POLICY RESEARCH JOURNAL
ISSN (E): 3006-7030 (P) 3006-7022

Volume 2, Issue 4, 2024

Received: 10 September 2024
Accepted: 10 October 2024
Published: 21 October 2024

PREDICTIVE ROLE OF LEARNING STYLES AND SELF-REGULATION IN ACADEMIC ACHIEVEMENT: A GENDER-BASED ANALYSIS AMONG UNIVERSITY STUDENTS

Fauzia Malik[*1], Anjum Afshan[2], Nida Abbasi[3]

*[*1,2]Assistant Professor, Head of Education Department, Fazaia Bilquis College of Education for Women, PAF Nur Khan base, Rawalpindi (Affiliated with Air University)*
[3]Education Department, Fazaia Bilquis College of Education for Women, PAF Nur Khan base, Rawalpindi (Affiliated with Air University)

[*1]fauziamalik@ymail.com; [2]anjumafshan9@gmail.com

ABSTRACT

This study explores the influence of learning styles and self-regulation on the academic achievement of university students. Conducted in two phases, the initial phase focused on the validation and reliability of scales measuring learning styles and self-regulation, with results affirming their appropriateness for the main study. In the second phase, data were gathered from 400 university students across Islamabad and Rawalpindi. Key findings revealed a significant positive relationship between learning styles, self-regulation, and academic achievement. Additionally, learning style emerged as a predictor of self-regulation. A gender-based analysis highlighted that female students scored significantly higher than males on both learning styles and self-regulation measures. These results emphasize the importance of personalized learning approaches and self-regulatory skills in fostering academic success.

Key Words: *Learning styles, Self-regulation, Academic achievement, University students, Gender differences, Predictive models*

INTRODUCTION

1.1 Background of the Study

This investigation was undertaken to explore the impact of learning styles and self regulation on academic accomplishment of university students. Learning is basically an activity or process of acquiring knowledge. An effectual learning is only being achievable and conducive when the pupils instill themselves with good quality and helpful study skills and learning styles. Good study practices inhibit fundamental point in the learning progression of individual learners. It is maintained that resourceful education exceedingly depends upon the creation and growth of excellent study practices. The failure collapsing of students in their educational paradigms is solitary due to the fact that they do not seize ample kind of learning patters to learn and grow well but not due to the actuality that they have no abilities in them at all (Menzel, 1982).

Learning style can be described in numerous characteristics, discernments and behaviors that outline our advance learning process. The "learning style" in general connotation is the way or approach by which a student learn something or else it is thought to be an accurate, and individualized learning technique encircled by the comprehension and retention of information. Experts are of the view that every individual utterly have a preference for different learning patterns and techniques. Every person and pupil in specific accommodates a fusion of learning styles and patterns to become skilled at. Some individuals generally believe that they have to instill certain forms of learning with minimum utilization of

analogous patterns. Others may be realizing that they have to use entirely different learning styles in different circumstances. Parents and teachers both are accountable for the installment of first-class study practices and techniques in brood and their contribution is way too crucial and decisive to the overall expansion of a kid (Lawrence, 2014).

The initiator of VAK model (visual, auditory and kinesthetic) was Fleming (2001) and according to him, most of the individuals possess a dominant or preferred learning style in different settings. For this, Dornyei, (2005) elucidates that the individual distinctions for example, language propensity, inspiration, innovativeness, uneasiness, and learning styles affect second language. The visual, auditory and kinesthetic model created by Fleming facilitates us to comprehend our dominant or most admired learning design. In this model, three primary designs were used to characterize the information data that can be characteristically being dominant. There exist countless learning styles and patterns but during this research study, the investigator employed 3-learning patterns including visual, auditory and kinesthetic patterns. The visual learners become skilled by watching, presuming images and by generating clear mental pictures in order to retain the desired information. These learners have illustration skills that help them in puzzle solving, interpreting, writing, apprehending graphs and charts etc. The auditory learners discover all the way through listening and possessed exceptionally urbanized audio proficiency and usually are sensible at verbal communication and presentation of information. Such kinds of learner study by means of spoken instructions, class discussions and by dialogues with peers. Kinesthetic learners on the other end study through touching, doing and moving the objects. They communicate through movements and memorizing and by processing data through communicating around them. These learners have familiar skills in physical management, physical talent, and hands on testing, using body language and dancing etc. Rossi-Le (1989) opined that learning style preferences manipulate learning methods that one might be able to use in learning of second language. Therefore, self-regulation is additionally influenced by learning designs. Self-regulation has been used as a substitute for learning method and the explanation for this substitution is unreliable tool for measuring learning method (Rose, 2011).

Zimmerman, B., (2000) inspected that self-regulation deal with the self-generated thoughts, feelings, and behaviors of individuals for the attainment of intended goals. It is the sort of learner who chooses suitable learning behaviors in accordance with the applicable standards and goals and is able to monitor and evaluates his/her own learning pattern. Shaw & Marlow (1999) also examined that the most admired learning model of students is one of the most individual distinction which affects the perspective of pupils about new information. The student‘s use of different self-regulated learning ways could also be an important consideration.

According to Peirce (2000), the learning mode is basically that technique which is liked by the students over those alternative strategies in learning which were likely to be practiced at school. So it is essential that lecturers, college administrators and other associates of educational squad should seize the explanation of pupils’ learning styles.

Many experts advocate in their studies that reimbursing interest into individual variations and learning uniqueness of learners, instructors and educational squad had an indispensable function in mounting up an eminence of learning and will definitely results in the augmentation of academic achievement of students. Wadsworth, Husman & Duggan (2007) also elucidates that a planned learner must recognize how to identify his learning goal, combine the learning style, recount proper skills, and be self-regulated to achieve the best outcomes from his learning. Karthigeyan & Nirmala (2013) in their document “Learning Style Preference of English Language Learners at international level” established the learning style inclinations, use of related approaches and self-regulated policies of learning and similar kind of investigation was also carried out by some other renowned researchers and practitioners of the field. To sum up the above narrated research studies, it can be accomplished that even though these researches were conceded out in diverse regions of the world on the persons of diverse age groups, public statuses, learning skills, yet the outcomes

were roughly alike and mostly revolved around learning patterns. Despite the fact, it has been discovered that understudies' learning styles do essentially impact their scholastic accomplishment; these discoveries were for the most part dependent on research directed in different nations of the world. The research studies cited here were chiefly from foreign countries and still a thorough investigation related to learning styles and self-regulation was needed in the milieu of Pakistani educational organizations. To fill up this gap found in the previous literature in Pakistani context, a study was projected to locate out the impact of learning styles and self-regulation on academic accomplishment of university students.

1.2 Purpose of the Study

The rationale behind this study was to explore the impact of learning styles and self-regulation on the academic achievement among university students.

1.3 Statement of the Problem

The majority of Pakistani educators have not yet recognized how learners become skilled in general classroom settings. With the current low achievement of pupils, it is apparent that students have not yet figured out how to learn or found their favored learning styles for various learning materials or substances in different subjects. Additionally, instructors have not comprehended the individual variety of their students, and they continue grasping the equivalent customary presentation styles in each unique circumstance. It is a known verity that learners learn in numerous dissimilar patterns depending upon the situations of learning. A few understudies are visual ones, while others are sound-related or sensational ones. Visual students adapt outwardly by methods for diagrams, charts, and pictures. Sound-related students learn by tuning in to talks and perusing, whereas kinesthetic ones on contrary study things by making movements. The difficulty arose when teachers do not pay individual attention to every learner in their classes and students too are unaware about their learning habits and designs. So, it is indispensable to understand the value of learning style inclination and its link with scholarly accomplishment in an array to generate powerful and fruitful learners. This will assist educators in improving their instructing patterns, in order to match it with student self-regulation. This will hopefully perk up the eminence of instructional progression in Pakistan.

1.4 Objectives of the Study

1. To examine the impact of students' learning styles and self-regulation on academic achievement.
2. To find out the relationship between students' learning style, self regulation and academic achievement.
3. To examine the gender differences of students' learning styles, self-regulation and academic achievement.

1.5 Hypotheses

1.5.1 Research Hypothesis

The subsequent hypotheses were made

H_1 There was significant impact of self regulation on academic achievement.

H_2 There was significant impact of learning styles on academic achievement

H_3There was significant relationship between learning styles and academic achievement.

H_4There was significant relationship between self-regulation and academic achievement.

H_5There was significant relationship between learning styles and self-regulation.

H_6There was significant difference between male and female students on learning styles scores.

H_7There was significant difference between male and female students on self-regulation scores.

H_8 There was significant difference between male and female students on academic achievement scores.

1.6 Significance of Study

This exploration will help the researcher in future when they are going to start their own study. Significance includes:

1. This study would be significant for officers and policy makers of education department to make better strategies to cope with the issue.

2. This study would theoretically and empirically significant because it is considered to provide such extreme causes that are not studied in earlier literature.
3. This study would help in understanding and planning new phenomenon and policies in the educational department of Pakistan.
4. This study would also help to define and elaborate the emerging trends in the private sector of education and its management style.
5. This study would also contribute to make the sector's management more impressive and fruitful.
6. This study would be useful for future studies, it should be noticed that more research is needed to gain a more in depth view on managerial preferences at school level in developing countries.
7. This study would be useful for teachers to develop more skilled techniques to cope with individual learning patterns of their respective pupils.

1.7 Delimitation

Even though the predicament desired through investigation, yet there were certain limitations in the form of time and monetary limitations, therefore, the study was delimited to public universities (Arid Agricultural University and National University of Modern Languages) of Rawalpindi and Islamabad.

METHODS AND PROCEDURES

The methodology employed in this study was:

3.1 Research Design

The research design was descriptive and correlation. Descriptive research describes the current status of a variable of interest to the researcher. Correlation refers to the relationship between variables that can be quantified. In this study, questionnaire was used to conduct a survey. This research design was carried out in two phases. In phase 1, the researcher conducted pilot testing and reliability of questionnaire on 50 respondents and in phase 2, SPSS was used for the analysis of 400 study respondents.

3.2 Population

The population of the study was embraced of students of public (male and female) universities of Rawalpindi and Islamabad.

3.3 Sample and Sampling Technique

For this study, stratified sampling practice was employed to chose a sample of 450 university students, male (n = 225), and female (n = 225) teachers. This sampling technique was employed in an array to gather data from Islamabad and Rawalpindi university students. The sample includes 225 male university students and 225 female university students from public sector universities.

3.4 Instrumentation

The questionnaires were measuring instruments for this descriptive study. In order to measure the variables of learning styles and self-regulation, two standardized questionnaires were used to gather data. Learning styles' questionnaire was developed by Reid (1995). The questionnaire of self-regulation was developed by Brown, Miller & Lawendowski (1999). These questionnaires were based on 5-points Likert scale.

3.4.1 Learning Style Scale

Perceptual Learning Style Scale (Reid, 1995) was employed to test learning patterns of pupils. This scale contains three learning styles and it measures VAK scale that is visual, auditory and kinesthetic learning mode. It was based on a 5-point Likert scale and contains 30 items on 3-learning styles.

3.4.2 Self-Regulation Scale

Self-Regulation Scale (Brown et al., 1999) was employed to examine self-regulation of pupils. This scale contains 62 items and it measures for the self-regulation of students and was based on 5-point Likert scale.

3.5 Pilot testing

The researcher completed pilot testing to check the soundness of scale of the questionnaire. In an array to establish the reliability and validity of instrument, it was pre-tested on 20 pupils, which were not incorporated into the study sample.

1.5.1 Validity of the Instrument

POLICY RESEARCH JOURNAL
ISSN (E): 3006-7030 (P) 3006-7022

For the purpose of validation, a conversation with experts was agreed to argue about the questionnaire. The rationale was to improve and validate the instrument and for this, experts gave necessary remarks and ask to observe and study other questionnaires, and return it for censure to other fellows of your class or your senior teachers, particularly those who have had practice in questionnaires' manufacture.

1.5.2 Reliability of the Instrument

Cronbach's alpha was employed to calculate the reliability of the instrument and was applied on the responses achieved from pilot testing. The reliability result of learning style questionnaire was .774 and the reliability of self regulation questionnaire was .909 which is satisfactory.

3.6 Data collection

The data was gathered via questionnaires and in person to guarantee 100% respondents' rate. The researcher obtained permission of the department coordinators of the selected universities and visited each sampled university and delivered each questionnaire to every pupil with self-addressed and stamped envelopes. The respondents were briefed about the study and instruments before data collection. The completed questionnaires were taken back after a week and reply rate was 100%.

ANALYSIS AND INTERPRETATION OF DATA

Table 4.1 Self Regulation and Academic Achievement

Regression

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.124[a]	.015	.013	1.093

interpreters: (Constant), academic achievements

The R is called the coefficient of multiple correlation. It is the correlation between a set of obtained scores in a test and the same scores predicted from the multiple regression equation. This r value symbolizes the plain correlation and was 0.124 that designates a constructive level of correlation. The value of R^2 designated the total variation in dependent variable (learning styles) can be elucidated by independent variable that is self regulation. In this case 1.5 % is very small.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.830	1	7.830	6.555	.011[b]
	Residual	498.103	417	1.194		
	Total	505.933	418			

b. Predictors: (Constant), academic achievements

This table tells that how well the regression equation fits the data This table indicates that the regression model predicts the dependent variable significantly well. In this table the significance level 0.011, which is less than 0.05, and indicates that, overall, the regression model statistically significantly predicts the outcome variable.

Table 4.2 Learning Style and Academic Achievement Regression

Model Summary

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate
1	.120[a]	.014	.012	1.075

a. interpreter: (Constant), academic achievements

The R is called the coefficient of multiple correlation. It is the correlation between a set of obtained scores in a test and the same scores predicted from the multiple regression equation. The r values represent the plain correlation and are 0.120 that reflects a constructive level of correlation. The value R^2column reflects on how much of the total variation is in the dependent variable.. In this case, 1.4 % can be narrated which is very small.

ANOVA[a]

M	Model	Sum of Squares	df	Mean Square	F	Sig.
1	R Regression	7.049	1	7.049	6.102	.014[b]
	Re Residual	481.743	417	1.155		
	Tot Total	488.792	418			

a. Dependent Variable: perceptual learning style preference questionnaire
b. Predictors: (Constant), academic achievements

This table tells that how well the regression equation fits the data. This table indicates that the regression model predicts the dependent variable significantly well. In this table the significance level 0.011, which is less than 0.05, and indicates that, overall, the regression statistically significantly predicts the outcome variable.

Table 4.3 Correlation between learning styles, self regulation and academic achievement

Correlations

		self regulation questionnaire	perceptual learning style preference questionnaire	academic achievements
self regulation questionnaire	Pearson Correlation	1	.156**	.124*
	Sig. (2-tailed)		.001	.011
	N	419	419	419
perceptual learning style prefrence questionnaire	Pearson Correlation	.156**	1	.120*
	Sig. (2-tailed)	.001		.014
	N	419	419	419
academic achievements	Pearson Correlation	.124*	.120*	1
	Sig. (2-tailed)	.011	.014	
	N	419	419	419

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

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The correlation coefficient of learning style and self regulation is cited in exceeding table. The value of correlation lies between -1 to +1 and -1 represents the strong negative and inverse relationship between the variables while +1 depicts the strong positive or direct relationship between the two variables. Hence relationship between learning styles and self regulation scales is positive because the value is 0.156 and the significant vale is .011 which is less than 0.05 so the value is highly significant.

Table 4.4 Independent Sample Test (Learning Style Scale)

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Tls	Male	212	111.52	15.439	1.060
	Female	206	115.52	17.905	1.247

It is evident from the preceding table that mean calculated for both males and female was 111.52 and the standard deviation was 15.439 and 17.905 correspondingly. It can be seen that there was a clear differentiation between the mean score and standard deviation of male and female pupils. Hence we can assume that variances of both were equal as there was a differentiation between the mean score on the learning styles' scale among males and females.

Table 4.4.1 Independent Sample Test (Learning Style Scale)

The value of significance level should b less than 0.05. In this table the significance value is 0.33 which is less than 0.05 so the value will not be significant.

		Levene's Test for Equality of Variances		**t-test for equality of means**							
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Diff of Diff	Std. Error Diff	95% interval	Std. Error Diff	95% Confidence Interval of the Difference
											Lower / Upper
tls	Equal variances assumed	4.558	.033	-2.446	416	.015	-3.996 -.784	1.634	-7.207	1.634	-7.207 / -.784
	Equal variances not assumed			-2.441	403.56	.015	-3.996 -.777	1.637	-7.214	1.637	-7.214 / -.777

Table 4.5 Independent Sample Test (Self-Regulation Scale)

Gender	N	Mean	Std. Deviation	Std. Error Mean

Tsr	Male	213	217.54	27.471	1.882
	Female	206	224.79	32.752	2.282

It is evident from cited entries in table above that mean calculated for both males and females was 217.54 and 224.79 and the standard deviation was 27.471 and 32.752 respectively. It can be seen that there was a clear differentiation among the mean score and standard deviation of male and female pupils. Hence we can assume that variances of both were equal as there was a differentiation between the mean score on the scale of self-regulation among males and females.

Table 4.5.1 Independent Sample Test (Self-Regulation Scale)

	Levene's Test for Equality of Variances		**t-test for Equality of Means**								
	F	Sig.	T	Df	Sig. (2-tailed)	Mean Diff	Std.Error Diff	95% Confidence Interrval of Diff Difference Lower	Upper	Mean Diff	Std. Error Diff	95% Confidence Interval of the Difference Lower	Upper
Tsr	11.629	.001	-2.457	417	.014	-7.247	2.949	-13.044	-1.449	-7.247	2.949	-13.044	-1.449
			-2.450	399.860	.015	-7.247	2.958	-13.062	-1.431	-7.247	2.958	-13.062	-1.431

It is apparent from the above table that the significance value was 0.01 which is less than 0.05 so the value is not significant as the value of significance level should b less than 0.05.

5.1 Discussion

The present study aimed to impact of learning styles and self-regulation on academic achievement among university students. The basic aim of the study was to see the impact of learning styles and self-regulation on academic achievement among university students at the same time to investigate the relationship of learning styles and academic achievement. Temporarily, the relationship of self-regulation and academic achievement and also investigate the gender differences. On the basis of these objectives hypotheses were formulated.

The present study was conducted in two phases. In phase-I reliability and validity of scales (learning styles and self-regulation scale) were administered on the sample(N=150) students are purposively selected in three different universities. The sample data was collected from the universities of Rawalpindi and Islamabad in which 50 students were selected in selected universities in which male (N= 25) and female (N=25).in measuring reliability, Nunnally (1978) proposed Cronbach's a

coefficient as a measure of reliability, a coefficient greater than 0.7 is highly reliable while less than 0.35 is low reliable . Results in the table no 4.1 in the previous chapter shows the reliability of scales (self- regulation scale .925** and learning style scale .917**), which was significant. Inter item correlation was also administered to check the internal consistency of the scales i.e learning styles and self-regulation on academic achievement among university students. The result of phase I (try-out)indicate that all these scales are reliable and valid to use in phase II of research to test the objectives of the study and hypothesis formulated, to test those objectives.

In phaseII main study was administered to fulfill the objectives of the study and to test the hypotheses formulated with the help of statistical analysis (correlation, t-test and regression analysis)by using SPSS (statistical package for social sciences).The Regression model of self regulation and academic achievement predicted dependent variable the significance level 0.011, which is less than 0.05, and indicates that, overall, the regression model statistically significantly predicts the outcome variable and the Regression model of learning styles and academic achievement predicted the dependent variable significantly well. In this table the significance level 0.014, which is less than 0.05, and indicates that, overall, the regression model statistically significantly predicts the outcome variable.

In the main study, data was collected from the sample of 450 students in selected Rawalpindi and Islamabad universities. Two scales i.e. learning styles and self-regulation scale were administered on the sample and also student's academic results are included. Before administering they were briefed about the rationale and objectives of the current study and be provided with the booklet containing aforesaid scales. They were assured of the discretion of the information that they were going to provide as it was only be used for research purpose. Informed consent was also taken through from. The instruments were accompanied by demographic data from and written as well as oral instruction on how to respond each question /item. The main objective of the study was to find out the relation between learning style, self-regulation and academic achievement among university students.

From the main objectives two hypotheses were made. A first hypothesis was null hypothesis that said that there is no significant impact between learning styles and self regulation on academic achievement. Whereas the second hypothesis that was alternative hypothesis says that learning style is positively correlated with self-regulation on academic achievement. To identify the association between these two variables correlation coefficient was calculated. Correlation between these two variables is .156 **which was in the significance level. The result proved our hypothesis that learning style is positively correlated with self-regulation on academic achievement among university students.

Previous research by (Gappi, 2013), examine that learning designs and their educational action. The main objectives of the study were to: describe the learning style preferences of scholars; to search out whether learning style preferences of the students differed with age, gender and educational program; and determine the relationship between the learning style preferences and the students' academic performance. The participants of the study are (131) the new students who were throughout the primary school year 2012-2013, composing of 118 national youth and 13 young adults. The index of learning styles (ILS) questionnaire was utilized to carry out the rationale of the study. In this study Result was showed that there was no significant effect of gender, age and academic program on the learning style preferences of the students (r= -0.056). Based on the result, there was no significant statistical preference of the students. This study was conducted among first year students in college, the difference of the results are small age and results may not significantly.

The third objective of the study was to examine the gender differences of students learning styles, self-regulation and academic achievement. From the main objective three hypotheses were made. First hypothesis was null hypothesis that said there is no significant difference between male and female students on learning styles scores, the second hypothesis are alternative there is a significance difference between male and female students on learning style scores, the result of group statistic of learning style

male students scores are 111.52 and female students score are 115.52 there is a difference between male and female score male scores are less than female scores and the significance value is 0.33 so value was not be significant. Other hypotheses of second objective were there is no significant difference between male and female students on self-regulation scores. The alternative of this study was that there is a significant difference between male and female students on self- regulation scores. The result of group statistic of self-regulation male students scores are 217.54 and female scores are 224.79 there is a difference between male and female scores, male scores are less than female scores and the significance value is 0.01 so the value was not be significant so the hypothesis was proved. While the last hypotheses of second objective were that, there is no significant difference between male and female students on academic achievement scores. The alternative hypotheses there are a significant difference between male and female students on academic scores.

While hypothesizing on the results produced by this examination, numerous elements can be mulled over that may negatively affect the results of this investigation. The aftereffects of the investigation may have been unique if the population involved would progressively be more diverse and arbitrarily sampled. The results of the study could have also been different if more institutions were sampled for this research study.

5.2 Recommendations

1. It is recommended that future research ought to be aimed to look at the connection among educating and learning patterns and how both recognize and performed with scholastic execution.
2. The future research may study the association between learning style, pooled with the policies, and scholastic performance. The study plan coupled with the learning style may be a booster for the affiliation with scholastic performance.
3. Educators/teachers have to reflect on their understudies' various learning styles, plan instructive practices that pact with distinctions of pupils and stay delicate to them during guidance course of action.
4. School managers required to present diverse learning resources which can acquire well-brought-up multiplicity in classrooms by utilizing visual, sound-related and kinesthetic materials, for instance, utilization of novelty and introduction of diverse approaches among learners.
5. Instructors ought to equally assist their understudies by perceiving their learning style inclinations and utilize them to create enduring learners.
6. Researcher strongly recommended that for future research must conduct to find out those factor in which learning style and self-regulation negative impact has on academic achievement.

5.3 Conclusion

The present study was investigating that the impact of learning style and self-regulation on the academic achievement among university students. The study was conducted into two phases (try-out) indicate that all these scale i.e. learning style and self-regulation well being scale are reliable and valid to use in phase II of research to test the objectives of the study and hypothesis formulated to test those objectives.

In Phase II the main study was administered to fulfill the objectives' of the study and to test the hypothesis formulated , with the help of statistical analysis co relational analysis , t-test analysis and regression analysis) by using spss in main study data was collected from the sample of 400 students (male= 200 , female= 200)of universities of Islamabad and Rawalpindi.

Following were the major findings based on objectives of the study

- A positive significant relationship was found between learning styles and self-regulation on academic achievement.
- It was initiate that learning style is a predictor of self-regulation
- It was found that there was a significant difference between male and female means score of learning style and self regulation, females have higher scores than male's scores.

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