Jurnal Penelitian Instruksional
e-ISSN: 2776-222X
Vol. 5(1) 2025, pp. 171 – 184
https://doi.org/10.30862/jri.v5i1.607

Correlation between learning styles and student learning outcomes in Islamic religious education subjects

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Submitted: 16-12-2024

Accepted: 14-01-2025

Published: 21-01-2025

Abstract: Learning outcomes are proof of the success of students in undergoing the learning process and are proof of success for teachers in educating their students. The compatibility between the learning style and the learning outcomes to be achieved will affect the learning outcomes. This study aims to examine the correlation of learning styles to student learning outcomes in Islamic religious education (PAI) subjects at Palangka Raya High School. This study involved 176 grade XI students consisting of 12 classes as a sample. Data was collected through a learning style questionnaire consisting of 30 statement items and a multiple-choice learning outcome test administered through Google Forms. The results of Spearman's correlation analysis demonstrated that the correlation coefficient between learning style and learning outcomes was 0.055 with a p-value of 0.466, which stated that there was no significant relationship between the two variables based on the analysis conducted. Thus, the student's learning style did not significantly affect the learning outcomes in PAI subjects. This study suggests looking at other more effective factors that influence learning outcomes, such as teaching methods and learning conditions, to be considered in further studies to obtain a more comprehensive picture of the factors that play a role in improving learning outcomes.

Keywords: Learning outcomes, Islamic education, learning styles, religion

Abstrak: Hasil belajar adalah bukti keberhasilan siswa menjalani proses pembelajaran dan menjadi bukti keberhasilan bagi guru dalam mendidik siswanya. Kesesuaian antara gaya belajar dan hasil belajar yang ingin dicapai akan mempengaruhi hasil belajar. Penelitian ini bertujuan untuk mengkaji korelasi gaya belajar terhadap hasil belajar siswa pada mata pelajaran pendidikan agama Islam (PAI) di SMA Palangka Raya. Penelitian ini melibatkan 176 siswa kelas XI yang terdiri dari 12 kelas sebagai sampel. Data dikumpulkan melalui angket gaya belajar yang terdiri dari 30 item pernyataan dan tes hasil belajar dalam bentuk pilihan ganda yang administrasikan melalui *Google Forms*. Hasil analisis korelasi Spearman menunjukkan bahwa koefisien korelasi antara gaya belajar dan hasil belajar adalah 0,055 dengan p-*value* sebesar 0,466, yang menyatakan bahwa tidak terdapat hubungan yang signifikan antara kedua variabel tersebut berdasarkan analisis yang dilakukan. Demikian, gaya belajar siswa tidak mempengaruhi secara signifikan hasil belajar pada mata pelajaran PAI. Penelitian ini menyarankan untuk melihat faktor lain yang lebih efektif yang mempengaruhi hasil belajar, seperti metode pengajaran dan kondisi belajar, dipertimbangkan dalam studi lebih lanjut untuk memperoleh gambaran yang lebih menyeluruh mengenai faktor-faktor yang berperan dalam meningkatkan hasil belajar.

Kata kunci: Capaian pembelajaran, pendidikan Islam, gaya belajar, keagamaan

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INTRODUCTION

Education is an important thing for people's lives because with education a person is able to actualize himself. Education plays a fundamental role in the formation of individuals as well as in promoting social progress and community development. This is because education is about providing knowledge and skills and shaping positive characters, values, and attitudes in individuals (Nasir et al., 2020; Rahman et al., 2022). Education is a structured and organized process that establishes a learning environment that encourages

students to develop their potential actively. This process is designed to equip students with the necessary skills, intelligence, good character, personality, and religious and spiritual strength to serve their interests, society, nation, and country (Makkawaru, 2019).

Success in achieving educational goals is highly dependent on how the process is, and educators who are facilitators and someone who interacts directly with students also play an important role in the success and effectiveness of learning (Abidin, 2019; Pambudi et al., 2022). Students' learning outcomes can also be evaluated in terms of successful education completion in institutions. After each learning process, an evaluation is conducted to evaluate the degree to which pupils have succeeded in engaging in the learning process over a specific period (Prameswara & Pius, 2023). Learning outcomes have a crucial role in education because they can provide important information for teachers and students, and other related parties regarding student progress in achieving learning goals through a more effective teaching and learning process (Nabillah & Abadi, 2019; Nasir et al., 2024). The results of the achievements obtained by individuals/students after participating in the learning, therefore learning results are important in an effort to see the success of student learning (Murti et al., 2024; Mustofa et al., 2024; Wicaksono & Iswan, 2019). Thus, learning outcomes refer to the cognitive, affective, and psychomotor skills that students have after undergoing the learning process (Khaerunnisa et al., 2025; Negara et al., 2025).

Learning outcomes are a measure of what students have understood, remembered and mastered after following the learning process. The results obtained by these students include skills related to cognitive, affective, and psychomotor aspects after they have experienced the learning process (Nasrul et al., 2024; Rahman, 2021). The ability of students after participating in the learning at school and can be used as one of the indicators of the success of the education process which is expressed in the form of values that are expected to achieve optimal learning outcomes obtained by students (Dewi et al., 2015). So it can be understood as an achievement that describes a deep understanding of the material being studied, as well as the ability to apply that knowledge in real-world situations. It also includes a balance between conceptual understanding, the application of knowledge in a variety of contexts, and the development of skills and attitudes that support the achievement of academic and professional goals.

However, in reality, not all students are able to get good learning outcomes or grades according to the completeness criteria set by the school because they have different backgrounds, needs, abilities, and challenges (Nusroh & Ahsani, 2019). Diversity of learning outcomes refers to the variation in student achievement or achievement in the context of education. These include differences in material comprehension, the ability to apply knowledge, and general academic progress. Significant differences in learning outcomes between students can result in academic gaps. This can cause some students to fall behind and have difficulty catching up with them (Putri & Supardi, 2014).

In PAI subjects, the material presented is often challenging to follow because students not only understand learning theory but are also required to practice and implement this knowledge in daily life, so not all of them are able to master it well. The process of transformation and internalization of religious knowledge and values to students, by paying attention to the improvement of their natural potential, in order to achieve equality and perfection of life in various aspects of life (Akmal, 2014). From the score data obtained from

the Islamic religious education subject at Palangka Raya high school, there are still students whose scores show below the minimum completeness criteria.

The score range of 0-54 includes 6 students in the very low and incomplete category**,** while the range of 55-64 has 5 students in the low category which is also incomplete**.** The score range of 65-74 involved 12 students in the moderate and incomplete category, while the range of 75-84 consisted of 27 students in the high complete category. The score range of 85-100 includes 79 students in the very high and complete category. This table illustrates the distribution of grades and the completeness of student learning. Based on the findings of an interview with one of the Islamic religious education teachers, it was stated that if you follow the rules of the independent curriculum, there is no minimum completeness criterion value, but the minimum criterion value is determined by the school, namely the minimum score standard of Islamic religious education subjects 75. It can be seen from the score data above that there are around 18% of student learning outcomes below the minimum completeness criteria, there are also students who get good scores, of course, from the distribution of student scores is very diverse.

In general, internal and external factors contribute to this disparity in learning outcomes. The learning outcomes of each student are influenced by a variety of factors, including external factors that originate from the environment and internal factors that originate from each student. These factors are significant variables that contribute to the variations in learning outcomes among students (Damayanti, 2022). External factors are factors that originate from outside the student, while internal factors are factors that support or inhibit students' learning objectives (Nasir et al., 2023).

This is also consistent with the findings of Kurniati et al. (2019), which suggest that learning outcomes are enhanced when the approach is tailored to the individual learning style of each student. Applying the right learning style will attract students to carry out learning activities, both when learning individually and in groups (Syarif & Nugraha, 2019). This is also in line with what Prameswara and Pius (2023) conveyed with learning that adjusts to the learning style of each student, there is an increase in learning outcomes. The implementation of appropriate learning styles increases students' interest in participating in learning activities, both individually and in groups (Syarif & Nugraha, 2019).

The data on the scores of Islamic religious education subjects in one of the high schools indicates that a few students continue to achieve scores below the minimum completeness criteria, as indicated by the results of the observations and interviews that have been conducted. Conventional or traditional teaching methods are still employed by educators. Internal and external factors also contribute to the variation in learning outcomes. One of the contributing factors is the difficulty experienced by teachers in understanding students' individual learning styles.

Every student has a unique learning style, and even each student tends to use a different learning style for each subject he or she studies (Fernando & Premadasa, 2024). The application of differentiated learning is still being pursued by some educators, while others have effectively implemented learning that is tailored to the unique requirements of each student in order to attain learning objectives, including factors related to students' learning patterns. It is crucial for educators to have a comprehensive understanding of the diverse learning styles that students possess, as the primary objective is to satisfy students' educational requirements (Özyurt & Özyurt, 2015; Soflano et al., 2015). The student

learning process is not limited to activities at school or in the classroom, but also involves learning experiences at home or outside the classroom, which are tailored to individual preferences and needs.

Based on the description and problems that have been explained, the researcher intends to conduct a study with the aim of examining the correlation between student learning styles and their learning outcomes in Islamic religious education subjects at Palangka Raya state high school.

METHOD

The research method used by this study is a quantitative approach with a type of correlation research. The quantitative approach was chosen because correlation research involves the use of special statistical indices, such as Pearson, Spearman, or Kendall correlation coefficients, which provide quantitative measures regarding the strength and direction of the relationship between the variables studied. This approach allows researchers to use appropriate statistical tools in analyzing data, so that they can draw valid and significant conclusions regarding the relationship between variables.

This study uses a type of correlation research, where the researcher does not intervene or manipulate the independent variables. Correlation research utilizes inferential statistics to test the statistical significance of the relationships between the variables studied (Pratama et al., 2023). This study uses the help of SPSS using Spearman. The time used in this study has been carried out since the issuance of the research permit, which is September.

In this study, the population in question is class XI students of Palangka Raya high school because this class is at a more mature stage of cognitive development compared to class X. They have a better ability to understand concepts in Islamic religious education, which allows for clearer learning outcomes to be analyzed. Class XI is an important transition year between the introductory period in grade 10 and exam preparation in grade XII. The total population of this study is 313 students from class XI. The sample in this study refers to the subgroup of the target population selected for research, with the aim of making generalizations about that population. This study uses a probability sampling technique with a random sampling approach, and the determination of the number of samples is carried out based on the Slovin formula. The number of samples involved in this study was 176 students.

The data collection technique employed in this research involves the acquisition of information regarding the learning styles and outcomes of students. The collected data was then processed and analyzed using statistical formulas to calculate the magnitude of the influence of variable X (learning style) on variable Y (learning outcomes) through the Spearman correlation test. This study implements two data collection techniques, namely a questionnaire consisting of 30 statements, which is divided into 10 statements for each visual, auditory, and kinesthetic aspect, as well as a learning outcome test that includes 30 questions. The results of the questionnaire validity test can be seen in Table 1.

Based on Table 1, the results of the instrument validity test for learning style variables show that the value of the correlation coefficient (r) of each statement tested is greater than the r value of the table (0.361). Therefore, it can be stated that all 30 statements on the instrument for the learning style variable are declared valid.

Table 1. Results of the validity test of the learning style questionnaire instrument

No	Calculate the value of r	No	Calculate the value of r
1	0.582	16	0.761
2	0.695	17	0.831
3	0.419	18	0.612
4	0.629	19	0.750
5	0.644	20	0.756
6	0.563	21	0.680
7	0.723	22	0.780
8	0.510	23	0.650
9	0.568	24	0.570
10	0.641	25	0.643
11	0.583	26	0.482
12	0.778	27	0.682
13	0.782	28	0.615
14	0.669	29	0.614
15	0.376	30	0.709

Table 2. Results of the validity test of the PAI learning outcome test

No	Calculate the value of r	No	Calculate the value of r
1	0.751	16	0.904
2	0.643	17	0.863
3	0.768	18	0.517
4	0.643	19	0.856
5	0.643	20	0.567
6	0.595	21	0.588
7	0.643	22	0.577
8	0.529	23	0.705
9	0.590	24	0.517
10	0.801	25	0.904
11	0.588	26	0.643
12	0.461	27	0.904
13	0.701	28	0.856
14	0.716	29	0.786
15	0.631	30	0.504

Based on Table 2, the results of the validity test of the instrument to measure student learning outcomes (variable Y) showed that the value of the correlation coefficient (r) of each question exceeded the r value of the table, which indicates that all questions are valid. Soit was stated that all 30 questions on the instrument to measure learning outcomes were declared valid.

Table 3. results of the reliability test of the student learning style questionnaire

Item	Cronbach alfa	N of items
Visual learning style	0.877	10
Auditory learning style	0.895	10
Kinesthetic learning styles	0.847	10

Based on Table 3, the results of the reliability test of the instrument used to measure students' visual, auditory, and kinesthetic learning styles in Islamic religious education (PAI) subjects showed that of the 10 statements in each learning style, the Cronbach alpha coefficient obtained was 0.877 for visual learning styles, 0.895 for auditory learning styles, and 0.847 for kinesthetic learning styles. All Cronbach alpha values obtained are greater than the reference value of 0.60, which indicates that the instrument has a good level of reliability and can be used.

Table 4. results of the reliability test of student learning outcomes

Cronbach alfa	N of items
0.949	30

Based on Table 4, the results of the reliability test of the instrument to measure the implementation of the exam in PAI subjects show that of the 30 questions tested, the value of the Cronbach alpha coefficient obtained is 0.949, which is higher than the minimum reference value of 0.60. So it is stated that the test instrument consisting of 30 questions can be used to measure learning outcomes.

In this study, the researcher adapted the learning style indicators proposed by DePorter and Mike (2007) as the basis for compiling the learning style questionnaire used, shown in Table 5.

Table 5. Learning style indicators

Aspects	Indicator
Visual	1. How to learn by looking 2. How to learn by reading on your own 3. Smart, meticulous and organized 4. Focus and not easily deceived 5. Quick talk
Hearing	1. Learning by listening 2. Read aloud or listen 3. Easily fooled or unfocused 4. Good/fluent speaker 5. Medium talk speed
Kinesthetics	1. How to learn by demonstration/practice 2. Reading with finger guidance 3. Using body cues 4. Loves the game 5. Slow speech speed

In this study, using median and interquartile ranges (IQR) to determine learning style categories, this approach is designed to classify students' learning styles into several categories (low, moderate, high, very high) based on the distribution of the data obtained. This is in accordance with the explanation given by Triola (2021), where median and IQR are effective methods in grouping data with more valid and representative results with the formula in Table 6.

Table 6. Categories of learning styles

Golongan	Formula
Very High	X > Q3 + 1.5 × IQR
High	Q3 ≤ X ≤ Q3 + 1.5 × IQR Q3
Keep	Q1 ≤ X ≤ Q3
Low	X < Q1 - 1.5 × IQR

RESULTS AND DISCUSSION

Analysis of student learning styles in PAI subjects

The research conducted by the researcher involved 176 respondents, who focused on the learning style of grade XI students at Palangka Raya State High School. Before explaining the dominant learning style categories, it is necessary to understand that the categories are based on the scores obtained from 10 questions for each learning style. The following are the dominant learning style categories in Table 7.

Table 7. Student learning styles in PAI subjects

Learning style	%
Visual	27
Auditory	47
Kinesthetic	26

Auditory learning is the most prevalent learning style among students, as illustrated in Table 7, with 82 students (47%), followed by visual learning style consisting of 49 students (27%), as well as kinesthetic learning style involving 45 students (26%). The dominance of auditory learning styles can be interpreted as students tend to understand the material more easily through oral explanations, discussions, and listening. In addition, the proportion of students with significant visual and kinesthetic emphasizes the importance of providing learning materials and activities that can meet students' learning needs through the use of visual media (images, diagrams, videos) and physical movements or exercises.

Visual Learning Style

Based on the calculation and data processing carried out, a median value of 22 was obtained, which indicates the middle value of the data distribution after the data is arranged sequentially. The value of the first quartile (Q1) is 20, while the third quartile (Q3) is recorded at 26, so the Interquartile Range (IQR) is obtained at 6, which indicates the range of data distribution between the first and third quartiles. Based on these values, the data is

then grouped into categories of visual learning style tendency levels using a predetermined formula, in Table 8.

Table 8. Visual learning style

Category	%
Very High	4
High	23
Keep	50
Low	23

Based on Table 8, it can be seen that most of the students in this study have a visual learning style in the medium category, which is 50% with a total of 88 students. The high category covers about 23% of the total 40 students, which indicates that a number of students have a more dominant visual learning style tendency. The very high category covers only 4% of the total 7 students, which indicates that only a few students have a very high tendency to visual learning styles. The low category was recorded at 23% with a total of 41 students, which indicates that some students tend to have a low visual learning style. Overall, the majority of students tend to have visual learning styles in the medium and high categories, while the very high and low categories have smaller percentages.

Auditory learning style

Table 9. Auditory learning style

Category	%
Very High	3
High	38
Keep	34
Low	25

Based on the calculation and data processing contained in Table 9, it can be seen that the majority of students in this study have auditory learning styles in the medium category, with a percentage of 34% and a total of 59 students. In addition, the high category covers 38% with a total of 67 students, which indicates that a number of students have a higher level of auditory learning style propensity. The very high category covers only 3% with a total of 6 students, which indicates that only a small percentage of students show a very high tendency to auditory learning styles. The low category was recorded at 25% or a total of 44 students, which indicates that a number of students show a tendency to have a low auditory learning style. Thus, the majority of students tend to have auditory learning styles in the high and intermediate categories, while the very high and low categories have a smaller percentage.

Kinesthetic learning styles

Table 10. Kinesthetic learning style

Category	%
Very High	2
High	29
Keep	51
Low	19

Based on the calculation and data processing contained in Table 10, it can be seen that the majority of students in this study have a kinesthetic learning style in the medium category, which is as many as 51% or 89 students. Furthermore, the high category covers 29% with a total of 51 students, which indicates that a number of students have a higher level of kinesthetic learning style tendencies. The very high category only covers 2% of the total respondents, i.e. 3 students, which indicates that only a few students show a very high tendency to kinesthetic learning styles. Finally, the low category was recorded at 19%, with a total of 33 students, which shows that some students tend to have low kinesthetic learning styles. Overall, the majority of students tend to have kinesthetic learning styles in the middle and high categories, while the very high and low categories have smaller percentages.

Analysis of learning outcomes

The study, which involved 176 respondents, revealed the learning outcomes of grade XI students, especially regarding the percentage of learning outcome categories in PAI subjects, which can be seen in Table 11.

Table 11. Categories of learning outcomes

Learning outcomes	Frequency	%	Category
76 - 100	146	83	Very high
51 - 75	17	10	High
26 - 50	9	5	Keep
0 - 25	4	2	low

Based on the results of the calculation and data processing listed in Table 10, it is stated that the majority of students show very high learning outcomes, with 83% or as many as 146 students in the score category of 76-100. This shows that the majority of students manage to achieve excellent performance in the exams or assessments conducted. The high category includes 10% or 17 students who obtained a score between 51-75, indicating that a small number of students had good learning outcomes despite not achieving very high levels. Meanwhile, the intermediate category includes 5% or 9 students with scores between 26-50, which indicates that a small percentage of students are at a moderate ability level. Finally, the low category includes 2% or 4 students who have a learning outcome with a score between 0-25, which indicates that very few students are obtaining low scores. Overall, the majority of students showed very high learning outcomes, with only a few students in the low category.

The data obtained from the tabulation of learning styles and student learning outcomes in PAI subjects in this study were analyzed using the Spearman correlation analysis technique, with the results listed in Table 12.

Table 12. Spearman rating test results

	Learning style	**Learning outcomes**
Correlation Coefficient	1.000	0.055
Sig.	.	0.466
N	176	176

The Spearman correlation coefficient between learning style (variable X) and learning outcome (variable Y) was 0.055, as determined by the Spearman rating test results conducted using SPSS version 26 for Windows. The relationship between learning outcomes and learning style is not statistically significant when the p-value is greater than 0.05. Consequently, the null hypothesis asserts that there is no significant relationship between the two variables, as illustrated in Table 13.

Table 13. Correlation coefficient correlation spearman rating correlation

Interval	**Relationship level**
0.00 – 0.25	Relationships are very weak
0.26 – 0.50	Enough relationships
0.51 – 0.75	Strong Relationships
0.76 – 0.99	The relationship is very strong
1.00	Perfect relationship

The Spearman correlation coefficient of 0.055 between learning outcomes (variable Y) and learning style (variable X) indicates that there is no significant correlation between the two variables. This value suggests that the correlation between the two variables is exceedingly feeble. The Spearman Rank Correlation test results indicated that there was no significant relationship between learning style and learning outcomes in the sample under investigation. This suggests that pupil learning outcomes are not significantly influenced by learning styles in the context of this data. However, the results do not rule out the possibility of other factors that may affect learning outcomes/grades, and further analysis involving other variables or methods may be needed to obtain a more comprehensive understanding. Although no significant correlation was found, the findings regarding the dominance of auditory learning styles still have important implications for PAI learning practices.

The purpose of this investigation is to investigate the relationship between learning styles and learning outcomes in PAI subjects at Palangka Raya state high school. The learning style of a student is the manner in which they receive and process information during the learning process, and it is tailored to the learning modalities that the student possesses. Learning styles are typically classified into three categories: auditory, visual, and kinesthetic (Nasution, 2022). Recognizing one's learning style does not guarantee an increase in intelligence, but with that understanding, individuals can choose more efficient learning strategies. Various studies have been conducted to show that each individual has a different learning style and mindset (Wahyuni, 2017). This study applied the Spearman

Rank correlation test to 176 students and produced a correlation coefficient of 0.055 with a significance value of 0.466. These results suggest that there is no substantial correlation between the learning outcomes of PAI and the learning styles. Several factors can explain this, such as the complexity of the learning process which is influenced by many factors other than learning styles, the potential for inaccuracies in learning style measurements, the simplification of learning style concepts, and the characteristics of PAI learning that may be less sensitive to differences in learning styles. The implication is that the focus of PAI learning is not only fixated on adjusting the material based on learning styles, but also on improving the quality of teaching, student motivation, and the use of various methods. Further research with a more comprehensive methodology and considering other variables is recommended. In conclusion, the learning outcomes of PAI were not significantly correlated with learning style in this study, underscoring the significance of other factors in the learning process.

The aforementioned interpretation is consistent with the perspective of Supit et al. (2023), which indicates that despite the absence of a significant correlation between visual, auditorial, and kinesthetic learning styles, it is advisable for educators to consider students' learning styles by implementing suitable strategies, particularly the use of props in the classroom. The objective is to accommodate the diverse learning requirements of students during the learning process. Research consistent with these findings demonstrates that learning styles do not have a substantial correlation with learning outcomes. This suggests that, despite the existence of variations in students' learning styles, it is uncertain whether these differences directly influence the attainment of significant learning outcomes. It was determined that there is insufficient evidence to substantiate the claim that the implementation of teaching methods that are tailored to the learning styles of students can substantially enhance learning outcomes (Pashler et al., 2008). In accordance with Hamsar (2017), students' learning styles do not have a substantial impact on their academic performance. Consequently, there were no substantial disparities among students who exhibited auditory, visual, and kinesthetic learning styles. Students can still demonstrate their comprehension of the cognitive material, despite the fact that their learning styles differ. Pearson's correlation calculation yielded a significance value of 0.728, which exceeded the threshold of 0.05. Thus, it is possible to deduce that there is no substantial correlation between variable X (learning style) and variable Y (learning outcomes) (Nurnaifah et al., 2022).

CONCLUSION

Based on the results of data analysis related to the relationship between learning styles and learning outcomes of grade XI students in the subject of Islamic Religious Education (PAI), this study concluded that auditory learning styles dominated in students, with a total of 82 students (47%), followed by visual learning styles of 49 students (28%), and kinesthetic learning styles of 45 students (26%). The dominance of listening style can be interpreted because students tend to understand the material more easily through oral explanations, discussions, and listening. Students demonstrated excellent learning outcomes, with 83% of students achieving very high learning outcomes, consisting of 146 students. As many as 10% of students have high learning outcomes, with a total of 17 students, while 5% of students achieve moderate learning outcomes, consisting of 9

students. Finally, 2% of students achieved low learning outcomes, for a total of 4 students. There was no discernible correlation between student learning outcomes and learning styles (visual, auditory, and kinesthetic). A significance value greater than 0.05 ($p > 0.05$) indicates that there is not enough evidence to show a significant correlation between the two variables. With a significance value of 0.466 which is greater than the commonly used significance level, which is 0.05. The results of this analysis show that other factors, besides learning styles, may have a greater role in influencing student learning outcomes.

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