The Mediating Effect of Languange Based Approach on the Relationship Between Students' Motivation and Cognitive Engagement

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Abstract— The purpose of this study was to determine the level of motivation of students, the level of cognitive engagement, and the level of language-based approach using the Filipino language. The study also aimed to identify the significant relationships between variables: students' motivation and cognitive engagement, learners' motivation and language-based approach learning, and language-based approach learning and cognitive engagement. The research used a non-experimental quantitative research design with a descriptive approach. Simple random sampling was used to determine the number of pupils per campus, and stratified sampling was used to generate the number of respondents in each branch of the school. Data were collected from 435 students with Filipino subjects from three selected private schools through a survey questionnaire. The collected data from the questionnaire were analyzed using mean, Pearson product-moment correlation coefficient, and linear regression. Results showed that students' intrinsic and extrinsic motivation levels both achieved high levels. Additionally, the results for the level of cognitive engagement, including suggestive interactions with members, constructive notetaking, active note-taking, active processing, and passive processing, still obtained an overall high level, indicating that respondents often displayed these behaviors. Moreover, passive processing emerged as the predictor of cognitive engagement. The level of language-based also achieved a high level, indicating that respondents often exhibited it. Finally, each variable was clearly evaluated, and the results showed that student motivation, cognitive engagement, and the use of the language-based approach were interconnected. Based on the results, student motivation and cognitive engagement are affected by the language-based approach, but this effect is indirect and depends on the strategy used.

Keywords— academic stability, student motivation, communication skills, language-based approach, path analysis, grades 11 and 12, Philippines.

I. INTRODUCTION

Despite measures and suggestions to improve learners' interactions, serious issues addressing lack of competence in their cognitive interactions continue to explode. The causes of this problem are not only simple issues of lack of focus, but a deep crisis that began with an insufficient knowledge foundation, lack of interest, and low self-confidence. The most critical challenge is the lack of learners to devote the right time and effort to truly understand complex topics, so their ability to learn difficult skills is hampered. It is also a big issue that they use learning strategies that are incompatible with the need for deeper processing, which hinders their success and continuity in education. Flawed learning approaches not only cause confusion but exacerbate the lack of conceptual understanding, which serves as the greatest obstacle to their cognitive engagement and growth in the academic field (Rotgans & Schmidt, 357-369). Such a situation demonstrates the urgent need for large-scale reforms and strategies that will address these challenges and strengthen learners' learning (Zimmerman, 64-70).

Ahmad's study (760) noted that cognitive interaction is considered an important concept to focus on during the teaching and learning process. Other than that, it is really important in influencing a student's active use of purposeful learning in the classroom and in the use of this interaction. Students can motivate, be interested and interactive to follow the learning in the classroom. Substantial research also revealed the significant role of cognitive engagement in students' success (Anti, 51). In addition, cognitive engagement is essential for learning and academic achievement. Indeed, a study conducted by Fredericks et al. (59) shows that students with deep interactions tend to use different learning strategies. These strategies are important agents for learners' success because they enable learners to learn meaningfully (Destroy, 512).

Learners' motivation and cognitive engagement have a strong relationship with their learning of a particular topic. According to the study by Bircan & Sungur (509-529), self-efficacy (motivation) and value in tasks (cognitive interaction) were associated with the use of

different learning strategies that help strengthen metacognitive beliefs. Their study also showed that more than 50% of the pupils had high motivation and interest, particularly in the literary subject, due to the use of language based strategies.

Thus, student motivation is an important factor that has a direct impact on their academic success, making it a worthy focus in any educational discourse. According to Deci and Ryan (227-268), motivation can be divided into two main types: intrinsic and extrinsic. Intrinsic motivation stems from the learner's natural satisfaction and interest in the task, while extrinsic motivation is caused by external incentives such as reward or punishment. In the context of language, studies show that there is a deep connection between language use and intensifying learner's motivation and focus in their lessons. Further, according to Gonzales (12-19), language is not only a communication tool but also an effective instrument to boost the learner's interest and motivation in the learning process. Through language, teachers and students have the opportunity to express their thoughts, ideas, and opinions, which in turn causes more active interaction and the development of more productive discourse within the classroom.

On the other hand, the connection of the dulog based on language and cognitive interaction has a significant impact on learners' learning. According to Vygotsky (174), language is a key tool in cognitive development, boosting the ability to think higher. Through language, students participate in discourse and exchange of ideas, which deepens their understanding. Swain (97-114) added that active language interaction expands learners' knowledge and skills through more open-minded and collaborative discourse. Moreover, classroom discussions enhance critical thinking and help deepen their understanding. In this way, effective use of language in interactive learning becomes key to improving students' academic performance (Mercer, 557).

II. METHOD

Research Respondent
Students at selected private schools, particularly in the northern sections A, B, and C, were the respondents to this research in Grades 11 and 12 of the said institution during the 2023-2024 school year. The total number of students with Filipino subjects in these schools was 1254. Using the Raosoft Formula, out of the 1254 population among all senior high school students at three schools, 435 participants were drawn with a confidence level of 99% and a margin of error of 5%. Therefore, according to Isip (1), this number was suitable for this research. In addition, the research was conducted at three selected private universities in Panabo City, Davao del Norte Region XI, because it was the area where the researcher belonged, and the threat posed by the pandemic made the data collection process tight. The researcher considered self-interest in conducting the study.

Three private schools with senior high school were included in this study: A (710 participants), B (80 participants), and C (464 participants). The researchers used stratified random sampling. This technique divided the total population into small groups and selected samples from those groups. Each individual was selected randomly, and all members of the population had an equal chance of being included in the sample.

There was no pressure of any kind on the participants as they responded to the questionnaire. Participants who refused to share their opinions or thoughts were highly respected by the researcher. Participants voluntarily took their time to answer questions, and no threats or penalties were imposed. The researchers also clearly stated that there was no penalty for those who did not respond to the research. Moreover, students who had no interest, no time, or doubts about answering the questionnaire had the freedom to withdraw from their participation in the study.

Research Instrument
The questionnaire used in this research had three parts. First, the questionnaire about the motivation of the students. The second part was about the language of the world. Finally, the third part was for cognitive interaction.

In the study of the students' motivation, the researcher used the questionnaire "An Analysis of Students' Motivation in Studying English" by Fachraini, S. (52), with two indicators and ten items. The second part of the questionnaire was derived from "Language-Based Approach as a Trend to Enhance Pupil's Interest in Children's Literature" (329), translated into Filipino with five items. For the final variable in this study, the researcher used the derived questionnaire from "Development of the Student Course Cognitive Engagement Instrument" by Barlow et al. (10), translated into Filipino. It had four indicators and eighteen items. The questionnaire was deemed acceptable based on the results of Cronbach's alpha:

0.767 for student motivation, 0.881 for cognitive interaction, and 0.768 for "dulog" based on language.

For measuring the level of motivation of students, cognitive interaction, and dulog based on language, the researcher used the following range: 4.20-5.00, with the descriptive highest level meaning that the item in question was always displayed in the aforementioned variant; 3.40-4.19, with a descriptive high level meaning that the item referred to was often shown in the aforementioned variant; 2.60-3.39, with a descriptive medium level meaning that the item in question was sometimes shown in the aforementioned variant; 1.60-2.59, with a descriptive low level meaning that the item was rarely displayed in the aforementioned variant; and 1.00-1.79, with a descriptive lowest level meaning that the item was not shown in the aforementioned variant.

Data Design and Collection

This study was conducted using a non-experimental quantitative design, specifically a descriptive-correlational survey. Quantitative research involves the process of collecting, analyzing, interpreting, and recording results in a study (Creswell, 19). It is designed to determine the relationship between two or more variables. The questionnaire was the method used to gather the data required for quantitative analysis.

In this research, cognitive interaction was the dependent variable, while the motivation of the students was the independent variable and linguistic intermediary. The research used a descriptive-correlational approach.

Quantitative data were analyzed to assess the relationship between two or more variables and to discover the relationship between students' motivation, linguistic factors, and cognitive interactions. Furthermore, according to Calmorin, the descriptive correlational method was designed to describe the relationship between two variables (X and Y). Therefore, it can be said that the research instrument had proper content.

Descriptive research is designed to provide a picture of a situation as it naturally occurs. It was used to justify current practice and to make judgments and to develop theories according to Elsevier (201) in Burns and Grove's book.

The purpose of this study was to determine whether there was a relationship between the independent variable of students' motivation and linguistic learning with the dependent variable of cognitive interaction. Path analysis was used to determine whether the mediator effect on the relationship between the independent and dependent variables was significant.

III. RESULTS AND DISCUSSION

Student Motivation

Table 1 shows the level of motivation for students in their studies. From the two indicators, it obtained a total mean of 3.63 with a total standard deviation of 0.68 and a descriptive level high and means that the item referred to is often manifested in the aforementioned variable.

Table 1. Student Motivation Level

Indicator	SD	Mean	Description
Intrinsic Motivation	0.73	3.77	High
Extrinsic Motivation	0.79	3.48	High
Total	0.68	3.63	High

Both indicators from this variant obtained a high descriptive level which means that the student often demonstrated learning motivation within the class. The motivation of intrinsic level students obtained a mean of 3.77 and a standard deviation of 0.73. While extrinsic motivation obtained a mean score of 3.48 and a standard deviation of 0.79.

In the first objective of this research that determines the level of motivation of students, it obtains a descriptive interpretation that is high. This means that students often show motivation in class. According to Westin (1-2), despite showing an important part of motivation in

learning, there is still a problem when it comes to extrinsic motivation, where the results are low when using the Filipino language. The researchers suggest that students should always demonstrate intrinsic and extrinsic motivation to become even better when using the Filipino language. In addition, teachers may provide activities related to learning in the Filipino language, such as writing essays or poems, making presentations in Filipino, developing projects that require the use of Filipino for discussion or research, and conducting debates or discussions centered on national or local issues using Filipino. These activities give students the opportunity to expand their skills and love for the

Filipino language while also strengthening their appreciation for the culture and identity of the country. To make their participation strong, they may be awarded prizes, such as additional participation points.

Cognitive Engagement

Table 2 shows the data on the level of cognitive interaction of selected students in the city of Davao, with an overall mean score of 3.85, a total standard deviation of 0.50, and a descriptive interpretation of high.

Table 2. Level of Cognitive Engagement

Indicator	SD	Mean	Description
Interacting with peers	0.73	3.69	High
Generates Note Taking	0.83	3.72	High
Active Note Taking	0.72	3.74	High
Active Processing	0.67	3.72	High
Passive Processing	0.64	4.44	Very High
Total	0.50	3.85	High

From the five indicators of cognitive interaction, it obtained a total mean of 3.85 and a standard deviation of 0.50, which means that the interaction of class students with language learning was often seen. Of the five indicators, passive processing had the highest descriptive interpretation with a mean of 4.44 and a standard deviation of 0.64. Meanwhile, active notetaking had a mean of 3.74 and a standard deviation of 0.72, generating note-taking had a mean of 3.72 and a standard deviation of 0.83, active processing had a mean of 3.72 and a standard deviation of 0.67, and interaction with members had a mean of 3.69 and a standard deviation of 0.73. All obtained a high descriptive interpretation.

The second table shows the result for the secondary purpose of this study. This refers to the level of cognitive interaction among study participants, which Ahmad (760) notes is considered an important factor in learning. In the result of the secondary objective, cognitive interaction is often seen in language learning among students. Therefore, it is important for teachers to have learning activities that attract the students' attention and increase their active processing of activities. Examples include conducting interactive discussions, creating groups for collaborative projects, developing visual aids or multimedia presentations, organizing role-playing or simulation activities, and using activities such as quiz games or puzzles. These activities give students the opportunity to think and apply what they have learned. Such practices help not only to maintain the interest of students but also to intensify their critical thinking skills and deepen their understanding of topics.

Language-Based Approach

Table 3 shows the dulog level data based on the language of selected students in the city of Davao, with a total mean score of 4.00, a total standard deviation of 0.71, and a descriptive interpretation of high.

Table 3. Language-Based Approach

Indicator	SD	Mean	Description
I want to learn the English language with the help of the language.	0.86	4.04	High
I think learning Filipino with language-based spindles is interesting.	0.92	3.96	High
I understand the text using language-based threads.	0.85	3.86	High
I feel confident in learning Filipino after I learn it using the language-based approach.	0.91	3.86	High
I feel happy when I understand the text through language-based puzzles.	0.82	4.26	Very High
Overall	0.71	4.00	High

From the five indicators of the dulog based on language, it obtains a total mean of 4.00 and a standard deviation of 0.71, which means that the dulog is often seen based on the learning of the Filipino language. From the five indicators, "I feel satisfied when I understand the text through linguistic-based puzzles" gets the highest mean of 4.26 and has a standard deviation of 0.82, indicating that learning in class in the Filipino language is always displayed. This is followed by the indicator "I want to learn Filipino using a language-based approach," with a mean of 4.04 and a standard deviation of 0.86, which means that the class often demonstrates the use of

Filipino as a learning tool. "I think that learning Filipino with linguistic-based approaches is interesting" is the subsequent indicator, with a mean of 3.96 and a standard deviation of 0.92, which means that learning and interacting with the class using the Filipino language is often manifested.

Meanwhile, two indicators got the same mean of 3.86: "I understand the text using language-based puzzles" with a standard deviation of 0.91, and "I feel confident to learn Filipino after I have learned it with the language-based loop" with a standard deviation of 0.91. This means that learning and interaction in the class are often shown in Filipino. According to Vygotsky (174), language is a key tool in cognitive development, boosting the ability to think higher. Through language, students participate in discourse and exchange of ideas, which deepens their understanding. But the results show that students often only demonstrate their learning in the Filipino language. So, as the researcher suggests, teachers should have activities related to the dissemination and expansion of the practice of using the Filipino language, such as writing essays and stories, presenting presentations related to social or academic issues, making projects that require in-depth investigation and discussion in the Filipino language, and performing activities that students work together to improve their ability to communicate and contribute their ideas. These activities enhance their understanding and application of the Filipino language in different contexts.

Analysis of the Relationship of Variants

Table 4 reveals the relationship between variables. It describes the strength of the correlation between learners' motivation and cognitive interaction, learners' motivation and language-based dulog, and linguistic and cognitive interaction.

Table 4. Analysis of the Relationship of Variants

IV at DV	Description	Value	p-value
IV at DV	Student Motivation and Cognitive Engagement	0.704	0.000
IV at MV	Student Motivation and Language-Based Approach	0.699	0.000
MV at DV	Language and Cognitive Engagement	0.686	0.000

From the initial analysis of each variable, the p-value is 0.000, which is lower than the typical alpha level of 0.05. This means there is sufficient evidence to rebut the null hypothesis (Ho), and there may be a significant relationship between Learners' Motivation and Cognitive Interaction. The correlation of 0.704 shows a strong positive relationship. The second variable, on the other hand, has a p-value of 0.000, with enough evidence to reject the null hypothesis (Ho). The cognitive relationship of 0.699 shows a strong positive relationship between Learners' Motivation and Language-based Approach. The final variable, with a p-value of 0.000, has sufficient evidence to reject the null hypothesis (Ho). The cognitive relationship of 0.686 shows a strong positive relationship between Dulog based on Language and Cognitive Interaction.

According to the study by Wigfield (165), the findings of this study correspond to Expectancy-Value theory, which argues that student motivation is a key factor in increasing participation and learning. The language-based approach used in the study may help foster a sense of autonomy, efficiency, and connection among students, leading to increased motivation and participation. In addition, the positive relationship between learners' motivation and their cognitive interactions can be explained by Self-Determination Theory.

Facilitating the language learning process in this way allows learners to focus more on understanding and using the language more effectively, bringing higher levels of skill and motivation.

The Difference between Three Variables

Submitted to medgraph data then underwent a linear regression analysis. The mediation analysis established by Baron and Kenny (1173) refers to the mediating effect of one variable on the relationship between the other two.

Mediation analysis was evaluated in four steps to determine whether the third variable can be considered a mediator in the relationship between the other two variables. In Table 5, these steps are categorized as Steps 1 to Step 4. As demonstrated, in Step 1, the direct effect of learners' motivation on cognitive interaction shows a high positive correlation, with a standardized beta of 0.704 and an unstandardized beta of 0.518. This shows that motivation exerts a significant and direct influence on cognitive interaction. In Step 2, the regression analysis shows that motivation has a powerful indication

of linguistic-based drowsiness with an unstandardized coefficient of 0.726 and a standardized beta of 0.699. This suggests that higher levels of motivation are strongly associated with more strategic approaches to cognitive tasks.

Meanwhile, at Step 3, the sway powerfully indicates cognitive interaction, with an unstandardized coefficient of 0.269 and a standardized beta of 0.380. This shows that the use of effective strategies is important to boost cognitive engagement, emphasizing the importance of task strategies in enhancing cognitive outcomes. In Step 4, the motivational effect on cognitive interaction is analyzed after considering the role of the language-based dulog. The direct effect is significant, with an unstandardized beta of 0.322 and a standardized beta of

0.438, demonstrating that even when taking into account the mediating effect of the linguistic basis, learners' motivation continues to have a strong direct influence on cognitive interaction. The effect is significant at p<0.05, thus showing partial mediation. This indicates that the spine partially mediates the relationship between motivation and cognitive interaction.

However, further mediation analysis using medgraphs is needed to determine the mediation effect significance since paths a, b, and c are found to be interrelated. The analysis will require the Sobel z test to determine whether the mediation effect is fair. Full mediation will determine whether the effect of the independent variable on the dependent variable becomes unfair or disappears once the mediator is included in the model.

Table 5. *Regression analysis showing the influence of pagganyak on Kognitibong pakikipag-ugnayan as mediated by dulog ng wika*

Step	Path	B	S.E.	β
1	c	.518	.025	.704***
2	a	.726	.036	.699***
3	b	.269	.031	.380***
4	c'	.322	.033	.438***

* p<0.05

In addition, Table 4 shows the result of calculating the mediation effect. The Sobel test in Table 6 gives a z value of 7.92, p<0.05. This indicates that the mediation effect is partial, where the original direct effect of students' motivation on cognitive interaction is reduced

after adding the linguistic-based conclusion. The positive value of Sobel z shows that increasing the motivation of the students reduces the effect of cognitive interaction on the linguistic basis.

Table 6. *Results of Statistical Analysis of the Presence (or Absence) of Mediation*

Combination of Variables	Sobel z	p-value	Mediation
Motivation → Approach → Cognitive Engagement	7.921379	<0.05	Partial Mediation

p < 0.05

The language-based approach shows indirectly the relationship between student motivation and adaptation to change. Effect size calculations provide numerical evidence for the strength of this relationship. The results show the importance of considering both direct and indirect effects in understanding the complex relationship in each variant.

Many studies show that language-based learning can have a positive impact on students' motivation, participation, and academic success. In addition, the researcher examines the impact of the mediator factor on academic success. Studies support the idea that certain variables can act as mediators in the relationship between other variants. Positive relationships between

teacher and student can increase student motivation and interaction. A language-based approach that fosters strong relationships can help build these positive outcomes.

Furthermore, the calculated effect size for the examination of the socks shown between the three variables is reflected in the figure. The impact measure determines the extent of the impact of learners' motivation in adapting to change that can be attributed to the indirect pathway. A total effect value of 0.518 is associated with the beta of cognitive interaction towards adaptation to change. The direct effect value of 0.322 is the motivation beta of the students considering the ability to innovate in regression. An indirect effect value

of 0.726 is the value derived from the original beta between learners' motivation and linguistic-based drive (a*b, where "a" refers to the path PNMM → DBSW and "b" refers to the path between DBSW and KP).

Results show that learners' level of motivation, cognitive interaction, and linguistic use of the dulog are connected to each other. Based on the results, it is clear that student motivation and cognitive interaction are affected by the language-based approach, but this is indirect and depends on the strategy used. Hence, as a result of research on the previous hypothesis in which there is a capacity to reject the hypothesis used in the study, there is a significant relationship between learners' motivation and cognitive interaction, learner motivation and language-based dulog, and linguistic and cognitive interaction. Rejection of the hypothesis shows that these relationships have a significant impact on the way learners learn and understand, and language and motivation play important roles in broadening their cognitive interactions.

Meanwhile, in the calculation of mediation, it is indicated that its effect is partial, where the original direct effect of students' motivation on cognitive interaction is reduced by applying the linguistic basis. Thus, the second hypothesis proves that language-based learning is of no importance when using students' motivation and cognitive interactions within the class.

IV. CONCLUSION

From the initial objective of the study stating what the motivation level of the learners is, the researcher from the study participants finds that it obtains a descriptive interpretation that is high. This means that the student often demonstrates motivation in learning. The second goal, which measures the level of cognitive interaction of students, obtains a descriptive interpretation that is high. This means that the student also often demonstrates interaction with learning. The third goal is to determine the level of the language level. The result from the five variants is high, and the student often demonstrates the above item to develop their language skills.

There is also a significant correlation between each variable in the study, which shows a significant relationship between the motivation of the students and the language of the students. Both intrinsic and extrinsic motivation in the language-based approach have a high positive relationship, indicating a high degree of importance. The total relationship shows the highest

relationship, which is proof and indication of the positive relationship between the two variables.

Additionally, the results also show significant relationships between the linguistic-based slope and different aspects of students' cognitive interactions. All relationships show high importance. The highest correlation is reflected in the overall cognitive outcome of the interaction, indicating strong positive relationships. Other aspects of cognitive interaction, such as interaction with members, active processing, etc., also show significant linguistic relationships based on language, which is just an indication that each variant affects the other. Finally, each variable is clearly evaluated, where the results show that the motivation of the students, cognitive interaction, and the use of the dulog based on language are connected to each other. Based on the results, proof is only anchored to the theory used in the Expectancy-Value theory study, which emphasizes the connectivity of each variable used in the research. It is clear that student motivation and cognitive interaction are affected by linguistic learning, but this is indirect and depends on the strategy the teacher uses.

V. RECOMMENDATIONS

Based on the results of this study, to increase the level of motivation of the students, the level of cognitive interaction, the level of the linguistic, and the relationship of each variable, the researcher proposes the following recommendations:

In the first objective, in motivating students on the extrinsic part regarding the feeling of "no one is really smart in learning unless he is fluent in the Filipino language," the researcher suggests having activities such as conducting assessments or contests. The teacher may organize competitions such as "Writing an Essay" or "Speaking in Filipino," where students are rewarded or incentivized to demonstrate proficiency in the use of the Filipino language. The reward can be in the form of certificates, points, or other forms of awards that encourage students to work hard. Another suggestion is to show model presentations where the teacher gives the students tasks to perform using the Filipino language, such as performing plays, poetry, or dramas, with a reward system for those who listen and participate properly. Moreover, it is also important to regularly provide positive feedback and recognition to students who use the Filipino language in activities and discourses, such as a "Filipino Student of the Week" program that honors students who demonstrate excellence in using Filipino in class.

In the second objective, in relation to the level of cognitive interaction, it obtains a descriptive high, which is often only shown through active processing as interaction with the class. Therefore, the researcher suggests that the teacher conduct structured discussions in groups, in which each pupil has a certain share or responsibility. For example, they can discuss a particular topic and provide a summary or solution based on their analysis and views. Such feats enhance active cognitive engagement and contribute to a deeper understanding of concepts. In addition, the teacher can also use the Think-Pair-Share Technique.

For the third purpose of studying the level of language learning, the indicator "I understand the text using language-based puzzles" has a low mean score. To consolidate the use of language in class, the researcher suggests that teachers have activities that expand students' vocabulary, such as tests that focus on the meaning, usage, and context of new words. Activities such as "word maps" or "vocabulary journals" can help students understand and apply new words they have learned. Activities such as role plays, dramas, or group presentations can also be performed where students need to use language in an active way. Such feats enhance their expressive capacity and allow for a deeper understanding of concepts.

Meanwhile, by finding the relationship between each variant, it is found that the result becomes weaker when applying the intermediate effect of the variable to the language-based node. Therefore, the researchers suggest that teachers perform activities such as grammar exercises and vocabulary-building activities, so that students learn basic language knowledge that serves as a bridge to more advanced learning concepts and structures of language. It is also recommended that the teacher conduct regular feedback sessions with students, where they can evaluate the use of language in their answers, essays, or presentations. Focusing on language aspects such as grammar, coherence, and cohesion provides an opportunity to improve learners' language usage and boost their language comprehension and practice.

In addition, to enhance and achieve the highest level of each goal, the researcher suggests that there should be implementation, especially in designing the curriculum of administrators, to enhance the quality of teaching by taking into account the attention of students in expanding their learning using different strategies and developing their learning with motivation and interest in the Filipino language.

Finally, since the research is conducted at a private university, it is suggested that the next researcher conduct further comparative studies in public institutions and use better indicators so that the result is not only partial.

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