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Complex thinking and its Relation to the Preferred Learning Styles of Gifted Secondary School Students in King Abdullah II Schools for Excellence in Light of some Variables

Rabee Ayed ALQahtani[1] **Ahmad Mohammad Alzoubi**[2]

1. Ministry of Education || Saudi Arabia
2. Al-Balqa Aplied university || Jordan

Abstract: This study aimed to identify complex thinking and its relation to the preferred learning styles among secondary school students in the King Abdullah II Schools of Excellence within the cities of Salt and Zarqa from 2013 to 2014 in light of the variables of sex and grade. The sample consisted of (213) male and female students, while the complex thinking scale was developed and used to include three main domains. The results of the study showed that the levels of complex thinking, and its domains were high among gifted students, with the critical thinking domain occupying the first rank followed by the reflective thinking domain then the creative thinking domain. The results also indicated that the most favored learning styles to the sample were respectively the visual and the kinesthetic, which both came at high levels followed by the auditory style that came at an average level. Finally, the study recommended diversifying teaching methods taking into consideration the three visual, kinesthetic and auditory learning styles, in addition to placing focus on the visual and kinesthetic activities while teaching the tasks that require complex thinking.

Keywords: complex thinking, learning styles, gifted students, secondary stage, Excellence.

Introduction

Complex thinking patterns are one of the educational outcomes to be gained by students. These highly complex thinking patterns contribute to students' increased awareness of the world around them. However, educational field indicators do not reveal, in the general sense, an acceptable level of students' capacity to complex thinking (Khreisat, 2005). The concept of Complex Thinking comes from the integrated model of thinking as an interactive system rather than a system composed of a separate set of thinking skills. This mode involves three types of thinking: creative, critical, and reflective, and requires extensive use of one's mental processes (Jonassen, 1996: 28-29).

Creative thinking is defined as a complex and purposeful mental activity guided by a strong desire to find a solution or to arrive at novel, authentic outcomes. Creative thinking is characterized by comprehensiveness and complexity because it involves interrelated emotional and moral elements that constitute a unique state of mind. This state includes originality, flexibility, sensitivity to problems and

elaboration. Researchers use other concepts that correspond to the creative thinking such as productive thinking, divergent thinking, and lateral thinking (Jarwan, 2002). Lipman (1991) defines critical thinking as a responsible thinking that facilitates access to good judgments; it is based on criteria, it is a self-reflective thinking. Watson and Glaser (1991), mentioned in Fisher (2001: 3), suggested the main skills of critical thinking: knowledge of assumptions, reasoning, analysis, interpretation, and evaluation. Daniel (2000), however, assumes that critical thinking includes a number of skills prompted by main characteristics. These are rationality, self-awareness, honesty, open-mindedness, discipline, and evaluation.

Kish and Sheehan (1997) point to contemplative thinking as linking an individual's knowledge, readings, and feelings. In this sense, curiosity is stimulated when the sequence of ideas and experiences are linked. Norton (1997, 1997) identified four main skills of reflective thinking: intellectual openness to alternative possibilities, curiosity, enthusiasm, self-direction, and intellectual responsibility. Understanding a student's method of learning is an important part of the process of selecting learning strategies. Guided by their skills, students must be the basic learning unit. The learning environment, where learning and teaching processes occur, affect students' behavior. In order to fully understand the students, the performance evaluation and the learning environment must reflect their personalities. The performance conditions and the learning environment surrounding students primarily influence students' learning (Qatami, 1999). The learning styles are cognitive, emotional, or physiological behaviors by students, which act as relatively constant indicators of how learners understand, deal with and respond to their learning environment. Learning styles are also meaning, techniques, and procedures followed by students to acquire new experiences (Dunn & Griggs, 1998).

Dunn & Dunn (1978) identified three styles of learning by students according to their preferred styles of dealing with information from physiological, psychological, environmental, social and emotional aspects. These styles were visual, auditory, and kinesthetic. Some students preferred auditory information, while others preferred visual information. In addition, some other students could understand better, when information was given by kinesthetic means. These learning styles of gifted students require further development so that students are prompted and motivated to adapt to unfamiliar aspects and work. Every learner acquires a special method of learning. Learners are visual, auditory, or kinesthetic. Learning styles differ as per students' differing environmental and social circumstances (Qatami and Qatami, 2000).

One can note that the gifted students are characterized by their high thinking abilities. Teachers and educators in general through activities, curricula, and teaching styles should observe such excellence. These styles are commensurate with the contents of curricula and are suitable to the individual characteristics of students. The difference in these styles among gifted students is natural and represents an aspect of the

individual differences between them. Therefore, taking into account the learning styles of these students is a requirement for the success of the educational process for gifted students.

Study Problem and Questions

With identifying the relationship between the complex thinking and the preferred learning styles of gifted students in the King Abdullah II Schools for Excellence, this study answers the following questions:

1. What is the level of complex thinking among gifted secondary school students in King Abdullah II Schools for Excellence?
2. What are the preferred learning styles for gifted secondary school students in King Abdullah II Schools for Excellence?
3. Do gender, grade, and the interplay between them affect the degree of complex thinking for gifted secondary school students in King Abdullah II Schools for Excellence?
4. Are the preferred learning styles of gifted secondary school students in King Abdullah II Schools for Excellence affected by gender, grade, and the interplay between the two?
5. Is there a statistically significant correlative relationship at the level of significance ($\alpha = 0.05$) between complex thinking and the preferred learning styles among gifted secondary school students in King Abdullah II Schools for Excellence?

Study Importance

1- Theoretical Importance:

- Highlighting the importance of studying the relationship between the subject of complex thinking and the styles of learning for gifted students.
- Offering a better understanding of the mental characteristics and styles of processing preferred information by gifted students.
- Adding to the educational literature and providing new knowledge that can be useful in the future.

2- Practical Importance:

- Providing teachers, educational counselors, and programmers with feedback on complex thinking and its relation to the learning styles of gifted secondary school students at the King Abdullah II Schools for Excellence.
- Working to strengthen the used learning styles and addressing the weaknesses.

- Benefitting teachers and curriculum designers regarding the use of learning styles consistent with the thinking levels of gifted students.

Theoretical and Procedural Definitions

Gifted Students: High school students in the King Abdullah II Schools for Excellence with high grades in academic achievement are enrolled in the King Abdullah II Schools for Excellence and passed the admission tests under the approved criteria of the Ministry of Education.

King Abdullah Schools for Excellence: Mixed government schools for outstanding and gifted students opened by the Ministry of Education across all governorates in the country. These schools are designed to provide talented students with the appropriate educational programs and means. Gifted students in these schools are enrolled in grades 7 through 11, however only under certain conditions and criteria for enrolment. The most important of these conditions are academic excellence in previous classes, enjoying a high mental capacity, and passing designated interviews (Jarwan, 2008).

Complex Thinking: High and complex mental processes that include critical thinking, creative thinking, and reflective thinking (Hynes & Bennet, 2004). Complex thinking in this study refers to the degree to which gifted students have acquired complex thinking measured by the complex thinking scale used in this study. The scale covers three areas: creative thinking, critical thinking, and reflective thinking.

Learning styles: The way in which student deals with the information delivered through visual, auditory and kinesthetic means, provided that the information is new and difficult to focus on, absorb, manipulate and retain (Dunn & Dunn, 1978). In this study, learning styles refer to the grades acquired by students while responding to the learning styles scale used in this study, which covers auditory, visual, and kinesthetic means.

Study Limits

The results of this study were limited to the following:

- Population: 10 and 11-grade levels from two schools: the Al-Zarqa and the Al-Salt schools of King Abdullah II Schools for Excellence.
- Space: King Abdullah II Schools for Excellence in Al-Salt, Al-Zarqa.
- Time: Second Semester 2013-2014.

Theoretical Framework of the Study

Complex Thinking

Complex thinking is concerned with communication to build new and different ideas from already existing ones. It also refers to the ability to brainstorm different ideas, taking into account other perspectives that may generate better solutions and connect conflicting views (Habib, 1995). Gestalt's paradoxical theory of change argues that overall thinking precedes partial thinking. Individuals, when facing a particular problem, examine it as well as its elements. However, they can reach a solution only through a process of mental foresight, which represents an integrated process of mental organization, and stimulation of mental processes to work together in a single frame. This frame contributes to finding a solution to the problem at hand. The complex thinking - according to this theory - is the process of foresight (Al-Zaghoul, 2010).

Several categories of thinking were found, including those classified into two main levels: low or simple thinking, and higher or complex thinking. Simple thinking involves many cognitive skills, including acquisition, storage, retrieval, observation, classification, comparison, summary, etc. Meanwhile, complex thinking involves critical and creative thinking skills, decision-making skills, problem solving, and meta-cognitive thinking (Al-Atoum et al., 2011).

Types of Complex Thinking

1- Creative Thinking:

Creative thinking refers to the mental process where learners interact with the many experiences they encounter in order to absorb the elements of the situation to finally arrive at a new understanding or production. This understanding must bring about an authentic solution to a problem or discover something new that is valuable to individuals or to their communities, (Habash, 2005). The skills of creative thinking include authenticity; fluency of words, dissimilarities, ideas, and forms; flexibility includes automatic and adaptive flexibility as well as sensitivity to problems.

Creative thinking among gifted students

A range of advantages characterizes the gifted students, which help them think in a creative way. The most prominent of these is that they are viewed as profound and wide-ranging, as their deep questions show. They are fertile in their linguistic repertoire, especially words relating to authenticity of thought and expression, and have the ability to generalize (Solomon, 2002).

2- Critical Thinking

Critical thinking refers to the process by which an individual analyzes the problem, examines its components and evaluates them to derive and generate new ideas and new functions of things that enable students to take a decision to live and work within this complex and changing technological world (Bahgat, 2005: 20). (Glaser) who is mentioned in (Fisher, 2001: 3) argues that critical thinking involves three aspects; the tendency or inclination to take into account previous problems and issues, i.e., experience, knowledge of reasoning methods, and the use of some skills in applying past trends and knowledge.

Critical thinking of gifted students

A range of traits characterizes students talented in critical thinking. The most prominent of these is that gifted students are open to new ideas, do not argue about things that are unknown to them, know when they need more information about a subject, and know that people have different ideas about topics. (Qatami, 2004).

3- Reflective Thinking

John Dewey coined the concept of reflective thinking, as Dewey's basic assumption was that learning arises from the process of meditation or deep reflection. Then, many terms related to this concept were found, such as critical thinking, problem solving, and high-level thinking. (Zoubi, 2014). It also underlies students' ability to deal with situations, events and educational stimuli with vigilance, and to analyze them in depth and with care to reach the appropriate decision at the right time and place to achieve the expected objectives (Barakat, 2005: 108). The skills of reflective skills include reflection and observation; detection of fallacies; giving convincing explanations; developing solutions and arriving at conclusions (Al-Emawi, 2009; Abdelhamid, 2011).

Reflective thinking among gifted students

A range of traits characterizes gifted students in reflective thinking, notably that they are unusually sensitive to the expectations and feelings of others, evolve early to enjoy a sense of justice, develop an ability to control and satisfy needs, possess advanced levels of moral judgment, emotions, and intensity, and are self-aware (Clark and Peterson, 1992).

Learning Styles

Auditory Learning (Dunn & Burke, 2006). A student who prefers the auditory learning style is better able to learn when the information is presented in an audible and oral manner. One of the most important learning styles and strategies is to join classes to help learn material, work with a colleague in the

preparation for an exam, review the material aloud to help remember during the exam, use audio recordings of books, or make special recordings prepared by reading teachers and listen to them prior to the exam.

Visual Learning (Dunn & Burke, 2006). A student who prefers the visual learning method is better informed when presenting information through pictures or charts. He/she prefers to study in a quiet room, and alone rather than with a group of students. The most important styles and educational strategies appropriate to visual learning is the use of colors to highlight the basic information, and work margins in the footnote to write the main ideas, symbols, and forms that help to remember information.

Kinesthetic Learning (Dunn & Burke, 2006). A student who prefers kinesthetic learning is better at learning by using his hands in activities, benefiting from experiments in the laboratory to help him/ her acquire information. The most important methods and educational strategies appropriate to kinesthetic learning are sitting in the front desks during classes and taking notes throughout the class without a focus on the correct spelling of words, or completion of sentences while writing.

Literature Reviews

1- Previous Studies on Complex Thinking and its Types.

Al-Shareeda and Bishara (2011) revealed that complex thinking and its relation to variables such as sex, cumulative average, specialization, and level of study among students of Al-Hussein Bin Talal University. The study sample consisted of 332 male and female students. Creative thinking is the most common pattern of complex thinking, and there was no statistically significant effect on gender, specialization or level of learning in complex thinking ability. Orhahne & Ortize (2011) compared gifted and normal students in the performance of creative tasks in light of the effects of motivation and emotion. The sample consisted of 58 gifted students and 82 normal students in grades 6 and 7 in Germany. The results indicated that 129 students of the sample preferred performance on the tasks of coloring pictures compared with 11 only, who preferred to write poetry. The study found that gifted students outperformed non-talented students.

2- Previous Studies on Learning Styles.

Al-Alwan (2010) studied the preferred learning styles employed by secondary school students in the city of Ma'an, Jordan. With 220 students, the researcher developed the Oliver scale to suit the sample of the study. The preferred learning styles were auditory, then visual, and finally kinesthetic. The study did not reveal statistically significant differences in learning styles in terms of sex. Furthermore, Al-Abwaini (2008) revealed the styles of learning, leadership behavior and social adjustment of gifted students in Jordan. The sample included 240 students from grades 9, 10 and 11 in the Jubilee School in Jordan. The study concluded that

there was no statistically significant difference in the overall score of learning styles due to sex. However, differences specific to visual learning were attributed to the grade, in favor of students in grade 10, and to sex in favor of females.

3- Previous Studies on Thinking and Learning Styles.

Sulaymani (2012) identified the relationship between learning styles and thinking patterns associated with the right and left hemispheres. The sample consisted of (219) high school students in Makkah. The study found that the most common thinking pattern in the sample was the integrated pattern, followed by the right brain thinking pattern, and the last was the left-brain pattern. The sample was effective experimentation, reflective observation, abstract conception, and finally concrete experience. The study also found a positive correlation between the left-brain thinking pattern and learning abstract concepts. Meanwhile, there was a negative correlative relationship between the pattern of right brain thinking and learning abstract concepts.

Yenice (2012) identified the relationship between pre-service teachers' preferred learning styles and their critical thinking, as well as gender and age. The sample included 122 students at the Faculty of Science in Korea. The study used Kolb's list of learning styles, in addition to CCTST Scales to evaluate students' aptitude for critical thinking. The study concluded that there was no statistically significant correlation between learning styles, critical thinking, gender, and age.

Methodology and Procedures

Study Design

The descriptive analytical approach was used to achieve the purpose of the study.

Study Population and Sample

The study's population is composed of all gifted students in secondary schools in the King Abdullah II Schools for Excellence in the cities of Al-Zarqa and Al-Salt in the Hashemite Kingdom of Jordan during the second semester of the year 2013-2014. The total number of male students reached (128) students, the number of females (85). 10-grade students make up (102) and 11 graders make up (111).

Study Tools

1. Complex Thinking Scale

The researcher prepared and developed the Complex Thinking Scale based on theoretical literature and previous studies. This scale includes three main domains. Each represents a kind of complex thinking:

creative, critical, and reflective. The scale has 36 degrees, 12 for each domain. Appendix (1) shows the degrees of the scale in relation to their respective domain.

Validity of the Complex Thinking Scale. The complex thinking scale proved to be valid in two ways:

A. Face Validity

The face validity of the study tool was verified by presenting it to ten arbitrators at Al-Balqa' Applied University. These arbitrators are specialized and well-experienced in educational and psychological sciences, measurement and evaluation and questionnaires. The tool won 80% approval, with a few modifications as per arbitrators' committee suggestions.

B. Discriminant Validity

The discriminant validity of the study tool was verified after application to a sample of 31 gifted 10 and 11 graders at the King Abdullah II Schools for Excellence in Irbid. The degrees of the scale were analyzed and the coefficient of discrimination of each degree, with the coefficient representing a sign of validity for each degree in the form of a correlation coefficient between each of the degrees and the total score on the one hand, between each degree and its relation to its specific domain, and between each domain and the total score as well. The information is detailed in the table (2):

Table (2) Coefficients between degrees of Complex Thinking Scale, overall degree, and domain.

Degree No.	Coefficient with domain	Coefficient with overall	Degree No.	Coefficient with domain	Coefficient with overall	Degree No.	Coefficient with domain	Coefficient with overall
1	.64(**)	.54(**)	13	.84(**)	.78(**)	25	.57(**)	.38
2	.69(**)	.62(**)	14	.72(**)	.64(**)	26	.47(**)	.45(*)
3	.64(**)	.49(**)	15	.38(*)	.36(*)	27	.61(**)	.52(**)
4	.61(**)	.43(*)	16	.48(**)	.45(*)	28	.70(**)	.62(**)
5	.77(**)	.57(**)	17	.69(**)	.66(**)	29	.39(*)	.39(*)
6	.65(**)	.61(**)	18	.36(*)	.37(*)	30	.59(**)	.64(**)
7	.67(**)	.67(**)	19	.77(**)	.77(**)	31	.37(*)	.40(*)
8	.81(**)	.66(**)	20	.57(**)	.35(*)	32	.63(**)	.39(*)
9	.55(**)	.54(**)	21	.83(**)	.75(**)	33	.53(**)	.40(*)
10	.37(*)	.40(*)	22	.72(**)	.64(**)	34	.74(**)	.87(**)
11	.40(*)	.44(*)	23	.85(**)	.80(**)	35	.62(**)	.72(**)
12	.51(**)	.46(**)	24	.52(**)	.45(*)	36	.62(**)	.50(**)

* Statistical significance at α = (0.05) level. ** Statistical significance at α = (0.01) level.

Table (2) shows that the correlation coefficients of the degrees with the tool as a whole ranged from 0.35 to 0.87 as well as with a range between 0.36 and 0.85. These were statistically significant at α = 0.05 level, which indicates that the scale degrees are characterized by high discriminant validity factors qualifying for application to the study sample. To investigate the extent to which the three domains (creative, critical, and reflective) are related to each other and to the total score of the scale, the Pearson correlation coefficients were calculated among them. Table (3) shows the results.

Table (3) correlation coefficients among complex thinking types and the total degree.

Domain	Creative Thinking	Critical Thinking	Reflective Thinking	Complex Thinking Scale
Creative Thinking	1			
Critical Thinking	.710(**)	1		
Reflective Thinking	.581(**)	.529(**)	1	
Complex Thinking Scale	.878(**)	.867(**)	.830(**)	1

**Statistical significance at (α= 0.01) level.

Table (3) shows that correlation coefficients between the domains of the Complex Thinking Scale and the total score were positive and statistically significant at the level of α = 0.01, indicating that these domains belong to one phenomenon, which is complex thinking. They all are also valid to measure this phenomenon.

Reliability of the Complex Thinking Scale

A. Test-Retest Reliability

The scale was applied to a pilot group (same previous group). Two weeks later, the same group took the test another time. The Pearson correlation coefficient was calculated between the two applications to determine the reliability of the scale, whose total coefficient was (0.83) as shown in Table (4).

B. Internal Consistency

By calculating Cronbach's α of the first test of the pilot group, the coefficient for the total score was (0.91). Table (4) shows these coefficients through test-retest reliability and internal consistency.

Table (4) Coefficients of the reliability of Complex Thinking Scale by test-retest reliability and internal consistency.

Domain	Test-retest reliability	Internal consistency (Cronbach's α)
Creative Thinking	0.80	0.81

Domain	Test-retest reliability	Internal consistency (Cronbach's α)
Critical Thinking	0.79	0.85
Reflective Thinking	0.74	0.78
Total Degree	0.83	0.91

It is clear from Table (4) that the reliability coefficients of the domains in the test-retest method ranged from 0.74 to 0.80 and in the internal consistency between 0.78 and 0.85. These reliability coefficients are high and acceptable for the purposes of the current study.

2- Learning Styles Scale

The Scale of Learning Styles prepared by Al-Abwaini (2008) has been used after verifying its validity and reliability. This scale follows the perspective of (Dunn & Dunn) on learning styles and classifies it into three styles: kinesthetic, visual and auditory learning. Al-Abwaini's Scale. The researcher has made some changes to the scale, where the linguistic formulations of some of the degrees were repeated, and a degree was deleted from the visual style so that the number of degrees goes from 11 to 10. Furthermore, a new degree is added to the auditory learning so that the number of degrees goes from 11 to 10 as well. Regarding the kinesthetic learning, the number of degrees remained the same.

Validity of the Learning Style Scale

1- Face Validity

The validity of the scale was verified by presenting it to ten arbitrators at the AL-Balqa' Applied University (BAU). These arbitrators are specialized and experienced in educational and psychological sciences, measurement and evaluation, questionnaires. They have approved the scale at a rate of over 80%, with some modifications proposed and made accordingly.

2- Discriminant Validity

The validity of the scale was verified after applying it to the same pilot sample used to validate the Complex Thinking Scale. The sample consisted of (31) gifted 10 and 11 graders at the King Abdullah II Schools for Excellence in Irbid. The coefficient of discrimination here represents a sign of validity for each degree in the form of correlation coefficient between each degree and the total score on the one hand, and between each degree and its relation to the domain to which it belongs as well as between each domain and degree, as shown in Table (5).

Table (5) Correlation coefficients between degrees of learning styles scale, total score, and its respective style.

Degree No.	Correlation coefficient with kinesthetic learning	Correlation coefficient with a tool	Degree No.	Correlation coefficient with auditory learning	Correlation coefficient with a tool	Degree No.	Correlation coefficient with visual learning	Correlation coefficient with a tool
1	.46(**)	.36(*)	11	.66(**)	.62(**)	21	.69(**)	.55(**)
2	.61(**)	.50(**)	12	.36(*)	.37(*)	22	.46(**)	.33(*)
3	.69(**)	.64(**)	13	.65(**)	.46(**)	23	.67(**)	.47(**)
4	.82(**)	.61(**)	14	.67(**)	.59(**)	24	.33(*)	.38(*)
5	.68(**)	.65(**)	15	.60(**)	.46(**)	25	.69(**)	.60(**)
6	.72(**)	.60(**)	16	.48(**)	.62(**)	26	.65(**)	.46(**)
7	.63(**)	.55(**)	17	.70(**)	.66(**)	27	.74(**)	.56(**)
8	.52(**)	.62(**)	18	.48(**)	.49(**)	28	.70(**)	.74(**)
9	.54(**)	.41(*)	19	.69(**)	.65(**)	29	.73(**)	.62(**)
10	.53(**)	.32(*)	20	.46(*)	.35(*)	30	.52(**)	.53(**)

* Statistical significance at (α= 0.05) level. **Statistical significance at (α= 0.01) level.

Table (5) shows that the correlation coefficients of the degrees with the tool as a whole ranged from 0.38 to 0.66 and with the range between 0.33 and 0.82, all of which were statistically significant at α = 0.05 level. The degree thus proved to be valid, qualifying for application to the study sample. Pearson correlation coefficients were computed to examine the learning styles relation to each other and the score of the scale and Table (6) shows the results.

Table (6) Correlation coefficients between the three learning styles and the total score.

	Kinesthetic domain	Auditory domain	Visual domain	Learning styles scale
Kinesthetic domain	1			
Auditory domain	.567(**)	1		
Visual domain	.540(**)	.755(**)	1	
Learning styles scale	.836(**)	.885(**)	.870(**)	1

**Statistical significance at (α= 0.01) level.

Table (6) shows that the correlation coefficients between the three learning styles and the total score of the scale were positive and statistically significant at the level of α = 0.01, indicating that these styles support the three learning styles and can be measured under the specified scale.

Reliability of Learning Styles Scale.

1- Test-Retest Reliability

The scale was applied to a pilot group (same previous group). Two weeks later, the same group took the test another time. The Pearson correlation coefficient was calculated between the two applications to determine the reliability of the scale, whose total coefficient was (0.82) as shown in Table (7).

2- Internal Consistency

By calculating Cronbach's α of the first test of the pilot group - the same sample used to measure the discriminant validity, the coefficient for the total score stood at (0.89). Table (7) shows these reliability coefficients for both test and retest reliability and internal consistency.

Table (7) Coefficient of the learning styles reliability scale using test-retest reliability as well as internal consistency.

Learning Style	Test and retest reliability	Internal consistency (Cronbach's α)
kinesthetic	0.77	0.81
Auditory	0.74	0.76
Visual	0.77	0.78
Total score	0.82	0.89

It is clear from Table (7) that the reliability coefficients of the styles in the test and retest reliability method ranged from 0.74 to 0.77 and in the internal consistency between 0.78 and 0.85. These reliability coefficients are high and acceptable for the purposes of the current study.

Study Variables

- **Intervening Variables**. Gender and grade (10 and 11 graders).
- **Study Variables**. All types of complex thinking (critical, creative and reflective) as well as styles of learning (auditory, visual and kinesthetic).

Statistical Processing. The following statistical methods were used to answer the questions of the study:

- Arithmetic averages and standard deviations were calculated.
- Pearson correlation coefficient was calculated.
- Calculation averages and standard deviations were calculated.
- The arithmetic averages, standard deviations, two-way ANOVA analysis, and two-way MANOVA analysis were calculated.

Study Results and Discussion

Results of the first question: What is the level of complex thinking among gifted secondary school students in King Abdullah II Schools for Excellence?

To answer this question, the arithmetic averages and standard deviations of complex thinking, and its three types were extracted for gifted secondary students in the King Abdullah II Schools for Excellence. Table (8) below illustrates this.

Table (8) Averages and standard deviation of complex thinking arranged orderly according to average.

Rank	Domain	Average	Std. deviation	Level
1	Critical thinking	3.77	.531	High
2	Reflective thinking	3.69	.597	High
3	Creative thinking	3.67	.587	High
	Total complex thinking scale	3.71	.483	High

Table (8) shows that the mathematical averages ranged between (3.67-3.77). All of them came at a high level. The domain of "critical thinking" ranked first with the highest average of (3.77), followed by the domain of "reflective thinking" (3.69), while the domain of "creative thinking" came in the last place with an average of (3.67). Meanwhile, the arithmetic average of the total score of the complex thinking scale reached (3.71), with a high level. The arithmetic averages and the standard deviations of the estimates of the study sample were calculated on the degrees of each domain separately, as follows:

First Domain - Creative Thinking

Table (9) Average and standard deviations for creative thinking domain organized according to average.

Rank	Degree No.	Degrees	Average	Std. deviation	Level
1	2	I understand the new obstacles I face	4.01	.908	High
2	7	I can offer varying views on a single subject	3.91	.927	High
2	11	I have a wide imagination that helps me draw images before speaking my mind	3.91	1.055	High
4	6	I can provide several opinions and thoughts on a specific topic	3.85	.904	High
5	12	I can deal with problems that require solutions I didn't come across before	3.77	.916	High

Rank	Degree No.	Degrees	Average	Std. deviation	Level
6	1	I make well-calculated risks to arrive at my desired outcome	3.76	1.075	High
7	9	I can develop familiar ideas into novel ones	3.61	1.039	Moderate
8	8	I can offer new ideas no one offered before	3.59	1.013	Moderate
9	3	I pose many unusual and unfamiliar questions	3.54	1.191	Moderate
10	10	I draw my thoughts in different images, such as mental maps	3.51	1.184	Moderate
11	4	I question some of the assumptions and beliefs that may seem logical to others	3.43	1.116	Moderate
12	5	I offer unfamiliar and unexpected answers	3.13	1.087	Moderate
Total creative thinking			3.67	.587	High

Table (9) shows that the averages range is (3.13 - 4.01). Degree (2), which states, "I understand the new obstacles I face," came in the first place with an average of (4.01), with a high average. Meanwhile, degree (5), which reads, "I offer unfamiliar and unexpected answers," came last with an average of (3.13), which was moderate. The mathematical average of creative thinking as a whole was 3.67, and its level was high.

Second Domain - Critical Thinking

Table (10) Average and standard deviations for critical thinking domain organized according to average.

Rank	Degree No.	Degrees	Average	Std. deviation	Level
1	17	I can absorb others' thoughts and distinguish negative from positive	4.09	.922	High
2	18	I can listen to others carefully and understand what they say	4.07	.869	High
3	13	I can analyze the situations that happen in my life	4.04	.982	High
4	14	I can discover other people's mistakes	3.92	1.021	High
5	23	I have strong arguments to judge my behaviors and others' behaviors	3.85	1.041	High
6	24	I rely on past and present facts to predict the future	3.84	1.025	High

Rank	Degree No.	Degrees	Average	Std. deviation	Level
7	19	I can know whether an idea is strong and impactful from its effects on the ground	3.77	.964	High
7	20	I support my judgment on others using Quranic evidence, poetry, and Arabic wisdom	3.77	1.095	High
7	21	I can understand others by knowing the most accurate of their details	3.77	1.001	High
10	22	I can distinguish all opinions accurately	3.69	.971	High
11	16	I can reason while thinking about many situations at once	3.66	1.055	High
12	15	I criticize others without understanding the situation	2.81	1.293	Moderate
Total critical thinking			3.77	.531	High

Table (10) shows that the mathematical averages range is (2.81 - 4.09). Degree (17) states, "I can absorb others' ideas and distinguish negative from positive". It came in the first place with an average of (4.09). However, degree (15), which reads, "I criticize others without understanding the situation" at the last rank with an average of (2.81), and the level was moderate. The arithmetic average of critical thinking as a whole was (3.77), and its level was high.

Third Domain - Reflective Thinking

Table (11) Average and standard deviations for reflective thinking domain organized according to average

Rank	Degree No.	Degrees	Average	Std. deviation	Level
1	26	I reflect on several past experiences that had an impact on me	4.18	.984	High
2	25	If I face a problem, I'd love to sit with myself to reflect on it	4.07	1.080	High
3	35	I keep thinking about my relationship with others and my feelings towards them	4.05	1.067	High
4	32	I like to watch programs with deep thoughts rather than entertainment programs	4.00	1.139	High

Rank	Degree No.	Degrees	Average	Std. deviation	Level
5	34	When faced with a problem, I reflect on all the possibilities to solve it	3.92	1.015	High
6	36	I think a lot before taking action	3.89	1.119	High
7	27	I'd rather not speak my mind regarding complicated issues	3.74	1.126	High
8	33	I contemplate the lives of deceased nations when I read their history	3.71	1.156	High
9	29	I avoid questioning values and traditions that should be reviewed	3.29	1.213	Moderate
10	28	I like to read philosophy books, and books with deep thoughts	3.24	1.382	
11	30	I spend a lot of time reading books, stories, and essays	3.15	1.339	Moderate
12	31	I avoid getting into social and political arguments with others	3.07	1.365	Moderate
Total reflective thinking			3.69	.597	High

Degree (26), which states that "I reflect on several past experiences that had an impact on me" in the first place with an average of (4.18), and the level was high. Nevertheless, degree (31), which reads: "I avoid getting into social and political arguments with others" at the last rank with an average of (3.07), and its level was moderate. The mathematical average of the reflective thinking as a whole was 3.69, and its level was high.

Results of the second question: What are the preferred learning styles for gifted secondary school students in King Abdullah II Schools for Excellence?

To answer this question, the arithmetic averages and standard deviations of the preferred learning styles of gifted secondary students in the King Abdullah II Schools for Excellence were extracted. The table below illustrates this.

Table (12) Averages and standard deviation of preferred learning styles for gifted secondary school students at King Abdullah II Schools for Excellence, arranged orderly according to average

Rank	Domain No.	Domain	Average	Std. deviation	Level
1	3	Visual learning	3.84	.635	High
2	1	Kinesthetic learning	3.81	.608	High

Rank	Domain No.	Domain	Average	Std. deviation	Level
3	2	Auditory learning	3.65	.640	Moderate
Total Learning Styles Scale			3.76	.520	High

Table (12) shows that the arithmetic averages ranged from 3.65 to 3.84. The visual domain came first with the highest mean (3.84) and a high level, followed by the kinesthetic domain at (3.81) and a high level as well. Meanwhile, the auditory domain came in the last place with an average of (3.65). The arithmetic average of the total score of the scale of learning styles stood at (3.76). The arithmetic averages and the standard deviations of the estimates of the study sample were calculated separately for each domain, as follows:

First Domain - Kinesthetic Learning

Table (13) Averages and standard deviation of kinesthetic learning degrees arranged orderly to average.

Rank	Degree No.	Degrees	Average	Std. deviation	Level
1	3	I prefer practical classes rather than theoretical lessons	4.27	.951	High
2	1	I like to do activities rather than talk about them	4.26	.867	High
3	5	I learn better when I practice activities rather than watch my teacher	4.15	1.046	High
4	4	I prefer handwork, installation and making things	3.89	1.148	High
5	2	I can't remain quiet for a long time without moving	3.85	1.118	High
6	6	When I do activities with colleagues, I understand better	3.74	1.110	High
7	9	Moving while studying makes me memorize things well	3.65	1.146	Moderate
8	7	I like to move my hands and use body language while reading to suit the situation	3.61	1.159	Moderate
9	8	I use my fingers to point to words that I learned	3.43	1.357	Moderate
10	10	I like to memorize things while walking	3.22	1.467	Moderate
		Total kinesthetic learning domain	3.81	.608	High

Table (13) shows that the mathematical averages ranged from (3.22 - 4.27). Degree No. (3), which states, "I prefer practical classes rather than theoretical lessons", came first with an average of 4.27.

Meanwhile, degree No. (10), which reads: "I like to memorize things while walking" at the last rank with an average of (3.22). The overall arithmetic means for the whole domain reached (3.81) and was high.

Second Domain - Auditory Learning

Table (14): Averages and standard deviation of auditory learning degrees according to average.

Rank	No.	Degrees	Average	Std. deviation	Level
1	12	I prefer to listen to stories rather than read them	3.94	1.190	High
2	20	I pay attention to classes whose teachers have attractive voices than attractive appearances or movements	3.79	1.048	High
3	18	I prefer to attend classes that allow me to talk rather than move or just sit and watch	3.76	1.035	High
4	13	I prefer to receive new information by verbal means	3.75	1.104	High
5	14	I like to read aloud to understand the material at hand	3.72	1.223	High
6	11	I prefer to memorize things while reading aloud	3.71	1.373	High
7	17	I can memorize teachers' explanations well	3.66	1.032	Moderate
8	19	I pay more attention to presentation accompanied by sound rather than pictures or movement	3.66	1.072	Moderate
9	15	I can listen to more than one conversation at once	3.41	1.216	Moderate
10	16	I prefer oral tests to written ones	3.08	1.349	Moderate
		Total auditory learning domain	3.65	.640	Moderate

Table (14) shows that the mathematical averages ranged from 3.08 to 3.94. Degree no. (12), which states, "I prefer to listen to stories rather than read them, came in the first with an average of 3.94. On the other hand, a degree no. (16), which reads, "I prefer oral tests to written ones" at the last rank with an average of (3.08). The arithmetic means for the whole domain stood at (3.65), and was moderate.

Third Domain - Visual Learning

Table (15): Averages and standard deviation of visual learning degrees according to average

Rank	Degree No.	Degrees	Average	Std. deviation	Level
1	28	I like visual communication for a better understanding	4.01	.952	High
2	23	I prefer to learn a new skill by watching rather than by listening	3.99	.978	High

Rank	Degree No.	Degrees	Average	Std. deviation	Level
3	27	I prefer teachers' illustrations, drawings and maps to talk	3.92	.958	High
4	24	I can distinguish between very similar things when I see them	3.91	.935	High
5	25	I prefer to use drawing, shapes, and charts to help me understand	3.90	1.009	High
6	26	I prefer charts rather than digital tables when understanding information	3.77	1.073	High
6	29	I prefer to understand lessons on videotapes	3.77	1.153	High
8	22	I prefer classes whose teachers have elegant appearance rather than movement or voice.	3.71	1.124	High
8	30	I mark important information using colors	3.71	1.313	High
10	21	I focus on presentations accompanied by pictures, not sounds or movements	3.70	1.007	High
		Total visual learning domain	3.84	.635	High

Table (15) shows that the mathematical averages range is (3.70 - 4.01). Degree no. (28), which states, "I like visual communication for a better understanding" came in the first place with an average of (4.01). However, a degree no. (21), which states, "I focus on presentations accompanied by pictures, not sounds or movements" at the last rank and with an average of (3.70). The overall arithmetic mean for the whole domain stood at (3.84), and was high.

Results of the third question: Is there a statistically significant correlative relationship at the level of significance (α = 0.05) between complex thinking and the preferred learning styles among gifted secondary school students in King Abdullah II Schools for Excellence?

To answer this question, the Pearson correlation coefficient was extracted between complex thinking and the preferred learning styles among gifted secondary school students in the King Abdullah II Schools for Excellence, as Table (16) shows.

Table (16): Pearson coefficient for the relationship between complex thinking and preferred learning styles among gifted secondary students in King Abdullah II Schools for Excellence.

Learning Style Thinking	Statistical	Kinesthetic learning	Auditory learning	Visual learning	Learning styles scale
Creative thinking	Correlation coefficient R	.250**	.399**	.311**	.388(**)
	Statistical significance	.000	.000	.000	.000
	The number	213	213	213	213
Critical thinking	Correlation coefficient R	.401**	.506**	.431**	.540(**)
	Statistical significance	.000	.000	.000	.000
	The number	213	213	213	213
Reflective thinking	Correlation coefficient R	.492**	.527**	.453**	.593(**)
	Statistical significance	.000	.000	.000	.000
	The number	213	213	213	213
Complex thinking scale	Correlation coefficient R	.451(**)	.564(**)	.471(**)	.599(**)
	Statistical significance	.000	.000	.000	.000
	The number	213	213	213	213

** Statistically significant at (0.01) level.

Table (16) shows positive correlation and statistical significance at (α = 0.01) level between the complex thinking and its three domains (creative, critical, and reflective) on the one hand, and the three preferred styles of learning (kinesthetic, auditory, visual) among gifted secondary school in King Abdullah II Schools for Excellence.

Results of the fourth question: Do gender, grade, and the interplay between them affect the degree of complex thinking for gifted secondary school students in King Abdullah II Schools for Excellence?

To answer this question, the arithmetic averages and standard deviations of complex thinking among gifted secondary school students in King Abdullah II Schools for Excellence were extracted in terms of sex and grade, as the table below illustrates.

Table (17): Averages and standard deviation of complex thinking for gifted secondary school students at King Abdullah II Schools for Excellence, arranged orderly according to sex and grade

Domain	Grade	Male			Female			Total		
		Average	Std. deviation	No.	Average	Std. deviation	No.	Average	Std. deviation	No.
Creative Thinking	10	3.79	.484	52	3.59	.625	50	3.69	.564	102
	11	3.59	.556	76	3.77	.706	35	3.64	.610	111
	Total	3.67	.535	128	3.66	.661	85	3.67	.587	213
Critical Thinking	10	3.91	.502	52	3.82	.466	50	3.86	.485	102
	11	3.65	.561	76	3.78	.556	35	3.69	.560	111
	Total	3.75	.551	128	3.80	.502	85	3.77	.531	213
Reflective Thinking	10	3.83	.549	52	3.78	.525	50	3.81	.536	102
	11	3.56	.622	76	3.63	.658	35	3.58	.631	111
	Total	3.67	.606	128	3.72	.584	85	3.69	.597	213
Complex Thinking Scale	10	3.85	.437	52	3.73	.474	50	3.79	.457	102
	11	3.60	.467	76	3.73	.553	35	3.64	.497	111
	Total	3.70	.469	128	3.73	.505	85	3.71	.483	213

Table (17) shows an apparent variance in the arithmetic averages and standard deviations of complex thinking among gifted secondary school students in King Abdullah II Schools for Excellence due to differences in gender and grade. To illustrate the significance of statistical differences between arithmetic averages, Table (18) illustrates the use of the Two-Way MANOVA analysis and two-way ANOVA analysis for the total score in Table (19).

Table (18) Two-Way MANOVA analysis of the effect of gender, grade and interaction on sub-skills of complex thinking scale among gifted secondary students in King Abdullah II Schools for Excellence.

Source	Skills	Sum of Squares	df	Mean Square	F	Sig.
Sex	Creative thinking	.007	1	.007	.021	.886
Hotelling=.001	Critical thinking	.021	1	.021	.076	.783
H=.970	Reflective thinking	.001	1	.001	.002	.965
Grade	Creative thinking	.008	1	.008	.025	.875
Hotelling=.047	Critical thinking	1.075	1	1.075	3.902	.050*
H=.023	Reflective thinking	2.179	1	2.179	6.268	.013*
Sex × Grade	Creative thinking	1.779	1	1.779	5.220	.023*

Source	Skills	Sum of Squares	df	Mean Square	F	Sig.
Wilkes=.974	Critical thinking	.663	1	.663	2.406	.122
H=.142	Reflective thinking	.179	1	.179	.516	.473
Error	Creative thinking	71.229	209	.341		
	Critical thinking	57.572	209	.275		
	Reflective thinking	72.653	209	.348		
Total	Creative thinking	73.146	212			
	Critical thinking	59.852	212			
	Reflective thinking	75.461	212			

*Statistically significant at ($\alpha = 0.05$) level.

Table (18) shows the following:

- There were no statistically significant differences at the level of ($\alpha = 0.05$) due to the effect of sex in all domains of complex thinking.
- There were statistically significant differences at the level of ($\alpha = 0.05$) attributed to the impact of the grade in the domains of critical and reflective thinking and the differences in favor of the 10 graders.
- There were no statistically significant differences at the level of ($\alpha = 0.05$) attributed to the effect of the interaction between sex and grade in all domains of complex thinking except for the domain of creative thinking.

Table (19) Two-Way MANOVA analysis of the effect of gender, grade and interaction on the total score of complex thinking scale among gifted secondary students in King Abdullah II Schools for Excellence.

Source	Sum of Squares	df	Mean of Squares	F	Sig.
Sex	.001	1	.001	.004	.952
Grade	.754	1	.754	3.314	.070
Sex × Grade	.735	1	.735	3.230	.074
Error	47.541	209	.227		
Total	49.440	212			

Table (19) shows the following:

- There were no statistically significant differences at ($\alpha = 0.05$) level due to the effect of sex and grade and the interaction between them on complex thinking.

Results of the fifth question: Are the preferred learning styles of gifted secondary school students in King Abdullah II Schools for Excellence affected by gender, grade, and the interplay between the two?

To answer this question, the arithmetic averages and standard deviations of the preferred learning styles of gifted secondary school students in the King Abdullah II Schools for Excellence were extracted by gender and grade, as shown in Table (20).

Table (20) Averages and standard deviation of preferred learning styles for gifted secondary school students at King Abdullah II Schools for Excellence, arranged orderly according to sex and grade

Learning Styles	Grade	Male			Female			Total		
		Average	Std. Deviation	No.	Average	Std. Deviation	No.	Average	Std. Deviation	No.
Kinesthetic Learning	10	3.72	.591	52	3.99	.567	50	3.85	.592	102
	11	3.76	.571	76	3.78	.730	35	3.76	.622	111
	Total	3.74	.577	128	3.90	.644	85	3.81	.608	213
Auditory Learning	10	3.69	.664	52	3.71	.652	50	3.70	.655	102
	11	3.63	.583	76	3.55	.713	35	3.60	.625	111
	Total	3.65	.615	128	3.64	.678	85	3.65	.640	213
Visual Learning	10	3.88	.646	52	4.02	.562	50	3.95	.608	102
	11	3.69	.616	76	3.84	.705	35	3.74	.646	111
	Total	3.77	.633	128	3.94	.628	85	3.84	.635	213
Total Score of Learning Styles Scale	10	3.76	.521	52	3.91	.494	50	3.83	.511	102
	11	3.69	.492	76	3.72	.591	35	3.70	.522	111
	Total	3.72	.503	128	3.83	.540	85	3.76	.520	213

Table (20) shows an apparent variation in the arithmetic averages and standard deviations of the preferred learning methods of gifted secondary school students in the King Abdullah II Schools for Excellence due to the different categories of sex and grade variables. To illustrate the significance of statistical differences between arithmetic averages, Table (21) illustrates the use of the Two-Way MANOVA analysis, in addition to the two-way ANOVA analysis for the total score in Table (22).

Table (21) Two-Way MANOVA analysis of the effect of gender, grade and interaction on domains of preferred learning styles scale among gifted secondary students in King Abdullah II Schools for Excellence

Source	Domains	Sum of Squares	df	Mean of Squares	F	Sig.
Sex	Kinesthetic Learning	1.035	1	1.035	2.841	.093
Hotelling=.036	Auditory Learning	.047	1	.047	.113	.737
H=.062	Visual Learning	1.030	1	1.030	2.620	.107
Grade	Kinesthetic Learning	.389	1	.389	1.068	.303
Hotelling=.021	Auditory Learning	.588	1	.588	1.428	.233
H=.233	Visual Learning	1.711	1	1.711	4.352	.038*
Sex × Grade	Kinesthetic Learning	.761	1	.761	2.091	.150
Wilkes=.987	Auditory Learning	.115	1	.115	.280	.597
H=.421	Visual Learning	.001	1	.001	.001	.971
Error	Kinesthetic Learning	76.120	209	.364		
	Auditory Learning	86.121	209	.412		
	Visual Learning	82.180	209	.393		
Total	Kinesthetic Learning	78.402	212			
	Auditory Learning	86.752	212			
	Visual Learning	85.600	212			

Table (21) shows:

- There were no statistically significant differences at (α = 0.05) level due to sex in the three learning styles (kinesthetic, auditory, and visual).
- There were no statistically significant differences at the level of (α = 0.05) due to grade on learning styles, except for visual learning, where the differences were in favor of 10 graders.
- There were no statistically significant differences at (α = 0.05) level due to the interaction between sex and grade in the three learning styles: (kinesthetic, auditory, and visual).
- The analysis of the Two-Way MANOVA analysis of the effect of sex and grade and the interaction between them was conducted on the total score of the preferred learning styles, as illustrated in Table (22).

Table (22) Two-Way MANOVA analysis of the effect of gender, grade and interaction on the total score of preferred learning styles scale among gifted secondary students in King Abdullah II Schools for Excellence

Source	Sum of Squares	df	Mean of Squares	F	Sig.
Sex	.366	1	.366	1.372	.243
Grade	.809	1	.809	3.031	.083
Sex × Grade	.157	1	.157	.588	.444
Error	55.803	209	.267		
Total	57.269	212			

Table (22) shows the following:

- There were no statistically significant differences at ($\alpha = 0.05$) level in the total score of learning styles due to sex, grade or the interaction between them.

Recommendations

In the light of previous findings, this study concluded the following recommendations:

1- It is of paramount importance to diversify the teaching methods so as to take into account the three styles of learning: visual, kinesthetic and auditory, in addition to focusing on visual and movement activities during classes that require complex thinking.

2- Teachers should use different types of complex thinking while teaching students, especially on scientific materials.

3- There is a pressing need to focus on activities that help develop students' complex thinking and learning styles.

4- Officials in the Ministry of Education should encourage teachers and instructors to use complex thinking types and styles of learning through programs designed by the ministry for this purpose.

Professional, Legal and Ethical Issues

- **Honesty:** the researcher has been committed to honesty that is recommended by scientific forums. The researcher presented the research data, methods, procedures and results in an honest manner. The researcher has been careful to avoid any falsifications or data misrepresentation.
- **Objectivity:** the researcher has avoided bias in all stages of researcher i.e. design, data analysis, experiments, and reviews. The researcher has avoided any personal/financial interests that would influence the researcher.

- **Integrity:** the researcher has ensured following all the procedures detailed in the research plan during the research implementation stage.
- **Carefulness:** the researcher strived to ensure the correctness of procedures made as well as the data. In additions, all research activities have been recorded, monitored and documented carefully in the final draft of research.
- **Openness:** the researcher has accepted ideas and corrections from the supervisors and peers.
- **Respect for Intellectual Property:** the researcher took into account the honor of patents, intellectual property, and copyrights. In addition, the research did not cite any unpublished study, data, results or methods without permission. Besides, the researcher acknowledged and credited all contributions to the research to avoid plagiarism.
- **Professionalism and Competency:** the researcher has been committed to improve his own professional competency and extend his expertise through ongoing learning before, during and after research implementation.
- **Legality:** the researcher abided by all relevant laws and fulfilled all policies set by government or institutions.

Prospective Studies

In the light of the results of study, the researchers recommends potential researchers to investigate the following topics:

- The different learning styles.
- activities that help develop students' complex thinking and learning styles.
- Utilization of complex thinking in other study contexts.

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التفكير المركب وعلاقته بأساليب التعلم المفضلة لدى طلبة المرحلة الثانوية الموهوبين في مدارس الملك عبد الله الثاني للتميز في ضوء بعض المتغيرات

الملخص: هدفت هذه الدراسة إلى التعرف على التفكير المركب وعلاقته بأساليب التعلم المفضلة لدى طلبة المرحلة الثانوية في مدارس الملك عبدالله الثاني للتميز في مدينتي السلط والزرقاء في العام 2014/2013م في ضوء متغيري الجنس والصف الدراسي، وقد بلغ أفراد الدراسة (213) طالباً وطالبة، وتم تطوير مقياس التفكير المركب واستخدامه، حيث شمل ثلاثة مجالات رئيسة هي: التفكير الناقد، والإبداعي، والتأملي، كما تم تطبيق مقياس أساليب التعلم المفضلة الذي طورته العبويني (2008) بعد التحقق من صدقه وثباته، ويشمل ثلاثة أساليب هي: النمط الحركي، والبصري، والسمعي. وقد أظهرت نتائج الدراسة أن مستويات التفكير المركب ومجالاته لدى الطلبة الموهوبين جاءت مرتفعة، وحصل مجال التفكير الناقد على المرتبة الأولى، ثم مجال التفكير التأملي، وأخيراً مجال التفكير الإبداعي، كما أشارت النتائج إلى أن أكثر الأساليب التعلمية تفضيلاً لدى العينة كان المجال البصري، ثم المجال الحركي اللذين جاءا بمستوى مرتفع، وأخيراً المجال السمعي الذي جاء بمستوى متوسط، وأخيراً أوصت الدراسة بضرورة تنويع طرق التدريس بحيث تراعي أساليب التعلم الثلاثة البصرية والحركية والسمعية، بالإضافة إلى التركيز على الأنشطة البصرية والحركية أثناء تعليم المهمات التي تتطلب تفكيرا مركبا.

الكلمات المفتاحية: التفكير المعقد، أساليب التعلم، الطلاب الموهوبين، المرحلة الثانوية، التميز.