

Perceived Impact of AI-Enhanced Personalized Learning Tools on Senior Secondary School Students' Academic Achievement in English Language in Ebonyi State

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The study investigated the Perceived Impact of AI-enhanced Personalized Learning Tools on Senior Secondary School Students' Academic Achievement in English Language in Ebonyi State. The study was guided by three specific purposes, research questions and hypotheses. Descriptive survey research design was adopted for the study. The population of the study comprised 7373 SS2 students. The sample size was 379 (163 male and 216 female). The data for the study was collected using a structured questionnaire with a 4-point rating scale titled "Perceived Impact of AI-enhanced Personalized Learning Tools on Senior Secondary School Students' academic Achievement in English Language Questionnaire (PIAPLTSSSSAAIELQ)". The instrument was validated by three experts and further tested for reliability using Cronbach Alpha reliability coefficient test, which result showed an overall reliability coefficient of 0.96. Data were analyzed using mean and standard deviation. T-test was used to test the null hypotheses at 0.05 level of significance. The findings revealed that Students have positive perception on the impact of Tutor AI, ChatGPT and Write & Improve on their academic achievement in English Language in Ebonyi State. It was also found that there was no significant difference in the mean rating of male and female students on their perception on the impact of Tutor Ai, ChatGPT and Write & Improve on their academic achievement in English Language in senior secondary schools in Ebonyi State. It was recommended that English Language teachers should incorporate Tutor AI, ChatGPT, and Write & Improve into classroom instruction as supplementary tools to boost students' achievement.

Keywords: Artificial Intelligence, AI Personalized Learning tools, English Language, Academic Achievement.

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I. Introduction

English language is a West Germanic language originating from early medieval England, now widely used globally. Oladipupo and Unuabonah (2020), described English as a core instrument of communication in Nigeria, essential not only in formal education but also in bridging Nigeria's linguistic diversity. In this work, English language is a core academic subject taught in schools, encompassing skills such as reading, writing, grammar, vocabulary, and comprehension. It serves as a medium for communication and learning, with AI-enhanced personalized learning tools aimed at improving students' academic achievement and interest in these linguistic competencies. English language, as both a subject of study and a medium of instruction, plays a foundational role in secondary schools in Nigeria. For students in secondary schools, proficiency in English is essential not just for academic success, but also for professional communication, research writing, and global engagement (Ushie & Jonah, 2021). Despite its significance, the learning of English in Nigerian secondary schools, including those in Ebonyi State, faces several persistent challenges which includes, teacher-centered method of teaching, inadequate resources, overcrowded classrooms, and a lack of personalized feedback for learners (Oluwole & Ajayi, 2020). These issues often result in low students' performance, limited motivation, and poor engagement in English language classes. These challenges gave rise to the introduction and use of Artificial Intelligence in the learning of English language.

Artificial intelligence (AI) encompasses various technologies and algorithms that allow machines to analyze data, recognize patterns, make decisions, and even perform tasks autonomously. According to Russell and Norvig (2021), AI is the study of agents that receive precepts from the environment and perform actions. In their view, AI involves creating systems capable of perceiving their surroundings and taking actions to maximize their success at achieving specific goals. In this work, Artificial intelligence (AI) refers to advanced computational systems and algorithms designed to deliver personalized learning experiences, adapting content, pace, and teaching methods to individual students' needs. Artificial intelligence (AI) is beginning to reshape the landscape of education in ways previously unimaginable. AI's ability to analyze data, personalize learning, and automate administrative tasks offer a great impact for education to become more inclusive, efficient, and tailored to

individual needs. Artificial intelligence technologies are revolutionizing educational methodologies by introducing intelligent systems that support learning, teaching, and assessment.

Personalized learning is an instructional approach that narrows educational experiences to the individual needs, skills, and interests of each student. Capuano and Caballe (2020), defined personalized learning as an approach that adapts to individual learners by using data-driven insights to tailor instructional content and pace. These systems often adjust content based on each learner's performance, improving knowledge retention and engagement through adaptive learning techniques. Eze and Okeke (2021), opined that it is an approach that focuses on tailoring the educational experience to fit each learners' pace, preferences, and learning goals. In this work, personalized learning is an individualized instructional method aimed at optimizing students' interest and academic success by aligning educational materials with each learner's strengths and weaknesses. These tools such as Tutor AI, ChatGPT, and Write & Improve have gained prominence for their potential to enhanced learners' academic achievement and stimulate greater interest in the subject.

Tutor AI is an artificial intelligence-enhanced personalized learning tool that provides individualized instruction, adaptive feedback, and interactive learning experiences. As defined by Updoin-Glossary (2025), it is an AI-powered educational assistant that uses machine learning algorithms to customize lessons and support learners. In this study, Tutor AI is described as a system designed to deliver tailored English language instruction by identifying students' weaknesses and providing instant corrective feedback. Unlike traditional teaching methods that overlook individual differences, Tutor AI adapts to each learner's needs using data-driven insights and natural language processing. It enhances comprehension and communication skills while keeping learners motivated through interactive and gamified activities, thereby helping to close learning gaps and improve academic performance.

ChatGPT, developed by OpenAI, is a conversational AI model that facilitates personalized tutoring, writing assistance, and grammar clarification through natural language interaction. Kasneci, Sessier, and Bannert (2023) emphasized that ChatGPT's adaptability to individual learners makes it a valuable tool for differentiated instruction in language learning. Their study found that students who used ChatGPT demonstrated improved critical thinking and engagement in writing tasks. Furthermore, ChatGPT promotes active learning by mimicking teacher-student dialogue, which is especially advantageous in schools with limited educational resources. Write & Improve, created by Cambridge English and iLexIR, provides students with writing prompts and immediate feedback based on CEFR standards. It encourages learners to revise and resubmit their work, thereby fostering reflective writing habits. Reynolds and Nguyen (2020) validated its effectiveness in helping English as a Second Language (ESL) Learners enhance their writing skills over time. The tool motivates students to practice writing more frequently, leading to notable improvements in vocabulary, sentence structure, and coherence, which collectively boost their academic achievement.

Academic achievement means the extent to which a student has attained their short or long-term educational goals, often measured through assessments such as tests, examinations, assignments, and overall grades. It is commonly used as an indicator of a learner's competence and success in school-related tasks. The American Psychological association (APA) (2021) defined academic achievement as the degree of success or proficiency demonstrated by a student in academic work, often quantified through GPA, test scores, and teacher evaluations. Academic achievement in English language includes students' proficiency in reading, writing, listening, and speaking, as assessed through classroom performance and standardized tests like WASCE and NECO. Academic achievement in English language is particularly crucial since the subject serves both as a core subject and prerequisite for admission into tertiary institutions. AI-enhanced personalized learning tools can play a transformative role in improving students' academic achievement, particularly in English language.

Statement of the Problem

Students' poor performance in English Language at the secondary school level in Nigeria has continued to worry educators, parents, and policymakers. The WAEC Chief Examiners' Reports of 2021 and 2022 revealed persistent weaknesses among candidates, including shallow vocabulary, poor comprehension skills, incoherent sentence construction, weak expression, and lack of clarity in writing. These deficiencies have resulted in consistently low scores and reflect a continuing trend of underachievement in this compulsory subject required for higher education admission. One of the perceived key factors responsible for this poor performance is the continued use of traditional teacher-centered instructional methods, which fail to engage students or accommodate their individual learning needs. This has led to disinterest and negative attitudes toward learning English, especially in Ebonyi State, where socio-economic and educational challenges further worsen the problem. The situation highlights the urgent need for innovative teaching methods. Therefore, the problem of this study is to examine how AI-enhanced personalized learning tools can improve senior secondary school students' achievement and interest in English Language in Ebonyi State.

Purpose of the Study

The main purpose of this study is to ascertain the perceived impact of AI-enhanced personalized learning tools on senior secondary school students' academic achievement in English language in Ebonyi State. Specially, the study investigated the perceived impact of:

1. Tutor Ai on the academic achievement of senior secondary school students in English language in Ebonyi State.
2. ChatGPT on the academic achievement of senior secondary school students in English language in Ebonyi State.
3. Write & Improve on the academic achievement of senior secondary school students in English language in Ebonyi State.

Research Questions

The following research questions guided the study:

1. What is the perceived impact of Tutor Ai on students' academic achievement in English Language in senior secondary schools in Ebonyi State?
2. What is the perceived impact of ChatGPT on students' academic achievement in English Language in senior secondary schools in Ebonyi State?
3. What is the perceived impact of Write & Improve on students' academic achievement in English Language in senior secondary schools in Ebonyi State?

Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

1. There is no significant difference in the mean rating of male and female students on their perception of the impact of Tutor Ai on their academic achievement in English Language in senior secondary schools in Ebonyi State.
2. There is no significant difference in the mean rating of male and female students on their perception of the impact of ChatGPT on their academic achievement in English Language in senior secondary schools in Ebonyi State.
3. There is no significant difference in the mean rating of male and female students on their perception of the impact of Write & Improve on their academic achievement in English Language in senior secondary schools in Ebonyi State.

II. Methodology

The design of this study is descriptive survey research design. This study was carried out in Ebonyi State, located in the South-East geopolitical zone of Nigeria. The population of this study comprised seven thousand, three hundred and seventy-three (7373) SS2 students across the three Education zones of Ebonyi state. males (3182) 43% and females (4191) 57%. — (Ebonyi State Secondary Education Board 2024). The sample size of this study is three hundred and seventy-nine (379). 163 male 43% and 216 female 57%. This figure was drawn by the researcher using a stratified random sampling technique to select the sample size of this study from the three Education Zones in Ebonyi State. The choice of this technique is informed by the need to have a balanced representation of the targeted population; with several subgroups which have distinct but peculiar characteristics (Kpee, 2015). A Taro Yamane's formula for sample size determination was employed in order to achieve a fair representation of different strata of the population. The instrument for data collection was a structured questionnaire. The instrument was validated and tested for reliability using Cronbach alpha which gave a reliability coefficient of 0.96, which indicated the instrument has a very high internal consistency. This figure also showed that the instrument was suitable for use for the study. Copies of the questionnaire were administered to the English Language students in their respective schools in Ebonyi State by the researcher and three research assistants. The respondents filled the questionnaires by ticking (✓) to the extent they agreed or disagreed with the statement made and the researcher with the research assistants collected the questionnaires at completion. Research questions 1-6 were answered on individual item basis using mean and standard deviation. The mean used for decision making was 2.50. Mean scores from 2.50 and above were positive perception while mean scores below 2.50 were negative perception. The null hypotheses were tested at 0.05 alpha level using t-test. When the SPSS P value exceeded 0.05, the null hypothesis was rejected and when the SPSS P value was less than 0.05, the null hypothesis was not rejected.

III. RESULT

Data collected for this study were analyzed and presented in this chapter as follows:

4.1 Research Questions

1. Research question 1: What is the perceived impact of Tutor AI on students' academic achievement in English Language?

The data collected from items 1-7 were used to answer the research question. Summary of the result of data analysis were presented in Table 1.

Table 1: Mean Score and Standard Deviation of Students' Perception on the Impact of Tutor Ai on Their Academic Achievement in English Language.

S/N	ITEM FOCUS	X	S.D	Decision
1	Tutor AI has helped me to improve my understanding of English grammar.	2.99	1.07	PP
2	Tutor AI provides explanations that make difficult English topics easier to understand.	3.17	0.81	PP
3	Using Tutor AI has improved my performance in English assessment.	3.10	0.97	PP
4	Tutor AI helps me to identify my mistakes and correct them in English tasks.	3.26	0.81	PP
5	I learn faster in English when using Tutor AI compared to traditional classroom learning alone.	3.25	0.95	PP
6	Tutor AI provides practice activities that have improved my English vocabulary.	3.44	0.80	PP
7	Tutor AI has positively influenced my achievement in English Language.	3.41	0.84	PP
	Grand Mean	3.23	0.89	PP

Results in Table 1 revealed that the items mean score ranges between 2.99 and 3.26, which are all above 2.50, and the standard deviation ranges between 0.80 and 1.07; which implies that there was no much deviation among the items scores, therefore all the items were perceived as positive. Furthermore, the grand mean of 3.23 is above 2.50 benchmark. These results support the view that students generally perceive Tutor AI as beneficial to their academic achievement in English Language. Therefore, students have positive perception on the impact of Tutor AI on their academic achievement in English Language in Ebonyi State.

2. Research question 2: What is the perceived impact of ChatGPT on students' academic achievement in English Language?

The data collected from items 8-14 were used to answer the research question. Summary of the result of data analysis were presented in Table 2.

Table 2: Mean Score and Standard Deviation of Students' Perception on the Impact of ChatGPT on Their Academic Achievement in English Language.

S/N	ITEM FOCUS	X	S.D	Decision
8	ChatGPT helps me to answer English Language questions more effectively.	2.94	0.93	PP
9	ChatGPT provides useful examples that improve my understanding of English concepts.	2.61	0.69	PP
10	I perform better in English class activities after using ChatGPT.	2.86	0.85	PP
11	ChatGPT helps me to improve my writing accuracy.	3.10	0.95	PP
12	ChatGPT provides explanations that support my preparation for English exams.	2.81	0.83	PP
13	ChatGPT has improved my confidence in tackling English assignments.	3.33	0.95	PP
14	ChatGPT has contributed positively to my academic achievement in English.	3.16	0.77	PP
	Grand Mean	2.97	0.85	PP

Results in Table 2 showed that the items mean score ranges between 2.61 and 3.33, which are all above 2.50, and the standard deviation ranges between 0.69 and 0.95; which implies that there was no much deviation among the items scores, therefore all the items are perceived as positive. Furthermore, the grand mean of 2.97 is above 2.50 benchmark. These results support the view that students generally perceive ChatGPT as beneficial to their academic achievement in English Language. Therefore, students have positive perception on the impact of ChatGPT on their academic achievement in English Language in Ebonyi State.

3. Research question 3: What is the perceived impact of Write & Improve on students' academic achievement in English Language?

The data collected from items 15-21 were used to answer the research question. Summary of the result of data analysis were presented in Table 3.

Table 3: Mean Score and Standard Deviation of Students' Perception on the Impact of Write & Improve on Their Academic Achievement in English Language.

S/N	ITEM FOCUS	X	SD	Decision
15	Write & Improve has helped me to develop better writing skills in English.	3.16	0.83	P P
16	The feedback I receive from Write & Improve has improved my grammar.	3.42	0.75	P P
17	Using Write & Improve has helped me to organize my essays more clearly.	3.21	0.94	P P

18	Write & Improve has improved my punctuation in English writing.	2.99	0.78	P P
19	Write & Improve has helped me achieve higher scores in English writing tasks.	3.27	0.97	P P
20	I learn from the corrections given by Write & Improve to apply them in other tasks.	3.01	0.94	P P
21	Write & Improve has enhanced my academic achievement in English Language.	2.90	1.18	P P
Grand Mean		3.14	0.91	P P

Results in Table 3 showed that the items mean score ranges between 2.90 and 3.42, which are all above 2.50, and the standard deviation ranges between 0.75 and 0.97; which implies that there was no much deviation among the items scores, therefore all the items were perceived as positive. Furthermore, the grand mean of 3.14 is above 2.50, the benchmark. These results support the view that students generally perceive Write & Improve as beneficial to their academic achievement in English Language. Therefore, students have positive perception on the impact of Write & Improve on their academic achievement in English Language in Ebonyi State.

4.2 Hypotheses

1. H0₁: There is no significant difference in the mean rating of male and female students on their perception of the impact of Tutor Ai on their academic achievement in English Language in senior secondary schools in Ebonyi State.

The t-test result of the analysis was presented in Table 4

Table 4: t-test Analysis of Male and Female Students' Responses on their Perception on Impact of Tutor Ai on their Academic Achievement in English Language in Senior Secondary Schools in Ebonyi State.

S/N	Variable	No.=379	X	SD	df	t.Cal.	p-val.	Decision
1	Male	163	2.99	1.07	377	0.07	0.95	Not Significant
	Female	216	2.99	1.07				
2	Male	163	3.17	0.81	377	0.06	0.95	Not Significant
	Female	216	3.17	0.81				
3	Male	163	3.08	0.97	377	0.31	0.76	Not Significant
	Female	216	3.11	0.97				
4	Male	163	3.26	0.13	377	0.07	0.94	Not Significant
	Female	216	3.26	0.81				
5	Male	163	3.23	0.96	377	0.37	0.71	Not Significant
	Female	216	3.26	0.95				
6	Male	163	3.43	0.80	377	0.24	0.81	Not Significant
	Female	216	3.45	0.79				
7	Male	163	3.40	0.84	377	0.21	0.84	Not Significant
	Female	216	3.42	0.83				

Table 4 showed that all the items have no significant results. This is because the p-values were greater than the level of significance (0.05). The overall shows a p-value of 0.85, which is greater than 0.05. Therefore, the null hypothesis that: there significant difference in the mean rating of male and female students on their perception on impact of Tutor Ai on their academic achievement in English Language in senior secondary schools in Ebonyi State, is not rejected.

2. H0₂: There is no significant difference in the mean rating of male and female students on their perception of the impact of ChatGPT on their academic achievement in English Language in senior secondary schools in Ebonyi State.

The t-test result of the analysis was presented in Table 5

Table 5: t-test Analysis of Male and Female Students' Responses on their Perception on Impact of ChatGPT on their Academic Achievement in English Language in Senior Secondary Schools in Ebonyi State.

S/N	Variable	No.=379	X	S.D	df	t.Cal.	p-val.	Decision
8	Male	163	2.92	0.93	377	0.348	0.73	Not Significant
	Female	216	2.95	0.92				
9	Male	163	2.60	0.69	377	0.351	0.73	Not Significant
	Female	216	2.62	0.70				
10	Male	163	2.86	0.86	377	0.129	0.90	Not Significant
	Female	216	2.87	0.85				
11	Male	163	3.09	0.96	377	0.161	0.87	Not Significant
	Female	216	3.10	0.95				
12	Male	163	2.80	0.83	377	0.199	0.84	Not Significant
	Female	216	2.81	0.84				
13	Male	163	3.33	0.96	377	0.083	0.93	Not significant
	Female	216	3.33	0.95				
14	Male	163	3.14	0.77	377	0.509	0.61	Not Significant
	Female	216	3.18	0.78				

Table 5 revealed that all the items have no significant results. This is because the p-values were greater than the level of significance (0.05). The overall shows a p-value of 0.80, which is greater than 0.05. Therefore, the null hypothesis that there is no significant difference in the mean rating of male and female students on their perception on impact of ChatGPT on their academic achievement in English Language in senior secondary schools in Ebonyi State is not rejected.

3. H₀₃: There is no significant difference in the mean rating of male and female students on their perception of the impact of Write & Improve on their academic achievement in English Language in senior secondary schools in Ebonyi State.

The t-test result of the analysis was presented in Table 6

Table 6: t-test Analysis of Male and Female Students' Responses on their Perception on Impact of Write & Improve on their Academic Achievement in English Language in Senior Secondary Schools in Ebonyi State.

S/N	Variable	No.=379	X	S.D	df	t.Cal.	P-val.	Decision
15	Male	163	3.15	0.84	377	0.21	0.84	Not Significant
	Female	216	3.17	0.83				
16	Male	163	3.40	0.75	377	0.33	0.74	Not Significant
	Female	216	3.43	0.74				
17	Male	163	3.21	0.94	377	0.07	0.95	Not Significant
	Female	216	3.20	0.94				
18	Male	163	2.99	0.78	377	0.02	0.98	Not Significant
	Female	216	2.99	0.78				
19	Male	163	3.26	0.97	377	0.18	0.85	Not Significant
	Female	216	3.28	0.98				
20	Male	163	2.99	0.94	377	0.41	0.68	Not Significant
	Female	216	3.03	0.94				
21	Male	163	2.94	1.17	377	0.52	0.60	Not Significant
	Female	216	2.88	1.19				

Table 6 revealed that all the items have no significant results. This is because the p-values were greater than the level of significance (0.05). The overall shows a p-value of 0.81, which is greater than 0.05. Therefore, the null hypothesis that there is no significant difference in the mean rating of male and female students on their perception on impact of Write & Improve on their academic achievement in English Language in senior secondary schools in Ebonyi State is not rejected.

IV. Discussion of Result

Perceived Impact of Tutor Ai on the Academic Achievement of Senior Secondary School Students in English Language in Ebonyi State.

Findings revealed that students have positive perception on the impact of Tutor AI on their academic achievement in English Language in Ebonyi State. The findings is in line with Sun and Zhang (2023), who found that AI-powered tutoring systems improved students' grammar proficiency and comprehension skills in English as a Second Language (ESL) classrooms. On the contrary, Johnson and Kumar (2021) found that while AI tutors improved engagement, they did not produce significant long-term gains in exam performance.

Findings also revealed that there is no significant difference in the mean rating of male and female students on their perception on impact of Tutor Ai on their academic achievement in English Language in senior secondary schools in Ebonyi State. This indicates that both genders benefit equally from the use of AI tutoring systems in the learning of English. This finding is in line with Zhang and Liu (2022), who found no significant gender differences in learning outcomes when using AI-based English tutoring tools, concluding that adaptive systems neutralize traditional gender gaps. However, Okoro and Nwachukwu (2022) discovered that male students were more receptive to AI tutoring tools and recorded higher academic gains compared to females in Nigerian classrooms.

Perceived impact of ChatGPT on the academic achievement of senior secondary school students in English language in Ebonyi State.

Findings revealed that students have positive perception on the impact of ChatGPT on their academic achievement in English Language in Ebonyi State. This is in line with Yang and Mei (2023) who reported that ChatGPT significantly improved ESL students' grammar and writing skills by providing instant corrections and model sentences. Contrary to these findings, Chukwuma and Musa (2023) observed that while ChatGPT provided immediate answers, students often relied too heavily on it, leading to shallow learning and reduced retention of content.

Findings also revealed that there is no significant difference in the mean rating of male and female students on their perception on impact of ChatGPT on their academic achievement in English Language in senior secondary schools in Ebonyi State. This shows that ChatGPT is perceived as equally beneficial across gender lines,

suggesting that it serves as a gender-neutral digital learning tool. Supporting this result, Adeoye and Okafor (2023) found no significant gender differences in Nigerian secondary school students' perception of AI tools, including ChatGPT, in relation to academic performance. However, opposing studies suggest that gender differences may exist in the use and impact of ChatGPT. For instance, Okeke and Eze (2023) reported that male students in Nigerian secondary schools showed greater enthusiasm and higher test score improvements than females when using ChatGPT for learning English.

Perceived impact of Write & Improve on the academic achievement of senior secondary school students in English language in Ebonyi State.

Findings also revealed that Students have positive perception on the impact of Write & Improve on their academic achievement in English Language in Ebonyi State. Supporting this finding, Ruan et al. (2023) demonstrated that the use of AI-based feedback tools like W&I significantly improved students' essay writing performance by providing immediate and actionable corrections. In an opposing view, Godwin and Yusuf (2022) observed that W&I feedback was often too generic, which made it less effective in supporting nuanced aspects of writing such as creativity and coherence.

Findings also revealed that there is no significant difference in the mean rating of male and female students on their perception on impact of Write & Improve on their academic achievement in English Language in senior secondary schools in Ebonyi State. This indicates that both genders benefitted equally from W&I's corrective feedback and writing support features. In consonance with this, Liu and Xu (2022) found no significant gender differences in the effectiveness of W&I among Chinese high school students, concluding that its adaptive features provide equitable support. Opposing this finding, Okoro and Nwachukwu (2022) found that male Nigerian students reported higher confidence and greater academic gains from using W&I compared to their female counterparts.

V. Conclusion

This study investigated the perceived impact of AI-enhanced personalized learning tools on senior secondary school students' academic achievement and interest in English Language in Ebonyi State, guided by six research questions and six hypotheses. The findings consistently revealed that students held positive perceptions of the three AI-enhanced tools examined, Tutor AI, ChatGPT, and Write & Improve, both in relation to their academic achievement and academic interest in English Language. This suggests that AI-assisted learning platforms are not only valued as effective academic supports but also as motivational tools that sustain students' engagement in English studies.

VI. Recommendations

Based on the findings, the following recommendations were made:

1. English Language teachers should incorporate Tutor AI, ChatGPT, and Write & Improve into classroom instruction to boost students' achievement.
2. Schools should invest in digital infrastructure, including reliable internet connectivity and access to AI-powered platforms, to ensure effective use of these Tutor AI, ChatGPT, and Write & Improve in teaching and learning.
3. The English Language curriculum should be revised by the curriculum planners to incorporate the use of Tutor AI, ChatGPT, and Write & Improve as part of instructional strategies.

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