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Development of Mind Mapping Media to Improve Short Story Writing Skills in Elementary Students

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Abstract: This research aims to develop teaching materials based on concept maps to improve the short story writing skills of fifth-grade students at MIS Ar-Rahman Tanjung Morawa, who previously faced difficulties in the use of spelling, critical thinking skills, text structure understanding, and writing interest. This type of research is Research and Development (R&D) using the ADDIE model. Data were collected through observations, interviews, questionnaires, and tests (pretest and posttest). Validation was conducted by experts in material, media, and language, followed by a practicality test involving students and teachers. The results of the validation showed a very high feasibility level, namely 90.91% (material expert), 84% (media expert), and 82.5% (language expert). The practicality test scored 86% from students and 91% from teachers. The teaching materials proved effective in improving short story writing skills and students' learning motivation. The development of teaching materials using a combination of mind mapping and interactive visual design facilitates students in understanding story structure, organizing ideas, and writing texts creatively. Teachers can use these teaching materials as engaging learning media that are easy to adapt to various content contexts, while schools can utilize them to encourage more interactive and student-centered writing learning. This research enriches the literature on the application of mind mapping in narrative writing education at the elementary school level and provides empirical evidence that a conceptual visual approach can enhance students' literacy skills.

Keywords: Mind Mapping, Short Stories, Teaching Materials, Writing Skills

A. Intruduction

Writing skills are one of the basic competencies that elementary school students must master because they play an important role in written communication, reasoning, as well as the development of critical and creative thinking abilities (Siang, Ying, & Mohamad, 2021). Writing short stories as a form of narrative writing requires skills in idea development, structuring the story (introduction, conflict, climax, and conclusion), as well as the use of coherent and cohesive language (Syukur, Tohamba,

& Faridawati, 2025). At the Madrasah Ibtidaiyah (MIS) level, the ability to write short stories also supports the achievement of Indonesian language competencies and character, such as creativity, independence, and the ability to express oneself.

However, in reality, many elementary school students face difficulties in organizing ideas coherently, developing plots, and varying their use of language. These obstacles are often caused by limitations in learning strategies that facilitate the thinking process and idea development, a lack of motivating learning media, and minimal opportunities to practice structured writing (Maulida, Rahman, Handrianto, & Rasool, 2022). Therefore, efforts to develop effective and easily implementable learning media become important to enhance writing skills at the basic level.

One of the approaches considered potential is the use of mind mapping media. A mind map is a graphic tool that helps students organize ideas visually, showing the relationships between main ideas and supporting ideas, as well as facilitating the writing planning process (Su & Zou, 2024). With a mind map, students can more easily plan the characters, setting, plot, and theme of the story, making the writing process more focused and structured (Jackson, Barrella, & Bodnar, 2024). The research on the development of mind map media in the basic education environment is expected to provide practical contributions to enhancing short story writing skills and to serve as an alternative learning strategy that is compatible with the characteristics of students at MIS Ar-Rahman.

MIS Ar-Rahman is located in Tanjung Morawa Village, Tanjung Morawa District, Deli Serdang Regency, North Sumatra Province. The socio-cultural conditions and infrastructure in this area influence the learning process, including the learning of the Indonesian language. Initial observations and formative assessment results in several elementary schools show that some students still experience difficulties in composing short stories with logical plots, adequate vocabulary variety, and completeness of story elements. These limitations impact the low learning outcomes and the decline in students' motivation towards creative writing activities.

Pedagogically, writing instruction at the madrasa level needs to be designed with media that not only delivers content but also facilitates the students' thinking process (Ittihad & Hamzah, 2025). Mind map media offers advantages in cognitive aspects by visualizing conceptual relationships and facilitating the mapping of ideas before writing. Motivationally, the visual and interactive form of mind maps can enhance student interest, especially for students with visual and kinesthetic learning styles (Andriyani, Ekawati, & Sukoriyanto, 2024). In addition, the mind map is easily adaptable to local materials and the local cultural context, thus accommodating the life experiences of students in Tanjung Morawa Village.

The gap between the curriculum demands for developing writing skills and the existing learning practices is an important reason to implement media-based interventions. The development of mind map media needs to be carried out systematically using an appropriate development model (such as ADDIE or other development models) to ensure its quality, feasibility, and effectiveness (Nata, Budiyono, Wirdiarti, & Yuwono, 2025). Evaluation of the developed media must include aspects of content validity, user acceptance (teachers and students), and effectiveness in improving short story writing skills, both in terms of text quality (structural appropriateness, cohesion, and vocabulary) and in quantitative terms (writing scores or grades) (Lestari, 2024).

Various previous studies (Cahyatul, Sari, & Astari, 2024) It has been proven that mind maps can help students organize ideas and enhance writing creativity. However, most of these studies have been conducted at the junior high and high school levels, and are more often applied to essay writing or nonfiction writing. Meanwhile, the application of mind map media to assist elementary school students in writing short stories, which require creativity, plot development, and character strengthening, is still rarely done, especially in the context of madrasahs in rural social backgrounds.

In addition, previous research (Utari & Rambe, 2023) This is done in schools with complete facilities and adequate learning media access. This condition is certainly different from MIS Ar-Rahman in Tanjung Morawa Village, Deli Serdang Regency, which has limited resources and students from diverse socio-cultural backgrounds. The challenges faced by students here are not only about articulating ideas, but also the limitations of learning media that can guide them in creating stories with a coherent and engaging plot. Another gap is seen in research methods. The study (Wati, Dayana, & Devianty, 2022) only focuses on the application of mind map media without going through systematic development stages and adequate validity testing. In fact, the development process that follows models such as ADDIE or Borg & Gall is very important so that the media truly meets the needs of students and is effective in improving learning outcomes. This is the gap in the research that needs to be filled, namely the development of contextual, tested mind map media that aligns with the character of students in rural areas.

This research aims to fill that gap by introducing several innovations. First, the developed mind map media not only facilitates the writing planning process but is also contextually conceptualized for students of MIS Ar-Rahman. The themes, illustrations, and vocabulary used are tailored to everyday life in Tanjung Morawa Village, making it relatable to students' experiences and imagination. Second, this media integrates elements of creative literacy based on local culture. Stories created by students are aimed at highlighting the values of local wisdom in Deli Serdang, so that writing lessons not only enhance language skills but also instill pride in cultural

identity. Thirdly, the development process is carried out through the ADDIE model that involves teachers and students in a participatory manner, from needs analysis to evaluation. The validation stage involves language experts, media experts, and education practitioners to ensure that the media is suitable for use in the classroom.

Fourth, the evaluation of the success of the media is not only measured by the increase in students' writing skills scores, but also by the level of acceptability by teachers and students, ease of use, and its impact on learning motivation. Thus, the results of this research not only produce effective media but also practical and easy to adapt in other madrasahs with similar conditions. With this novelty, the research is expected to enrich strategies for teaching creative writing in elementary schools, while also serving as a model for developing learning media that is oriented towards the needs of students in rural areas.

B. Methods

This research uses the Research and Development (R&D) method with the ADDIE development model, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation. The choice of the ADDIE model is based on the consideration that this model is systematic and flexible, making it effectively applicable in the development of learning media based on user needs (Branch, 2009). Compared to other R&D models such as (Borg & Gall, 1983) which has longer and more complex stages, ADDIE provides a simple structure while maintaining the rigor of the development process.

In the Analysis stage, researchers identify learning needs, competency gaps of students, and constraints in teaching short story texts through initial observations and interviews with classroom teachers. The Design stage includes the development of learning media based on concept mapping/mind mapping, including the design of content material, visual design, and evaluation instruments. The Development stage involves producing the initial media, which is then validated by three categories of experts: subject matter experts, media experts, and language experts. The Implementation stage involves limited trials with fifth-grade students to assess the effectiveness and practicality of the media. The final stage, Evaluation, is used to assess the feasibility of the media based on expert feedback and user responses.

The subjects of this study are 24 fifth-grade students from MIS Ar-Rahman Tanjung Morawa, Deli Serdang Regency, North Sumatra, in the second semester of the 2024/2025 academic year. The selection of subjects was conducted using purposive sampling technique, which considered the following criteria: (1) active students in fifth grade, (2) the initial understanding level of short story texts being in the low to medium category based on the pretest results, and (3) willingness to participate in the

entire research process (Creswell, 2020). The composition of participants consists of 12 male students and 12 female students aged 10–11 years.

Data collection was conducted through tests, observations, interviews, and questionnaires. Tests were used to measure students' initial ability (pretest) and final ability (posttest), consisting of 10 items (5 fill-in-the-blank and 5 matching questions) with a scoring scale of 1–5. Observations were conducted directly during the learning process with a duration of approximately 35 minutes per session, using a structured observation sheet (Sugiyono, 2022). Interviews were conducted in a semi-structured manner with fifth-grade teachers and several selected students, using a guide that contained 10 questions exploring experiences, perceptions, and suggestions regarding the use of media (Moleong, 2000). The questionnaire is used to assess validation by material, media, and language experts, as well as to measure the responses of teachers and students to the learning media. The research instruments include expert validation sheets, observation sheets, semi-structured interview guides, pretest and posttest questions, as well as user response questionnaires. Validation is carried out by providing assessment sheets to experts using a scale of 1–5. The scores obtained are calculated using the percentage formula:

$$\textbf{Validator (v)} = \frac{score\ total\ validation\ from\ validator}{Maximal\ Total\ Score}\ x\ 100\%$$

Quantitative data from the tests were analyzed using SPSS version 26 to calculate the mean score, percentage of improvement, and perform difference tests (paired sample t-test) between pretest and posttest results. Qualitative data from observations and interviews were analyzed using thematic analysis (Miles, Huberman, & Saldaña, 2014) with the following steps: (1) data transcription, (2) open coding, (3) axial coding, and (4) drawing conclusions that are verified with field data. With this methodological design, the research ensures that the data collection and analysis processes are conducted rigorously, transparently, and can be scientifically accounted for.

Table 1. Quality Level of the Feasibility of Teaching Materials from ExpertsProduct Validation Criteria

Achievement Percentage	Interpretation
85% – 100%	Very Valid
70% – 84%	Valid
55% – 69%	Fairly Valid
<55%	Not Valid

C. Results and Discussion

Process of Developing Teaching Materials

This research produces teaching materials for short story writing skills based on concept maps (mind mapping) developed through five stages of the ADDIE model.

The analysis stage shows that writing instruction in fifth grade is still dominated by lecture methods with limited media utilization, resulting in suboptimal writing skills among students. Mind mapping was chosen as an innovative medium because it is considered capable of helping students understand the structure and elements of a story visually.

In the design phase, the researcher composes a draft of teaching materials that integrates the intrinsic elements of short stories into a concept map format. The design is created using the Canva application with a combination of engaging text and illustrations, making it easier for students to follow the learning flow. The development stage produces interactive teaching materials in the form of a mind mapping-based pop-up card. The initial product is validated by subject matter experts, media experts, and language experts. Feedback from the validators is used to refine the quality of the content, visual design, and readability.

The implementation of teaching materials in the practicality testing phase shows that this media is effective in increasing student engagement, efficient in time usage, and capable of triggering creativity and interaction during the learning process. An attractive appearance also enhances student learning motivation. The evaluation phase is conducted formatively at every stage of development for continuous improvement and summatively at the end of the research to ensure the feasibility and final quality of the product. Overall, the mind mapping-based teaching materials developed are proven to be feasible, practical, and effective for use in teaching short story writing in fifth-grade elementary school. The diagram in this research process has been attached by the researcher below.

Figure 1. ADDIE Model

Expert Validity

The purpose of expert validation is to assess the effectiveness of concept maps / mind mapping. This activity involves three groups of experts: media experts, material experts, and language experts, each consisting of one validator. The validators evaluate the teaching materials based on their expertise. The results of this assessment are used to determine whether the teaching materials are suitable for use in learning or need further improvement.

Table 2. Results of the Media Validator Assessment

Description Validator	Score
Total Score (∑x)	84
Maximum Score (∑xi)	100
Percentage (P)	84%
Average Percentage ($\bar{x}$)	84%
Category	Valid

Table 3. Results of the Validator Assessment of the Material

Description Validator	Score
Total Score (∑x)	50
Maximum Score (∑xi)	55
Percentage (P)	90.91%
Average Percentage ($\bar{x}$)	90.91%
Category	Very Valid

Table 4. Assessment Results of Language Validators

Explanation	Score Validator
Total Score (∑x)	**33**
Maximum Score (∑xi)	**40**
Persentase (*P*)	**82,5 %**
Average percentage ($\bar{x}$)	**82,5 %**
Category	**Valid**

Table 5. Recapitulation of Expert Validation Results

No	Validator	Total Score (∑x)	Maximum Score (∑xi)	Percentage (%)	Category
1	Media Expert	84	100	84.00	Valid
2	Material Expert	50	55	90.91	Very Valid
3	Language Expert	33	40	82.50	Valid
Average	—	—	—	85.80	Very Good

Note: The average percentage of validation is in the range of 81–100%, thus the developed teaching materials fall into the category of Very Good and are suitable for use in teaching. Expert validation is conducted to assess the feasibility and effectiveness of the media-based teaching materials of concept maps (mind mapping) that have been developed. The validation process involves three groups of validators with different expertise, namely media experts, subject matter experts, and language experts. Each group is represented by one validator who assesses the teaching materials according to their field of expertise. The assessment is carried out using an instrument containing indicators of conformity based on media aspects, substance of the material, and language.

The results of the media expert validation show a total score of 84 out of a maximum score of 100, resulting in a feasibility percentage of 84%. Based on the score interpretation criteria, this score falls into the valid category, meaning the media is suitable for use with minor improvements. Meanwhile, the results from the content expert validation received a total score of 50 out of a maximum score of 55, with a

percentage of 90.91%, categorized as very valid, indicating that the content and completeness of the material meet the learning objectives. Furthermore, the validation from the language expert produced a score of 33 out of a maximum score of 40 or 82.5%, which falls into the valid category, indicating that the use of language is in accordance with the rules but can be refined to improve readability and clarity. The recap of the validation results shows an overall average percentage of 85.80%, which falls within the range of 81–100%. Based on the feasibility criteria, the developed teaching materials are categorized as very good and suitable for use in the learning process. This aligns with Akker's (1999) opinion that expert validation is an important stage in the development of teaching materials to ensure the suitability of content, media, and language before being implemented on students. Thus, these validation results indicate that the developed concept map media has high potential for use as an effective learning tool.

Effectiveness of Learning

The practicality test of the teaching materials is carried out through the completion of questionnaires by students and teachers after the teaching materials have been used in the learning process. The practicality assessment for students is obtained from the average score of all statements on the filled questionnaire, which is then converted into a percentage to determine the level of practicality. The results of a small-scale trial on students showed a percentage of 82%, while the large-scale trial produced a percentage of 86%. Meanwhile, the practicality assessment from teachers received a percentage of 91%. Based on the percentage interpretation criteria (81–100% = very practical), both the results from students and teachers indicate that the teaching materials are classified as very practical for use in learning activities. These findings indicate that the developed teaching materials are not only suitable in terms of content and language, but also easy to use and facilitate the learning process, in line with Nieveen's (1999) view that practicality is an important indicator of the success of a learning product.

Table 5. Recapitulation of the Practical Test Results of Teaching Materials

No	Respondent	Test Scale	Percentage (%)	Category
1	Students	Small Scale	82.00	Very Practical
2	Students	Large Scale	86.00	Very Practical
3	Teacher	–	91.00	Very Practical
Average	–	–	86.33	Very Practical

Note: The practicality category is determined based on the percentage interval of 81–100% = Very Practical; 61–80% = Practical; 41–60% = Fairly Practical; 21–40% = Less Practical; 0–20% = Not Practical.

This research produces teaching materials in the form of concept maps or mind mapping specifically designed for fifth-grade elementary school students in Indonesian language learning, focusing on short stories. The teaching materials are equipped with illustrations and interactive concepts like pop-up cards to make them more engaging, easy to use, and help students understand the material more effectively. The development of teaching materials is carried out through five stages of the ADDIE model, namely analysis, design, development, implementation, and evaluation. In the analysis stage, it was found that students need visual learning media to improve their understanding of the material, but their writing interest is still low and their dependence on the teacher is quite high due to the limitations of textbook resources.

The design stage is carried out by creating an initial draft of the teaching materials, arranging the layout, and sketching with consideration of visually appealing and easily understandable aspects for students. The dominant color used is pink with a clear readable font. The development stage includes pre-production, production, and post-production using hardware such as mobile phones, laptops, and mice, as well as software such as Canva for layout design, images, and illustrations. The implementation stage is conducted through small-scale and large-scale trials. The small-scale trial with 24 students obtained a feasibility score of 98% (categorized as 'Very Feasible'), while the large-scale trial with 23 students obtained a score of 86% (categorized as 'Very Feasible'). Teacher responses to the teaching materials received a score of 91% (categorized as 'Very Feasible').

The evaluation stage is conducted at each phase of development. The media expert's assessment shows a score of 84% (category 'Very Feasible'). The material expert's assessment received an average of 90.91% (category 'Very Feasible'), with the indicators of material relevance, language clarity, content appeal, and relevance to the development of science and technology receiving the highest scores. The language expert's assessment scored 82.5% (category 'Very Feasible'), with indicators of sentence structure, term accuracy, grammar, and symbol consistency scoring 100%, while spelling accuracy and critical thinking received scores of 90%.

The results of the student questionnaire show an average of 86% (in the 'Very Suitable' category). The application of mind mapping has proven to enhance students' ability to understand the elements of short stories and facilitate their organization of structure and content. Additionally, this method also has a positive impact on improving students' short story writing skills, as evidenced by the increase in the average scores after using the teaching materials.

Discussion

Process of Developing Teaching Materials

The research results show that the teaching materials for short story writing skills based on mind mapping, developed through the five stages of the ADDIE model, have high feasibility, practicality, and effectiveness. In the analysis stage, the main problem in writing instruction in the fifth grade is the dominance of lecture methods and the lack of innovative media, which affects students' low writing skills. This aligns with the findings. (Ulfa, Nasution, Annas, Hidayana, & Farisi, 2024) which states that the lecture method tends to make students passive and less able to develop ideas independently.

The selection of mind mapping as a learning medium is supported by research findings. (Wati, Dayana, & Devianty, 2022) which explains that mind mapping can help students visualize the relationships between intrinsic elements of a story, facilitate the organization of writing outlines, and enrich vocabulary. Furthermore, an attractive visual format can enhance students' intrinsic motivation in writing, as evidenced by the study Puspitasari and Ramadhani (2022), which found a significant increase in student participation and the quality of their written works when mind mapping was used as a pre-writing strategy.

Products developed in the form of pop-up cards based on mind mapping provide an interactive learning experience. According to research. (Dalimunthe, Affandi, & Suryanto, 2021), The media pop-up not only enriches the visual aspect but also creates emotional engagement for students through direct interaction with the media. This supports findings from practical trials that show an increase in student engagement and creativity.

The validation process by experts in content, media, and language, as well as formative and summative evaluations, shows the optimal application of the ADDIE model. This result is in line with the study by (Syavira, 2021) which emphasizes that continuous evaluation in the ADDIE model can improve the final quality of learning products. With student and teacher response scores categorizing as 'very practical' (81–100%), the findings of this study reinforce the research results. (Maulana & Hayati, 2025) that media that meets the criteria of feasibility and practicality tends to be well received by teachers and students and is effectively used in the classroom.

Overall, this research indicates that the combination of mind mapping and systematically developed pop-up media through the ADDIE model is an effective solution in teaching short story writing in elementary schools. This innovation not only improves writing skills but also motivates students to be more actively involved.

Expert Validation

The results of expert validation on the teaching materials based on concept maps (mind mapping) show an average feasibility percentage of 85.80%, which falls into the very good category and is suitable for use in learning. The assessment was conducted by three groups of experts representing the aspects of media, content, and language. The media expert gave a feasibility score of 84% (valid category), the content expert gave a score of 90.91% (very valid category), and the language expert gave a score of 82.5% (valid category). These findings indicate that the teaching materials have met the feasibility standards in terms of media presentation, accuracy and completeness of the content, as well as the language suitability with linguistic norms. The result is in line with the research (Ulviani, Amin, Hafid, & Kemala, 2025) which emphasizes that expert validation is a crucial stage in the development of teaching materials to ensure the content aligns with learning objectives and the usability of the media used. Assessment from various aspects, such as the substance of the material, media design, and language, allows developers to make targeted improvements before implementation in the field. In addition, these findings are consistent with studies by (Vejayan & Yunus, 2022) which shows that mind mapping-based teaching materials can enhance student engagement in the learning process because the systematic and visual presentation of material facilitates understanding of concepts. The high validation score from material experts (90.91%) in this study strengthens the argument that mind mapping is not only visually appealing but also can maintain the accuracy and completeness of learning content.

From a linguistic aspect, the validity percentage of 82.5% indicates that the language used meets the standards, although it can still be improved. This is in line with the view (Siswantini, Suharto, & Soleh, 2022) which emphasizes the importance of a communicative, straightforward, and rule-compliant language so that the teaching materials are easily understood by the students.

Overall, the results of this validation support the opinion (Mirandani, 2022) which states that expert validation is part of the development cycle that determines the feasibility of educational products before being tested. With a high average validation percentage, the developed concept map media has great potential to become an effective learning tool, supporting the achievement of learning objectives and enhancing students' understanding of the material.

Effectiveness of Learning

The results of the practicality test of the concept map-based teaching materials (mind mapping) show that both students and teachers rated it in the very practical category. The small-scale trial by students resulted in a percentage of 82%, while the large-scale trial reached 86%. The assessment from teachers was even higher, at 91%. The overall

average percentage of 86.33% indicates that the teaching materials are not only appropriate in terms of content, media, and language, but also easy to use, engaging, and support the smoothness of the learning process.

This finding is consistent with the opinion (Mustika, Charles, Hercy, Liao, & Chan, 2025) which emphasizes that practicality is one of the important indicators of the success of a learning product, alongside validity and effectiveness. Learning materials are said to be practical if they can be easily used by the target users, both teachers and students, without requiring complicated adjustments. In this study, the high ratings from teachers indicate that the teaching materials support the teaching process, while the positive assessments from students signify that the learning materials are able to facilitate a more independent understanding of the material. In line with this, the research conducted by (Lovenia, 2021) It shows that visual-based teaching materials such as mind mapping have a high level of practicality because they can help students organize information and facilitate their recall. The research found that the use of mind mapping in learning the Indonesian language increases learning motivation while also speeding up material comprehension. In addition, the research (Uysal & Sidekli, 2020) It also reveals that factors such as visual design, text readability, and content relevance are the main determinants of students' perceptions of the practicality of learning materials. In this development, the learning materials are equipped with pop-up card illustrations, attractive dominant colors, and a neat layout, aligning with these recommendations.

Based on the results of this study, the application of mind mapping has been proven to improve students' short story writing skills. This is in line with the study by Safitri & (Lestari, 2024) which states that the mind mapping technique is able to facilitate students in identifying story elements, developing plots, and enhancing writing creativity. Thus, the high practicality score in this study reinforces the argument that teaching materials should not only be assessed in terms of the appropriateness of content, media, and language, but also in terms of ease of use in the classroom. High practicality ensures that teachers can implement teaching materials without obstacles, and students can use them effectively to improve their understanding and skills.

D. Conclusion

This research develops instructional materials for short story writing skills based on mind mapping for fifth-grade elementary school students through the ADDIE model. The expert validation results show a very good feasibility level (average 85.80%), while the practicality test by students and teachers is categorized as very practical (average 86.33%). The implementation of these instructional materials proves to enhance learning motivation, student engagement, as well as the ability to organize ideas and write short stories. This study confirms that mind mapping can be an effective medium in narrative writing education at the primary level. The research

results reinforce the theory that visual representation of ideas helps students understand story structure, connect intrinsic elements, and stimulate writing creativity. This finding expands the literature on the use of concept maps as a cognitive strategy to develop basic literacy skills. Teachers are advised to integrate mind mapping into weekly writing exercises, utilizing attractive visual designs, and combining it with interactive learning methods such as pop-up cards. Schools can provide training on the use of simple design applications (e.g., Canva) for teachers to independently produce similar media. This research was conducted in one elementary school with a limited number of subjects, so the results cannot yet be generalized broadly. In addition, the duration of the trial is relatively short, so it has not measured the long-term impact on students' writing skills. Further research can be conducted at different levels and regions to test the replication of these findings, while also exploring the influence of using mind mapping on other aspects such as critical thinking, vocabulary, and text editing skills. Longitudinal studies are also necessary to assess the sustainability of the learning impact with this media.

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