

The Effect of the Hot Seat Strategy on the Achievement and Emotional Intelligence Development of Second-Graders' in Science

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This research aims to know the effect of the hot seat's strategy on the achievement and emotional intelligence development of second-grade middle school students in science. To achieve the goal of the research, two hypotheses were established, and the research was limited to the second intermediate class students in the Nineveh Governorate centre for the first semester of the year (2019-2020). The first hypothesis was experimental and was studied according to the strategy of the hot seat and the other was studied according to the usual method. The equivalence process was conducted for the two research groups in; the students' age in months, the degree of science subject in the first grade, the average educational level for the parents of students, the educational level of student's mothers and the pre-test level of emotional intelligence. Achieving the goal of the research requires the presence of two tools, one for the researcher to measure the achievement of the middle and second grade students, and the other used is a measure of emotional intelligence consisting of forty (40) paragraphs. Hoping for the difficulty and the differential strength, the researcher also extracted the coefficient of achievement test achievement using the Kuder-Richardson equation twenty (20), as it reached stability (0.81), while the coefficient of the measure of emotional intelligence reached (0.84) and after statistical data processing using the T-test for two independent samples. The results show that the experimental group outperformed the control in achievement and emotional intelligence.

Key words: *Strategic Effect, Emotional smartness, Knowledge, Stability.*



Introduction

Research Problem

From the outset, the researcher noticed there are global and local trends towards adopting modern education paradigms that makes the individual learner a focus of the educational process. There is also the comprehensiveness of the goals of teaching science in their cognitive, skill and sentimental aspects, and from this students have achieved the integrated growth of their personality and their preparation for the changes of the scientific and technological revolution, plus the ability to absorb and adapt. This is why many educational strategies and educational models have appeared, among which is the hot seat strategy, which has become common in most advanced educational systems.

Thus, the Research Problem Can Be Formulated with the Following Question

What is the effect of using the hot seat strategy on the achievement of the middle second-grade students and on developing their emotional intelligence?

Research Importance

The current era is witnessing a knowledge explosion and astonishing technological progress that has led to the division of science and multidisciplinary specialties, which has left its mark on all aspects and areas of life, and this is accompanied by an increase in the amount of knowledge and information available. It has become difficult for curricula at all different educational stages to include all of these enormous cognitive developments, and in addition there is the emergence of many problems facing individuals in their daily lives, which require changing the philosophy and objectives of education from traditional education based on the teacher and the teacher's efficiency only, and from a negative learner who receives only what the teacher provides, to active learning centred on the learner (Qarni, 2017, p. 27).

Therefore, the need for active learning has emerged as a result of several factors, perhaps the most prominent of which is the confusion that learners complain of after each educational situation, which can be interpreted as the result of the lack of real integration of new information in their minds after each traditional educational activity (Asaad, 2019, p. 15).

Active learning is an educational philosophy that focuses on learning processes more than on learning outcomes, and emphasises the positive of the learner in the educational situation, through the student's practice of many individual and group activities that have active learning elements, namely listening, speaking, reading, writing and meditation. Active learning includes all educational practices and teaching procedures that aim to activate the learner's role and maximise it through work, research and experimentation, relying on one's self in obtaining information, acquiring skills and creating values and trends; the learner, according to the philosophy of active learning, does not depend on memorisation and indoctrination, but rather on the work of thinking, ability and the skills of problem solving, in addition to teamwork and cooperative learning (Qarni, 2017, p. 27).



The interest in active learning as a curriculum or course doubled, which includes many teaching methods that are based on an educational environment rich in experiences and that allows the learner to actively engage in education and participate in taking responsibility for his or her learning (except for the development of educational strategies that help students learn, think and understand knowledge), together with interacting and cooperating with others (Awwad and Zamil, 2010, p. 22). One of the strategies for active learning is the hot seat strategy. The idea of this strategy is based on submitting questions from students to another student or teacher, so that the axis of the questions is a specific topic for students. This strategy is one of the effective ways for a teacher to establish certain values and beliefs among students and it develops several skills such as reading, building questions and exchanging ideas. This technique is also preferred when the teacher wants to detail a specific topic or concepts (Shawaheen, 2019, p. 45).

The hot seat strategy is an interactive strategy in which students practice speaking and listening activities, as each student gets a session to sit in the hot seat in front of other students in the classroom while other students ask questions, and the role of the teacher is to guide students by giving them directions to focus on their questions. By means of these the strategy enables students to create many varied questions and the teacher only corrects the grammar of students' questions (Young, 2008: p2).

It can be said that academic achievement plays a major role in shaping and defining the learning process, but it is not the only variable in the learning process, as the goal of this process is affected by various factors and forces, some of which relate to the learner – abilities, preparations, moods and health qualities – some of which are related to the learned experience, the method of learning it and what surrounds that learning. The individual has the capabilities; the ability to understand others is an important human ability because the individual spends most of his or her life between other people, so therefore the individual must have the ability for social interaction in his or her relationships with others, a sensitivity to what others think and feel and the ability to diagnose difficulties in interpersonal relationships, and these are generally the main talents in interpersonal relationships (Abu Amsa, 2013, p.2). Attention to the emotional side of intelligence began with the American psychologist, Goleman. The concept of emotional intelligence as per Goleman refers to the ability to recognise self-feelings and the feelings of others, and the ability to stimulate oneself and manage emotions and positive relationships with others (Abdullah and Al-Aqad. 2009, p. 8).

The concept of intelligence in general is related to creating opportunities and experiences that are available in the environment surrounding the individual, especially in the field of home and school, as this enhances the strength inherent in the brain in dealing with different situations in a distinctive and positive manner (Solomon, 2010, p. 11).

From these preceding ideas, the importance of the current research is reflected in the following:



1. Adopting the strategy of the hot seat in science, in order to increase the achievement of the learner.
2. The importance of teaching science, its methods, methods and strategies.
3. The research highlights the importance of emotional intelligence because of its close relationship with the individual's success in life.

Research Objective

The current research aims to identify the use of the hot seat strategy in achieving the average in second grade students and on developing their emotional intelligence.

Research Hypotheses

1. There is no statistically significant difference between the average score of the experimental group that is taught according to the hot-seat strategy and the average score of the control group that is taught according to the usual method of achieving the average score among second grade students in the science subject.
2. There is no statistically significant difference between the mean scores of the experimental group that are taught according to the hot-seat strategy and the average of the controlling group scores, which are taught according to the usual method of developing emotional intelligence, among students of the second grade average in Science.

Research Limits

The current research was limited to:

1. Middle intermediate second-grade students in Mosul for the 19-20 academic year.
2. The first semester of the academic year 19-20.
3. Chapters V, VI and VII of the text book that is scheduled for Science for the second intermediate grade, first edition 2017

Specify Requirements

First: The Hot Seat Strategy Known to Each of (Attia: 2016)

It is a strategy adopted in teaching most of the subjects and academic subjects in cases where it is intended to create convictions or establish certain values and develop the ability to manage discussion, formulate questions and build evidence, or when detailing on a specific topic and to explore the ideas of others about it, as well as developing reading skills and deriving what is behind read lines and discussion of the author or the content of the topic. (Atiyah, 2016 p. 388).

Second :Achievement was Defined by Hourani (2011), States that

The student's progress in achieving the goals of the studied educational subject, which is measured by his score obtained in the achievement test "(Hourani, 2011, p. 27).

The Researcher Defines the Achievement in Practice: The ability of the intermediate second-grade student to define scientific concepts and mention their characteristics, as well as to explain scientific reasons and explain them and link them to their events and causes and then benefit from them in new situations. This ability is measured by the degree obtained by the response to the achievement test paragraphs prepared by the researcher.

Third: Emotional Intelligence: Known to Everyone Bar-On (Bar-On, 1996).

A set of non-cognitive abilities, competencies, and skills that affect an individual's ability to succeed and coexist with the requirements and pressures of life (Al-Qadi, 2012, p. 38).

Theoretical Background and Previous Studies

First :Theoretical Background

Hot Seat Strategy

The hot seat strategy is one of the applications of active learning, the trend that calls for the learner to be an effective participant in the learning process and stressing the student's positivity. The hot seat strategy gives a distinct role to the student in the learning process to the extent which enables leading the learning process in some situations, in addition to its role in enhancing student self-confidence, and ability to lead the axes of discussion and to ask questions and think about their answers, as well as for that role in developing the skills of discussion and dialogue and to defend opinions or see others' ideas (Le Si, 2017, p. 41).

Hot Seat Skills

- Cognitive development.
- Develop the skill of asking questions.
- Develop the skill of exchanging ideas.
- Develop the skill of communicating with others.

The Goals of the Hot Seat

- Provide opportunities for students to formulate and direct questions.
- Develop their skills in re-reading, reviewing the text and preparing for an analytical article, as well as their skill in narration and analysis.
- Developing a spirit of cooperation among students in formulating questions.
- Encouraging students to play roles in an interactive way.



- Encouraging students to practice activities that take into account the individual differences between them and develop their creative thinking. (Al-Sindhi ,2015 ,p.734)

Hot Seat Steps

1. The position of the seats or the chair in the classroom is moved into a circle and the hot seat (chair) (is placed in the centre of the circle.
2. The teacher requests a student volunteer with a specific subject, content or skill to sit in the hot seat.
3. Students ask questions and the student in the hot seat answers questions from students .Preferably, the questions are not requiring answers with one word, but rather are multiple-answer questions) or open questions .Also, the teacher can sit in the hot seat in order to encourage students to form questions and encourage them to open questions (Muhammad and Naji ,2018 , p.(178).

Methods of Implementing the Hot Seat Strategy

This strategy is implemented in several ways as follows:

The Student's Hot Seat

1. The teacher asks a volunteer student who has a specific subject, content or skill to sit in the hot seat.
2. The chair is in the middle and the rest of the students surround it.
3. The student answers the students' questions.
4. The questions must be answered with one word.

The Teacher's Hot Seat

1. The teacher sits in the hot seat to encourage students to formulate questions.
2. In the same way, the teacher is in the middle.
3. The teacher answers students' questions.
4. The teacher encourages students to form open questions (Al-Shaari ,2017 ,p.(38) .

The Hot Seat in the Group System

1. The teacher divides the students into small groups (5-6) students after they read the lesson or divides the lesson into paragraphs so that each student is concerned with a specific paragraph.



2. A volunteer student from each group first sits on the hot seat in the middle and the rest of the class surrounds him.
3. The class ask the student in the hot seat open questions either about the lesson or the paragraph that belongs to the one sitting on the hot seat.
4. They exchange roles with each other after encouragement from the teacher.
5. The teacher monitors and directs them (Shawahin, 2019, p. 46).

The Rules Governing the Hot Seat Strategy

- When the students sit in the hot seat, he or she tells the teacher that they will ask at least three questions and the students is entitled to answer or pass, after which the student moves and a teacher.
- Always use open questions after giving an introduction (Abdul Karim, 2016, p.14).

Second :Emotional Intelligence

The term emotional intelligence entered modern terminology in 1989; emotional intelligence first entered the hands of Americans (John Mayer and Peter Salovey), thanks to the clarification of its meaning to the world by Daniel Golman in his book *Emotional Intelligence* (Al-Mawla, 2012, p. 33). Many names have been given to this concept, some call it emotional intelligence, others call it emotional intelligence, and the third team calls emotional intelligence, and the fourth group calls are the poet's intelligence, and that these designations have the closest meaning to what is called in language and yet we speak (emotional intelligence) Al-Kaabi, 2011, p. 23).

Illustrative Examples of Emotional Intelligence

The Peter Salovey Model and John Mayer 1990

Peter Salovey gave the the nature of intelligence, and defined emotional intelligence as a set of capabilities whereby: a person knows their emotions or feelings, and manages these feelings or emotions, and drives them him or herself, and this means that the person is the source of motivation for his or herself and recognises feelings and others, and manages relationships with others (Abdullah, 2010, p. 10).

The Goleman Model 1995

Goleman identified the components of emotional intelligence in five dimensions:

1. Self-awareness: the basis of self-confidence in the individual's need to know the strengths and weaknesses that this knowledge has taken, as the basis for his or her decisions.



2. Treating emotional aspects: the individual knows how to deal with feelings that hurt and annoy them, and this treatment is the basis of emotional intelligence.
3. Mental sympathy (understanding): reading the feelings of others in their voice or facial expressions, and not necessarily from what they say, knowing that the feelings of others is a basic human ability, and it is the individual who does not encourage human cruelty; this preserves human civilisation.
4. Motivation: progress and the pursuit of motivation is the fourth dimension of emotional intelligence, and through it the individual has the ability to know the steps that work towards achieving his or her goals, and he or she has the perseverance and enthusiasm for success.
5. Social skills: one of the basic skills in life that individuals must learn is the skill in the art of relationships, how to deal properly with others, and how to calm oneself at a time of rage (Kiki, 2011, p. 8-9).

The name Yc Bar and Aven

Bar identification - the universe of components of emotional intelligence in five dimensions:

1. Internal personal components: a group of non-cognitive competencies or a group of abilities that help the individual to deal with him or herself successfully.
2. Components of personal relationships: a group of social competencies that help the individual to establish successful relationships and have a positive impact on others.
3. Adaptive components: a group of unidentified competencies that help an individual to successfully adapt to real life and the requirements of the environment.
4. Stress Management Components: a set of competencies that help an individual manage stress, pulse resistance and self-control.
5. General mood components: a group of competencies that help one to recognise and change one's mood. (Al-Hamdani, 2013, p. 51).

Emotional Characteristics and Features

1. They have high adaptability and pressure management.
2. They have a low degree of depression and anxiety.
3. They are more flexible, open and reckless towards others.
4. They have a great sense of social responsibility.
5. They have the ability to self-control and the appropriate expression of feelings.
6. They have the ability to solve problems calmly.
7. They have the potential for optimism and self-awareness.
8. They have the ability to plan, set goals and persevere in doing business.
9. They have an emotional balance in their lives.

10. They have a great deal of focus and reflection (Al-Qadi, 2012, p. 49).

First: Studies That Deal with the Hot Seat Strategy in Science

The above study aimed to reveal the effectiveness of using the hot seat strategy in collecting scientific concepts for the development of the love of scientific survey. The study was conducted in Iraq, where a research sample was formed for (44) students from one generation at Al-Ahlia School and distributed to the experimental groups. Naturally, the researchers used the test of achievement of component (30) items of optional type R doubling, after the investigation of charity and perseverance from researchers on a scientific scale consisting of (20) items, whose validity was also verified and proven. The results show the superiority of the experimental group using the hot seat strategy over the control group, using the usual method (Muhammad and Naji 0.2018, p. 171).

Al-Anzi and Al-Jarjri Study (2019)

The above study aimed to identify the effect of the hot seat strategy on developing numerical sense skills and on motivating academic achievement for fifth-grade primary students in mathematics. This study was conducted in Mosul, where the study sample consisted of (64) students who were randomly distributed between two experimental groups, the first of which were studied using the hot seat strategy, and the second group studied in the usual way. The researcher prepared two tools. The first is a test of numerical sense skills that consists of (30) paragraphs and the second is a measure of motivation for academic achievement and consists of (38) paragraphs. The study results show the superiority of the experimental group that was studied using a set of hot-shaped armpit strategies on the chair using the usual method (Anzi Jerjeri 0.2019, p. 13).

Second: Studies that Dealt with Emotional Intelligence Al-Hamdani Study (2013)

This study aimed to know the effect of the mutual teaching strategy on the achievement of second grade students in Islamic education, and the development of emotional intelligence for them. This study was conducted in Mosul, where the study sample consisted of (60) students who were randomly distributed between two experimental groups, the first was studied using the mutual teaching strategy, and the recipients were studied, and the second in the usual way. The researcher prepared two sections, one of which is an achievement test and the other is a scale for measuring emotional intelligence, which consists of (40) subjects. Results were shown using test. The experimental group that was studied using the mutual teaching strategy outperformed the control group that studied in the usual way (Al-Hamdani, 2013, p. 1).

Study MTGK (2017)

This study aimed to know the effect of integrative strategies and brainstorming on cognitive achievement and emotional intelligence and learning the skill of volleyball for students of the second stage at the College of Physical Education and Sports Science. The study was conducted in Iraq, in the holy city of Karbala, where the research sample consisted of (40) students divided into two experimental groups. An experimental group first studied an integrative strategy and the second group studied a brainstorming strategy. The researcher prepared two tools to achieve the goals of the first test to accomplish the research and the second to measure emotional intelligence. The results show the superiority of the first group Al-Thani in the ABG group for emotional intelligence, as well as the superiority of the second group over the first group in aspects of cognitive development (Al-Mazrou, 2017, p. 1).

Indications and Indications from Previous Studies

1. Objective: the aim of the first axis studies was to determine the effect of using the hot-seat strategy in acquiring concepts and the love of scientific exploration. This is the case in the study by Muhammad and Naji, in the numerical sense, and for the academic motivation and achievement as seen in the study by Al-Anzi and Al-Jarjari. As for the current research, it was intended to use the hot seat strategy in combination with emotional intelligence. The second axis studies aim to know the impact of using one or more strategies in developing emotional intelligence, as in the study by Al-Hamdani and the study by Marzouk. The current research is compatible with the studies in the second group, using one strategy (the hot seat) and learning about the emotional intelligence.
2. The sample: with regard to the size of the samples used in the previous studies, we notice that they varied in their sizes according to the designs, goals and variables included in each study, where the number of sample individuals ranged from (40) individuals in the study by Al-Marzouq as a minimum, and (64) individuals in the study by Al-Anzi Al-Jarjari, as a maximum. As for the current research, the research sample consisted of (62) middle class students.
3. Ordinary: most of the previous achievement tests for female students were used to measure achievement in emotional intelligence, as in the Hamdani study (2013) and the Mazarok study (2017), while the Muhammad and Naji study (2018) used a test to measure science concepts with a scientific survey. The Anzi Jerjeri study (2019) used a test to measure numerical sense with the motivation to achieve academic achievement. As for the current research, it will access two tools: the achievement test and the emotional intelligence scale.

Research Procedures

First: Experimental Design

The researcher adopted the experimental design B, which is called the approach of equations, for the purpose of achieving the research goal and hypotheses (Anwar and Adnan, 2008, p. 487), as shown in table 1.

Table 1: Research Experimental Design

Group	Pre-test	Independent variable	Post test	
Experimental	Emotional intelligence	Hot seat strategy	Emotional intelligence	Educational attainment
Control		The usual method		

Among the requirements of this design is the testing of two equal groups, one of which makes an experimental group that studies with the hot seat strategy, while the other group remains a control group that studies in the usual way.

Second :The Research Community and Its Sample

The research community includes all middle school students in the morning middle schools for boys in Mosul for the academic years (2019-2020).

As for the research sample, it was represented by (62) students of the second intermediate-grade students in Al-Gomhoria School for Boys for the academic year (2019-2020), intentionally chosen from the research community for the following reasons:

1. The cooperation of the school administration and science teacher with the researcher in applying the research.
2. The school contains four grades for the average second, which gave the researcher more opportunities to choose the sample, and the willingness of the subject teacher to present the lesson according to the plans prepared by the researcher (Appendix 4) The researcher distributed the sample to two groups of (32) students in the experimental group and (30) students in the control group, Table (1) shows this:

Table 2: Persons of the research sample

The people	The number of students who passed	The number of students who failed	Group	Teaching style
A	32	-	Experimental	Hot seat strategy
G.	30	-	Control	The usual way
Total	62	-	-	-

Third :The Equivalence of the Two Groups

The researcher performed parity between the two groups, experimental and control, before applying the experiment, which included the variables: chronological age in months, degree of science subject in the first intermediate grade, intelligence, educational level of mothers, educational level of parents, degree of emotional intelligence in the pre-test), table (2) clarifies.

Table 2: The calculated T value of valence variables for the two research groups

Variables	Groups	Numbers	SMA	standard deviation	T value		T value		
					Calculated	Calculated			
Chronological lifetime in months	Experimental	32	160.4062	9.54399	0.462	2,000	Equal		
	Control	30	161.6333	7.10261					
Science subject degree	Experimental	32	72.7500	12.45638	0.006		2,000	Equal	
	Control	30	72.7667	10.90297					
Degree of intelligence	Experimental	32	45.1250	5.55181	0.571			2,000	Equal
	Control	30	44.5000	5.5658					
The degree of emotional intelligence	Experimental	32	98.6250	15.20134	0.401	2,000			Equal
	Control	30	88.1000	14.72120					

Since the value of (calculated below the value of t) is tabulated from (2000) dollars at the level (0.05) and the degree of freedom (60) this means that the totals are equal in all variables, as the researcher conducted parity between mg and BTS research at the educational level is not B students and the educational level of mothers students.

Table 3: Results of the Kaykai test for the difference between the two groups in the variable of the parents' education level.

The value of the Chi square		Educational level for parents				the number	the group
Tabular	Calculated	Total	Institute and college	Intermediate and middle school	Primary and below		
5.99	1.042	32	8	10	14	32	Experimental
		30	6	7	17	30	Control
		62	14	17	31	62	Total

The Educational Level of the Mother

Data were collected on the level of education of the respondents' mothers for the two research groups. After classifying these data in three categories (primary and below, intermediate and middle, institute and college), the Chi Square was used as a statistical method. It was found that there were no statistically significant differences between the two research groups in this variable, as the calculated T value of the square of Kay (0.196) is less than the tabular value of the Kay square (5.99) at the significance level (0.05), and the degree of freedom (2) indicates the formula for the two groups in this variable, which Table (4) demonstrates.

Table 4: Chi-square test results between the two research groups at the educational level of mothers.

The value of the Chi square		Educational level for parents				the number	the group
Tabular	Calculated	Total	Institute and college	Intermediate and middle school	Primary and below		
5.99	0.196	32	6	9	17	32	Experimental
		30	7	8	15	30	Control
		62	13	17	32	62	Total

Search tool: For the purpose of achieving the research goal and assumptions, this requires the use of two tools:

Preparing an Achievement Test

Performing the research requires preparing an achievement test to measure student achievement after the end of the experiment, and since the objective tests are easily comprehensive with the subject and after performing and repairing them (Samara et al., 1989, p. 65), the researcher prepared a test for a type of test consisting of several paragraphs (20) (Appendix 2). The test passed the following steps:

Preparing the Schedule of Specifications

The specifications table has been prepared according to the steps of preparing the specifications table (Al-Zahir, 2002, p. 81) and table (5), the specification table, shows the achievement test:

Table 5: A test map for achievement test

Content	Page NO.	Focus ratio	remember	Accommodating	Application	Total%100
			%51	%31	%81	
Chapter V	8	26.66	3	2	1	6 paragraphs
Chapter VI	11	36.66	4	3	1	8 paragraphs
Chapter VII	11	36.66	4	3	1	8 paragraphs
Total	30	99.98	11	8	3	22 paragraphs

Check the Achievement Test

1. The researcher has verified the validity of the achievement test content by presenting it in its initial form to a number of arbitrators in the field of psychology and teaching methods (Appendix 1). In light of expert opinions, none of the test paragraphs were deleted, as the agreement between the experts ranged between 80-100%.
2. Statistical analysis of paragraphs.
3. For the purpose of finding the statistical analysis of the test items, the researcher applied it to a survey sample from the research community consisting of (40) students from Al-Shafei School for Boys.
4. Together for difficulty: after calculating the difficulty factor for each paragraph of the test, it is clear that it falls between (0.38 - 0.65) and indicates that the test items were acceptable. C, as Bloom sees this test is good and has good arithmetic if the coefficient of the paragraphs ranges from (0.20- 0.80).
5. Discrimination factor: the researcher extracted the discriminatory power of the test elements using the paragraph determination coefficient and found that it ranges between (0.30 - 0.60), which falls within the acceptable range (Rusan et al., 1992, p. 84).
6. Stability of the test: the researcher extracted the test using the Kuder-Richardson equation 20. The reason for choosing this equation is that it can be applied in the test, and the degree of the answer to the paragraph. Then it takes one degree or as an error, it takes zero, and the stability factor extracted according to this method is the stability parameter of internal consistency, which means homogeneity of the test elements (Allam, 2013, p. 171). After applying the equation, the achievement coefficient in the achievement test reached (0.81), which is a good stability factor, and therefore the test is valid for application in its final form which consists of (22) paragraphs.

Emotional Intelligence Scale

The researcher adopted a ready-made scale to measure emotional intelligence, prepared by Al-Hamdani (2013), owing that his paragraphs are commensurate with the nature of the stage of study in the current study, which is characterised by validity and reliability indicators as it consists of a scale, with (40) paragraph corresponding to each Vq Rh. The four alternatives are: always, sometimes, rarely, never. To set an application scale, these steps were followed:

Validate the Test

The researcher concluded the clear sincerity of the scale by presenting it to a number of experts specialised in the field of educational psychology and teaching methods for the purpose of explaining the validity of the scale (Appendix 1), and none of the paragraphs of the scale were deleted, and therefore the scale was ready for application.



Correct the Range

The scale was corrected according to the correction key, where the researcher gave the weightings (4, 3, 2, 1) for the four alternatives, so the highest score on the scale is (160) degrees and the lowest (40) degrees.

Post-test the Two Groups

After completing the application of the experiment by covering the chapters that have been identified, the researcher's summative post-test application of the two groups on 3/12/2019 the next day, a brief summary of 12/04/2019 was applied emotional intelligence on the scale of two groups.

Statistical Means

The researcher used the following statistical methods:

1. T-test for two independent sample to perform valence and to identify the significance of the difference between the two groups.
2. Chi-squared test to find the difference between the two groups in parental achievement.
3. Paragraph difficulty factor.
4. Paragraph discrimination coefficient.
5. Pearson correlation coefficient to find the stability of the emotional intelligence scale.
6. Coder - Richardson equation (KR-20) to find the stability of the achievement test.

Results Related to the First Zero Hypotheses, which States:

There is no statistically significant difference between the mean scores of the experimental group that are taught according to the hot-seat strategy and the average of the control group and that are taught according to the usual way of achieving the average second grade among students in the science subject.

For the purpose of verifying this hypothesis, the researcher extracted the mean and standard deviation of the two experimental and control groups in the achievement of science. Using the T-test for two independent samples, the T-value was extracted, as shown in Table (6).

Table 6: T-test results for the experimental and control groups in the achievement test

T value		standard deviation	SMA	the number	the group
Tabular	Calculated				
2,000	3,655	3,05857	17,5000	32	Experimental
		3,81603	14,3000	30	Control

It is clear from Table (6) that the calculated value of T has reached (3,655), which is greater than the tabular value (2000) at the level of importance (0.05) and the degree of freedom (60). This means that there are statistically significant differences between the average achievement of the two groups in favour of the experimental group, and therefore imposes a null hypothesis and accepts the alternative. This result indicates that the strategy of the hot seat has an effect on achievement in the science subject, and that this result is consistent with the results of studies that dealt with the strategy of the hot seat in some variables, such as in the study of Muhammad and Naji (2018) and those in the study of Al-Anzi and Al-Jarjari (2019).

Results Related to an Empty Hypothesis Which States

There were no statistically significant differences between the average score of the experimental group that is taught according to the hot seat strategy and the average score of the control group, which is taught according to the usual method of developing emotional intelligence among second-graders middle-school students in science. To verify this hypothesis, the researcher extracted the average emotional intelligence growth in the experimental and control groups, then applied the T test for two independent samples, as a method for the difference between two tests for the experimental group (33 4375) and the average difference between the two tests for the control group (15, 15333), while it reached the standard deviation of the experimental group (15, 95748) and the standard deviation of the control group (13, 25540). The calculated value of T was (4, 788) which is greater than the tabular value (2.000), the significance level (0.05) and the degree of freedom (60). This means that there is a statistically significant difference between the average growths of the emotional intelligence of the total. The experimental group, thus rejecting the zero hypothesis and accepting the alternative hypothesis, as shown in Table (7).

Table 7: The value of emotional intelligence growth in experimental and control groups

T value		standard deviation	SMA	Numbers	Group
Calculated	and tabular				
2.000	4.788	15.95748	33.4375	32	Experimental
		13.25540	15.5333	30	Control

The researcher attributes this growth in emotional intelligence to the effectiveness of the hot seat strategy in developing emotional intelligence among middle school students in the midst



of studying science, and this result is consistent with the study of both Al-Hamdani (2013) and Mazrouk (2017).

Conclusions

In light of the research results, the researcher concludes the following:

1. The effectiveness of the hot seat strategy in achieving middle school students in the sciences.
2. The effectiveness of the hot seat strategy in developing emotional intelligence among middle school students.

Recommendations

1. Teachers should use the hot seat strategy in science teaching.
2. Male and female teachers be trained on how to use the hot seat strategy in teaching science through training courses.
3. Introducing the hot seat strategy in the vocabulary of methods of teaching science in basic education colleges.

The Proposals

To complete the current research, the researcher suggests conducting the following future studies:

1. The effectiveness of the hot seat strategy in developing dialogue skills and scientific interest among middle school students.
2. The effect of using the hot seat strategy in developing contemplative thinking for primary school students.

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