

**Science Teachers' Awareness of the Hot Seat
Strategy and its Uses in Teaching at the
Primary Level in Tabuk City**

By:

Dr. Ataallh Aodh Alatoai

Assistant Professor of Curriculum and Teaching
Methods of Science-University of Tabuk, Tabuk,
Kingdom of Saudi Arabia

**٣. Science Teachers' Awareness of the Hot Seat Strategy
and its Uses in Teaching at the Primary Level in Tabuk City**

وعي معلمي العلوم باستراتيجية الكرسي الساخن وإستخداماتها في التدريس بالمرحلة الابتدائية بمدينة تبوك

د/ عطاالله بن عوده العطوي*

المستخلص:

هدف البحث الحالي إلى الكشف عن درجة وعي معلمي العلوم في المرحلة الابتدائية في مدينة تبوك بإستراتيجية الكرسي الساخن؛ استراتيجية تعليمية نشطة وطريقة للطلاب لممارسة مهارات التفكير على مستوى أعلى واكتساب فهم أعمق للمحتوى الذي يتعلمونه. ولتحقيق أهداف البحث تم استخدام المنهج الوصفي التحليلي في هذه الدراسة من خلال جمع البيانات حول أفراد العينة وتنظيمها وتحليلها، وتكونت عينة البحث من (١١٧) من معلمي العلوم (٥٣) معلم و(٦٤) معلمة في مدينة تبوك. وتمثلت أداة البحث في إستبانة تتضمنت فقرات خاصة ب(مجال طرق استخدام استراتيجية الكرسي الساخن- مجال القواعد المنظمة لاستراتيجية الكرسي الساخن- مجال خطوات استخدام استراتيجية الكرسي الساخن- مجال استراتيجية الكرسي الساخن وتعلم العلوم)، وبعد التأكد من صدقها وثباتها، أثبتت نتائج الدراسة، أن أفراد العينة يرون أن درجة وعي معلمي العلوم للاستراتيجية الكرسي الساخن جاءت بدرجة منخفضة حيث بلغ الوزن النسبي لأفراد العينة حول إجمالي العوامل (1.298). وأثبتت النتائج وجود فروق ذات دلالة إحصائية في إستجابات عينة الدراسة نحو درجة وعي معلمي العلوم للاستراتيجية الكرسي الساخن وفقاً لمتغير (النوع) لصالح المعلمات. من جهة أخرى، أثبتت النتائج عدم وجود فروق ذات دلالة إحصائية عند مستوى الدلالة (٠.٠٥) بين متوسطات إجابات أفراد عينة الدراسة حول درجة وعي معلمي العلوم باستراتيجية الكرسي الساخن تعزى للخبرة التدريسية، وفي ضوء هذه النتائج، قدم البحث الحالي قائمة من التوصيات، واقترح إجراء المزيد من الدراسات الوصفية لاستكشاف استخدام استراتيجية الكرسي الساخن في مواد أخرى في المراحل التعليمية المختلفة، ولتحديد الاحتياجات التدريبية لمعلمي العلوم في استخدام استراتيجيات التعلم النشط.

الكلمات المفتاحية: استراتيجيات التعلم النشط- استراتيجية الكرسي الساخن- معلمي العلوم- المرحلة الابتدائية.

* د/ عطاالله بن عوده العطوي: أستاذ المناهج وطرق تدريس العلوم المساعد- جامعة

تبوك- تبوك- المملكة العربية السعودية.

Science Teachers' Awareness of the Hot Seat Strategy and its Uses in Teaching at the Primary Level in Tabuk City Dr. Ataallah Aodh Alatoai

Assistant Professor of Curriculum and Teaching Methods of
Science-University of Tabuk, Tabuk, Kingdom of Saudi Arabia

Abstract

This study aims at investigating the awareness of science teachers at the primary level in Tabuk of the hot seat strategy; an active teaching strategy and way for students to practice higher-level thinking skills and to gain a deeper understanding of the content they are learning. To achieve this purpose, the researcher used the descriptive analytical approach by collecting, organizing, and analyzing data. The research sample consisted of (117) members of science teachers in Tabuk city, 53 males and 64 females. The research tool was a questionnaire survey that included specific phrases about (rules of the hot Seat strategy - the ways to use the hot seat strategy-steps for using the hot Seat strategy - hot Seat strategy and teaching and learning Science). After confirming the validity and consistency of the questionnaire, the results of the study showed that the degree of awareness of science teachers of the hot Seat strategy was low where the relative weight of the sample individuals about the total factors reached (1.298). The results confirmed that there were statistically significant differences in the responses of the study sample on the degree of awareness of science teachers to the hot Seat strategy according to the variable (of gender) in favor of the female teachers. On the other hand, the results revealed that there were no statistically significant differences at ($\alpha=0.05$) between the averages of the responses of the members of the study sample due to the teaching experience. In light of these findings, the current research made a list of recommendations, and suggested conducting further descriptive studies both to explore the use of the hot teaching strategy in other courses at different educational stages, and to identify the training needs for science teachers in using active learning strategies.

Key words: active learning strategies - hot Seat strategy-
curriculum, science teachers - primary stage.

I. Introduction and Theoretical Background:

In light of the enormous cognitive and technological development, as well as the emerging of huge educational theories that explain learning behaviors and events, a number of teaching methods have appeared and turned out to be effective in improving desirable educational products. The trend towards active learning has been one of the most important means and mechanisms that seek to improve the teaching and learning process, achieve overall quality in education, and transfer learning from traditional methods based on memorization, conservation and application to more positive methods and strategies. Effective teaching strategies had great positive impact on the learning process, and found by trial to be very fruitful to the learner in developing his personality, participation, academic ability, as well as his intelligence. Curriculum experts consider that active learning is one of the most important means that we must value to develop the creativity process and raise the mental and skill level of students.

Upon examining the curricula in most of educational institutions, it has been realized that there is a serious shortage of real curricula that stimulate the student's mind and stimulate his talents. This, in turn, will hinder developing the creative abilities of our students. Thus, indoctrination is the dominant characteristic of the study materials, and if educational output is to be improved, it is necessary to develop curricula, together with continually rehabilitating educational staff; stimulating and well programming them (Suleiman, 2013).

The Kingdom of Saudi Arabia has been keen on keeping pace with modern trends in education, and has given great credit to active learning in the educational process. The Ministry of Education has begun to implement active learning in the educational field by adopting the recommendation presented in the meeting of assistants and educational affairs assistants held in Riyadh during the period 7-8 / 5/2013, Which

calls for setting off the active learning initiative in the primary stage. Thus, the education agency at the Ministry of Education adopted the active learning initiative and expanded its application to all educational institutions in letter No. 341688068 dated 17/8/2013. Therefore, the Ministry of Education associated the general goal of the learning project with the development of concepts and skills of school staff to launch active learning (Alansari, 2017).

The Hot Seat Strategy is a modern active learning strategy that is a good haven for teachers and learners alike to achieve the number of educational goals for learners such as developing dialogue skills and scientific interest. It depends on the efforts of both the teacher and the learner (Alsenidi, 2015). Using Hot Seat Strategy, gives the students the opportunity to ask questions and react with each other. In addition, it develops the spirit of cooperation among students in formulating questions, and encourages the students to play roles in an interactive way. Furthermore, in the hot seat strategy, students enjoy doing activities and working in groups (Alafoon, Maykhan, 2018).

The use of the modern hot-seat strategy in teaching and learning science comes at the forefront of the focus of those in the teaching of science and scientific education (Siry, Lang, 2010). The use of the strategy to teach students is possible to a large extent and not complicated, as it addresses many of the disadvantages of the traditional method (Acar, Turkmen & Roychoudhury, 2010)

What is a hot seat strategy?

The hot Seat strategy relies on motivating learning activities and as students carry out these activities, they ask a group of specific or necessary questions related to the lesson to whoever sits on the hot Seat and answers them (Moore, 2015). It is defined as: An active learning application that is based on

discussion, asking and answering questions, and is based on arranging students' seating seats in one or several episodes in the middle of which is a seat called a "hot Seat" on which a select student from whom He has an interest in the topic or paragraph to answer others' questions, discuss their ideas, and be punished by other students according to the lesson plan (Attia, 2016, 388-389).

The strategy of the hot Seat is one of the active applications of learning that includes a set of procedural steps that rely on role-playing, so it is based on determining the student who answers the questions posed to him by his other colleagues, after defining a specific topic (Alsenidi, 2015).

The Advantages of Hot Seat strategy:

According to (Shabrina, 2018), The Hot Seat Strategy is one of the strategies that has many advantage in teaching as following:

1. The hot seat strategy is competitive because it is challenging and also fun for the students.
2. The hot seat is a very active strategy that can give students new experience in learning.
3. This strategy makes the students enthusiastic, and motivate them in learning.
4. Students on the "hot seat" will use their critical thinking to give appropriate clues for their team, thus, this strategy can build students' critical thinking.

The philosophy underlying the hot Seat strategy:

The hot Seat strategy is one of the active learning strategies, as it makes the student active during learning and responsible for his learning, by searching for knowledge himself from multiple sources and communicating with his colleagues and teachers. Active learning requires taking an active role on the part of the student, and interacting with what he watches, reads, or listens to in class. Further, it demands making observations, comparison, interpretation, generating ideas, examining hypotheses, making judgments and

discovering relationships, as he communicates with his peers and teachers directly and softly (Shehata, Al najjar, 2003).

Active learning is a philosophical trend based on transferring the focus of attention in the learning process from the teacher to the learner and makes him active in learning the scientific subject. Moreover, it makes learning related to the life of the learner, his interests and needs. It urges students to depend on his abilities, preparations and interaction with everything in his home, school or social environment (Attia, 2016). Therefore, it makes the learner at the center of the educational process an active participant and a seeker of knowledge and not a passive recipient.

Active learning is characterized by a set of characteristics that students learn through their participation in activities related to their real life. Students bear a responsibility towards their learning through their cooperation with their colleagues. The teacher is a facilitator and a guide for learning processes, accepts ideas from all students, and creates a safe learning environment that helps them present all their questions (Alshammari, 2011). Indeed, the teacher integrates visual aids during learning well, and pays attention to performances and presentations accomplished by students.

Steps of the hot seat strategy:

To use the hot seat strategy the following steps are followed (Alshammari, 2011; Attia, 2016; Alafoon, Maykhan, 2018):

- Defines the subject of the lesson and the required tasks.
- The seats are arranged in one or two episodes according to the number of students in the classroom. Each episode is mediated by a hot Seat on which one of the pupils sits alternately or sometimes the teacher.

- Each student researches and performs his role whether being in the hot seat circle or not. All students direct questions that require brain storming and deep thinking.
- Students sitting in the hot seat are constantly changed to make sure that all students take roles.
- The student in the hot Seat urges his classmates to ask all types of questions relevant to content of the class lesson.
- The student in the hot seat position answers all his classmates' questions and opens the floor for further discussion in case of any interrogations, additions , or clarifications.
- The teacher makes finally an overall evaluation of the class session and jots down his own observations about what has been accomplished, together with any further demands or recommendations for further exploration of the discussed topics by the students.

The rules governing the hot seat strategy:

The hot seat strategy helps students dig deeper into the topic that they are studying, and search for its ins and outs. It is beneficial to students because the structure provides them with the ability to think deeply about the presented problem to be solved or any other subjects to be discussed or analyzed. The teacher does the following to elicit the required thinking skills and abilities of the students and to indulge them in the learning process (Alshammari, 2011; Fowler, 2016; Abdulkarim, 2016):

- Teacher tells the student when he sits in the hot Seat that he will be asked at least three questions which he can answer, and if not, the questions are directed to another student.
- Open questions after a brief introduction of the subject are highly recommended.

The Hot Seat Strategy and Science Teaching and Learning

The hot seat strategy plays an important role in teaching and learning science. It makes the student positive in the

educational situation using his discussion skills in his learning of science (Barab, 2006). In addition, it gives students a distinctive role in the learning science process because they participate in discussion, asking questions and answering and has no place for negative students, also, the students in this strategy have the opportunity to exchange their (Alafoon, Maykhan, 2018).

It is important to use the modern teaching methods like Hot Seat Strategy in teaching science, and this is what Abdulkarim's study (2016) have emphasized. It found that using hot seat strategy was so successful through teaching science to develop dialogue skills and scientific interest for elementary stage pupils. Fowler (2016) stated that Hot Seat Strategy facilitates students in making connections between content learned in science lecture and the real world, and increases class participation, and plays as an informal assessment of students' critical thinking and scientific literacy. Thus, this strategy has been successful in increasing students' understanding of science, their appreciation of its relevance to their lives.

This strategy is one of the most effective strategies that help students exchange ideas, understand problems, learn about meanings and understand differing views on topics, and help students learn productive and analytical thinking skills through those explorations and experience. It provides them with opportunities to play roles (Wilhelm, 2002).

II. Problem of the Study:

Teachers should be able to practice teaching strategies that help the learner to build meaning for what he learns, develop his confidence in himself, and his ability to learn. This is a requirement for teaching science in the primary stage, as science education requires the practice of science teachers for

effective and varied teaching strategies, including the hot Seat strategy.

This is confirmed and supported by the Asiri study (2016), which indicated the need to address educational problems using modern strategies and methods, and to address the deficiencies in the performance of teachers through attention to effective guidance and training. He asserts that the focus should be not on traditional patterns, but on modern strategies and methods to hone the thinking skills of the students and their scope of understanding of the subject matter. The teacher is advised to use such modern teaching methods in planning for his/her lessons in class, and to get his/her students actively involved in the teaching process.

The researcher noted through personal experience that there are several deficiencies in the process of applying active learning strategies within the schools of Tabuk City, especially with regard to the hot seat strategy. Such deficiencies in active learning will hinder achieving the desired goals and learning outcomes of science subjects in most schools. Theoretical dumping on the part of the teacher; together with memorization, brain storage, and retrieval on the part of the student suppresses the achievement of many goals of science education, such as not developing thought, dialogue, skill, or interest. Thus, this study was conducted to determine the extent of teachers' awareness the hot seat strategy and its uses.

III. Questions of the Study:

1. What is the degree of awareness of science teachers in the primary school in Tabuk city of the hot seat strategy and its use in teaching?
2. Are there statistically significant differences at the level ($\alpha \leq 0.05$) among science teachers due to the variables of (gender, educational experience)?

IV. Objectives of the Study:

The present study seeks to achieve several goals, which are to reveal:

ξ . **Science Teachers' Awareness of the Hot Seat Strategy and its Uses in Teaching at the Primary Level in Tabuk City**

- The degree of awareness of science teachers in the primary stage in Tabuk
- city of the strategy of the hot Seat and its using in teaching.
- If there are statistically significant differences among science teachers due to the variables of (gender, teaching experience).

V. Importance of the Study:

The importance of the study stems from the fact that it deals with one of the vital issues of concern to those in charge of the educational process and decision makers, which is monitoring the actual reality of the use of the hot-Seat strategy in teaching science, and the extent to which it is implemented effectively inside the classroom. In addition, the current study gains its importance in being one of the first studies that dealt with the awareness of hot seat strategy among teachers of science, taking into consideration several variables such as gender and teaching experience.

The study is also important due to the following:

- 1- It assists decision-makers in taking assistive means in facing the obstacles that limit the use of the hot seat strategy and making use of its applications in achieving desired educational products.
- 2- Providing specialists and those in charge of developing science curricula in the various educational stages with the reality of using the hot Seat strategy and the most important physical and organizational obstacles, and teacher-related obstacles that limit the use of the hot Seat strategy in the educational process.

VI. Limitations of the Study:

The generalization of the current search results is limited to the following parameters:

- Objective limits: The research focuses on the awareness of science teachers of the hot seat strategy in terms of (its concept - its steps - the rules governing it).
- Human limits: The study community will consist of primary science teachers in Tabuk City, Governmental Schools, Kingdom of Saudi Arabia.
- Time limits: the second semester of the year 2019.

VII. Definitions of Key Terms:

Awareness: awareness is defined as the first step in forming the emotional aspects including attitudes and values. It means the individual's awareness of certain things in the situation or phenomenon (Shehata, Al najjar, 2003, 339).

And procedurally known as: Teachers' awareness, knowledge, and familiarity with the concept, steps, and rules of the Hot Seat strategy, and this was measured procedurally through their response to the tool (questionnaire) prepared for this purpose.

Science teachers: They are male and female science teachers who teach primary school students in Tabuk Governorate schools.

Hot Seat Strategy: It is one of the active learning strategies that includes a set of procedural steps that consist of steps to play roles, namely the identification of the student answering the questions and the roles of other students in asking questions after defining a specific topic by the teacher according to the plans he prepared for this procedure (Alharbi, 2019, 6).

And the strategy of the hot Seat is defined procedurally as: a strategy that is closely related to its use in discussion and dialogue between students, on the one hand, and between them and the teacher, on the other hand, so that it contributes to the development of many desirable educational products for students of the elementary stage by learning the subjects of science determined at this stage.

VIII. Literature Review:

(Elnada, 2015) conducted a study that aimed at verifying the effectiveness of using the hot seat strategy by English language teachers to enhance the English language skills of students - at Al-Azhar University in Gaza. For this purpose, the quasi-experimental one-group approach with a pre-test after was used. The study sample was chosen intentionally, consisting of (24) female students, and the results of the study showed that there are statistically significant differences in the mean results between the pre and post speaking test of the target group at each level of speaking skills in favor of the post test.

Abdulkarim (2016) conducted a study that aimed to investigate the effect of using hot seat strategy through teaching science for developing dialogue skills and scientific interest for elementary stage pupils. The study sample reached (74) students classified as an experimental group of (37) students, and a control group of (37) students. An achievement test was prepared, and the results showed the superiority of the experimental group students who studied using the hot seat strategy over the students of the control group who studied in the usual way.

Alharbi's Study (2019) aimed to investigate the effect of using the hot seat strategy in developing reading and writing skills in Arabic language for the second grade primary students in the State of Kuwait. The study sample consisted of (54) students set in two groups (control and experimental), and the results of the study showed that there are statistically significant differences between the arithmetic averages for the performance of the two study groups on all reading skills individually and collectively due to the variable of the teaching strategy in favor of the experimental group. Furthermore, there are statistically significant differences of performance between

the arithmetic averages the two study groups on all writing skills, individually and collectively, due to the variable of the teaching strategy, in favor of the experimental group. In light of the study results, the study recommended employing the hot seat strategy in teaching Arabic.

And Nasser study (2019) aimed to identify the effect of using the hot seat strategy in collecting and developing historical sympathy for middle school students in the subject of social studies. To achieve this goal, the research hypotheses were formulated that there are no statistically significant differences at the level of significance (0.05) between the average score of the students of the experimental group who studied according to the hot-seat strategy and the average score of the students of the control group who studied according to the usual method in teaching social studies, as there are no statistically significant differences at the level of significance (0.05) between the pre and posttests. The experimental group studied using the seat and a hot strategy between the pre and posttests of the control group who studied in accordance with the usual way in the historical development of empathy scale. The study confirmed the validity of the study's hypotheses, and in light of this it presented many recommendations and proposals.

It is noted through previous studies and research that these studies followed the experimental approach to reveal the effectiveness of the hot-seat strategy in achieving many desired educational products such as analysis and historical sympathy as in the Nasser study (2019), reading and writing as in the study of Al-Harbi (2019); as well as the its effect in teaching science as in the study Abdulkarim (2016). However, according to the researcher's knowledge, there is no study that dealt with the degree of awareness of teachers of different specializations - as well as the science specialization - that dealt with the degree of teachers' awareness of the hot seat

strategy, which is justified by the researcher conducting the current study.

IX. Research Methodology:

The current research follows the descriptive analytical approach in this study by collecting data from the sample members, and then organizing and analyzing them with the appropriate statistical methods to reach the results.

i. Participants:

Participants of this study were primary school Saudi science teachers in Tabuk city. All teachers had a bachelor degree in science education. All teachers involved were primary school male and female science teachers who agreed to participate on a voluntarily basis and signed a consent form. A total of (53) male science teachers, and (64) female science teachers holding bachelors' degree participated in the study.

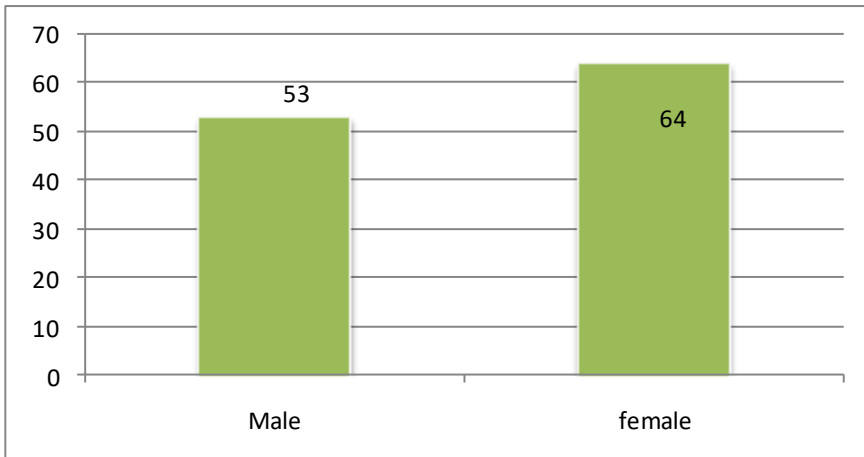
ii. The Study Sample:

To determine the characteristics of the individuals in the study sample, percentage of respondents were calculated based on the study tool according to the demographic variables represented in (gender -number of years of teaching experience), as follows:

Table (1) Distribution of the study sample individuals according to the gender variable

Type	N	Percentage
Male	53	45.29%
Female	64	54.71%
Total	117	100.0

Table (1) shows the distribution of the members of the study sample according to the gender variable, containing (53) teachers of the sample representing (45.29%) males, and (64) of a percentage (54.71%) females. The displayed data in previous table can be displayed in the following graph:

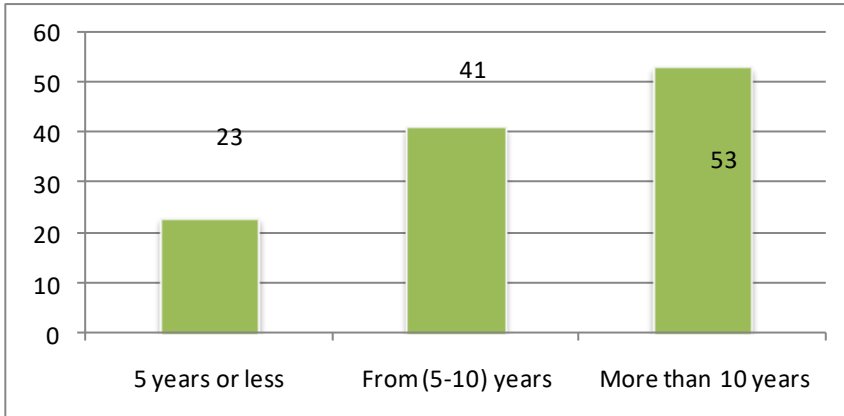


Graph (1): Distribution of the study sample individuals according to the gender variable

Table (2) Distribution of study sample individuals according to the variable of teaching experience

Teaching experience	N	percentage
5years or less	23	19.66%
From (5-10) years	41	35.04%
More than 10 years	53	45.3%
Total	117	100.0

Table (2) displays the distribution of the study sample members according to the teaching experience variable (5 years or less, 5-10 years, and more than 10 years). Teachers with 10 years of classroom work showed the largest percentage and represented (45%) of the total study sample. Members with a teaching experience of (5-10 years) calculated a percentage of (35.04%); and those with (5 years or less) showed a percentage of (19.66%). The previous table is further clarified in the following graph:



Graph (2): Distribution of study sample individuals according to the variable of teaching experience

iii. Statistical processing:

To answer the study questions, and calculate the averages, standard deviations and percentages of the sample population scores will be calculated based on the questionnaire responses. The (T) test was used for the independent samples to compare the levels of the type variable, and a single variance analysis will be used to compare the levels (number of years of experience).

iv. Field study procedures and results:

After going over previous studies related to the current field of research, together with the literature related to the subject of the study, and in light of field goals, the study tools were identified and were used to designate a questionnaire for the use of the hot Seat strategy. Further details of the study tools are as follows:

1. Description of the study tool:

The study tool consisted of two parts:

- A. The first section: It aims to investigate the demographic data for the study sample individuals, namely (gender - number of years of teaching experience).

B. The second section: A questionnaire to determine the extent of awareness of primary school science teachers with the hot Seat strategy, and it includes field items about (ways for using the hot Seat strategy - rules governing the hot Seat strategy - the field of steps for using the hot Seat strategy - the field of the hot Seat strategy and teaching and learning Science).

2- Face validity:

The face validity of the questionnaire was calculated by asking seven academics professors for their advice on the appropriateness of the prepared questionnaire. They expressed their opinions and observations on the questionnaire and items in terms of the appropriateness for the subject of the study, and its objectivity in disclosing the desired information for the study, as well as in terms of the correlation of each phrase. Feedback was received for improvement with regard to the scale and suitability of the questionnaire, and notes were forwarded of deletion, retention, and modification of the phrases of the questionnaire.

Based on the opinions of the arbitrators and their observations, some expressions were modified, as well as adding and deleting some expressions so that they became valid for application in the final image, which was reached after the arbitration process and was used in the data collection process from the research sample.

3. Validity of the internal consistency of the questionnaire:

The questionnaire was applied to a prospective sample of (30) male and female teachers. 12 members were randomly selected, and (18) male teachers remained outside the basic study sample. Internal consistency was calculated, by:

A) By using the Pearson correlation coefficient between the score of each phrase and the overall degree of the axis a members belongs to.

٤٨ **Science Teachers' Awareness of the Hot Seat Strategy and its Uses in Teaching at the Primary Level in Tabuk City**

B) Using the Pearson correlation coefficient between the score of each axis and the total score of the scale to which it belongs.

Table (3) Pearson correlation coefficient between the score of each phrase and the overall degree of the axis

N	Ways to use the hot seat strategy	N	The rules governing the hot seat strategy	N	Steps to use the hot seat strategy	N	Hot Seat strategy, teaching and learning science
1	.776 **	12	.779 **	18	.758 **	27	.730 **
2	.836 **	13	.809 **	19	.724 **	28	.696 **
3	.801 **	14	.842 **	20	.845 **	29	.865 **
4	.791 **	15	.824 **	21	.903 **	30	.825 **
5	.739 **	16	.843 **	22	.790 **	31	.869 **
6	.599 **	17	.933 **	23	.850 **		
7	.734 **			24	.849 **		
8	.844 **			25	.852 **		
9	.913 **			26	.843 **		
10	.780 **						
11	.851 **						

****Statistically significant at the level of significance less than 0.01**

It is clear from the previous table that the Pearson correlation coefficient between each phrase mark and the total mark of the axis to which the members belong, is statistically significant at a level of significance less than (0.01). This indicates the adherence of these statements and their suitability to apply to the study sample.

Table (4) Pearson correlation coefficient between the mark of each axis and the total score to identify science teachers' awareness of the hot seat strategy

N	the axis	Correlation coefficient
1	Ways to use the hot seat strategy	.837 ^{**}
2	The rules governing the hot seat strategy	.935 ^{**}
3	Steps to use the hot seat strategy	.936 ^{**}
4	Hot Seat strategy, teaching and learning science	.961 ^{**}
**Statistically significant at the level of significance less than 0.01		

From Table (4), it is clear that the Pearson correlation coefficient between the degree of each axis and the total degree of the questionnaire is statistically significant at a level of significance less than (0.01). This indicates the adherence of these axes and their suitability to apply to the study sample.

4. Stability of the questionnaire:

The stability of the questionnaire was verified by two methods: the Cronbach’s alpha equation, the half-hash method, and Table (5) illustrate the results.

Table (5) Coefficient of stability of the questionnaire in the Cronbach’s alpha equation and the half-way method

N	the axis	Total number of phrases	The first half	the other half	Cronbach Alpha	The link between the two halves	Spearman Brown
1	Ways to use the hot seat strategy	11	5	6	.842	.888	.941
2	The rules governing the hot seat strategy	6	3	3	.914	.899	.947
3	Steps to use the hot seat strategy	9	5	4	.892	.861	.926
4	Hot Seat strategy, science education	5	3	2	.907	.844	.917
Total		31	16	15	.969	.967	.983

It is clear from Table (5) that the stability values, either by the Cronbach’s alpha equation or by the half-hash method, for all axes and the questionnaire as a whole are statistically

o. **Science Teachers' Awareness of the Hot Seat Strategy and its Uses in Teaching at the Primary Level in Tabuk City**

acceptable, as the stability factor is statistically acceptable if its value is greater than (0.60). This in turn validates the questionnaire and asserts its reliability for application on research sample.

X. Research results:

First: The results of the opinions of the sample members regarding the awareness of science teachers of the hot seat strategy are as follows:

A- The total results of the opinions of the sample members:

These results can be illustrated by the following table:

Table (6) Shows the average total, the relative weights, the standard deviation, and the significance level for the opinions of the sample

Dimensions - Total sample 117		Relative weight	standard deviation	Degree of awareness
1	Ways to use the hot seat strategy	2.26	1.17	Medium
2	The rules governing the hot seat strategy	1.53	1.62	Low
3	Steps to use the hot seat strategy	1.28	1.41	Low
4	Hot Seat strategy, teaching and learning science	1.022	1.31	Low
Overall average		1.298	1.53	Low

From the previous table (6), it is clear:

- That the individuals of the sample believe that the degree of awareness of science teachers to the hot-seat strategy came on a low degree of awareness, where the relative weight of the sample individuals around the total factors (1.53).
- That the individuals of the sample see that the second axis of the rules governing the strategy of the hot seat on a low degree and low intensity, as that axis came in the first place

in relation to other aspects, where the relative weight of the sample members on this axis (1.53).

- The sample members also see the last axis of the hot seat strategy at a low degree of importance, as this axis came in the last place in relation to other aspects, where the relative weight reached (1.298)

This was a summary of the results of the sample members of science teachers on identifying the degree of science teacher’s awareness of the hot seat strategy in an aggregate form. Details of the expressions for each axis of the questionnaire separately are presented in the ensuing sub-heading.

B- Details of the results related to the opinions of respondents:

The results for each axis of the questionnaire are presented from the viewpoint of male and female science teachers in the elementary stage, and they are as follow after analysis and processing:

- 1- The results of the first axis: It includes the phrases related to the ways of using the hot seat strategy:

These results can be illustrated by the following table:

Table (7) Mathematical Averages and Standard Deviations for the Estimates of the Research Sample Individuals on the First Component of the Questionnaire:
Ways of Using the Hot Seat Strategy

N	Items	Mean	standard deviation	Rank	Degree of awareness
1	In the hot seat strategy, the seat is in the middle of the classroom and the rest of the students surround it.	3.63	1.13	The first	High
2	The teacher sits in the hot seat to encourage pupils to form and ask questions.	3.14	1.37	The second	High
3	Students ask the student sitting in the seat open-ended questions about either the lesson or the paragraph of	3.09	1.41	The third	High

٥٢ **Science Teachers' Awareness of the Hot Seat Strategy
and its Uses in Teaching at the Primary Level in Tabuk City**

N	Items	Mean	standard deviation	Rank	Degree of awareness
	the one sitting in the hot seat.				
4	Students exchange roles between them, after the teacher encourages them.	2.53	1.21	The fourth	Medium
5	The teacher's role in a hot-seat strategy is to monitor and guide students	2.48	1.35	Fifth	Medium
6	The teacher should divide the pupils into small groups (5-6 pupils in the group) after reading the lesson.	2.34	1.14	Sixth	Medium
7	The lesson should be divided into paragraphs, so that each pupil should have a specific paragraph.	2.21	1.08	The seventh	Medium
8	One way to use the hot seat strategy is the hot seat in the group system.	1.90	1.35	Eighth	Low
9	One way to use the hot seat strategy is for the teacher hot seat.	1.41	1.24	Ninth	Low
10	A volunteer student from each group first sits in the hot seat in the middle and the rest surrounds him.	1.07	1.09	tenth	Low
11	In a hot-seat strategy, the answers to questions should not be worded	1.02	1.51	eleven	Low

From the previous table (7) it is clear that the total relative weight of the first axis is methods of using the hot seat strategy (2.26) which is considered medium, compared to the standard upon which the study was based. This indicates that the teachers have a lack of awareness of this strategy despite the clarity of its steps

The phrase "In the hot seat strategy, it is in the middle of the classroom and the rest of the students surround it." In the first order with a high degree, and the phrases that got this degree of awareness "can be explained" that these phrases may be perceived by simply knowing the name of the strategy. The phrases (8-11) came in the last arrangement to a low degree.

This may be due to the fact that some teachers do not give the appropriate role to the learner when practicing active learning strategies in general as the focus of the educational process. Therefore, the activities and practices of these strategies are not based on the active participation between the teacher and the learner, i.e. learning that exists between two parties and jointly, which works to develop thinking of the learner and giving him the ability to analyze situations and solve problems facing him. Thus, the teachers must confront learners with carrying out activities related to the subject such as asking questions, developing hypotheses, experimenting and participating in discussions, research and reading, writing, comparison and classification, and other skills that can be developed by learners through the hot seat strategy. Further, the teachers must direct the learner to practice activities that enable him to search for information himself from multiple sources, participate in group learning and encourage him to ask questions and ideas. Teacher training is required in using such concepts that are included in the hot seat strategy to avoid any kind of educational deficits. This concurs with the findings of (Nasser, 2019) that recommended organizing courses for male and female teachers to train them on modern teaching strategies, including the hot seat strategy.

2- The results of the second axis: it included the phrases related to the field of rules organizing the hot seat strategy:

These results can be illustrated by the following table:

οε **Science Teachers' Awareness of the Hot Seat Strategy
and its Uses in Teaching at the Primary Level in Tabuk City**

Table (8) Mathematical Averages and Standard Deviations for the Estimates of the Research Sample Individuals on the second Component of the Questionnaire: The rules governing the hot seat strategy

N	Items	Mean	standard deviation	Rank	Degree of awareness
3	Determine the rationale for using the hot-seat strategy.	1.34	1.14	The first	Low
2	Determine the required tasks.	1.28	1.75	the second	Low
1	When he sits in the hot seat, he tells the student that he will be asked at least three questions.	1.20	1.35	The third	Low
4	From the pupil's urge to answer or pass, then another pupil moves and comes.	1.18	1.48	Fourth	Low
5	The student always uses open questions after giving an introduction.	1.11	1.44	Fifth	Low
6	Provide enough time for the participating students to read the role required.	1.02	1.04	Sixth	Low

The results in Table (8) indicate the weakness of the level of the rules governing the hot seat strategy within the classroom, as their ability to use information, knowledge and trends in situations related to the hot seat strategy and its applications did not reach the acceptable level. This gives an indication of the necessity to focus on the development of the axes of the applied component of the strategy, and considering the percentage of averages of the axes of the second component. Upon going over applying rules governing the hot seat strategy within the classroom, we find that estimates

ranged between (1.02-1.28), and this is due to the lack of adequate training for teachers in applying this strategy. Thus, training courses must be offered to teachers on all modern teaching strategies. This is asserted by Elnada study (2015), which recommended that teachers should be provided with the rules for the uses of the hot seat strategy through courses and training workshops.

3- The results of the third axis: it includes the phrases related to the steps of using the hot seat strategy:

These results can be illustrated by the following table:

Table (9) Mathematical Averages and Standard Deviations for the Study Sample Estimates for Teachers' Awareness Level on the Third Component of the Questionnaire: Steps to Use the Hot Seat Strategy

N	Items	Mean	standard deviation	Class	Degree of awareness
1	Change the position of the seats in the classroom in a circular motion, and put the (hot seat) in the center of the circle.	2.81	1.86	The first	Medium
8	Selection of student participants.	2.46	1.83	the second	Medium
9	Creating student viewers.	2.24	1.61	The third	Medium
4	The first student asked the question, Beginning Why ?Then the question repeats itself after each answer to his colleague five times, and it is not necessarily that it is the same number, it has less or more.	2.04	1.74	Fourth	Medium
3	Presenting the activity to students, the activity may be reading a text or discussing a specific concept, or searching for the root of the problem.	1.73	1.01	Fifth	Low
2	Divide pupils into small peers or groups.	1.58	1.25	Sixth	Low
5	The exchange of roles between students.	1.37	1.44	The seventh	Low
6	The teacher may use an organizational chart to help students write or draw.	1.19	1.78	Eighth	Low
7	Have a discussion and calendar of activity again.	1.14	1.85	Ninth	Low

٥٦ **Science Teachers' Awareness of the Hot Seat Strategy and its Uses in Teaching at the Primary Level in Tabuk City**

It is noted from the previous table that (4) phrases came with a medium degree of awareness and (5) phrases came with a low awareness level. Accordingly, the average degree of awareness ranged between (1.14-2.46). On the other hand, the phrase for "Change the position of the seats in the classroom in a circular motion, and put the (hot seat) in the center of the circle" scored a mean (2.81), and the phrase "Selecting the participants from the students" calculated a mean (2.46). Thus, the results showed that the degree of cognitive awareness of the steps of the hot seat strategy for teachers came low. This may be due to the failure to develop periodic development strategies on an ongoing basis, changing according to the variables of the modern era in which active learning strategies impose themselves, and perhaps to the lack of equipment and lack of awareness of priorities during preparation when support is available, which results in lack of quality training for teachers on modern strategies.

4-The results of the fourth axis: It includes the phrases related to the field of hot seat strategy and science education and learning:

These results can be illustrated by the following table:

Table (10) Mathematical Averages and Standard Deviations for the Study Sample Estimates for Teachers' Awareness Level on the fourth Component of the Questionnaire: The Hot Seat Strategy and Science Teaching and Learning

N	Items	Mean	standard deviation	Class	Degree of awareness
5	Teaching pupils some topics of science by using the hot seat strategy is a major goal of science teaching strategies.	2.56	1.95	The first	Medium
1	The use of a hot seat in learning science for primary school students contributes greatly to	1.41	1.06	the second	Low

N	Items	Mean	standard deviation	Class	Degree of awareness
	developing their thinking and dialogue skills.				
4	The student's use of the hot seat strategy in learning science achieves a great level in the scientific investigation process.	1.24	1.71	The third	Low
2	The Hot Seat Strategy greatly helps develop the knowledge structure of primary school students in science	1.73	1.01	Fourth	Low
3	The hot seat strategy contributes to improving pupils' science learning and correcting this learning.	1.04	1.75	Fifth	Low

It is clear from the previous table that the level of awareness of science teachers in the area of hot seat strategy and science education and learning is low, as the general mean arithmetic of the axis (1.022). Further, the degree of awareness was "low" for all phrases of the axis, with the exception of one phrase that got a degree of "medium" awareness, which is Statement (5). Clearly, the level of awareness of science teachers of hot seat strategy is low. This is not consistent with the study of Abdul Karim (2016) which demonstrated that the effectiveness of the hot seat strategy in science education and learning and that it has an effective role in achieving science education goals. The researcher attributes this to the following reasons: the lack of sufficient training courses for teachers on the relationship of the hot seat strategy to science teaching and learning. In addition, the Hot Seat strategy is a hot modern topic as a strategy among active learning strategies, and it did not receive enough attention at the level of scientific research, and therefore it is not clear for teachers.

To answer the second study question which states: Does the degree of science teachers' awareness of the hot-seat

٥٨ **Science Teachers' Awareness of the Hot Seat Strategy and its Uses in Teaching at the Primary Level in Tabuk City**

strategy differ according to gender variable and number of years of teaching experience?

First: Differences according to the gender variable:

Table (11) The results of (T) test to identify the differences in the responses of the study sample towards the degree of science teachers' awareness of the hot seat strategy according to the (gender) variable.

Dimensions	Type	the number	SMA	standard deviation	Values T	Significance level
Ways to use the hot seat strategy	Female	64	2.13	0.606	7.462	.000
	Male	53	1.24	0.909		
The rules governing the hot seat strategy	Female	64	1.61	0.570	5.849	.000
	Male	53	1.12	0.838		
Steps to use the hot seat strategy	female	64	1.63	0.621	7.604	.000
	Male	53	0.93	0.913		
hot seat strategy and science education and learning	female	64	2.51	0.603	6.018	.000
	Male	53	1.98	0.820		
Total	female	64	2.49	0.532	7.361	.000
	Male	53	1.91	0.792		

It is clear from Table (11): that there are statistically significant differences in the responses of the study sample towards the degree of awareness of science teachers of the hot seat strategy according to the variable (gender). These statistically significant differences are present in all axes, and in the scale as a whole, for all the values of the test (T) are statistically significant when Significance level is less than (0.05). These differences were clearly in the direction of females with a higher arithmetic average, which means that the degree of awareness of female science teachers with the hot seat strategy is higher than what male teachers see. Such

differences can be due to administrative burdens that male teachers have placed more than female teachers, and the female teachers were keen to take advantage of the inter-time between the shares in the learn about modern teaching strategies, including the hot seat strategy.

Second: Differences according to the variable of Teaching Experience:

To find out whether there are statistically significant differences between the averages of the responses of the study sample regarding the degree of awareness of science teachers of the hot seat strategy attributable to the variable of experience in the field of teaching, the "One Way Anova" test was applied and the results were as follow in table (12):

Table (12) Results of "One way Anova" test for the differences between the responses of the study members according to the difference in teaching experience

dimension	Sources of variance	Sum of squares	Degrees of freedom	Average sum of squares	F	Statistical significance level
The degree of science teachers awareness of the hot seat strategy in Tabuk	Between groups	0.359	2	0.179	0.418	0.660
	Within groups	39.881	114	0.429		
	Total	40.240	116			

It is clear from the results in the above table that there are no statistically significant differences at the level of significance (0.05) between the averages of the responses of the study sample individuals regarding the degree of awareness of science teachers with the hot seat strategy attributed to the teaching experience. The value of P (0.418) is a statistically significant value at the level of Significant (0.05), which means that the views of the teaching experience on the degree of

٦. Science Teachers' Awareness of the Hot Seat Strategy and its Uses in Teaching at the Primary Level in Tabuk City

science teachers' awareness of the hot seat strategy from the teachers' point of view in teaching science are not different. This is due to the generalized content of the paraphernalia of the training program (s) they receive from the Ministry of Education which does not take into consideration the levels of teaching experience of the participants.

XI. Study recommendations:

In light of the findings of the study, the current research recommends several recommendations that would develop the competencies of the science teacher as follow:

- Educating science teachers in particular about the concept and steps of the hot seat's strategy, its rules, and its relationship to science education through systematic workshops and seminars.
- Holding training courses for science teachers to train them on how to use the hot seat strategy during teaching, and to encourage them to benefit from it.
- Encouraging science teachers to use the hot seat strategy, and to have the necessary skills for implementation.
- Creating a unified science teaching platform for the Ministry of Education to implement the use of active learning strategies and a hot seat strategy and work to evaluate and develop them.
- The necessity to study and analyze science curricula and curricula in the elementary stage, and work to develop them with a view to designing guides for teachers to train them to use active learning strategies.
- Creating an appropriate environment that enhances the effectiveness of using the hot-seat strategy in classrooms.
- The importance of administrative, moral and material support for teachers, in order to benefit from the use of modern learning methods that include more modern and effective learning.

XII. Suggested Research:

In light of the results reached, the researcher suggests conducting the following researches and studies:

1. Conducting a similar descriptive study on the reality of using active learning strategies and a hot Seat in teaching other courses at different educational stages.
2. Conducting a similar study dealing with methods of identifying training needs for science teachers towards the use of active learning strategies.
3. Conducting a study of the relationship between the use of active learning strategies in teacher training, and the goal related to teacher training in light of the Kingdom's 2030 vision.
4. Conducting an analytical study of the content of science courses in different educational stages, to get to know the nature of the learning strategies that science courses need, in order to achieve the educational and educational goals that they seek to achieve.

References:

- Abdulkarim, S. "The Effect of Using Hot Seat Strategy through Teaching Science for Developing Dialogue Skills and Scientific Interest for Elementary Stage Pupils." *Journal of Assiut University* 32, 2 (2016): 1-57.
- Acar, O. S., Turkmen, L. X. & Roy Choudhury, A. N. "Student difficulties in socio-scientific argumentation and decision-making research findings: Crossing the borders of two research lines." *International Journal of Science Education* 32, 9 (2010): 1191-1206.
- Alafoon, N., & Maykhan, H. "The Effect of Round Robin and Hot Seat Strategies in the Achievement of the Second Intermediate Grade Student's in Biology." *Journal of the College Of Basic Education* 24, 100 (2018): 237-264.
- Alansari, F. "The effect of active learning on self-learning. At the Fourth International Conference on Folklore Studies entitled: Folk Heritage between Egypt and Indonesia." *Center for Indonesian Research and Studies at the University of the Suez Canal - Ismailia Egypt: Suez Canal University - Center for Indonesian Research and Studies* 2 (2017): 229 - 282.
- Alsenidi, N. "The effect of the integration of the hot seat and the one-minute paper on the achievement of human rights material for students of the College of Education in Baghdad and the development of their positive thinking." *Journal of the College of Basic Education for Educational and Human Sciences, University of Babylon* 14, 20 (2015): 370-397.
- Alshammari, M. *101 Strategies in active learning*. Saudi Arabia: Ministry of Education, 2011.
- Alharbi, O. "The impact of using the hot seat strategy on developing of the reading and writing skills in Arabic

- for 2nd grade students in the state of Kuwait." *Master Thesis*. Al-Bayt University, Mafraq, 2019.
- Asiri, A. "The extent to which science processes are represented in preparing science lessons for middle school science teachers." *Journal of the Faculty of Education* 64, 4 (2016): 467 - 512.
- Attia, M. *Learning: modern patterns and models*, Dar Safa, Oman, 2016.
- Shehata, H., & Al-Najjar, Z. *Educational and psychological terms*, Egyptian Lebanese House: Cairo, 2003.
- Barab, S. D. *Design-based Research: a methodological toolkit for the learning scientist. The Cambridge Handbook of the Learning Sciences*. NY: Cambridge University Press, 2006. 153-170.
- Elnada, Z. "The Effectiveness of Using Hot Seating Strategy on Enhancing Student-Teacher's Speaking Skills at Al-Azhar University-Gaza," *Master Thesis*, Al-Azhar University-Gaza, 2015.
- Fowler, S. R. "Putting Students on the Hot Seat to Stimulate Interest in Biology in Non-Science Majors," *the American Biology Teacher* 74, 6 (2016): 410-412.
- Moore, K.D. *Effective Instructional strategies*. London: Sage Publications, 2015.
- Nasser, B. "The effect of using the hot seat strategy on obtaining and developing the historical sympathy for middle school students in social studies subject." *Journal of Basic Education College Research*. 4 (2019): 793-830.
- Shabrina, T. "The Implementation Of Hot Seat Strategy On The Students' Ability In Mastering English Vocabulary At Grade Eighth Of SMP Swasta Al-Hidayah Medan Tembung In Academic Year 2018/2019. Skripsi thesis, Universitas Islam Negeri Sumatera Utara, 2018.
- Siry, C. & Lang, D. "Creating participatory discourse for teaching and research in early childhood

٦٤ **Science Teachers' Awareness of the Hot Seat Strategy
and its Uses in Teaching at the Primary Level in Tabuk City**

science." *Journal of Science Teacher Education*, 21, 2
(2010): 149-160.

Suleiman, T. "The effect of using active learning as an
introduction to develop the capabilities of artistic
creativity for prep students." *Educational and social
studies - Programmer* 19, 3 (2013): 733-762.

Wilhelm, J. *Action Strategies for Deepening
Comprehension*. NY: Scholastic Professional Books,
2002.