



ISSN: 0303-3872

AFRICAN JOURNAL OF EDUCATIONAL RESEARCH

VOLUME 30, DECEMBER, 2024

**JOINTLY PUBLISHED BY:
DEPARTMENTS OF ARTS AND
SOCIAL SCIENCES EDUCATION,
EARLY CHILDHOOD AND
EDUCATIONAL FOUNDATIONS AND
SCIENCE AND TECHNOLOGY EDUCATION,
UNIVERSITY OF IBADAN.**

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Effects of Retrieval-Practice Instructional Strategy on Pupils' Performance in English Studies in Kaduna, Nigeria

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Abstract

This paper focused on assessing the effects of retrieval-practice instructional strategy on pupils' performance in English Studies. The research design employed for the study was a quasi-experimental design. The target population consisted of all the 12,494 basic five pupils in Sabon Gari Local Government Area of Kaduna State. Multistage sampling procedure which consisted of purposive, stratified and simple random sampling techniques was used to sample 291 pupils that participated in the study. English Performance Test (EPT) was used for data collection and two guides were used for instructions. The instruments were validated by some lecturers in the Departments of Adult and Primary Education, University of Ilorin and basic five English language teachers. Parallel-form reliability subjected to Pearson Product Moment Correlation analysis yielded 0.76 correlation coefficient. The research hypotheses were tested using Analysis of Covariance (ANCOVA) at 0.05 level of significance. The study found a significant main effect of retrieval-practice instructional strategy on pupils' performance in English studies. Also, the study showed no significant interaction effect of retrieval-practice instructional strategy and gender on pupils' performance in English Studies but revealed significant interaction effect of retrieval-practice instructional strategy and school type on pupils' performance in English Studies. Based on the findings, the study recommended that teachers should adopt retrieval-strategy to improve pupils' performance in English while governments and educational stakeholders are urged to consider reviewing curriculum to integrate evidence-based instructional strategies like retrieval-practice into the national curriculum. Administrators need to also organise regular workshops and training sessions on retrieval-practice to help teachers improve their instructional abilities and as well provide adequate resource allocation for schools.

Keywords: Retrieval-practice, Instructional Strategy, Pupils' Performance, English Studies

Introduction

In Nigeria, the importance of English language in everyday activities of the citizens is similar to none. This is because English is the official language recognized by all and sundry. As a result, no single learner can escape its encounter as it is one of the compulsory subjects in Nigerian schools, especially at the basic level of education. English is central to Nigerian's educational growth as it serves as the medium of knowledge delivery in Nigerian schools. Though a second language, it is the country's dominant and official language of international business and economic development.

As stated by Iroegbu (2017), English as a subject is taught from the first day in primary school to the end of primary school education and its proficiency correlates highly with educational achievements as well as several other professional activities. That explains the reason it is being taught as a subject and a second language in all educational institutions. According to Vyomakesisri (2017), English as a second language is a traditional term for the use or study of the English language by non-native speakers in an English-speaking environment.

Several researches have pointed to the fact that teaching and learning English language, especially in Nigeria is confronted with many challenges. Saleh (2021) stated that there are several problems militating against successful teaching of English Language at the basic education level in

Nigeria. According to Audu and Ominike (2021), inadequate funding of English language programmes, insufficient professional English language teachers, inadequate instructional resources, inadequate infrastructural facilities and poor capacity development programmes for language teachers are problems of teaching and learning of English language programmes in Nigerian public primary schools. Khan and Khan (2016) also reported that one of the challenges faced by English teachers in the classroom is lack of resources that stimulate the learning environment and help to arouse imaginations from the learners' perspective. While Al-Khalidi (2020) in the study, 'main challenges encountered by students in learning English as a foreign language' reported that fear and anxiety are the most challenging factors that hinder the learning of English language. On the overall, Saleh (2021) categorised the problems under psychological, linguistic and pedagogical.

More importantly, there have been records of prevailing poor performance of pupils in English language attributed to lack of effective teaching strategies. For example, Iroegbu (2017) cited in Aina, et al (2013) blaming the poor performance of students in Nigerian primary and secondary schools to lack of effective teaching strategies used by teachers. The author therefore submitted that teachers should shift from using boring strategy of lecture method or 'teacher-talk', for early childhood

and basic level learners.

In an attempt to solve this problem, Ikebuaso and Obumneke-Okeke (2020) study perceives influence of memorisation and self-instructional learning strategies on primary school pupils' academic performance in English Studies and found that primary school teachers agreed that memorisation strategy enhances the reading culture and self-instructional strategy improves pupils reading, speaking, writing and pronunciation skills among others. Iroegbu and Igweike (2019) also examined the comparative effectiveness of instructional graphics and classroom labelling strategies on reading skills of primary school pupils and found out that instructional graphics was significantly better than the conventional strategy. This therefore revealed the more reasons for the use of innovative strategies in basic schools.

The retrieval-practice is one of the innovative instructional strategies. It is a cognitive learning strategy based on the ideas of active recall and memory. In retrieval-practice strategy, a learner recalls information through calling it to mind, that is, remembering what has been taught from memory. Retrieval-practice is actively pulling information from memory without having direct access to the course material, using techniques like concept mapping, free recall exercises, and self-quizzing, as opposed to passive study or rereading of the content (Agarwal, et al 2020, Nero and Zulkiply, 2021, Wang, Muenks and Yan, 2023).

Empirical research has consistently demonstrated the effectiveness of retrieval-practice in improving learning outcomes across various subjects and educational levels. According to studies, retrieval-practice improves knowledge transfer to new contexts, better understanding, and memory retention. As submitted by Agarwal et al (2020), transfer of learning is robust with retrieval-practice because retrieval-practice in its many forms (clickers, mini-quizzes, practice problems, and so on) is excellent for improving learning. Lending credence to the above, Kenny and Baily (2021) submitted that retrieval-practice is very effective and beneficial to students learning at all levels, including boosting memory for preschool aged children and middle school students. Students who practice retrieval often improve their capacity to remember and apply what they have learned, which improves long-term retention and fosters a better comprehension of the subject matter. Retrieval-practice boosts learning and forces learners to pull knowledge out and also enables the teacher to examine what the learners know and can do (Agarwal et al. 2020). Beyond simple memorising, retrieval exercise helps students develop self-

regulated learning mechanisms and metacognitive awareness.

Roediger and Karpicke (2006) investigated the benefits of taking retrieval-practice tests on long-term retention of materials in college students. The findings revealed that repeated testing significantly enhanced retention of the tested materials compared to repeated studying alone. Fritz, et al (2007) also carried out a study on the benefits of expanding retrieval-practice for preschool children in United Kingdom. Research was explored in two experiments. Expanding retrieval-practice therefore provides an effective method to improve learning by young children. Goosen, et al (2013) also carried out research on the effect of retrieval-practice in primary school vocabulary learning. The researchers intended to find whether the use of retrieval-practice instructional strategy can be applied to teaching primary school pupil vocabulary and results show that retrieval-practice improved vocabulary learning in children.

Agarwal, Nunes and Blunt (2021) screened nearly 2000 abstracts and systematically coded 50 experiments to establish a clearer picture of benefits from retrieval-practice in real world educational settings. It was found that retrieval-practice improved learning for a variety of education levels, content areas, experimental designs, final test delays, retrieval and final test formats, and timing of retrieval-practice and feedback. Nero and Zulkiply (2021) also conducted a study on the effects of retrieval-practice across levels of thinking and retention interval on reading comprehension among the undergraduate students in Malaysia. The findings found among other things that there were no significant differences in reading comprehension across the different types of retrieval-practice.

Wang et al (2023) carried out interventions to increase students' understanding of how to implement retrieval-practice effectively and decreasing their perceived cost of using retrieval-practice. This study found that retrieval-practice can be implemented flexibly in various formats and that engaging in retrieval-practice costs too much time and effort, as compared to a traditional retrieval-practice intervention. Lechuga, Ortega-Tudela, and Gómez-Ariza (2024) investigated the benefits of concept mapping as an initial retrieval activity with college students. The findings demonstrated the educational usefulness of retrieval-based learning for a variety of learners and educational contexts.

Concerns about academic performance with respect to males and females have generated a considerable interest in the field of educational testing over the years. For instance, Kisigot, et al

(2021) see gender is the range of physical, biological, mental and behavioural characteristics pertaining to and differentiating between masculinity and femininity. Umar Goni, Ali and Bularafa (2015) examined the gender differences among student on their academic performance and the finding revealed that it was the individual's background characteristic that affect his/her academic performance and not the gender. Okenyi and Ezema (2022) on the effects of Mnemonics and Prior Knowledge Instructional strategy on the academic performance of pupils in English Language with gender as a moderating indicated that the male pupils had slightly higher mean performance score than the female pupils at the posttest stage. Also in another development, Musa et al (2016) study revealed gender difference in performance goals and performance in English Language and Mathematics of senior secondary schools' students in Borno State, Nigeria. *Attah and Ita (2017)* examined the influence of gender on academic performance in English Language among senior secondary school students in Calabar metropolis, Cross River State, and the result of the analysis showed that gender has no significantly influence on academic performance in English Language among senior secondary school students in Calabar metropolis.

On the other hand, controversies have existed on the effects of school type and pupils' performance. Agbofa (2023) conducted a study 'exploring the difference in academic performance determinants between public and private junior high schools in Ghana. It was revealed that private school students scored higher in terms of the indicators of academic performance. Cadiz-Gabejan (2022) in a comparative study on the English proficiency of students from public and private schools in Philippine examined whether private or public could produce more proficient students in English Language. The findings of the research therefore revealed that private school students performed better than those in public schools in Grammar while those in public schools outshine their counterparts in private schools in the areas of vocabulary and English comprehension. The study therefore concluded that there is a relationship between English proficiency and the type of school the students attend.

Cansiz, et al (2019) also conducted research to find out on the causal effects of school type on student academic Performance in Turkey. Gender, parental attitude and type of house were the moderating variables in the study. 3, 752,374 secondary school students between the periods of 2014-2016 session were used for the study. The

outcome of the finding revealed that school type has significant impact on students' Performance as students from private schools were found to perform better than their counterparts in public schools. Saleh (2021) also investigated the problems militating against successful teaching of English language at junior secondary schools in Katsina State, Nigeria. The problems were categorized as psychological, linguistic and pedagogical. However, among the three types of schools used in the study, problems identified are more pronounced in public schools. Adeyemi (2014) carried out a comparative study of pupils' academic performance between private and public primary schools Ilesa east and west local government council areas of Osun state, Nigeria. Results showed that pupils in the private primary schools performed better than their counterparts in the public schools. Yusuf and Adigun (2010)'s study also revealed that school type, sex and location had no significant influence on students' academic performance.

Being able to communicate in English is not just a prerequisite for education but also a means of gaining access to employment and other global prospects. Attaining optimal proficiency in English studies poses a considerable barrier in Kaduna State, Nigeria, where language varieties and resource limits collide with educational problems. Even though English is acknowledged as a crucial subject, teachers in Kaduna State face challenges while trying to develop pupils' language skills at the basic level of education.

Many researchers have attempted to proffer solutions to the problem through studies on the effects of innovative instructional strategies. It was established that retrieval-practice enhances learners' recall and recognition; students engage in retrieval activities using free call, short answer quizzes and tests; the term 'testing creates confusion with unrelated educational activities such as summative assessment and standardized testing. To clear the identified confusion, evidence-based research is needed to develop a comprehensive understanding of the implementation strategies of using retrieval-practice in classroom. It is against this backdrop that this present study examined the effects of retrieval-practice instructional strategy on middle basic pupils' academic performance in English Studies in Sabon-Gari Local Government Area of Kaduna State. This study therefore filled this gap by measuring the effect of retrieval-practice on pupils' performance in English Studies using concept mapping, index card and 'have someone to ask you a question'. Additionally, there are contradictions in the literature about the impact that gender and type of school can have on pupils' academic

performance, especially in English studies. Hence, the study also determined the significant interaction effect of retrieval-practice instructional strategy, gender and school type on pupils' performance in English Studies.

Theory of Cognitive Development by Jean Piaget (1936), the Swiss psychologist, revealed the nature of knowledge and development of children's intelligence as they grow. Cognitive development in children is not only related to how knowledge is acquired but also deals with the way children construct and use the knowledge in their world (Miller, 2011). Cognitive theory, rooted in the work of Piaget and other prominent psychologists, offers a rich framework for understanding how individuals acquire, absorb, store, recall, and process information when learning. Cognitive theory of learning places more of an emphasis on active engagement with the content and the production of knowledge based on cognitive processes than rote memorisation (Lachman, Lachman and Butterfield, 2018; Goldstein, 2019; Ansari, 2020). The fundamental tenet of cognitive theory is that people absorb information actively rather than passively as they take in information from their surroundings. In order to organise and make sense of new experiences, learners actively interact with and interpret information, relying on preexisting expectations and cognitions. Retrieval-practice is highly compatible with cognitive theory concepts, especially the idea that retrieval is an effective learning aid. Cognitive theory holds that memory is a dynamic process of encoding, storing, and retrieving information rather than a static storage bank. By training pupils to actively retrieve knowledge from memory, retrieval exercise strengthens brain connections and improves long-term retention. By practicing retrieval, pupils improve their mental models of the material they have acquired and strengthen their memory of it, which leads to a greater comprehension and application of the knowledge. (Bertilsson, 2022; Frankenstein, et al 2022).

Research Hypotheses

The following null hypotheses would be tested at the significant level of 0.05 in the course of this research.

1. There is no significant main effect of retrieval-practice instructional strategy on pupils' performance in English Studies.
2. There is no significant interaction effect of retrieval-practice instructional strategy and gender on pupils' performance in English Studies.
3. There is no significant interaction effect of

retrieval-practice instructional strategy and school type on pupils' performance in English Studies.

Methodology

The research design employed for this study was a quasi-experimental design. The research utilized a quasi-experimental approach that incorporates a pre-test and post-test, employing a non-randomization and non-equivalent control group design. Within this framework, intact class was randomly assigned to the experimental or the control group. A factorial design of 2X2X2 was adopted for this study. The first two levels were the experimental group (retrieval-practice instructional strategy) and the control group. The second factorial level was gender (male and female), and the third factorial level was the school type (private and public). The population for this study consisted of all 36,815 middle basic pupils in Sabon Gari Local Government Area of Kaduna State. (Kaduna State Annual School Census Report (2020). Kaduna State Bureau of Statistics.) The target population for this study consisted of all the 12,494 basic five pupils in Sabon Gari Local Government Area of Kaduna State. There are 119 private schools and 64 public primary schools in Sabon Gari Local Government Area of Kaduna State. The study adopted multi-stage sampling procedure which involved purposive, stratified random and simple random sampling techniques to sample four schools, (2 private schools and 2 public schools) for the study, and the schools were randomly assigned to experimental and the control groups. 252 pupils participated in the study with 41 participants in the experimental group and 111 participants in the control group. English Performance Test (EPT) and Retrieval-practice Instructional Guide (MPIG) and Instructional Guide for Conventional Method (IGCM) were used for data collection. The data collection phases spanned for eight weeks. Research hypotheses were tested using Analysis of Covariance (ANCOVA) at 0.05 level of significance.

Results

Research Hypothesis One: There is significant main effect of retrieval-practice instructional strategy on pupils' performance in English studies.

In order to test this research hypothesis, the pretest and posttest data collected from the participants in experimental group (retrieval-practice instructional strategy) and control group (conventional method) were subjected to Analysis of Covariance (ANCOVA) using SPSS statistical software. The result of the analysis is presented in the table below.

Table 1: Summary of ANCOVA on significant main effect of retrieval-practice instructional Strategy on pupils' performance in English Studies.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Remark
Corrected Model	3466.690 ^a	2	1733.345	75.738	.000	
Intercept	1004.500	1	1004.500	43.891	.000	
PRETEST	1441.824	1	1441.824	63.000	.000	
GROUP	1072.181	1	1072.181	46.849	.000	*Significant
Error	3410.020	149	22.886			
Total	68238.000	152				
Corrected Total	6876.711	151				

a. R Squared = .504 (Adjusted R Squared = .497)

From table 1 above, the value of F (46.849) is significant at 0.05 alpha level ($p < 0.05$). This indicates that the null hypothesis which states that there is no significant main effect of retrieval-practice instructional strategy on pupils' performance in English studies is not retained. It shows that there is significant main effect of retrieval-practice instructional strategy on pupils' performance in English studies. This implies that the participants that were taught with retrieval-practice instructional strategy performed better than the participants that were taught using the conventional method. Therefore, the finding of this study revealed that there is significant main effect of retrieval-practice instructional strategy on pupils'

performance in English studies.

Research Hypothesis Two: There is no significant interaction effect of retrieval-practice instructional strategy and gender on pupils' performance in English studies.

In order to test the above stated research hypothesis, the pretest and posttest data collected from the participants in experimental group 1 (retrieval-practice instructional strategy) and control group (conventional method) using gender of the participants as moderating variable were subjected to Analysis of Covariance (ANCOVA) using SPSS statistical software. The result of the analysis is presented in the table below.

Table 2: Summary of ANCOVA on significant interaction effect of retrieval-practice instructional strategy and gender on pupils' performance in English studies

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Remark
Corrected Model	3485.938 ^a	4	871.485	37.781	.000	
Intercept	964.119	1	964.119	41.797	.000	
PRETEST	1445.356	1	1445.356	62.660	.000	
Group	1017.861	1	1017.861	44.127	.000	
Gender	15.774	1	15.774	.684	.410	
Group * Gender	12.149	1	12.149	.527	.469	*Not Significant
Error	3390.772	147	23.066			
Total	68238.000	152				
Corrected Total	6876.711	151				

a. R Squared = .507 (Adjusted R Squared = .494)

The table 2 above shows that the F-value of 0.527 indicating the interaction of gender with retrieval-practice instructional strategy is not significant at 0.05 alpha level ($p > 0.05$). This shows that there is no significant interaction effect of retrieval-practice instructional strategy and gender on pupils' performance in English studies. Hence, the null hypothesis which states that there is no significant interaction effect of retrieval-practice instructional strategy and gender on pupils' performance in

English studies is retained. This implies that the effect of retrieval-practice instructional strategy on academic performance of pupils in English studies does not depend on gender.

Research Hypothesis Three: There is significant interaction effect of retrieval-practice instructional strategy and school type on pupils' performance in English studies

In order to test the above stated research

hypothesis, the pretest and posttest data collected from the participants in experimental group 1 (retrieval-practice instructional strategy) and control group (conventional method) using school

type of the participants as moderating variable was subjected to Analysis of Covariance (ANCOVA) using SPSS statistical software. The result of the analysis is presented in the table below.

Table 3: Summary of ANCOVA on significant interaction effect of retrieval-practice instructional strategy and school type on pupils' performance in English studies

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Remark
Corrected Model	3781.467 ^a	4	945.367	44.898	.000	
Intercept	1233.459	1	1233.459	58.580	.000	
PRETEST	1213.076	1	1213.076	57.612	.000	
Group	1307.482	1	1307.482	62.095	.000	
Gender	240.457	1	240.457	11.420	.001	
Group*Schooltype	222.206	1	222.206	10.553	.001	*Significant
Error	3095.243	147	21.056			
Total	68238.000	152				
Corrected Total	6876.711	151				

a. R Squared = .550 (Adjusted R Squared = .538)

Table 3 above revealed that the F-value of 10.553 indicating the interaction effect of retrieval-practice instructional strategy and school type is significant at 0.05 alpha level ($p < 0.05$). This shows that there is significant interaction effect of retrieval-practice instructional strategy and school type on pupils' performance in English studies. Hence, the null hypothesis which states that there is no significant interaction effect of retrieval-practice instructional strategy and school type on pupils' performance in English studies is not retained. This implies that the effect of retrieval-practice instructional strategy on academic performance of pupils in English studies depend on school type.

Discussion of Findings

Results from the study revealed that there is a significant main effect of retrieval-practice instructional on pupils' performance in English studies. This implies that the participants that were taught using the retrieval-practice instructional strategy performed better than the participants that were taught using the conventional method of teaching. This is consistent with the findings of Gooseen, et al (2013) who found that retrieval-practice instructional strategy improves the vocabulary learning in children. This is also in line with in submission of Agarwal et al (2020) and Bertilson (2022) who demonstrated how retrieval-practice can improve learning outcomes by demonstrating its effectiveness at different educational levels and for different learner characteristics. In similar vein, the outcome is in agreement with Lechuga et al (2024) who found that retrieval practice, using concept mapping improves

students' academic performance. This is perhaps because retrieval-practice allows feedback which does not only help students strengthen the knowledge that they already have; but also helps them fill in gaps in their knowledge. As a result, students will improve their understanding and be better able to transfer their knowledge. No wonder retrieval-practice has been acclaimed to be a strong and robust memory strategy that should generalize to an ecologically valid learning situation and can be effective for teachers to implement in the classroom to assess and optimize content learning (Dunlosky, et al 2013; Coglian, 2018; Thomas, et al 2021).

Conversely, the result contradicts the findings of Abel and Roediger (2017), who reported that the retrieval-practice strategy did not produce a positive effect unless special measures were implemented to facilitate students' effortful covert retrieval. Also, the study is not in agreement with Ralph (2020) and Nero and Zulkiply (2021) who observed the ineffectiveness of retrieval-practice as a way to enhance learning in Biology and English language classroom respectively. This could be attributed to complexity of the subject matter, variations in instructional design, students' level of engagement and the duration of retrieval-practice implementation. While these findings reinforce the effectiveness of incorporating the retrieval-practice instructional strategy in enhancing pupils' performance in English studies, it acknowledges that contextual factors may also influence its efficacy in certain subjects or learning environments.

The study further revealed that there was no significant interaction effect between the treatment

(retrieval-practice strategy) and gender on pupils' performance in English studies. This suggests that the effectiveness of the retrieval-practice instructional strategy was not influenced by whether pupils were male or female. In other words, pupils' performance improvements were attributed to the instructional strategy itself, regardless of gender. This finding aligns with the studies of Febana et al. (2022) and Usman, Yew, and Saleh (2020), who also reported no significant interaction between gender and teaching strategy. Similarly, Attah and Ita (2017) found that gender did not significantly influence academic performance in English Language among senior secondary school students. However, contrasting findings were reported by Okenyi and Ezema (2022), who observed that girls outperformed boys in English Language, and by Musa et al. (2016), who found that males performed better than females, indicating a gender-related difference in performance.

Additionally, the study revealed a significant interaction effect between the retrieval-practice instructional strategy and school type on pupils' performance in English studies. This indicates that the type of school whether public or private influenced pupils' performance. Analysis showed that pupils from private schools outperformed their counterparts from public schools. Factors contributing to this outcome include differences in the language of instruction, with private school teachers primarily using English, while public school teachers often switched between English and the local language. Furthermore, teachers in private schools appeared more willing to adopt innovative teaching strategies, benefiting their pupils more effectively. These findings are supported by the research of Agbofa (2023), Cadiz-Gabejan (2022), Cansiz et al. (2019), and Adeyemi (2014), who all reported that students from private schools tend to perform better academically than those from public schools.

Moreover, the challenges faced by public schools, such as the inconsistent use of English as the language of instruction and teachers' limited adoption of innovative methods contributed to the lower performance of their pupils. Saleh (2021) similarly noted that psychological, linguistic, and pedagogical problems in teaching English are more prevalent in public schools than in private ones. These findings collectively suggest that pupils in public basic schools tend to underperform in English Language compared to their peers in private basic schools.

Conclusion

Based on the findings of the study, it can be

concluded that retrieval-practice instructional strategy significantly improves pupils' performance in English Studies with no significant gender differences but effectiveness of the strategy can vary across school types.

Recommendations

Based on the findings of this study, the under listed recommendations were made.

1. Governments and educational stakeholders need to consider reviewing existing teaching policies and integrate evidence-based instructional strategies like retrieval-practice into the national curriculum.
2. It is essential that administrators organise regular workshops and training sessions on innovative teaching methods, such as retrieval-practice, to help teachers improve their instructional abilities and as well provide adequate resource allocation for schools.
3. The English language curriculum ought to be updated to include activities on retrieval-practice instructional strategies, along with suitable teaching aids like flashcards, story maps, and quizzes.
4. Since there was no significant interaction effect between gender and this instructional strategy, teachers should ensure that both male and female pupils receive equal opportunities to engage in retrieval-practice without bias.
5. Government and school administrators should provide support for schools, particularly public schools, to implement retrieval-practice instructional strategy through adequate teacher training and resource allocation.

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