Crossword Puzzles with Colour as a Learning Tool for Grammar Development

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Abstract

This research is a game–based teaching technique that utilizes crossword puzzles enhanced with colour cues. It can be regarded as a visual, game–oriented instructional technique for grammar development, combining games and visual support in English language teaching. Grammar development here focuses on enhancing learners' understanding and use of grammar.

The approach of the current study supports this by making learning interactive, visual, and engaging.

This integration has gained increasing attention for its potential to enhance learners' understanding and achievement. (Fatah,2025)

This research aims to investigate the use of crossword puzzles with colour as an instructional technique for grammar development among EFL learners at the primary school level. Drawing on the principles of game–based learning (De Freitas, 2018) and visual scaffolding (Paivio, 2006). Unlike traditional memorising exercises, crossword puzzles combine problem–solving with playful interaction, while the use of colour coding provides learners with additional cues for noticing and recalling grammar rules. This research argues that coloured crossword puzzles can foster engagement, reinforce memory retention, and facilitate deeper understanding of grammatical structures.

Previous studies have demonstrated the positive effects of puzzles and gamification on language learning outcomes (Turgut & Irgin, 2009; Baleghizadeh & Ashoori, 2011), yet limited research has examined their specific application to grammar instruction. This research seeks to overcome that problem by exploring how crossword puzzles with colour can be systematically applied as a classroom technique to promote grammatical accuracy, as well as simplified grammar understanding and use. The research also places this technique within the theoretical framework of Grammatical Consciousness Raising (GCR), (Rutherford & Sharwood Smith,1985; Ellis,1993), arguing that colour acts as a primary visual scaffold to direct learners' attention to targeted grammatical forms: Nouns, verbs, and adjectives within an engaging, problem-solving context. This technique differs from traditional deductive methods, it requires learners to inductively deduce grammatical rules based on the patterned use of colour clues, thereby promoting deeper cognitive processing and metalinguistic awareness (Schmidt,1990).

In light of the research aim, the research's null hypothesis has been formulated to be tested. The design of one group is adopted and pre- and post-tests are used. The sample includes (35) female pupils who are randomly selected from Qubatulsakhrah primary school for girls in Mosul city.

The findings of the single-group design showed improved learners' grammar knowledge and retention after using the crossword puzzles with colour. Furthermore, learners' feedback was expected to reflect greater understanding and positive attitudes toward grammar learning. While the lack of a control group limits the ability to demonstrate causal effects, the results provide valuable insights into the potential of crossword puzzles with colour as an interactive and supportive tool for grammar development among primary pupils.

Keywords: Crossword Puzzles, Grammar.

الكلمات المتقاطعة الملونة كأداة تعليمية لتطوير القواعد اللغوية

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الملخص

هذا البحث، ببساطة هو أسلوب تعليمي قائم على اللعب إذ يستخدم ألغاز الكلمات المتقاطعة المُعززة بإشارات لونية. فهو أسلوب تعليمي بصري قائم على اللعب لتطوير القواعد النحوية فهو مزيج من الألعاب والدعم البصري في تدريس اللغة الإنجليزية ولقد حظي هذا التكامل باهتمام متزايد لقدرته على تعزيز دافعية المتعلمين وإنجازاتهم(فاتح، ٢٠٢٥)

يهدف هذا البحث إلى دراسة استخدام ألغاز الكلمات المتقاطعة الملونة كأسلوب تعليمي لتطوير القواعد بين متعلمي اللغة الإنجليزية كلغة أجنبية في المرحلة الابتدائية. بالاعتماد على مبادئ التعلم القائم على اللعب والتدعيم البصري. وعلى عكس التمارين التقليدية تجمع ألغاز الكلمات المتقاطعة بين حل المشكلات والتفاعل المرح بينما يوفر استخدام الترميز اللوني للمتعلمين إشارات إضافية لملاحظة قواعد النحو وتذكرها. ويجادل هذا البحث بأن ألغاز الكلمات المتقاطعة الملونة حيث يمكن أن تعزز المشاركة، وتعزز حفظ الذاكرة، وتسهل فهمًا أعمق للتراكيب النحوية.

أظهرت الدراسات السابقة الآثار الإيجابية للألغاز واللعب على نتائج تعلم اللغة (Turgut & Irgin، ٢٠٠٩؛ Baleghizadeh & Ashoori، ٢٠١١)، إلا أن أبحاثًا محدودة جرى تطبيقها بشكل محدد على تعليم القواعد النحوية للغة الانكليزية.

لذلك يرمي هذا البحث إلى سد هذه الفجوة من خلال البحث عن كيفية تطبيق ألغاز الكلمات المتقاطعة الملونة بشكل منهجي كتقنية صفية لتعزيز الدقة النحوية واستقلالية المتعلم والدافع وتسهيل تطوير القواعد النحوية لدى متعلمي اللغات الأجنبية.

يضع البحث أيضًا هذه التقنية ضمن الإطار النظري لرفع الوعي النحوي (GCR) (Rutherford & Sharwood Smith ، ١٩٨٥؛ Ellis، ١٩٩٣)، حيث أن اللون يعمل كسقالة بصرية أساسية لتوجيه انتباه المتعلمين إلى الأشكال النحوية المستهدفة: الأسماء والأفعال والصفات في سياق تفاعلي لحل المشكلات. تختلف هذه التقنية عن الطرق الاستنتاجية التقليدية، إذ تتطلب من المتعلمين استنتاج القواعد النحوية استقرائيًا بناءً على الاستخدام النمطي لدلائل الألوان، مما يعزز المعالجة المعرفية العميقة والوعي اللغوي (Shchmit،١٩٩٠).

في ضوء هدف البحث، تمت صياغة الفرضية الصفرية للبحث ليتم اختبارها. تم اعتماد تصميم المجموعة الواحدة واستخدام الاختبارات القبلية والبعدية. تشمل العينة (٣٥) تلميذة تم اختيارهن عشوائيًا من مدرسة قبة الصخرة الابتدائية للبنات في مدينة الموصل.

أظهرت نتائج تصميم المجموعة الواحدة تحسنًا في معرفة المتعلمين بالقواعد النحوية للغة الانكليزية واحتفاظهم بها بعد استخدام ألغاز الكلمات المتقاطعة بالألوان. علاوة على ذلك، كان من المتوقع أن تعكس ملاحظات المتعلمين دافعًا أكبر ومواقف إيجابية تجاه تعلم القواعد. في حين أن عدم وجود مجموعة ضابطة يحد من القدرة على إظهار التأثيرات السببية، فإن النتائج توفر رؤى قيّمة حول إمكانات ألغاز الكلمات المتقاطعة بالألوان كأداة تفاعلية وداعمة لتطوير القواعد النحوية بين تلاميذ المرحلة الابتدائية.

الكلمات المفتاحية: الكلمات المتقاطعة الملونة ، القواعد اللغوية.

Introduction

One of the most important challenges in teaching grammar to young children is moving beyond memorization and abstract rules to a more concrete, engaging, and contextualized approach. Traditional methods often fail to capture the attention and interest of children, for whom play is a vital mode of learning (Vygotsky, 1978). Crossword puzzles, particularly when supported by strategic colour coding, offer an effective solution by transforming grammar practice into a fun and cognitively stimulating problem-solving activity.

Grammar serves as the structural foundation of language and includes the rules that govern syntax, morphology, and usage. Its abstract nature can make it difficult for learners to grasp and apply effectively. Educational research advocates for teaching approaches that move away from traditional deductive methods, suggesting more inductive, communicative, and form-focused tasks that highlight grammatical forms in meaningful contexts (Long, 1991; Doughty & Williams, 1998). Effective tools in this approach encourage learners to become aware of linguistic forms, which refers to their conscious recognition of these forms, and provide opportunities for controlled practice, eventually leading to automaticity in usage (Schmidt, 1990).

Crossword puzzles serve as an effective educational tool that encourages active learning and problem-solving. They require learners to recall and apply their grammatical knowledge in a meaningful context, enhancing both their understanding and use skills (Fitzpatrick, 2018). Additionally, the crossword puzzle technique provides a fun and engaging activity for elementary students, and helps pupils to reduce the cognitive load often associated with learning grammar. This shift transforms grammar practice into an exciting challenge rather than a monotonous task (Nation & McAllister, 2021).

The integration of colour creates a multi-sensory learning environment that combines cognitive, visual, and kinesthetic elements, making it especially effective for young learners. Research has shown that such multimodal approaches can boost understanding and improve academic outcomes in language classrooms (Al-Shiji, 2016; Yip & Kwan, 2020). Therefore, exploring the use of crossword puzzles with colour as a teaching tool for grammar development could provide valuable insights into innovative methods for teaching grammar to primary school EFL learners

Statement of the Problem

Although developing grammatical competence is a fundamental yet consistently challenging goal in language education (Dekeyser,2007) Teachers of primary schools concentrate on traditional techniques and methods of teaching, they rarely apply non-traditional techniques of teaching such as word puzzles with colour technique which enhancing the skills of the learners' understanding and use of grammar.

On the other hand, although crossword puzzles have been used in language classrooms to aid vocabulary learning, their potential for grammar development particularly when enhanced with colour as visual cues has not been thoroughly examined. Colours can act as attention-grabbing signals, helping learners to identify grammatical categories such as verb tense, plurals, and parts of speech (Dzulkifli & Mustafar, 2013; Mayer, 2021). However, there is a lack of empirical studies exploring the effectiveness of colour-based crossword puzzles for grammar learning in elementary EFL (English as a Foreign Language) settings.

Aim of the Research

This research aims to investigate the use of crossword puzzles with colour as a game based teaching technique to enhance grammar

learning in English by examining students' grammar achievement, comprehension of grammar, the study seeks to contribute to effective classroom practices and expand research on game-based language teaching approaches.

Hypotheses of the Research:

The research assumes that there are no statistically significant differences between the development mean scores of the group in a given pre-test and post-test.

Importance of the Research

The significance of this research lies in its contribution to the growing literature on game-based learning, by examining crossword puzzles with colour as an innovative teaching technique, this research is important for teachers and curriculum designers, as it demonstrates how crossword puzzles with colour enhance grammatical awareness, recall, and learner understanding. It is particularly relevant in resource limited learners, where teachers often seek innovative and simple tools to make learning more interactive.

Finally, this research benefits learners themselves. By combining play, problem solving, and visual support, crossword puzzles with colour may alleviate grammar anxiety, foster positive attitudes, and support lifelong learning skills such as critical thinking and collaboration.

Limits of the Research

The current research is limited to:

1- A sample of the Fifth Grade Primary class female pupils on the left bank of Mosul.

2- Teaching the sentence structure pattern in the English language from the book (English for Iraq, fifth primary Book). UK. Published by Garnet Publishing Ltd. First edition 2017

3. The second term of the academic year 2023 - 2024.

Definition of Basic Terms

As far as this research is concerned

Crossword puzzles refer to grid-based word games in which learners complete intersecting both horizontal and vertical words by solving clues related to grammar structures or forms. Unlike traditional use for vocabulary, crossword puzzles here are adapted for grammar practice, requiring learners to understand and apply grammatical rules in a problem solving context (Fitzpatrick, 2018).

Colour refers to the use of different hues to highlight grammatical categories or structures within crossword puzzles (e.g., verbs in blue, nouns in red, adjectives in green). Colour functions as a visual cue to enhance learners 'attention, categorization, and memory retention (Dzulkifli & Mustafar, 2013; Mayer, 2021).

Grammar development is defined as the process through which learners acquire, internalize, and apply rules governing the structure of a language, including parts of speech, tenses, agreement, and sentence formation. (Ellis, 2017).

Grammar development here means improving learners' understanding and use of grammar.

Game-based learning refers to the integration of play elements and structured games into the learning process, to enhance understanding, and use. Crossword puzzles are categorized here as a form of game-based learning that makes grammar practice more interactive and enjoyable (Yip & Kwan, 2020).

Primary school learners are children between the ages of approximately 7 to12 who are learning English as a foreign language in a school context. They are at a developmental stage where visual, interactive, and playful activities are particularly effective for sustaining attention and boosting language acquisition (Cameron, 2001).

Procedures

According to the aims and materials of Unit 2 Lesson 4 which are:

1- To learn adjectives that describe characteristics (animals)

2- To practice asking and answering questions about animals and their general characteristics

Materials: Pupil's Book pages 28-29

Activity Book pages 26-27

Optional: blank sheets of paper or a clean notebook page

The three sentences taken from the text book are written on the board and explained:

1- Cats are playful.

2- Horses are fast.

3- Sharks are dangerous.

- What do you notice? The teacher/researcher asks, …… aha, he adds, "cat, horse and shark" are nouns, like your name, your classmates' names: "Fatima, Ann, Sara … etc.".

"are" is a verb means action or movement, as you know we use "is" for singular and "are" for plural. We call "is and are" verbs to be. They are used here to connect words before and after.

Whereas "playful, fast and dangerous" are adjectives, they describe the nouns or the names as we said.

After that the pupils are asked to read chorally and loudly the sentences one by one after him.

Then he asks what is this pointing to the words individually:

 cat, horse and shark, they say nouns,

are, they say verb,

playful, fast and dangerous, they say adjectives.

The pupils are asked to look at pages 28 and 29 for further nouns, verbs and adjectives as a home work.

Then he goes ahead to explain what they have according to his daily plan, and that will be repeated along by the experiment days.

In the next lesson, he reviews what they have given about nouns, verbs and adjectives.

Then the Pre-Test starts by giving five short sentences each sentence gets 3 marks, the total marks is 15 in Appendix1

After that the experiment starts by using Crossword Puzzles with Colour technique:

As we said before,

Cats are playful.

Horses are fast.

Sharks are dangerous.

Who can give a similar sentence, let me start first, he asks two pupils to approach the board and asks them:

- What is your name?

- Hiba, Ann

- Great, what is Hiba? Is she a boy or a girl?

- Girl.

- Yes, she is a girl.

- What about Ann?

- She is a girl.

- Great, so what are Hiba and Ann?

- Girl,

- Girl or girls?

- Girls.

- So, Hiba and Ann are girls. Since you are all beautiful, we can say that:

- Girls are beautiful.

Then about 10 pupils give similar sentences.

- What can you see in these three sentences?

- Some pupils reply noun, verbs and adjectives.

- What about other pupils? Hmm …. No response

Ok let's agree on that, sentences like these have three elements "word"

noun, verbs and adjectives, we will give each one of them a colour code

noun will be green "n", verbs will be red "r" and blue "adj." for adjective.

As you see, we start with green, red and then blue successively.

In other words, green is the name of persons, like Hiba and Ann, or animals like cat and horse etc., red links "n" and "adj." whereas blue describes the green, as girls, playful or fast etc. Let us begin:

n   v   adj.

Cats are playful.

  n   v   adj.

Horses are fast.

n   v   adj.

Sharks are dangerous.

Let us put them in a diagram. (Appendix 2)

The sentences are read two times first as "cats are playful" and second as "n, v, adj." Pupils are asked to read them chorally three times.

Some pupils are asked to write sentences on the boards. others to write n, v and adj.

In the next lesson, the topic is reviewed and a prepared diagram is mounted on the board.

- If I ask you, what are cats? Who can answer?

Oh, no one?

Let us use colours then:

What are cats? Which colour comes first?

- Green.

Yes, very good. cats, Which one in the middle? Which links words?

- Red.

- Yes, marvelous, are

- and finally which colour comes last?

- Blue,

- Excellent, playful

Now arrange them according to the colours;

Cats are playful.

Wonderful.

The same process repeated in details with the two other sentences.

Five minutes are given to the pupils to discover that in question red becomes before green, and in normal sentence "affirmative" green comes first.

By finishing that, the lesson achieves the first two aims, which are the focus of the current research.

In the next lesson, the topic is reviewed and a new diagram of 16 cells is amount on the board (Appendix 3).

Now we have a funny game:

- Look at this diagram, it has green, red and blue words, right?

- yes.

- I would like you to look at it deeply and extract at least on sentence from it. I will give you a hint, the researcher writes "Girls are beautiful." Who can find it inside the diagram? After minutes a pupil finds

- Great, come and draw an arrow next to it. Excellent, applaud her for her brilliance.

- Who else? Yes, good come and draw an arrow next to it. Now write it on the board. Excellent, applaud her for her brilliance.

The process repeated for 35 minutes.

In the next lesson, the Post-Test is taken (Appendix 1) and the experiment is done.

The Experimental Design of the Research

	Pre-Test	Independent Variable	Post-Test
Research Group	Five questions based on examples taken from the text book	Crossword Puzzles with Colour Technique	Five questions based on examples taken from the text book

Implementation of the Post-Test:

After completing the experiment, the Post-Test of the same questions as shown in the Appendix (4) is conducted to the research group.

The results shown in the table below are reached:

Mean, Standard Deviation, and T Values in the Pre and Post-Tests of the Pupils'.

Research Group	Tests	No. of Pupils	Mean	Standard Deviation	T Value		Level of Significance
					Calculated	Tabulated	
	Pre-Test	35	6.427	3.9093	3.945	2.021	(0.05) At 34 degrees of freedom
	Post-Test	35	9.933	0.2527			

Data Analysis and Results Discussion:

It is obvious that the calculated T value (3.945) is higher than the tabulated T value which is (2.021) with $(\alpha = 0.05)$ alpha and (34) degree of freedom. Consequently, the null-hypothesis is rejected and the alternative one is accepted. That is to say, there are statistically significant differences between the mean scores of the Pre-Test and the Post-Test in favour of the Post-Test. In other words, the use of "crossword Puzzles with colour" technique has a positive effect on productive and comprehension skills of the fifth grade primary pupils, as the pupils' scores in Post-Test are higher than with their scores in the Pre-Test.

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Appendix 1
Pre-Test and Post-Test

Identify the nouns "**n**", verbs "**v**" and adjectives "**adj.**" in the following sentences:

1- Dolphins   are   friendly.

2- Lions   are   strong.

3- Camels   are   intelligent.

4- Boys   are   smart.

5- Desks   are   clean.

Appendix 2

Diagram 1

cats	are	playful
horses	are	fast
sharks	are	dangerous

Appendix 3

Diagram 2

dangerous	Sharks	are	beautiful
horses	Are	fast	cats
beautiful	Cats	are	sharks
are	Playful	girls	are
girls	girls	horses	dangerous
are	Are	are	fast
beautiful	Hiba and Ann	beautiful	horses