of gender on creativity depends on the kinds of creativity tests.

METHODOLOGY

This study is conducted to investigate creative thinking level and its relation to achievement in English language, attitude towards school, and learning motivation. This chapter presents the design of the study, the population and sample, instrumentation of the study, validity and reliability procedures and data analysis.

The Design of the Study

This is a descriptive study that aims to measure creative thinking level and its relation to achievement in English language, attitude towards school, and learning motivation. To achieve this purpose, three scales for collecting the necessary data for this research were used: Torrance Test of Creative Thinking, the Attitudes toward School Scale, and the Learning Motivation Scale. Also, the study aims to investigate whether there were any significant statistical differences at the level ($\alpha = 0.05$) in creative thinking levels, English achievement, attitude towards school, and learning motivation among students due to gender. For this purpose, (195) ninth-grade students were selected, 102 males and 93 females.

Population

The population of this study consisted of all the students in the ninth grade at governmental schools in Jerusalem district during the scholastic year 2004/2005. The population is (2713) and it is distributed according to gender. (Table 5)

Table (5)

The distribution of the population of the study according to gender

Population	Number of Students	Number of Schools
Male	1431	11
Female	1282	11
Total	2713	22

Subjects

The subjects are 198 ninth grade students, 105 males and 93 females. However, only (102) male students whose scores were calculated. The left (3) did not complete one of the scales. They were randomly selected from four schools according to gender.

Instrumentation

For the purpose of the study, the following tools were used: (see appendix).

1. Learning motivation Scale:

This scale is prepared by Al-Mughrabi (2003) to measure learning motivation after reviewing the relevant literature and by returning to the Academic Motivation Scale (AcMo) for Baker & Siryk (1984). The Learning Motivation Scale includes a 23-item designed to assess students' motivation for learning. It includes 5-point Likert Scales ranging from "Strongly agree" (5) to "Strongly disagree" (1). The scale items assess aspects of academic motivation such as:

- Items (11, 8, 3, 2): Personal standards regarding academic performance.
- Items (1, 7, 18, 19, 23): Academic values and interests.
- Items (5, 9, 12, 15, 16): Diligence in meeting past academic obligations.
- Items (4, 6, 17, 21, 22): Attitude toward intellectual activity.
- Items (10, 13, 14, 20): Self – assessment of aptitude and preparedness for college work.

2. Attitude toward School Scale

This scale based on the Attitude – to – School Inventory for Marjoribanks (1995) to measure how students feel about School. This scale was used before in a study about School and family environments for learners that was mentioned in the International Journal of Educational Research (1995). Also it was used by Al-Mughrabi (2003) to discover the relation between motivation for learning and each of the scholastic achievement and attitudes toward school. This scale includes a 20-item designed to asses students' attitudes toward school. It includes 5-point Likert scales ranging from "strongly agree" (5) to "Strongly disagree" (1)

3. Torrance Test of Creative Thinking (Figural Form)

TTCT stands for Torrance Test of Creative Thinking which is the best known and most widely used test of divergent thinking. (TTCT) was developed by Torrance (1974) to measure various aspects of creative thinking among children and adults. The test materials include a verbal section "thinking creatively with words", and a non-verbal or figural section "thinking creatively with pictures". In this study the figural form was used. It includes three tasks designed to assess somewhat different aspects of creative functioning. These tasks are:

Task 1: Picture Construction which includes a curved shape

Task 2: Picture Completion which includes ten simple, incomplete figures

Task 3: Lines Section which includes twenty-two sets of parallel lines

The (TTCT) was scored according to the scoring instructions by Yamamoto (1960). Scores on four subscales of creativity were collected: Fluency, Flexibility, Originality, and Elaboration. (See the Appendix)

The Validity and Reliability of the Tests

To assure content validity of the learning Motivation Scale, Attitude toward School Scale and the Creative Thinking Test for Torrance were submitted to nine university teachers who are specialists in the field of education in two different Palestinian universities; namely, Al-Quds and Bir-Zeit. Those faculty opinions, recommendations of any suggested modifications were highly appreciated and taken into account. Some items were modified; others were added or deleted.

To measure the reliability of the tests Cronbach Alpha Formula was used. Alpha obtained in the learning motivation scale was (0.87); and in the attitude toward school scale it was (0.80).

Variables

The dependent variables of the study are:

1. Creative thinking levels:
 - a. Fluency
 - b. Flexibility
 - c. Originality
 - d. Elaboration

2. English Achievement.
3. Attitude towards school.
4. Learning Motivation.

The independent variable is gender (Male, Female).

The Administration of the Tests

The researcher was given a letter from the major advisor of this study Prof. Ahmad Fahim Jaber / Al-Quds University, in order to get a permission for the research study in elementary schools in Jerusalem district that belong to the Israeli Ministry of Education. The letter facilitated the researcher visits to the schools, meeting the schools' principals, distributing the tests, and gathering data from the sample.

After the researcher made sure that the tests were valid and reliable, she visited all the target schools in the district of Jerusalem, and asked the principal or one of the teachers to help her in distributing the scales among the target sample. Torrance Test of Creative Thinking was first distributed, the students were given instructions for (15) minutes before starting the test; they were asked to think of some objects or designs that no one else in the class will think of, to try to include as many ideas as they can in their drawing, to make up a title for each of her / his drawings and write it next to the figure, to raise their hands if there is any question, not to turn the page until they are asked, and not to return to the previous task after starting the next one. The students first filled in the background questions part; the personal information requested were the name, gender, and the schools' names. Concerning timing the students had only (10) minutes to complete each task, which means (30) minutes to complete the creative thinking test, and they completed the creative thinking test. Then they Learning Motivation Scale and the Attitude toward School Scale were distributed. The researcher asked one of the teachers to help her in distributing the scales and to read the items of each scale for the target sample in order to make it easier for the students and to save time. Students were instructed to wait to begin the scales together. From the (198) scales distributed, (195) scales were calculated.

Statistical Analysis

After collecting the data, they were analyzed statistically by the SPSS program using Pearson correlation, means, standard deviations, ANOVA One way analysis of variance and t-test were processed so that each hypothesis was investigated. For example, Pearson correlation coefficient was used to investigate the relationship between creative thinking levels and English achievement, learning motivation, and attitude towards school. t-test and One Way ANOVA were both used to investigate whether there were any significant statistical differences in creative thinking levels, English achievement, learning motivation and attitude towards school among students due to gender.

Summary

In this chapter, the researcher presented all the necessary information about the population, sample, instrumentation, validity and reliability procedures, administration of the tests, and data analyses.

RESULTS OF THE STUDY

This chapter presents the results of the study and the answers for the seven research questions.

The study aimed at measuring creative thinking level and its relation to achievement in English language, attitude towards school, and learning motivation among the ninth grade students in the governmental school in Jerusalem district. It also aimed at investigating whether there were any significant statistical differences at the level ($\alpha = 0.05$) in creative thinking levels, English achievement, learning motivation and attitude towards school among students due to gender.

To achieve this, three scales were administered for this research: Torrance Test of Creative Thinking (figural form), Learning Motivations Scale, and the Attitude toward School Scale. These scales were distributed among (195) ninth grade students (103 males and 93 females) who were randomly selected from the schools according to gender. To investigate the hypotheses of the study, data were collected and analyzed statistically by the SPSS program; Pearson correlation, means, standard deviations, one way analysis of variance ANOVA and t-test were calculated.

The first research question concerned with the nature of the relationship between creative thinking levels (fluency, flexibility, originality, and elaboration) and academic achievement in English language. Table (6) details the correlation between creative thinking levels and English achievement. From these results it would appear that there is a significant positive correlation between creative thinking and English achievement ($r = 0.201$, $p < 0.05$). The results indicate that the correlation between English achievement and both fluency ($r = 0.160$) and elaboration ($r = 0.176$) is significant at 0.05; whereas the correlation of English achievement and originality ($r = 0.286$) is significant at 0.01. While there is no significant correlation between English achievement and flexibility ($r = -0.104$).

As can be seen in table (6), the results are seen as not confirming the first hypothesis of the study, according to which there was no correlation between creative thinking levels and English achievement.

Table (6)**The Correlation between Creative Thinking Levels and English Achievement**

Creative Thinking Skills	Correlations	English Achievement
Fluency	Pearson Correlation Sig. (2-tailed) N	0.160* 0.027 191
Flexibility	Pearson Correlation Sig. (2-tailed) N	-0.104 0.151 191
Originality	Pearson Correlation Sig. (2-tailed) N	0.286** 0.001 189
Elaboration	Pearson Correlation Sig. (2-tailed) N	0.176* 0.015 191
Total	Pearson Correlation Sig. (2-tailed) N	0.201* 0.005 191

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

The second research question of the study was concerned with the nature of the relationship between creative thinking levels (fluency, flexibility, originality, and elaboration) and the attitude towards school. Table (7) shows that there is a low positive correlation between creative thinking levels and the students' attitude towards school ($r=0.022$). However, this relation is not statistically significant. There are negative correlations between the attitude towards school and fluency ($r= -0.028$), flexibility ($r= -0.020$) and elaboration ($r = -0.021$), whereas, a positive correlation between the attitude towards school and originality ($r= 0.067$). However, these correlations are not statistically significant at any level.

The results are seen as confirming the second hypothesis of this study, according to which there was no correlation between creative thinking levels and the attitude towards school.

Table (7)

The Correlation between Creative Thinking Levels and the Attitude towards School

Creative Thinking Skills	Correlations	Attitude towards school
Fluency	Pearson Correlation Sig. (2-tailed) N	-0.028 0.715 177
Flexibility	Pearson Correlation Sig. (2-tailed) N	-0.020 0.788 177
Originality	Pearson Correlation Sig. (2-tailed) N	0.067 0.376 175
Elaboration	Pearson Correlation Sig. (2-tailed) N	-0.021 0.784 177
Total	Pearson Correlation Sig. (2-tailed) N	0.022 0.767 177

The third research question was concerned with the nature of the relationship between creative thinking level (fluency, flexibility, originality, and elaboration) and learning motivation. Table (8) shows that there is no significant correlation between the overall score of creative thinking level and learning motivation. It seems that fluency ($r = -0.023$), flexibility ($r = -0.029$) and originality ($r = -0.018$) are negatively related to learning motivation, but these correlations are not statistically significant. Whereas, elaboration has a positive correlation to learning motivation ($r = 0.041$), but it is also not significant.

As can be seen in table (8), the third hypothesis was confirmed.

Table (8)**The Correlation between Creative Thinking Levels and Learning Motivation**

Creative Thinking Skills	Correlations	Learning motivation
fluency	Pearson Correlation Sig. (2-tailed) N	-0.023 0.758 179
Flexibility	Pearson Correlation Sig. (2-tailed) N	-0.029 0.701 179
originality	Pearson Correlation Sig. (2-tailed) N	-0.018 0.810 177
Elaboration	Pearson Correlation Sig. (2-tailed) N	0.041 0.586 179
Total	Pearson Correlation Sig. (2-tailed) N	-0.008 0.914 179

The fourth research question was concerned with discovering if there are any differences between creative thinking levels for the target students in terms of gender. t-test was performed to estimate the mean differences in creative thinking levels between male and female students. As presented in Table (9), the mean differences between males and females in creative thinking were not statistically significant. From these results it would appear that males achieved higher creativity scores on all of the creativity subscales of fluency, flexibility and elaboration except originality. Unlike the males, the females scored higher than males on the creativity subscale of originality. However, these differences were not statistically significant.

As can be seen in table (9), the results are seen as confirming the fourth hypothesis, according to which there are no differences between the means of creative thinking for the target students due to gender.

One way analysis of variance (ANOVA) was performed, with one between groups, and two within groups. Full results of the analysis of

variance are reported in table (10). ANOVA analysis does not show a significant difference between the overall creativity score due to gender ($F=0.489$, $p < 0.485$).

Table (9)
The Mean Differences and Standard Deviations of Creative Thinking Levels due to Gender

Creative Thinking Skills	Sex	N	Mean	Std. Deviation	t	df	Sig. (2-tailed)
Fluency	Male	102	22.94	6.69	1.004	191	0.318
	Female	91	21.99	6.48			
Flexibility	Male	102	14.60	8.65	1.604	191	0.110
	Female	91	13.00	4.14			
Originality	Male	100	91.65	28.44	-0.157	189	0.876
	Female	91	92.22	20.89			
Elaboration	Male	102	45.92	12.95	0.992	191	0.323
	Female	91	44.13	11.99			
Total	Male	102	175.75	47.18	0.699	191	0.485
	Female	91	171.34	39.63			

Table (10)
The Difference in Creative Thinking Levels due to Gender

Creative Thinking Skills	Sum of Squares	Df	F	Sig.(2-tailed)	
Fluency	Between group	43.602	1	1.004	0.318
	Within group	8298.636	191		
	Total	8342.238	192		
Flexibility	Between group	122.817	1	2.574	0.110
	Within group	9112.520	191		
	Total	9235.337	192		
Originality	Between group	15.468	1	0.024	0.876
	Within group	119338.35	189		
	Total	119353.82	190		
Elaboration	Between group	154.044	1	0.984	0.323
	Within group	29905.790	191		
	Total	30059.834	192		
Total	Between group	937.123	1	0.489	0.485
	Within group	366257.31	191		
	Total	367194.44	192		

The fifth research question was concerned with discovering if there were any differences between the means of academic achievement in English language for the target students due to gender. Table (11) contains the mean scores and standard deviations on English achievement. As shown in table (11), the mean differences between male and female students in English achievement were not statistically significant. Females achieved higher scores in English language (M=64.62) than males. For the males, the mean achievement score was 61.37. Although there were differences between the means of English achievement due to gender, however, these differences were not statistically significant.

One way analysis of variance (ANOVA) was also performed, with one between groups, and two within groups. Full results of the ANOVA are reported in table (12). The ANOVA analysis does not show this difference to be significant ($F=1.545$, $p < 0.215$). These results are seen as confirming the fifth hypothesis of this study, according to which there are no differences between the means of English achievement for the target students due to gender.

Table (11)

The Mean Differences and Standard Deviations of English Achievement due to Gender

	Sex	N	Mean	Std. Deviation	t	df	Sig.
English Achievement	Male	102	61.37	17.95	-1.243	189	0.215
	female	89	64.62	18.05			

Table (12)

The Difference in English Achievement due to Gender

	Sum of Squares	df	F	Sig.	
English Achievement	Between Groups	500.612	1	1.545	0.215
	Within Groups	61226.854	189		
	Total	61727.466	190		

The sixth research question was concerned with discovering if there were any differences between the means of the attitude towards school for the target students in terms of gender. t-test computed for the mean differences between the male and female students on the attitudes towards school scale (M=70.46) than the male subjects (M=67.56). As shown in table (13), these results are seen as confirming the sixth hypothesis, which states that there were no differences at the significant level ($\alpha=0.05$) between the means of the attitude towards school due to gender.

ANOVA was also performed. The results of the analysis of variance are reported in Table (14). ANOVA analysis does not show significant differences between the means of the attitude towards school due to gender ($F=2.377$, $p < 0.125$).

Table (13)

The Mean Differences and Standard Deviations of the Attitude towards School due to Gender

	Sex	N	Mean	Std. Deviation	t	df	Sig.
Attitude towards School	Male	94	67.56	14.56	-1.581	175	0.125
	Female	83	70.46	9.54			

Table (14)

The Differences in the Attitude towards School due to Gender

	Sum of Squares	df	F	Sig.	
Attitude toward School	Between Groups	369.173	1	2.377	0.125
	Within Groups	27175.719	175		
	Total	27544.893	176		

The seventh research question was concerned with discovering if there were any differences between the means of learning motivation for the target students regard to gender. Table (15) details the differences in learning motivation between males and females. From these results it would appear that males achieved (M=74.96) higher mean scores in learning motivation than female students (M=73.88). However, these differences failed to reach significance. As can be seen in table (15), the seventh hypothesis was confirmed.

One way analysis of variance (ANOVA) was also performed. ANOVA analysis does not indicate a significant effect of gender in learning motivation (F=0.583, $p < 0.446$) (as shown in Table 16)

Table (15)

The Mean Differences and Standard Deviations of Learning Motivation due to Gender

	Sex	N	Mean	Std. Deviation	t	df	Sig.
Learning Motivation	Male	94	74.96	9.82	0.768	177	0.446
	Female	85	73.88	8.92			

Table (16)

The Differences in Learning Motivation due to Gender

	Sum of Squares	df	F	Sig.
Learning Motivation	Between Groups	51.592	1	0.583
	Within groups	15650.653	177	
	Total	15702.246	178	

DISCUSSION OF RESULTS AND RECOMMENDATIONS

In this chapter, the results of the study will be summarized and discussed following the stated hypotheses. Also, they will be compared with the literature. The recommendations stemming from the findings of the present study will be presented too.

- *Discussion of the first question: What is the nature of the relationship between creative thinking levels (fluency, flexibility, originality and elaboration) and the academic achievement in English language?*

The results indicated that there is a statistical significant positive correlation between the overall score of creative thinking and English achievement of the ninth grade students at the significant level ($\alpha = 0.05$). However, this correlation was not great ($r = 0.201$).

The reason might be attributed to the fact that Torrance Test of Creative Thinking (figural form) is concerned with measuring cognitive skills (e.g. fluency, flexibility, originality, and elaboration). Whereas, students' achievement in English language involves verbal skills, and that fluency, flexibility and originality are not required for academic achievement. Another possible interpretation is that the role of creativity is not emphasized in most schools. Schools face difficulties in fostering both students' academic achievement and creativity at the same time. As a result, students find themselves in school system that emphasizes convergent thinking, and the conventional production of idea much more than the development of creative thinking skills. The results are in line with those of Yamamoto (1964), Tuli (1985), Smith et. al. , McCabe (1991), Kim & Michael (1995), Ikhlayel (1999), Ai (1999), and Garcia & Hughes (2000) in that creativity is related to academic achievement. Specifically, McCabe (1991) found a positive correlation between academic performance in English and creative thinking. On the contrary, Toth & Baker (1990), and Freeman (1991) indicated that there is a negative correlation between creative thinking and academic achievement: the high creative thinking students got lower average level of achievement, while the low achievers got higher average levels. However, Seaki et. al. (2001) found no correlation between creative thinking and achievement.

- ***Discussion of the second question: What is the nature of the relationship between creative thinking levels (fluency, flexibility, originality, and elaboration) and the attitude towards school?***

The results indicated that there is no significant correlation between creative thinking levels (fluency, flexibility, originality, and elaboration) and the attitude towards school ($r = 0.022$). This unexpected finding might be attributed to the fact that the attitude towards school scale involves statements regarding how he/she feels about school which does not indicate the students' cognitive skills or abilities. In addition, the students' attitude towards school is affected by the parents' attitude toward their children, the attitude of teachers toward creativity, and creative students, and the students' attitude toward creativity, subject matter, achievement, and the future, which seemed to be neglected in our society.

Prior research indicated that these factors might have a significant effect on students' attitude toward school. Orth (1988) found a significant positive correlation between children's creativity and parents' attitudes about child-raising; Davis et. al. (1972) refer to the importance of some programs that teach attitudes in fostering students' creativity. Shillor (1997) confirm on the students' attitudes toward the subject matter. Carson et. al. (1994) found that teaching creative thinking may lead to promoting positive attitudes toward school. He indicated that creative thinking is associated with better coping to the school environment, as well as fewer problematic responses to stress and behavioral difficulties. Reuterberg (1998) confirm on the crucial role of the students' attitudes toward school on entrance into higher education and future plans. Ikhlayel (1999) also found out that there is a positive correlation between creative thinking and attitudes toward mathematics.

It seems that there is a positive trend in which attitude towards school is seen as an essential factor to foster creative thinking.

- ***Discussion of the third question: what is the nature of the relationship between creative thinking levels (fluency, flexibility, originality and elaboration) and learning motivation?***

The results indicated that there is no significant correlation between creative thinking levels (fluency, flexibility, originality, and elaboration) and learning motivation. One possible interpretation refers to some motivational factors that include the ways in which parents, teachers and society treat students. It seems that they have lower expectation from

students, they do not encourage them to think or to act independently, they do not allow self – discovery and individualism, and they place greater emphasis on uniformity and discipline. This is also supported by Street (2001) in that not all schools are providing a conducive environment in which motivation could be nurtured and sustained.

Another interpretation might be related to some motivational constraints (e.g. reward, evaluation, feedback, competition, mood, goals ...etc) which have a direct impact on creative performance. There seemed to be a lack of awareness toward these motivational constraints. Bears' studies concerned in investigating the effects of some motivational constraints on creativity. He indicated that there is a statistically significant difference in the creativity of work produced under the two motivational conditions (extrinsic and intrinsic), Hennessey & Zbikowski (1993) investigated the effect of intrinsic motivation on students' creativity. They found that there was a significant effect of intrinsic motivation training on students' creativity under both reward and no reward conditions.

The results of this study seemed to be inconsistent with Shalley & Oldham (1997) who found that different forms of competition can enhance the creative achievement of individuals; and Landau et al. (1996) showed that motivation is positively related to giftedness.

It should be noted that the goal of education is to generate academically motivated and successful students. Since motivation has a direct influence on the academic achievement of the gifted students in secondary schools as Street (2001) suggested.

- ***Discussion of the fourth question: Are there differences between creative thinking levels (fluency, flexibility, originality, and elaboration) for target students in terms of gender?***

The results indicated that there are no significant differences in creative thinking levels (fluency, flexibility originality and elaboration) in terms of gender. It seemed that males achieved higher creativity scores on all of the creativity subscales of fluency, flexibility and elaboration, except originality. While females scored higher than males on the creativity subscale of originality. However, these differences were not statistically significant.

From the above result, it seems that there is a radical transforming in our society in recent years. In traditional Arab cultures, students face sex-role stereotyping from infancy to adulthood. Males were provided with

social acceptance and praise, they have more freedom and power, they received strong support from parents ... etc. On the contrary, females in Arab culture are expected to conform and obey, they have less freedom and face more pressure particularly during their adolescent period, they receive less education and not enough support from their families. From the result of the study, it is evident that in our society, students whether males or females do not face sexism. One possible interpretation might be that both males and females grew up in similar socio-economic background families and are exposed to the same teaching methods and environments.

Since no significant main effect for gender was found, the results are consistent with Raina (1980) and Ikhlayel (1999) who indicated that there were no significant differences between males and females students on creativity thinking test. However, other studies revealed a significant main effect for gender in creative thinking. Richardson (1986) indicated that there were statistical significant sex differences in favor of the females; Soliman (1989) pointed out that males achieved a higher mean than females on the right hemisphere scale, which suggests that males seem to be more creative than females; Scott (1999) found that there was a significant interaction between sex and creativity, females were seen as more creative than males; Gupta (1981) found that females scored higher than males on nonverbal subscales such as originality, complexity and productive designing ability; Kim & Michael (1995) also pointed out that females are more creative than males.

- ***Discussion of the fifth question: Are there differences between the means of academic achievement in English for the ninth grade students in terms of gender?***

The results revealed that females achieved higher mean scores in English than males. However, this difference was not statistically significant. In other words, there is no significant main effect for gender in English achievement. This result indicates a positive trend in which achievement is seen as a non-gender issue. This unexpected finding might be attributed to the social and cultural developments which, in fact, tended to reduce the different identifications of the gender roles for boys and girls in our society.

The researcher expected that female students will have more positive perceptions of studying foreign languages which considered as feminine subjects. Unlike, male students who prefer scientific subjects which are masculine. In fact, females are more motivated to study languages than

male students by the support of their parents, which has an influence on their academic achievement. This expectation is supported by Giota (2002) who found that females scored higher on the general school achievement, language, art, education, and music; while males scored higher in mathematics and science. In contrast, Ai (1999) found that females tended to have higher achievement in (social science, mathematics, natural science) except for English and Spanish. Maitra & Kumari (1996) indicated that there was no gender difference in science; however, there is gender difference in Maths. The result of the study seems to be consistent with Ikhlayel (1999) who indicated that there was no significant difference in the students' achievement due to gender.

- ***Discussion of the sixth question: Are there differences between the means of attitude towards school for target students in terms of gender?***

The results revealed that there are no significant main effects for gender on the attitude towards school. Female students achieved higher mean scores on the attitude toward school scale than the male subjects. However, these differences are not statistically significant. This might be attributed to the fact that male and female students are equally respond to cues of their social environments. Therefore, both males and females are expected to have the same perceptions toward school, higher education, career, schools' subjects, and future.

The results of the study is in line with Tamir (1993) who found that there were no statistical significant differences between the top 5% and the remaining science majors either in attitudes toward school or toward science, and Ikhlayel (1999) who indicated that there was no significant differences in the attitude towards mathematics due to gender.

However, Kobayashi (2002) found that there were significant differences in the students' attitudes toward the long-term learning of English due to gender. Females achieved higher mean scores than males on the attitude toward long-term English learning scale.

- ***Discussion of the seventh question: Are there differences between the means of learning motivation for the ninth grade students in terms of gender?***

The results indicated that there are no significant main effects for gender on learning motivation. Males achieved higher mean scores in learning motivation than females. However, these differences failed to reach significance. This result might be attributed to the fact that both males and females students experience the same levels of intrinsic or extrinsic motivation. However, after reviewing the literature, it seems that there are significant main effects of some motivational factors and constraints on gender. Males and Females are influenced negatively or positively by these motivational constraints (e.g. feedback, reward, competition, evaluation, goals ... etc). Bears' study (1997) indicated that there are significant main effects for gender on learning motivation. He found that there is a highly significant effect for gender in different motivational conditions in favor to females. Females' creativity decreased under extrinsic constraints, but males' did not.

RECOMMENDATIONS

In light of previous discussions, the following recommendations can be suggested:

1. Similar studies should be conducted taking different variables into consideration such as the educational level of parents, parents' attitudes toward education, home environment, the economic level of the family, teachers' qualifications and students' age.
2. To design other scales and tests in order to locate creativity taking into consideration the need for the measurement of creativity to include cognitive , affective , and personality characteristics.
3. Further research and studies should be conducted to examine the teachers' practices in their classes in order to investigate the effect of the teacher in fostering creative thinking in students.
4. Teachers should use alternative teaching strategies and methods, and should strive to encourage creativity in all students. Thus to develop positive attitudes toward school.
5. The need to change the situation in educational practices to reach a holistic development in students' creativity, and this can be done through providing a curriculum that stimulates creative behavior in all students, motivation to learn, and positive attitudes toward school.

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(1)

مقياس دافعية التعلم

الجزء الأول: معلومات شخصية

اسم الطالب/ة: _____

اسم المدرسة: _____

الجنس: ذكر أنثى

أخي الطالب/ أختي الطالبة

هذا المقياس لقياس مقدار دافعية التعلم لدى الطلبة، يرجى قراءة كل فقرة من الفقرات الأتية، ووضع إشارة (X) في مربع الفقرة التي تجدها تنطبق على حالتك .
لا توجد إجابة صحيحة وإجابة خاطئة، فالإجابة صحيحة طالما أنها تعبر عن رأيك بصدق، لذا يرجى الإجابة بصدق وأمانة مع العلم أن إجابتك سوف تستخدم لإغراض البحث العلمي فقط.

مع الشكر

الجزء الثاني:

يوجد أدناه (23) فقرة تقيس دافعية التعلم لدى الطلب ، وبعد كل فقرة يوجد الخيارات التالية : (موافق بقوة، موافق، محايد، معارض، معارض بقوة) .
بعد قراءة كل فقرة يرجى وضع إشارة (X) في مربع العبارة التي تجدها تنطبق على حالتك.

التسلسل	الفقرة	موافق بقوة	موافق	محايد	معارض	معارض بقوة
1.	يهمني كثيراً أن أكون طالباً ناجحاً في دراستي.					
2.	أهمل كثيراً في دراستي .					
3.	غالباً أكون من المتأخرين في إنجاز الأعمال الصفية المدرسية.					
4.	أستمتع بالقيام بأنشطة خارجية لا علاقة لها بالمواضيع المدرسية .					
5.	أعمل بجد لإنجاز الواجبات البيتية المدرسية .					
6.	أطالع كثيراً في الكتب الخارجية .					
7.	أستمتع بالدراسة .					
8.	الواجبات المدرسية مملّة بالنسبة لي .					
9.	غالباً، أتساءل كيف يستطيع بعض الطلبة الإنهاء بجد في الدراسة .					
10.	يصعب عليّ التركيز جيداً عندما أستعد للإمتحان .					
11.	أحصل على علامات متفوقة في إمتحانات المدرسة .					
12.	أواجه صعوبات كثيرة عند القيام بالواجبات المدرسية .					
13.	عندما أبدأ بالدراسة أهمل كل ما حولي وأركز فقط على دراستي .					

					يصعب علي الإنتباه أثناء شرح المعلم .	14
معارض بقوة	معارض	محايد	موافق	موافق بقوة	الفقرة	التسلسل
					بعد أخذ إستراحة من عمل الواجبات المدرسية والعودة لاكمالها فإنني أجد صعوبة .	15.
					أترك الواجبات المدرسية التي أجد صعوبة في إنجازها دون إتمام .	16.
					أفضل الواجبات المدرسية التي لا تحتاج الى جهد كبير لإنجازها .	17.
					أميل إلى عدم الإلتحاق بالدراسة الجامعية لولا أهمية الشهادة الجامعية للحصول على وظيفة .	18.
					أتطلع قدماً لإكمال دراستي الجامعية بعد التخرج من المدرسة .	19.
					ينصرف إنتباهي بسهولة عن الدراسة للإنشغال بأمر أخرى .	20.
					أفضل القيام بأي شيء على القيام بإنجاز الواجبات المدرسية.	21.
					أشعر باللامبالاة بخصوص الدراسة .	22.
					أحرص كثيراً على أداء واجباتي المدرسية بنجاح.	23.

(2)

مقياس الإتجاه نحو المدرسة

اسم الطالب/ة: _____

اسم المدرسة: _____

الجنس: ذكر أنثى

أخي الطالب / أختي الطالبة

فيما يلي مقياس يتكون من عشرين فقرة تتعلق بشعورك نحو مدرستك، يوجد بعد كل فقرة الخيارات التالية: (موافق بقوة، موافق، محايد، معارض، معارض بقوة). يرجى قراءة كل فقرة من الفقرات الآتية، ووضع إشارة (X) في مربع العبارة التي تجدها مناسبة لشعورك نحو المدرسة.

التسلسل	الفقرة	موافق بقوة	موافق	محايد	معارض	معارض بقوة
1.	أموري تسير مع المعلمين بشكل جيد .					
2.	التحصيل الجيد في المدرسة هو أهم شيء عندي .					
3.	المدرسة مملّة بصورة عامة .					
4.	إنني إلى حد ما جيد في أداء أنشطتي المدرسية .					
5.	أحب أن ألهو أثناء الدروس .					
6.	أشعر أنّ المعلمين يعتقدون أنني ذكي .					

التسلسل	الفقرة	موافق بقوة	موافق	محايد	معارض	معارض بقوة
7.	أشعر بالأسف عندما ينتهي الدوام اليومي في المدرسة .					
8.	بشكل عام, تقلقني الواجبات المدرسية .					
9.	عادة ما يكون المعلمون لطيفين معي .					
10.	أشعر بالإضطراب عندما يسألني معلمي عن الواجبات المدرسية .					
11.	أعتقد أن الالتحاق بالعمل أفضل من الذهاب الى المدرسة .					
12.	عندما يطلب مني القيام بواجب مدرسي يحتاج الى اكمال فانني أحصل على علامات جيدة في العادة .					
13.	أكره الطلبة المزعجين أثناء الحصص .					
14.	دروسنا في هذا الصف شبيقة في الغالب .					
15.	عموماً أحب المدرسة كثيراً .					
16.	أجد أن الكثير من الواجبات البيتية المدرسية صعبة الفهم .					
17.	صفي أحسن صف من بين جميع صفوف مدرستي .					
18.	أحب أن أكون واحداً من أذكطلبة مدرستي .					
19.	إنّ الذهاب إلى المدرسة مضيعة للوقت .					
20.	أبذل جهداً كبيراً في العمل المدرسي .					

(3)

اختبار التفكير الإبداعي

صورة الأشكال "أ"

اسم الطالب/ة : _____

اسم المدرسة: _____

الجنس: ذكر أنثى

تعليمات الاختبارات:

أخي الطالب/ أختي الطالبة :

ستجد في هذه الصفحات ثلاثة أشياء مسلية لنقوم بعملها، وكلها ستعطيك فرصة لكي تستخدم خيالك للتفكير في أفكار تضمها معاً بطرق مختلفة، ونريدك أن تفكر في كل نشاط في أكثر الأفكار إثارة للاهتمام وأكثرها عدم ألفة. أفكار لم يفكر فيها أحد من قبلك وبعد أن تفكر في فكرة استمر في الإضافة إليها والبناء عليها حتى تصبح عبارة عن قصة تثير الاهتمام.

ستعطي وقتاً محدداً لكل نشاط – لذلك استخدم وقتك استخداماً جيداً وحاول أن تستمر في التفكير، وإذا انتهيت قبل الوقت المقرر لكل نشاط اجلس هادئاً وانتظر حتى يطلب منك قلب الصفحة.

إذا أردت أن تسأل سؤالاً بعد البدء لا تتحدث بصوت عال، ارفع إصبعك وستجدي أمامك لأحاول الإجابة على أسئلتك.

أتمنى لك

أعمالاً ناجحة

الباحة

(4)

Torrance Test of Creative Thinking (Figural Form)

Scoring Procedures

Torrance Test of Creative Thinking (figural form) was corrected according to the scoring instructions given by Yamamoto (1960). It includes three tasks designed to assess different aspects of creativity. These tasks are the following:

Task 1: Picture Construction

Scores on three subscales of creativity were calculated: originality, elaboration, and title originality to evaluate the titles given in this task.

Originality

A score for originality is determined by the principle with which a subject utilized the colored sheet in making up his picture. Table (17) presents the principles in scoring for originality.

Table (17)
Principles in Scoring for Originality

Category	Principles Involved	Scoring Weight*	Example
Life-Nature (L)	Simple figure	10	Cloud, sun, potato, lake
	Structural part	5	Human or animal body, tree
	Field	10	Human or animal face, garden
Ornamental- Household (O)	Simple figure	10	Hotdog, hat, bread, pool, cake
	Structural part	10	Umbrella, skirt, candle-holder
	Field	15	Flag, design, cage
Scientific- Mechanical (S)	Simple figure	5	Boat, bomb, motorboat, canoe
	Structural part	10	Bus, rocket, glasses, iron, submarine
	Field	15	Highway, traffic-sign, race-track

*Weights determined as follows: Weight = 5, if frequency $\geq 15\%$

Weight = 10, if $15\% > \text{frequency} \geq 5\%$

Weight = 15, if frequency $< 5\%$

Elaboration

A response is given a score according to the following scheme:

Score	Description
0	No elaboration beyond the minimum essentials to represent and convey what a subject has in mind
5	Elaboration of picture elements outside of the colored sheet
10	Elaboration of picture elements inside of the colored sheet
15	Elaboration of picture elements both inside and outside of the colored sheet

Title Originality

A response is given a score according to the following scheme:

Score	Description
0	No title given
1	Simple label or name of the drawn objects without any modifier
2	Label or name of the drawn objects With descriptive modifier
3	Imaginative title which express Feelings, reactions, and descriptions over and beyond what can be seen in the picture

Task 2: Picture Completion

Scores on five subscales of creativity were calculated: fluency, flexibility, originality, elaboration and title originality to evaluate the titles given in this task.

Fluency

A score for fluency is obtained by counting the number of responses a subject completed.

Flexibility

A score for flexibility is obtained by counting the number of runs revealed in responses in terms of the following three categories:

1. Life-Nature (L): Any response representing organic life or inorganic nature in any form. This category includes plants and their parts, animals and their parts, human beings and their parts, as well as natural elements such as sky, sea, cloud, mountain, and the like.
2. Ornamental-Household (O): Any response representing daily household or decorative items which exclude those belonging to the third category. This category includes furnitures, decorative articles, tablewares, clothes, processed foods, drugs, sports goods, and the like.
3. Scientific-Mechanical (S): Any response representing mechanical constructs or scientific instruments which imply more or less self-contained energy sources and / or spontaneous movement. This category includes various kinds of vehicles, ships, bridges, roads, buildings, electrical and mechanical instruments, and the like.

Originality

A score for originality is determined according to the basic principles in table (18).

Table (18)
Principles in Scoring for Originality

Categories for Flexibility	Principle for Originality	Scoring Weight*
Life-Nature (L)	Symmetry	1
	Asymmetry	4
Ornamental- Household (O)	Symmetry	1
	Asymmetry	4
Scientific- Mechanical (S)	Symmetry	2
	Asymmetry	4

*Weights were determined as follows: Weight = 1, if frequency $\geq 30\%$
 Weight = 2, if $30\% > \text{frequency} \geq 15\%$
 Weight = 3, if $15\% > \text{frequency} \geq 5\%$
 Weight = 4, if frequency $< 5\%$

Elaboration

Each response is further considered for its elaborateness and given either two or one points.

Title Originality

A score for title originality is determined by the titles given and their expressiveness according to the scheme in task (1).

Task 3: Lines Section

Scores on five subscales of creativity were calculated: fluency, flexibility, originality, elaboration and title originality. The scoring procedures for task (2) and task (3) are the same.

(5)

Academic Motivation Scale

R.W. Baker and B. Siryk

Primary source

Baker, R. W, & Siryk, B. (1984). Measuring academic motivation of matriculating college freshmen. *Journal of College Student Personnel*, 25,459-464.

Purpose statement

Academic Motivation Scale (AcMo) is a 35-item major designed to assess college student's motivation for doing academic work. The AcMo is designed primarily for freshmen students, as several items use the high school experience as context. Scale items assess aspects of academic motivation such as personal standards regarding academic performance, academic values and interests, diligence in meeting past academic obligations, attitude toward intellectual activity, and self- assessment of aptitude and preparedness for college work.

Reliability

Coefficient alpha= .88.

Number of Questions

35.

Directions for Scoring

This self- report questionnaire includes 19 point likert scales ranging from “applies very closely to me” (1) to “ doesn’t apply to me at all” (19).The negative scored items are: 1,4,6,7,8,9,10,11,13,14,17,22,23,26,28,29,31,32 , 33, 34 and 35.Values from 1 to 19 assigned to successive scale points for each statement item, and from 3 to 17 over the slightly narrower range of alternatives for the multiple choice items, higher values representing higher motivation. A total score is summated.

Academic Motivation Scale **R.W. Baker and B. Siryk**

PLEASE READ THESE INSTRUCTIONS VERY CAREFULLY,
BE CAREFUL NOT TO SKIP ANY ITEM, AND BE JUST AS FRANK
AND HONEST AS POSSIBLE.

Below are statements relating to various feeling and attitudes about academic settings and activities. Each statement has beneath it a continuum of asterisks labeled at one end "Applies very closely to me" and the other end "doesn't apply to me at all". Please encircle an asterisk at the point in the continuum which best represents the degree of your own personal feeling and/or opinion regarding the statement. Because your feeling or opinion may vary considerably from item to item, you should feel to use any asterisks in each continuum- but, please, only one asterisk in the each continuum.

1-Doing well in high school was important to me.

Applies very closely to me

Doesn't apply to me at all

2-I wasn't very interested in my high school courses.

Applies very closely to me

Doesn't apply to me at all

3-In school I often got behind in daily class work.

Applies very closely to me

Doesn't apply to me at all

4-I enjoyed doing outside readings and projects in connection with my high school courses.

Applies very closely to me

Doesn't apply to me at all

5-Most of the things I am interested in are not related to things we read or talked about in high school courses.

Applies very closely to me

Doesn't apply to me at all

6-I always felt confident in high school that I would get pretty good grades.

Applies very closely to me

Doesn't apply to me at all

7-I feel that my high school has prepared me well to do college work .

Applies very closely to me

Doesn't apply to me at all

8-I worked hard at my schoolwork in high school.

Applies very closely to me

Doesn't apply to me at all

9-I had high standards for my academic work in high school.

Applies very closely to me

Doesn't apply to me at all

10-My friends in high school tended to be among the better students.

Applies very closely to me

Doesn't apply to me at all

11-I look forward to going to college.

Applies very closely to me

Doesn't apply to me at all

12-I would just as soon not go to college if the degree were not so necessary for getting a good job.

Applies very closely to me

Doesn't apply to me at all

13-I am positive that I will graduate from college.

Applies very closely to me

Doesn't apply to me at all

14-I expect to stay at Clark for four years to get a bachelor's degree.

Applies very closely to me

Doesn't apply to me at all

15-I find the idea of deferred admission (i.e., starting college at a later time than next fall) attractive.

Applies very closely to me

Doesn't apply to me at all

16-I had a difficult time deciding whether to attend Clark.

Applies very closely to me

Doesn't apply to me at all

17-I do a lot of reading on my own.

Applies very closely to me

Doesn't apply to me at all

18-Schoolwork bores me.

Applies very closely to me

Doesn't apply to me at all

19-I always have to force myself to get schoolwork done.

Applies very closely to me

Doesn't apply to me at all

20- I am less "intellectual" than most people of my age.

Applies very closely to me

Doesn't apply to me at all

21-I have a lot of trouble getting started on homework assignments.

Applies very closely to me

Doesn't apply to me at all

22-I enjoy going to classes.

Applies very closely to me

Doesn't apply to me at all

23-I enjoy studying.

Applies very closely to me

Doesn't apply to me at all

24-I often wonder how people can become excited about books that they read.

Applies very closely to me

Doesn't apply to me at all

25-I often distracted very easily from homework assignments.

Applies very closely to me

Doesn't apply to me at all

26-I am pretty good in taking examinations.

Applies very closely to me

Doesn't apply to me at all

27-I don't concentrate very well when I study for a test.

Applies very closely to me

Doesn't apply to me at all

28-I consider myself a scholarly person.

Applies very closely to me

Doesn't apply to me at all

29-My friends tend to identify me as a person who is interested in academic work.

Applies very closely to me

Doesn't apply to me at all

30-After taking a break from homework, I usually have a lot of trouble getting back to it .

Applies very closely to me

Doesn't apply to me at all

31- I feel that I will do well at college.

Applies very closely to me

Doesn't apply to me at all

32-I will probably do graduate work after finishing college.

Applies very closely to me

Doesn't apply to me at all

In the following three items please encircle one letter grade for each statement.

33-The grade average that you would like to have at the end of your freshman year.

A+ A A- B+ B B- C+ C C- D+ D D- F+ F F-

34- The grade average that you would be satisfied to have at the end of your freshman year.

A+ A A- B+ B B- C+ C C- D+ D D- F+ F F-

35- The grade average you think you will actually have at the end of your freshman year.

A+ A A- B+ B B- C+ C C- D+ D D- F+ F F-

5- I like fooling about during my lessons	SA	A	NC	D	SD
6- My teacher think that I am clever	SA	A	NC	D	SD
7- I am sorry when school is over for the day	SA	A	NC	D	SD
8- Generally, my school work worries me	SA	A	NC	D	SD
9- Generally, my teachers are very pleasant to me	SA	A	NC	D	SD
10-When my teachers ask me questions about my work I often get upset	SA	A	NC	D	SD
11-I think that going out to work would be better than coming to school	SA	A	NC	D	SD
12- when we have school work to complete I generally get very good grades	SA	A	NC	D	SD
13- I don't like other students who are noise during lessons	SA	A	NC	D	SD
14- In this class our lessons are always very interesting	SA	A	NC	D	SD
15- overall, I like school quiet a lot	SA	A	NC	D	SD
16- I find a lot of my school work hard to understand	SA	A	NC	D	SD

17- Of all the classes in the school, my class is the nicest of all	SA	A	NC	D	SD
18- I would like to be one of the cleverest students in my school	SA	A	NC	D	SD
19- Going to school is a waist of time	SA	A	NC	D	SD
20- I work and try very hard at my school work	SA	A	NC	D	SD

Thank you very much indeed for
completing this questionnaire.

Note for investigator: The even-numbered items refer to affective attitudes, where as the odd- numbered items assess cognitive attitudes toward school.

