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The Role of Multi-sensory Learning Activities on Iraqi Preparatory School Pupils' Communication

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Abstract

The research aims to identify how multi-sensory learning activities affect the communication growth of Iraqi preparatory school pupils as well as how those pupils' communication skills evolve in the classroom. Multi-sensory learning activities engage multiple senses (visual, auditory, kinesthetic, tactile) to enhance information processing and retention. By incorporating diverse sensory stimuli, these activities create rich and engaging learning experiences that cater to various learning styles. The research is hypothetical in that, in the posttest for Visual Learning Pupils, posttest for Auditory Learning Pupils, posttest for Kinesthetic Learning Pupils, and posttest for Tactile Learning Pupils communication test, The mean scores of the experimental groups and the control group differ statistically significantly. In the current research, 100 fifth-stage pupils were chosen during the academic year 2023–2024

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from Aghalar Preparatory School for Boys. Every group is equal in terms of age and parents' level of education.

The researcher statistically analyzed the data collected from the four post-test outcomes using one-way, two-way, three-way, and four-way ANOVA (analysis of variance) to gauge the pupils' post-test communication. Multi-sensory learning activities are more successful than using the traditional approach for communication, The results demonstrate a statistically significant difference in mean scores between the experimental groups and the control group. Concluding remarks, suggestions for more research, and recommendations complete the research.

Keywords: Communication, Concept of multi-sensory learning activities, Role of Multi-sensory Learning Activities on Pupils' Communication.

دور أنشطة التعلم متعدد الحواس في التواصل بين تلاميذ المدارس الإعدادية العراقية

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المستخلص

يهدف البحث إلى تحديد كيفية تأثير أنشـطة التعلم متعدد الحواس على نمو التواصـل لدى تلاميذ المدارس الإعدادية العراقية وكذلك كيفية تطوير مهارات الاتصـال لدى هؤلاء التلاميذ في الفصـل الدراسـي. تعمل أنشـطة التعلم متعدد الحواس على إشـراك الحواس المتعددة (البصـرية والسـمعية والحركية واللمسـية) لتعزيز معالجة المعلومات والاحتفاظ بها. ومن خلال دمج المحفزات الحسـية المتنوعة، تخلق هذه الأنشـطة تجارب تعليمية غنية وجذابة تلبي أنماط التعلم المختلفة. يفترض البحث أنه في الاختبار البعدي لتلاميذ التعلم البصري، والاختبار البعدي لتلاميذ التعلم السمعي، والاختبار البعدي لتلاميذ التعلم الحركي، والاختبار البعدي لتلاميذ التعلم اللمسـي، فإن متوسـطات درجات المجموعتين التجريبية والمجموعة الضـابطة تختلف اختلافا ذو دلالة إحصـائية. . تم في البحث الحالي اختيار 100 تلميذ من تلاميذ المرحلة الخامسـة خلال العام الدراسـي 2023–2024 من مدرسـة أغالار الإعدادية للبنين. وكل مجموعة متساوية من حيث العمر ومستوى تعليم الوالدين.

وقام الباحث بتحليل البيانات التي تم جمعها إحصـــائيا من نتائج الاختبار البعدي الأربعة باســـتخدام تحليل التباين الأحادي والثنائي والثلاثي والرباعي (تحليل التباين) لقياس تواصـــل التلاميذ بعد

الاختبار. تعتبر أنشـطة التعلم متعدد الحواس أكثر نجاحا من اسـتخدام المنهج التقليدي للتواصـل، وأظهرت النتائج وجود فرق ذو دلالة إحصـائية في متوسـط درجات بين المجموعات التجريبية والمجموعة الضـابطة. الملاحظات الختامية والمقترحات لمزيد من البحث والتوصيات تكمل البحث.

الكلمات الدالة: التواصـــل، مفهوم أنشـــطة التعلم متعددة الحواس، دور أنشـــطة التعلم متعددة الحواس في تواصل التلاميذ.

1. Statement of Problem

One of the most common educational activities utilized in classrooms is multi-sensory learning activities, which help pupils develop their learning system and help them retain new concepts, expressions, and meanings of the target language. The primary issues with this research are the pupils' disinterest in reading passages, their lack of desire to participate in class, and the teachers' incapacity to offer innovative teaching activities, especially in the fields of teaching, speaking, listening, and reading.

It is clear from a detailed analysis of the educational strategies used by Iraqi teachers that many of them are ignorant of the different learning styles displayed by their pupils. The subtleties of language acquisition have been ignored, seeing them as unimportant components of the educational process. Too many English teachers in Iraq appear to be ignorant of the particular preferences that their pupils have while learning a new language, as well as the methods necessary to accommodate these preferences. Because learning styles and multiple intelligences (MI) are interconnected aspects that work together to improve learning, (MI) has also been disregarded (Denig, 2004).

The following questions capture the nature of the research's issue:

1. What kinds of multi-sensory activities help pupils in preparatory schools in Iraq improve their communication skills the most?
2. How does the inclusion of kinesthetic, auditory, and visual activities affect pupils in preparatory schools in Iraq's language learning process as a whole?
3. How does the combination of kinesthetic, auditory, and visual learning activities affect Iraqi preparatory school pupils' overall language acquisition process?
4-What difficulties do teachers of preparatory schools in Iraq encounter when putting multi-sensory learning activities into practice, and how may these difficulties be overcome?

1.2 Aims

The research aims to determine:

1. How multi-sensory learning activities affect the communication skills of Iraqi preparatory school pupils.
2. The impact of the multi-sensory learning activities' two-, three-, and four-way interactions on pupils' communication.

This would demonstrate the potential synergistic or antagonistic effects on communication skills of specific combinations of multi-sensory learning activities (high kinesthetic + high tactile, or high visual + high auditory).

1.3 Hypotheses

The following null hypotheses are put forth to be verified:

1- The experimental group, which is taught using visual learning activities, has statistically significantly higher mean scores in post-pupil communication skills than the control group, which is taught using a (traditional) conventional technique.

2- The experimental group, which is taught using Auditory learning activities, has statistically significantly higher mean scores in post-pupil communication skills than the control group, which is taught using a (traditional) conventional technique.

3- The experimental group, which is taught using Kinesthetic learning activities, has statistically significantly higher mean scores in post-pupil communication skills than the control group, which is taught using a (traditional) conventional technique.

4- The experimental group, which is taught using Tactile learning activities, has statistically significantly higher mean scores in post-pupil communication skills than the control group, which is taught using a(traditional) conventional technique.

1.4 Introduction

The strength of this intelligence, which is called a profile of intelligence, the methods by which are employed by teachers to complete various tasks in various fields are where pupils differ. According to Garner (1999), these variations present a challenge to educational systems that presuppose that all pupils learn the same material in the same way and that a single, all-encompassing test is sufficient to assess pupils' learning. As it stands for an educational system which is based on linguistic modes of instruction and assessment. A different set of presumptions is more likely to have a positive impact on education. pupils acquire knowledge in distinctly identifiable styles. If disciplines could be presented in a variety of methods.so, learning could be accessed through a variety of means, and a wider range of pupils would be better achieved.

Pupils learn and develop their learning through VAKT experiences (Visual, Auditory, Kinesthetic, and Tactile) (Gillingham & Stillman, 1997). Multiple multisensory learning activities support learning requirements and promote growth among learners. Teachers aim to give pupils experiences that enable memorable conceptual understanding, especially in teaching (Boaler, 2022).

Cortiella (2011,p.89) States that, "the more senses are used, the more opportunities are given the brain to take in information by using preferred sense". Various pupils learn in various methods and benefit most from various learning activities. While some pupils learn well via auditory learning, others learn best through visual or kinesthetic learning. Activities that engage various senses will give varied pupils more accessible and meaningful learning opportunities.

Additionally, pupils better transfer new material to their long-term memories when given a chance to reinforce their learning via visual, auditory, kinesthetic, and tactile (VAKT) activities. Although it might be tempting for teachers to continue with traditional teaching activities, "bringing in a multisensory element into any teaching situation" (Mortimore, 2008,p.167) not only makes the class more engaging but also enables pupils to advance academically. Interactive activities that use manipulatives, play, images, and peer cooperation are ideal for primary teachers to incorporate (VAKT) learning activities into their lessons.

This research is limited to preparatory school pupils at Aghalar Preparatory School (for Boys) in Kirkuk city in the 2023–2024 academic year—the sample comprised (100) pupils from the fifth preparatory school. The control group was instructed using conventional techniques while the experiment groups received instruction using Multi-sensory Learning Activities.

The Research's Value are believed to exist:
1. Teachers can learn more about the best practices for developing instructional techniques and course materials both of which are crucial to the teaching and learning process by engaging in multi-sensory activities.

2. pupils who are prepared will be motivated to engage in multi-sensory learning activities and linguistic communication practice, which will improve their long-term memory.
3. The curriculum designer should create a curriculum that takes into account the needs, intellect, and inclinations of pupils.
4. Teachers should abandon the traditional teacher-centred approach and adopt student-centered teaching. To help pupils understand course objectives, evaluate communicative tasks and activities, participate in subject and material selection, work collaboratively, and identify their learning preferences, teachers are encouraged to implement different instructional strategies.

1.5Definition of The Basic Terms

1.5.1 Role: The part that each participant plays in each communication act is called their role. Certain jobs possess a degree of permanence (Richards and Schmidt, 2013).

1.5.2 Multi-sensory Learning Activities: are centered on assisting pupils in absorbing new information through a variety of senses. It is encouraged by this teaching approach to employ activities that stimulate pupils' kinesthetic, tactile, visual, and auditory senses (Hoisington,2015).

1.5.3 Communication: Communication has a critical role in the teaching-learning process. Pupils and teachers engage in social interactions during teaching. According to Sitihendon and Khalidjah (2007), communication between them is essential for learning to take place.

2.0 Theoretical Background

2.1 Concept of Multi-sensory Learning Activities

Visual learning activities are one of the "most exciting and stimulating methods" (Baratta, 2010, p.32). there is no separation between "vision and thinking," while still recognizing the importance of each. They are all a part of the same process. Visual learning is the process of organizing, arranging, and interpreting visible things. Reading the written text is one highly specialized visual talent. A vast range of media and visual presentation approaches are beneficial for language learners. To put it another way, audio-visual resources can help with language acquisition if used properly and at the correct moment. When learning and teaching a language, the pupil employs both his eyes and his ears. According to Rivers (1981, p.67), "It contributes to the understanding of another culture by providing vicarious contact with speakers of the language, through both audio and visual means".

The auditory pupils have excellent listening abilities. To understand anything, they have to hear it or say it. They are adept at picking up knowledge by watching players, copying, or listening to instructions spoken aloud, and then making notes or using written notes. Initially, they prefer to listen to lectures. Despite their enjoyment in class discussions, noise may easily take their attention

away. They may often find solutions by talking things out, paying close attention, and repeating information to make it clear. They recount stories with a terrific sense of humor (Weber, 2000).

The auditory pupils have personalities that get along, love chatting and listening, and struggle to follow written instructions. They need to hear and listen to an explanation to understand and learn. Visual pupils may filter information by listening and repeating what they hear rather than necessarily creating images in their thoughts. They are adept at utilizing "talk" to narrate stories and solve issues. Along with preparing and listening to their graded notes, they also ask questions, whisper new knowledge on their own, volunteer in the classroom, and "listen" to previous conversations to remember specifics (Kayalar and kayalar, 2017).

One of the ideas that encourages kinesthetic learning is the Montessori Method, developed by Italian physician Maria Montessori. According to Montessori's idea, learning relies heavily on muscle memory. According to her philosophy, Montessori believed that practicing a movement often helped the individual remember it in the future (Rusinko, 2011).

Tactile pupils should attempt or touch the content for best comprehension. This approach is commonly known as multi-sensory learning because tactile pupils adapt what they hear or see to their surroundings after absorbing the knowledge. This is not the same as auditory or visual learning, in which pupils are unable to comprehend instructions unless they are seen or heard. It is believed that tactile pupils learn best via doing things on their own or through practical experiences. They hear or see something unexpected at first, and then they employ more senses and engage in the action to finish the learning process. On the other hand, pupils who are classified as auditory and visual pupils might not need to take this extra step to fully absorb and understand new ideas and concepts (Cakir,2006).

Pupils differ in the strength of their intelligence or the so-called profile of intelligence, and how they apply and mix it to accomplish different jobs, solve different difficulties, and progress in other professions. These differences constitute a problem for educational institutions that assume that every pupil can acquire the same content in the same way and that a single, comprehensive exam is adequate to gauge each pupil’s progress. Currently, linguistic forms of instruction and assessment are greatly favoured in our educational system, with logical-quantitative modes receiving less weight. Alternative presumptions are more likely to have a beneficial effect on schooling. pupils pick up knowledge in ways that are easily recognized. A larger spectrum of pupils—and maybe the entire society—would benefit from learning if subjects could be taught in several ways and learning could be accessed through a variety of means (Lane, n .d).

2.2 Communication

Practical, helpful, and intentional communication takes place in the classroom. Both official and informal contexts, as well as interactions between pupils and teachers, are conducive to it. It involves everything from talking to lecturing to describing. In addition to guiding pupils through discussions and debates, the teacher should provide ideas and examples. Pupils use questions, doubts, and queries to communicate their issues, which the instructor must effectively respond to. An active teacher may keep control of their class even when they exhibit indications of passivity or boredom by using a range of interactive tactics to catch and keep their attention. However, if a pupil displays little interest in the lecture or lesson through their body language and facial expressions, the problem might worsen, and the pupil's attention may wander from the topic of the class discussion. Pupils learn to talk and listen during their early years, and these skills persist long after pupils have

developed their foundational speech and language abilities. Pupils constantly change, strengthening their cognitive functions, increasing their vocabulary, and innovating. Speaking and listening are two essential skills that are required in the classroom. In addition to being patient and paying close attention to their pupils, teachers also need to be proficient communicators. Active listening requires behaviors such as listening, understanding, or providing meaning to what is known about it, assessing it, and considering it. It is not the same as just hearing (Moats and Farrell,2005).

Transferring knowledge and understanding to another individual is known as communication. All that occurs during communication may be the speaker and listener exchanging a little message. It is important to remember, nevertheless, that accurate message understanding on the part of the recipient is a critical element of communication. When the recipient fails to grasp the primary intention of the message, communication fails to achieve its intended purpose. This implies that communication is useless when there is miscommunication between the speaker and the listener. When speaking with other people, it's important to remember that the way you convey your message matters (Ibrahim, 2023).

2.3 Role of Multi-sensory Learning Activities on Pupils' Communication

Multi-sensory learning activities help pupils' receptive language skills to develop. Receptive language talents are those that allow one to comprehend written or spoken words. Multi-sensory learning activities support the development of grammar and vocabulary skills by providing pupils with a range of approaches to learning new terms. For example, pupils can learn new words by seeing, hearing, and feeling them through the use of flashcards, audio recordings, and object play. Furthermore, via seeing, hearing, and using new language structures in real-life situations (such as role-playing, listening to stories, and reading aloud), they can acquire new language structures (Garner, 1999).

The capacity of pupils to communicate expressively through language can be enhanced by multi-sensory activities for learning. Profound expressive language abilities are necessary for efficient language usage in communication. Through multi-sensory activities, pupils may practice language usage in a variety of contexts, which can aid in the development of these abilities. To get better at speaking, pupils might employ puppets, games, and storytelling. They can also practice writing by using different writing tools (such as pencils, crayons, and markers), writing letters, and maintaining a diary (Tomlinson, 2003).

Since different pupils learn in different ways, good teachers recognize that communication is a symphony of the senses. Like how a composer employs an array of instruments to craft a complex aural experience, integrating tactile, visual, kinesthetic, and auditory learning activities into the classroom cultivates a more welcoming and dynamic setting that enables pupils to cultivate powerful communication abilities (Bain,2007).

The benefit is in combining these methods in a way that works well together. The use of visuals can improve an aural lesson, and written reflections can be used to accompany a kinesthetic activity for visual pupils. These multi-sensory learning activities guarantee a greater comprehension of the content, accommodate a range of learning styles, and give pupils a variety of opportunities to practice communication (Smith,2018).

Finding efficient strategies to get pupils ready for natural conversation is one of the main problems facing the present paradigm of language instruction. People utilize language as a medium of communication to convey their wants, emotions, and ideas. Thus, acquiring a language different from one's native tongue facilitates communication across international borders. Speaking ability is

evoked by learning communication skills. People must learn to listen intently and communicate clearly to improve their communication abilities. That's why it's called "skill"; it requires learning, honing, and development (Ahmed AL-ahbaby & Al Azzawi, 2024).

3.1 Methodology and Procedures

It is necessary to address (Kirk, 2013), the statement that the process of selecting experimental groups is known as experimental design before disclosing the kind of design. It offers details on the experiment's independent and dependent variables as well as the statistical methods applied. Research hypothesis testing cannot be done without first selecting an adequate experimental design.

The fifth-grade groups must be used in the present research to test the objectives and hypotheses utilizing the "2x2x2x2 Factorial Design". A factorial design is used to investigate how learning activities that are tactile, kinesthetic, visual, and auditory affect communication abilities. The design of the experimental investigation is shown in Table (3.1).

The following would be the levels of the independent variables:

1. Visual Learning Style	**2. Auditory Learning Style**	**3. Kinesthetic Learning Style**	**4. Tactile Learning Style**
Level 1: Low Visual	Level 1: Low Auditory	Level 1: Low Kinesthetic	Level 1: Low Tactile
Level 2: High Visual	Level 2: High Auditory	Level 2: High Kinesthetic	Level 2: High Tactile

These results would be in a 2x2x2x2 = 16 experimental conditions:

1. Low Visual + Low Auditory + Low Kinesthetic + Low Tactile
2. Low Visual + Low Auditory + Low Kinesthetic + High Tactile
3. Low Visual + Low Auditory + High Kinesthetic +Low Tactile
4. Low Visual + Low Auditory + High Kinesthetic + High Tactile
5. Low Visual + High Auditory + Low Kinesthetic + Low Tactile
6. Low Visual + High Auditory + Low Kinesthetic + High Tactile
7. Low Visual + High Auditory + High Kinesthetic + Low Tactile
8. Low Visual + High Auditory + High Kinesthetic + High Tactile
9. High Visual + Low Auditory + Low Kinesthetic + Low Tactile
10. High Visual + Low Auditory + Low Kinesthetic + High Tactile
11. High Visual + Low Auditory + High Kinesthetic + Low Tactile
12. High Visual + Low Auditory + High Kinesthetic + High Tactile
13. High Visual + High Auditory + Low Kinesthetic + Low Tactile
14. High Visual + High Auditory + Low Kinesthetic + High Tactile
15. High Visual + High Auditory + High Kinesthetic + Low Tactile
16. High Visual + High Auditory + High Kinesthetic + High Tactile

Table (3.1)
The Experimental design

Group	Pre-test	Independent variable	Dependent variable	Post-test
Experimental Group (Visual Learning style)	Pupils' communication	1-Low visual 2-High visual	communication in English subject	Pupils' communication
Experimental Group (Auditory Learning style)	Pupils' communication	1-Low Auditory 2-High Auditory	communication in English subject	Pupils' communication
Experimental Group (Kinesthetic Learning style)	Pupils' communication	1-Low Kinesthetic 2-High Kinesthetic	communication in English subject	Pupils' communication
Experimental Group (Tactile Learners)	Pupils' communication	1-Low Tactile 2-High Tactile	communication in English subject	Pupils' communication
ControlGroup	Pupils' communication	Traditional teaching activities	communication in English subject	Pupils' communication

3.2 Population and Sample of the Research

Lehman, et al (1971) assert that the population precisely indicates the number of individuals inside the group as well as the group.

Furthermore, according to (Best and Kahn,2006), a population is a group of pupils who have at least one characteristic in common that makes them unique from one another.

The research's sample comprises a total of (100) pupils selected from Aghalar Preparatory School for Boys' fifth scientific grade. The pupils are divided into five groups, A, B, C, D, and E, which are randomly selected to serve as the experimental and control groups. (20) pupils are divided into two sections: (10 pupils for low visual and 10 pupils for high visual)in Section (A) for the visual learning activities, and (10 pupils for low auditory and 10 pupils for high auditory) in section (B) for the Auditory learning activities .Section C comprises of 20 pupils for kinesthetic learning activities (10 pupils for Low Kinesthetic and 10 pupils for High Kinesthetic), Section D comprises of 20 pupils for tactile learning activities (10 pupils for Low Tactile and 10 pupils for High Tactile), and Section E comprises of twenty pupils for acting as the control group for all learning activities.

3.2 Test Construction

Brown and Abeywickrama (2010) suggest utilizing evaluations to determine how well pupils are doing in a classroom lesson, unit, and curricular subject within a certain time frame by concentrating on the goals of a specific course. It can help the pupils identify the areas in which they still require development. The test's main purpose after a lesson is to show that the learning objectives

have been reached. A Seven-question literacy posttest was provided to the pupils. There are five elements in each question.

1-Posttest1 for Visual Learning Pupils

The first question is an objective test on reading comprehension in which pupils are asked to respond based on how well they understand the passage. There are five elements in this question; each has two scores; the right answer gets two scores, while the wrong answer gets zero. The purpose of this question is to gauge the pupils' levels of understanding and knowledge.

In the second question, pupils are expected to match the provided words with the sentences in an objective test. There are five items total, and each one gets two scores. Ten scores are awarded for the second question in total, to measure the pupil's level of recognition.

In the third question, pupils must match the sentences with the correct photos in an objective test. There are five items in total, and each one gets two scores. Ten scores are awarded for the third question in total. to measure the pupil's level of knowledge.

In the fourth question, pupils are asked to choose whether the five sentences are true or false. This branch has a total score of (10) items. Two scores are awarded for a right answer, and zero for a wrong answer. This is used to measure the level of evaluation.

The fifth question is a subjective test. consists of a picture that the pupils are required to describe in compositions. The test is descriptive. The five questions have a total score of (10) scores. The level of comprehension and creativity is measured by this question.

The sixth question is a semi-objective one. Pupils are required to list and describe five places they have previously visited in their papers. This question has a total score of 25. To measure the pupil’s level of understanding and creativity.

The seventh question is also subjective. Pupils are asked to imagine themselves in the role of teachers and how they would plan the lesson. This question has a total score of 25 scores. To measure the pupil's level of creativity, understanding, and imagination development.

2-Posttest 2 for Auditory Learning Pupils

The first question is an objective test on reading comprehension in which pupils are asked to respond based on how well they understand the passage. There are five elements in this question; each has two scores; the right answer gets two scores, while the wrong answer gets zero. The purpose of this question is to measure the pupil’s levels of understanding and knowledge.

In the second question, pupils are asked to match the provided words with sentences that include the definitions of the given words in an objective test. There are five items, and each one gets two scores. Ten scores are awarded for the second question in total. to measure the pupil's level of recognition.

In the third question, there are five items. For each item, pupils choose the correct answer from a list of choices (a, b, c, d). This question has a total score of (10) and each item gets two scores. This is used to measure a pupil's remembering.

Question four consists of five items. Where pupils are asked to match words from list (A) with words from list (B) that have the same rhyme and have the same sound. This question has a total score of 10. Two scores are given for the right answer and zero for the wrong. This is done to measure the ability of pronunciation.

Question five requires pupils to write compositions about the advantages and disadvantages of the Internet. It is a subjective test. Descriptive test items are used. The question has a total score of (10) scores. The degree of comprehension and creativity is measured by this question.

Question six consists of five questions and a recorded short story which is a subjective test. The pupils listen to the story that has been recorded and respond verbally to the questions that follow. This question has scored a total of (30) scores. This test measures understanding level.

In question seven a tape recorder is played, and pupils listen to words, and the pupils are asked to write the number of stress syllables in each word. This question consists of 10 items, and it is a semi-objective test. The total score of this question is (30) scores. The correct answer gets (3) scores, and the wrong answer gets (zero) These scores measure the level of comprehension and remembering.

3-Posttest 3 for Kinesthetic Learning Pupils

Question one is an objective test. involves having pupils match the sentence with the five provided pictures. There are (10) possible scores in total for this question. This question measures comprehension.

The second question has been utilized to measure how well pupils use grammar. There are ten tasks total, and each one requires pupils to do it as required. This question has a total score of (10), with one score given to each item. This is to measure the extent of their analysis and synthesis.

The third question is a semi-objective. consists of five tasks in which pupils must arrange the words to create sentences. The question has a total score of (10) scores. The subject-verb arrangement is measured by this question.

The fourth question is an objective test with five items in which pupils are asked to choose suitable words to fill in the blanks. The question has a total score of 10, with two scores given for the right answer and zero for the wrong one. That is, to measure the level of comprehension of vocabulary.

The fifth question is a subjective test. Pupils are asked to name the four items they have seen in the given picture to fill in the blanks. The final task is to give a suitable title to the image. This question is given (10) scores, and its goal is to measure the level of analysis and synthesis.

In the sixth question of the test, which is a subjective one, pupils are asked to list five things they do every day from sunrise to night. The test items are meant to be descriptive. There are (25) scores in total for this question. This test measures the level of understanding and creation.

In the seventh question, which is a subjective test, pupils are asked to name five Olympic sports and give a brief description of each. Descriptive test items are used. The question has a total score of (25) scores. The level of comprehension and creativity is measured by this question.

4-Posttest4 for Tactile Learning Pupils

The first question is an objective test that asks pupils to read an unseen passage and then answer some questions about it. There are five items in all. The question has a total score of (10). (2) scores are given for a correct answer; and zero for a wrong answer.

The second question is an objective test with five items in which pupils are asked to choose suitable words to fill in the blanks. The question has a total score of (10), with (2) scores given for the right answer and zero for the wrong one. That is, to measure the level of recognition.

The third question consists of five items. Where pupils are asked to match words from list (A) with words from list (B) that make compound nouns. This question has a total score of (10). (2) scores are given for the right answer and zero for the wrong. This is done to measure the level of memorization.

In the fourth question, which is a subjective test, pupils are asked to mention five activities that they can learn from using their senses. Descriptive test items are used. The question has a total score of (10) scores. The level of comprehension and thinking is measured by this question.

The fifth question is a semi-objective test. Pupils are asked to name the five senses they have seen in the given picture. This question is given (10) scores, and its goal is to measure the level of comprehension.

The sixth question is a subjective test. where pupils are asked to play the role of teacher in the class, introducing a new subject in English. Try to construct tasks that require them to compose and use a variety of senses, such as touch. Descriptive test items are used. The question has a total score of (25) scores. The level of comprehension and creativity is measured by this question.

The seventh question is a subjective test. Pupils are asked to mention the five things they have seen in the given picture. This question is given (25) scores, and its goal is to measure the level of comprehension and creation.

3.3 Face Validity

One quality of a test and its items is face validity. The appropriateness, sensitivity, or relevance of the test and its items as they appear to the person taking it is referred to as face validity, as opposed to more technical forms of validity. Do individuals taking the exam believe the items on it are genuine and relevant? Face validity is the extent to which test-takers believe the questions and test material are appropriate for the situation in which they are being delivered (Stein., 2012).

3.4 Content Validity

Test items' correspondence to the real event that the test is intended to replicate is referred to as content validity (Hughes 1989). This is crucial since it correctly depicts the situation. The relationships between independent and dependent variables are when experiments are conducted. External validity occurs when our findings may be applied to a larger population, whereas internal validity is related to eliminating difficult factors from investigations.

Bloom's Taxonomy of Behavioral Objectives' cognitive domain serves as the foundation for the content analysis of the test items. The table below illustrates how the cognitive domain progresses

from the lower level of cognition, which is "remembering," to the higher level of cognition, which is "creating." As shown in table (3.2)

Table (3.2)
Numbers of Test Items for Each Level of Bloom's Taxonomy

Test items	Remembering	Understanding	Applying	Analyzing	Evaluating	Creating	Total
Q 1		20					20
Q 2		15	10				25
Q 3		7	3		10		20
Q 4	5	10				5	20
Q 5				2	2	9	13
Q6	2		3			15	20
Q7	5	2		5		13	25
Total	12	54	16	7	12	42	143

3.5 Reliability of the Posttests

The test is deemed reliable when it can be utilized by several researchers and yields consistent, non-varying results under steady surroundings. The ability to maintain consistency and repeatability over time is known as reliability. Furthermore, the measurement error-freeness of a test determines its reliability, the more prone to measurement errors, the less reliable the test is (Maree and Fraser, 2004).

The alpha-Cronbach formula is used to evaluate the reliability of the post-test. The coefficients for kinesthetic learning (KL) (0.81), tactile learning (TL) (0.78), audio learning (AL) (0.75), and visual learning (VL) (0.79) are considered acceptable.

3.6 Pilot Study

Arain et al. (2010) state that the pilot study is a little feasibility study created to evaluate various protocol components in preparation for a more exhaustive, accurate, or verified inquiry.

For the current research, it is highly recommended that a pilot study be conducted. Because of this, 15 pupils are picked at random from Aghalar Preparatory School for Boys' fifth scientific class. The pilot test was conducted in a classroom under regular conditions on October 8, 2023. Subsequently, the investigator gathers and modifies the papers that the participants submitted. Following the conclusion of the pilot study, the investigator discovered the following:

1. The post-test instructions don't include any significant ambiguity.

2. It takes 50 to 60 minutes to complete the exam items.

3.7 Item Analysis

Item analysis seems important since it depends on the pilot study results. The analytic process must identify the test items' discriminating power and difficulty level, two crucial aspects. These are listed in the following order:

3.7.1 Difficulty Level

The percentage of pupils that properly answer a test question indicates how tough the issue is. A higher proportion is correlated with lower difficulty. An item's difficulty and index have an inverse connection, according to Wood (1960), indicating that the tougher the item, the lower its index. Brown (2001) states that an ideal test item will fall between (0.15) and (0.85) in terms of difficulty. The DL of the present research test items are from (0.28)to (0.70).

3.7.2 Discrimination Power

It is the extent to which a certain thing can tell pupils with high and low abilities apart. Discrimination is required because more discriminating test items will be more dependable (Hughes, 2005). It may also be defined as the ability of a test to differentiate between bright pupils and those who are not (Arikunto, 2006). Higher exam results are associated with intelligence, while lower marks are associated with laziness. Discrimination, like the term "level of difficulty," has an index. It is a measure of an item's ability to differentiate between strong and poor candidates. The research test item DP is found to have a range of (0.10) - (0.70).

4. Analysis of Data and Discussion of Results

4.1 Comparison of the Five Groups' Mean Scores

One-way (ANOVA) Analysis of Variance is used to determine whether there are any statistically significant differences in the mean achievement post-test scores of the five groups. As seen in the following Table:

Table (4.1)

One-way analysis of Variance (ANOVA) among the Five Groups

Variables	Sum of Squares	DF	Mean Square	F-value		Sig.
				Calculated	Tabulated	
Between Groups	4610.660	4	1152.665	5.059	2.47	0.05
Within Groups	21644.250	95	227.834			
Total	26254.910	99				

The calculated F-value (5.059) is higher than the tabular F-value (2.47) at the (0.05) level of significance and DF = 4. It shows that there is a substantial variation in the pupils' post-test mean scores.

To obtain the aims of the research (Two-way) ANOVA of variance was used between the four groups.

Table (4.2)

Two-way analysis of Variance (ANOVA) among the (Visual, Auditory, Kinesthetic, and Tactile) groups

Source	Sum of Square	DF	Mean Square	F-Value		Sig
				Calculated	Tabulated	
Corrected Model	1186.95000	7	169.564	0.642	2.72	0.720
Intercept	383922.050	1	383922.050	1453.256		0.000
Multisensory learning activities	241.450	3	80.483	0.305		0.822
Levels (Low*High)	806.450	1	806.450	3.053		0.085
Multisensory Learning Activities *Levels	139.050	3	46.350	0.175		0.913
Error	19021.000	72	264.181			
Total	404130.000	80				
Corrected Total	20207.950	79				

a.R Squared =0.059(Adjusted R Squared =0.033)

According to Table (4.2), there are statistical differences in the interaction between the four groups (Visual, Auditory, Kinesthetic, and Tactile). The F-value for the comparison is 0.305, which is less than the tabulated value of 2.72, and the p-value is 0.822. However, there are no statistically significant variations in the interaction between the two levels, as indicated by the estimated F-value for the two levels (Low and High), which is 3.053, greater than the Tabulated value and the p-value of 0.085. In conclusion, there are statistically significant differences between the groups and the levels when comparing the Multi-sensory Learning Activities with levels. This is shown by the calculated F-value of 0.175, which is lower than the tabular one, and the p-value of 0.913.

Table (4.3)

Three-way analysis of Variance (ANOVA) among the (Visual, Auditory, Kinesthetic, and Tactile) groups

Source	Sum of Square	DF	Mean Square	F-Value		Sig
				Calculated	Tabulated	
Corrected Model	7077.819000	10	707.782	4.156	2.72	0.000
Intercept	66052.195	1	66052.195	387.836		0.000
Multisensory learning activities	41.327	2	20.664	0.121		0.886
Levels (Low*High)	65.340	1	65.340	0.384		0.539
Interaction	4755.013	1	4755.013	27.920		0.000
Multisensory Learning Activities *Levels	62.113	2	31.057	0.182		0.834
Multisensory Learning Activities* *Interaction	4.766	2	2.383	0.014		0.986
Levels*Interaction	0.013	1	0.013	0.000		0.993
Multisensory Learning Activities *Levels*Interaction	0.544	1	0.544	0.003		0.955

Error	8345.164	49	170.309			
Total	309283.000	60				
Corrected Total	15422.983	59				

a.R Squared =0.459(Adjusted R Squared =0.348)

According to Table (4.3), there are statistical differences in the interaction between the four groups (Visual, Auditory, Kinesthetic, and Tactile). The F-value for the comparison is 0.121, which is less than the tabulated value of 2.72, and the p-value is 0.886.However, there are statistically significant differences in the interaction between the levels, as indicated by the estimated F-value for the two levels (Low and High), which is (0.383), which is lower than the Tabulated value and the p-value, which is (0.539). Lastly, there are statistically significant differences between the groups, the levels, and the interaction between the groups and levels when comparing the Multi-sensory Learning Activities with levels and the calculated F-value is (0.003) lower than the tabulated one and the p-value is (0.955)

Table (4.4)

Four-way analysis of Variance (ANOVA) among the (Visual, Auditory, Kinesthetic, and Tactile) groups

Source	Sum of Square	DF	Mean Square	F-Value		Sig
				Calculated	Tabulated	
Corrected Model	8208.731000	14	586.338	3.176	2.72	0.001
Intercept	89349.116	1	89349.116	484.006		0.000
Multisensory learning activities	48.659	3	16.220	0.088		0.966
Levels (Low*High)	35.158	1	35.158	0.190		0.664
Interaction	6039.185	1	6039.185	32.714		0.000
Multisensory Learning Activities *Levels	57.265	3	19.088	0.103		0.958
Multisensory Learning Activities* *Interaction	19.364	3	6.455	0.035		0.991
Levels*Interaction	31.939	1	31.939	0.173		0.679
Multisensory Learning Activities *Levels*Interaction	15.685	2	7.842	0.042		0.958
Error	11999.219	65	184.603			
Total	404130.000	80				
Corrected Total	20207.950	79				

a.R Squared =0.406(Adjusted R Squared =0.278)

Table (4.4) shows that the p-value is (0.966) and the F-value is (0.088) less than the tabulated value (2.72) for the comparison of the four groups (Visual, Auditory, Kinesthetic, and Tactile) This indicates that the interactions between the groups differ statistically.The interaction between the two levels is statistically significant, as indicated by the estimated F-value of 0.190 for the Low and High

levels, which is lower than the Tabulated value and the p-value of 0.664. Lastly, the calculated F-value is (0.042) less than the tabulated one and the p-value is (0.958) indicating that there are statistically significant differences between the groups, the levels, and the interaction between the groups and levels.

4.2 Discussion of the Obtained Results

The research looks at how Iraqi Preparatory School pupils' communication is impacted by multi-sensory learning activities. It also looks at whether the five groups differ in any significant ways.

1. a comparison of the groups:

1. Compared to those with low visual learning styles, those with strong visual learning styles will have superior communication abilities.
2. Those who learn best by listening will have superior communication abilities than others who learn best by listening.
3. Those who learn best via kinesthetic means will have superior communication abilities than individuals who learn best through sensory means.

4. Those with a high tactile learning style will communicate more effectively than pupils with a low tactile learning style.

2. Interaction Hypotheses:

1. Those with a high visual and high auditory style of learning will have the best communication skills due to the significant two-way interaction between visual and auditory learning styles.

2. Visual, auditory, and kinesthetic learning styles will significantly interact in three ways, and the greatest communicators will be those with an established reputation in each of the three.
3. The four learning styles—visual, auditory, kinesthetic, and tactile—will significantly interact with one another. As a result, those who possess the highest degree of proficiency in all four modalities will have the most advanced communication abilities.

Based on the theoretical framework and previous research, these hypotheses summarize the important correlations that researchers hope to find. To offer a thorough knowledge of how various learning style preferences influence communication ability, the factorial design will enable the assessment of these primary effects and interactions.

A deeper understanding of the pupils' behaviour may be obtained by examining several elements that influence how they interact with these assumptions. Furthermore, Using ANOVA one-way, two-way, three-way, and four-way forms provides additional factors impacting how pupils interact. Pupils at high levels outperform those at low levels. According to the aforementioned data, there are statistically significant relationships between the mean scores of the four Experimental Groups and the Control group in one, two, three, and four ways. According to the results, all four hypotheses are accepted.

5. Conclusions

The following conclusions have been drawn in light of the results of the research:

1. English communication skills among pupils in preparatory schools may be effectively improved through multi-sensory learning activities.
2. The experimental group's pupils performed better than the control group's pupils when using concept maps to encourage creativity in learning and generate motivation, indicating that the latter group was more receptive to the multi-sensory learning activities. Memory cards and writing devices were highlighted in drawings.

3. The activities that use several senses to learn encourage both cooperative and competitive learning among group members.
4. By involving pupils in discussions and taking turns in small or large groups, multi-sensory learning activities used in preparatory school instruction promote pupil-teacher and pupil-pupil interaction.
5. pupils show a strong degree of interest in and willingness to learn English when they are exposed to these novel activities. This is adequate to guarantee that teaching is a productive profession.
6. Test results show that using multi-sensory learning activities in the classroom has a major influence on the communication skills of Iraqi preparatory pupils.

7. Develop lively and captivating environments that motivate pupils to participate actively in the educational process by placing them in collaborative, competitive, imaginative, and lively learning scenarios.

8. Making use of a range of tools, including pictures, movies, diagrams, and visual organizers, to make learning new ideas easier. It attracts pupils' attention and piques their curiosity, motivating them to seek out more information.

9. The link between pupils and their teacher, who directs the learning process in the classroom, is strengthened through multi-sensory learning activities.

6. Recommendation

The following suggestions are made by this research:

1. To improve and elevate their pupils' achievement, English teachers ought to receive training on the use of multisensory learning activities in their classrooms.

2. It is advocated by curriculum designers and EFL methodologists to incorporate multisensory learning activities into lessons in English in schools.

3. English as a second language (EFL) schools must promote pupils' use of the language in thinking, problem-solving, and comprehension inside the classroom.

4. The benefits of cooperative and motivational learning in the classroom for EFL instruction should be emphasized by pupils as well as teachers.

5. To greatly foster the abilities and interests of pupils, teachers should concentrate on a variety of pedagogical approaches, techniques, and tactics for teaching English.

6. To encourage creative thinking and active learning, teachers must use a variety of instructional aids, including data displays, recordings, and practice exercises that help pupils learn the English language easily.

7. EFL teachers should encourage and support the development of their pupils in bravery and confidence.

8. Developing a range of lessons that may be taught using multisensory learning activities to boost the drive of pupils.

7. Suggestion for Further Studies

1-The Impact of multi-sensory learning activities on Teaching Writing or Listening Skills.

2-The Effect of multi-sensory learning activities on University Students' Achievement in writing.
3-The Effect of multi-sensory learning activities on Teaching Literacy texts.

4-The Role of Using Multi-Sensory Learning Activities in teaching grammar, poetry, and short stories for EFL Iraqi pupils.

5-The Effect of multi-sensory learning activities on short and long-term memory.

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