



# Creativity and innovations of teachers of modern school: empirical aspect

## Creatividad e innovación de los profesores de la escuela moderna: aspecto empírico

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#### ABSTRACT:

In the article the results of diagnostics creativity and innovations of teachers of modern school are presented. It is established that the readiness to introduce innovations in professional activity of teachers and the level of their creativity depend on the motivation to focus on success, the characteristics of value orientations, the tendency to reasonable risk taking, the willingness to take responsibility in terms of risks and creativity of teachers.

**Keywords:** innovations, creativity, teacher, willingness to innovative activity

#### RESUMEN:

En el artículo los resultados de la creatividad de diagnóstico y las innovaciones de los profesores de la escuela moderna. Se establece que la disposición a introducir innovaciones en la actividad profesional de los docentes y el nivel de su creatividad dependen de la motivación para centrarse en el éxito, las características de las orientaciones de valores, la tendencia a asumir riesgos razonables, la voluntad de asumir responsabilidades en términos de riesgos y la creatividad de los docentes.

**Palabras clave:** innovaciones, creatividad, maestro, disposición a la actividad innovadora

## 1. Introduction

At the level of public administration the social order for pedagogical innovations is included in all strategic documents in the field of education. The state not only stimulates the innovation movement in education, but also initiates these processes. On the other hand, state authorities provide the teacher with freedom necessary for innovative creativity within the framework of professional educational activities (Gracheva & Simaranov, 2001).

In the recent works of Vcherashny and Sukharev (2000); Rerke, Bubnova& Tatarinova (2019) it is emphasized that in whatever aspect the development of education is considered (as reforming, modernization or optimization), from whatever position innovations in education would be analyzed (in terms of the scale of innovations, according to the criterion of objective and subjective novelty; from the standpoint of the process or result), in any case, factor relations between innovation and the development of the education system are preserved.

However, despite these progressive changes in the practice of development and implementation of innovative pedagogical projects, a number of problems remain (Yagolkovsky, 2010). As the study

of the experience of innovative educational institutions shows, the basic problem, is the formal nature of innovation. Educational organization, using consultants, scientists, develops a promising innovative idea, prepares regulatory planning documentation (program of development of the institution, the program of the experiment, etc.), analyzes and confirms the availability of the necessary resources, including human resources (Vcherashny, Sukharev, 2000), undergoes examination at a high scientific and methodological level (Christensen, 2006), brings documentation to a practical stage and fails. On the one hand, everything is ready for the implementation of an innovative project, on the other hand, there are no innovative developments in the institution.

The question of the reasons for such a formal, as it seems, innovative pseudo-movement is extremely important and without solving this question the further development of innovative processes in education is difficult.

A number of studies have shown that the reason is as follows. In the analysis of the available resource for the implementation of an innovative project in the institution the personnel resource is considered from the perspective of professionalism of teachers – the institution has a lot of high-level teachers, methodologists, providing high results of educational activities, therefore, there's always someone who can perform the innovative project. At the same time, it is not taken into account that a highly qualified teacher is a teacher with a high readiness for professional pedagogical activity, but innovative activity is fundamentally different from pedagogical activity, and, consequently, readiness for pedagogical activity even at the highest level does not guarantee the readiness of this teacher for innovative activity. Accordingly, the analysis of the personnel resource implementation of the innovative project in the institution should include the study of the readiness of the teaching staff to creativity and innovations.

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## 2. Methodology

This research was conducted during 2019. The study took place on the basis of Irkutsk secondary school. The study involved 58 teachers aged 23 to 65 years. Work experience in the specialty ranges from 1 to 35 years. All examinees were women. Taking into consideration their position they are subject teachers, primary school teachers, as well as 3 managers - Deputy Directors.

For the diagnosis of personality traits that determine the innovativeness of teachers, we used the following methods: Curton's questionnaire "diagnosis of the subject's innovation" (Curton's, 2002), test "diagnosis of personality creativity" (Torrens, 2006), diagnosis test "the degree of teachers' readiness for risk" (Schubert, 2002), test "value orientations" by Rokich (2006).

The test technique of Curton "diagnosis of the subject's innovation" (Curton's, 2002) makes it possible to establish how difficult or easy a person retains the features of innovative or adaptive behavior over a long period of time.

Curton questionnaire "diagnosis of the subject's innovation" (Curton's, 2002).

1. I like people who have changed several professions in their lifetime.
2. I am keenly interested in the results of the new activities of my colleagues.
3. I am ready to (a) give up the interests of my career for the sake of participating in an interesting new activity.
4. I am ready to invest my personal money in a risky event.
5. Many people consider me a troublemaker in the team.
6. I am able to "infect" others with my ideas.
7. I generate many new ideas, some of which I myself later acknowledge as unreasonable.
8. Often my proposals, which initially met with protests, were subsequently recognized by most of the people associated with them.
9. I believe that the best solution to any problem is a radical restructuring of the system.
10. I am ready to (a) confront the majority of those around in upholding my ideas.
11. While walking, I prefer to walk different routes.
12. I am ready (a) to initiate the creation and head of a venture company.
13. I highly value personal freedom and the possibility of initiative activities (even to the detriment of my own comfort).

Test "diagnosis of personality creativity" (Torrens, 2006) aims to study the creativity of the individual. Thus, Torrens understood creativity as the general ability of a person, based on the constellation of general intelligence, personal characteristics and the ability to productive thinking. In the context of studying innovations of teachers, we share the position of Torrens (2006) regarding the creative process, which consists of the stages of perception of a problem, finding a solution, the emergence and formulation of hypotheses, testing hypotheses, their modification and finding the result.

The test consists of three tasks. Task "Draw a picture" - a certain element is used as a starting point for creating a picture. The idea is evaluated.

The task "Incomplete figures." From Gestalt psychology, it is known that unfinished figures cause a desire to complete them in the simplest way. Therefore, in order to create an original answer, it is necessary to counteract this desire. All ten figures differ from each other, but they impose certain stable images.

The "Repeating Figures" task is aimed at overcoming the rigidity of thinking and the ability to put forward a variety of ideas

Diagnosis test "the degree of teachers' readiness for risk" (Schubert, 2002) will allow to establish readiness of teachers to risk, its necessity and expediency.

Questionnaire "the degree of teachers' readiness for risk" (Schubert, 2002).

1. Would you exceed the set speed in order to provide the necessary medical care to a seriously ill person?
  2. Would you agree to participate in a dangerous and lengthy expedition for good earnings?
  3. Would you stand on the way of a dangerous burglar running away?
  4. Could you ride on the bandwagon of a freight car at a speed of more than 100 km / h?
  5. Can you work normally the other day after a sleepless night?
  6. Would you be the first to cross a very cold river?
  7. Would you lend a large amount of money to a friend, being not quite sure that he would be able to return this money to you?
  8. Would you enter a cage with lions together with the tamer, if he had assured you that it was safe?
  9. Could you climb a tall factory chimney under external leadership?
  10. Could you operate a sailboat without training?
  11. Would you risk grabbing a running horse by the bridle?
  12. Could you ride a bicycle after 10 glasses of beer?
  13. Could you take a parachute jump?
  14. Could you, if necessary, travel without a ticket from Tallinn to Moscow?
  15. Could you make a car trip if your friend who was in a serious traffic accident recently was driving?
  16. Could you jump from a 10-meter height onto a tent of a fire brigade?
  17. Could you get a life-threatening surgery to get rid of a protracted illness with bed rest?
  18. Could you jump from the steps of a freight car moving at a speed of 50 km / h?
  19. Could you as an exception, along with seven other people, take the elevator for only six people?
  20. Could you cross a busy street intersection blindfolded for a large cash reward?
  21. Would you take on a life-threatening job if you were paid well for it?
  22. Could you calculate the percentage after 10 glasses of vodka?
  23. Could you take on the high-voltage wire on the instructions of your supervisor, if he assured you that the wire was de-energized?
  24. Could you, after some preliminary explanations, fly a helicopter?
  25. Could you, having tickets, but without money and food, get from Moscow to Khabarovsk?
- "Value orientations" by Rokich (2006) made it possible to identify the value-meaning areas of the individual. The system of value orientations determines the content direction of the personality

and forms the basis of its relationship to the world, to other people, to itself, the basis of the world view and the core of the motivation of life activity, the basis of the life approach.

The technique of "value orientations" by Rokich (2006) is based on direct ranking of the list of values. Rokich distinguishes two classes of values:

terminal - the belief that some ultimate goal of individual existence is worth it to strive for;

instrumental - the belief that some kind of action or property of the individual is preferred in any situation. This division corresponds to the traditional division into value-goals and value-means.

Rank the terminal values in the questionnaire:

1. active life;
2. life wisdom;
3. health;
4. interesting work;
5. beauty of nature and art;
6. love;
7. secure life;
8. presence of good and faithful friends;
9. public recognition;
10. knowledge;
11. productive life;
12. development;
13. entertainment;
14. freedom;
15. happy family life;
16. happiness of others;
17. creativity;
18. self-confidence.

Rank instrumental values in the questionnaire:

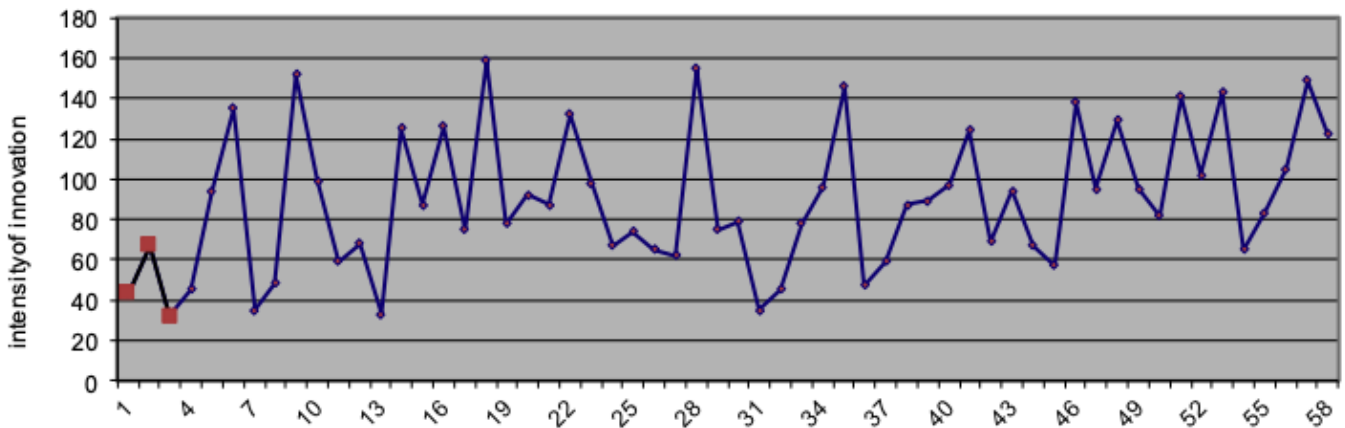
1. accuracy;
2. good breeding;
3. high inquiries;
4. cheerfulness;
5. diligence;
6. independence;
7. intolerance to deficiencies;
8. education;
9. responsibility;
10. rationalism;
11. self-control;
12. courage;
13. firm will;
14. tolerance;
15. honesty;
16. sensitivity;
17. breadth of view;
18. efficiency in business.

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### **3. Results**

The study of the personal innovation formation of teachers as subjects of pedagogical activity was started with the test method of Curton (2002), which allows to identify how difficult or easy a person retains the features of innovative or adaptive behavior for a long period of time. The results obtained during the processing of the test method are shown in Fig.1.

**Figure 1**  
The manifestation of the index of teachers personal innovation



Analysis of the results presented in Fig.1. shows that the studied sample of group of teachers is characterized by a large variety of personal innovativeness. The minimum index of personal innovativeness was fixed at the level of 32-35 points and was found in 3 teachers characteristics (subjects 3, 13, 31). The maximum index of personal innovativeness was recorded at the level of 159 points (subject No. 18). According to the studied indicator, the sample has a wide range of indicators ( $\sigma = 35.078$ ), which demonstrates its heterogeneity.

The presence of a high index of innovativeness was revealed in 15 teachers' characteristics. Its indicator ranged from 120 to 159 points. This group included 5 teachers of an educational institution and one leader (subject No. 9). In the process of choosing the answers to the questionnaire, these subjects chose a high degree of agreement (4-5 points) on statements about attractiveness to people who often change their profession, about readiness to take risks in their professional activities when it comes to an interesting new project, about their tendencies to disturbing the team and so on. This group of examinees (subjects) can be referred to innovators.

The presence of a low index of innovativeness was revealed in 13 teachers characteristics. There were no management representatives (leaders) from educational institutions in this group. Individual indicators of the innovativeness index for this group of subjects ranged from 32 to 60 points. In the process of working with the questionnaire, these subjects showed disagreement (1-2 points) with regard to taking risky events, which may bring positive results later; manifestation of conservatism with regard to changes occurring in society; a negative attitude towards reforms.

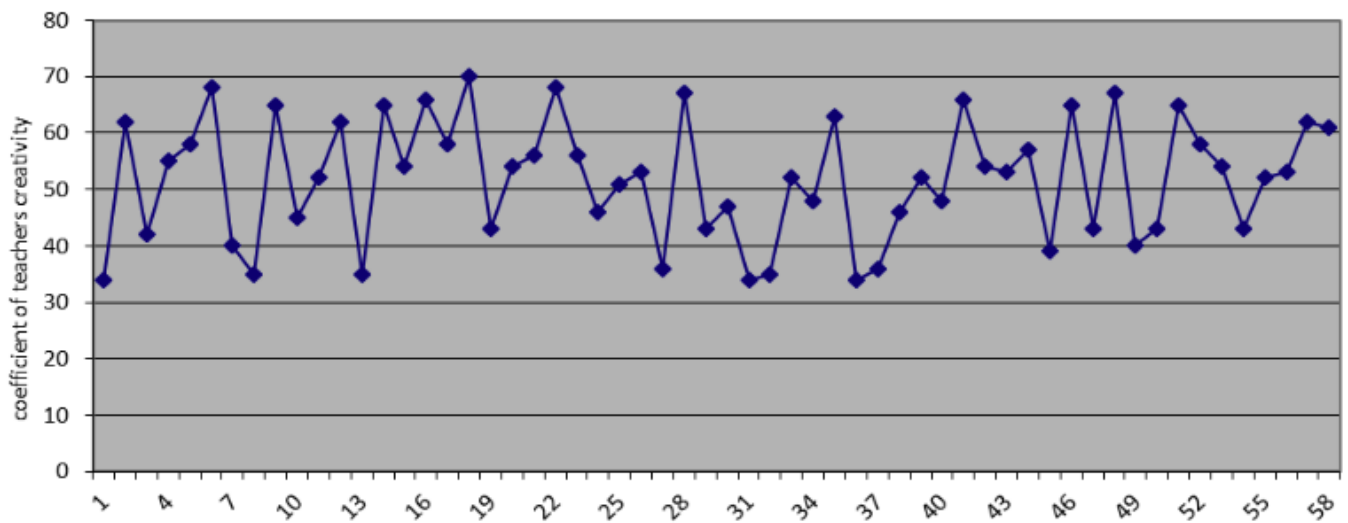
The rest of 30 teachers, including 2 managers, demonstrated an average value of the index innovativeness, which ranged from 61 to 119 points. These subjects showed agreement (4 points) regarding readiness for changes occurring in their professional activities, neutral results were observed in statements regarding the manifestation of their own initiative to implement a reform in activity (3 points); negative attitude, disagreement (1 point) in relation to willingness to invest their own funds in risky events.

Thus, according to the results of the innovativeness diagnosis by M. Curton, the subjects as a whole, are characterized by different levels of personal innovativeness, the polarity of the agreement manifestation in relation to the reforms and teachers' personal contribution to the implementation of reforms in their professional activities.

Let us present the results of the study of the sample group using the Torrens' Personality Diagnostic Technique "figured test". Using the test, we tried to determine the fluency (speed and ease of generating new ideas) and originality (the ability to generate not just options, but new, not template options and ideas) of our examinees. The combination of these two properties will allow us to ascertain about the creativity of the teacher.

The results are presented in Fig.2.

**Figure 2**  
Index of the individual coefficient of teachers' creativity.



The General results of the creativity coefficient for each teacher are shown in Fig.2. The results show that the studied sample group of teachers is characterized by a wide variety of creativity development. The minimum result was recorded at the level of 31 points and was revealed with the subject №1. The maximum result in the intensity of creativity was recorded at 70 points (test number 18). According to the studied indicator, the sample group has a large spread of indicators ( $\sigma = 10.64$ ), which demonstrates its heterogeneity.

High rates of creativity development at the level from 66 to 70 points (the indicator of creativity above the norm) were detected in the characteristics of 7 examinees. This group included 3 subject teachers and 4 primary school teachers. Management representatives from educational institution in this group were not identified.

Creativity indicators below the norm (from 30 to 34 points) were revealed in characteristics of 3 teachers. This group is represented by 1 primary school teacher (test number 1) and 2 primary school teachers (test numbers 31, 36).

Creativity indicators slightly below the norm (from 35 to 39 points) were found in characteristics of 6 teachers. This group is represented by 2 subject teachers (subject №8, 13) and 4 primary school teachers (test numbers 27, 32, 37, 45).

The rest of the teachers (43 people, including 3 heads from educational institution), demonstrated an average value of the indicator of creativity, which ranged from 40 to 65 points.

Thus, the readiness of teachers to innovate on the basis of creativity is assessed by us in accordance with the following values. If a teacher has scored more than 60 points according to the Torrens test, then we can state his readiness for innovative activity. In our sample, this group included 16 people. Regarding managers, we can state that only 1 manager (subject No. 9) showed readiness for innovation.

If a teacher has scored from 35 to 60 points, then the teacher is not ready for innovation activity judging by the level of creativity development; the preparation of this teacher for the innovator's functions is expedient. The preparation should focus on the development of teacher creativity, for example, through participation in creativity training. This group in our sample was the most numerous and comprised 39 people.

In our sample group 3 teachers were also identified who scored less than 35 points, therefore, they are not ready for innovation activity and their preparation in innovation activity will most likely not be expedient.

In addition to creativity, we believe that the professional courage of the teacher plays a big role in the willingness to innovate, a tendency to reasonable risk, and a willingness to be responsible in terms of risk.

In addition to this technique, a risk readiness diagnosis was carried out using the Schubert test. The results are shown in Fig.3.

Fig. 3. The manifestation of the degree of propensity to risk teachers.

The analysis of the results presented in Fig.3. shows that the studied sample group of teachers is characterized by a sufficient variety of manifestations of the teachers' degree of propensity to take risks. The minimum degree of risk appetite is presented by the teachers № 1,2,3,11,28, 32, 32 and ranges from -35 to - 28 points. The maximum degree of risk appetite is presented by the

teachers No. 6,9, 14, 18, 22,35,58, which is from 20 to 35 points. The maximum number of points (35) was identified in the characteristics of the examinee No. 18. According to the studied indicator, the sample group has a variation of indicators  $\sigma = 16,12$ , which indicates its heterogeneity. The results of this technique have a high degree of conjugation with the results of the questionnaire search for new sensations ( $p < 0.01$ ).

The central value in the course of the study was devoted to the study of the value orientations of teachers with different levels of readiness for innovation. For this, we used the method of "value Orientations" by M. Rokich. The results obtained during its implementation are presented in table 1.

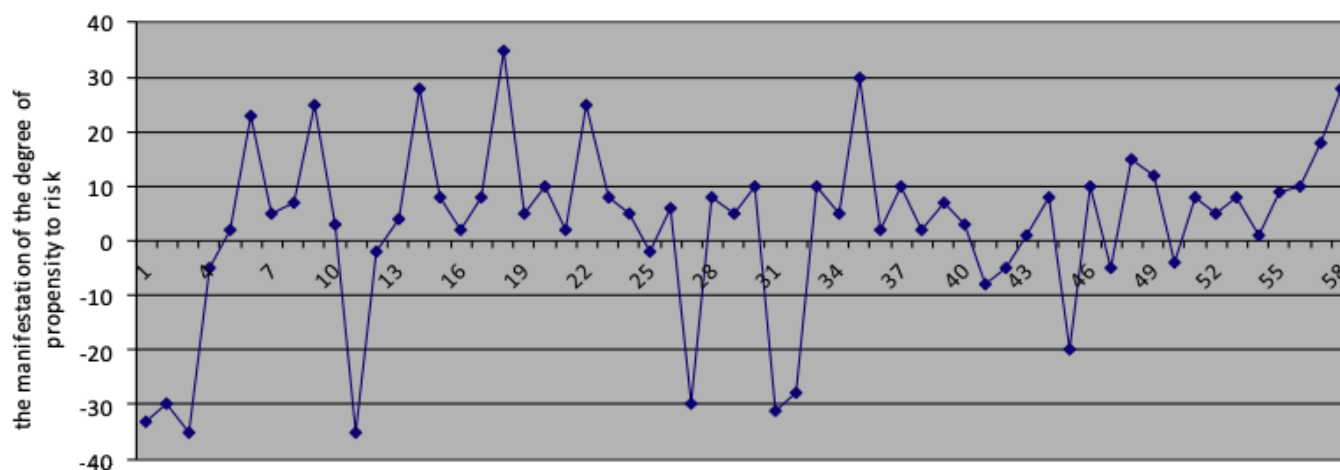
**Table 1**  
Leading values of teachers the results of "value Orientations" test (Rokich, 2006)

Value orientations	
terminal	Active life Interesting work Material secured life Public recognition Creativity
instrumental	Independence Education Responsibility Breadth of views

Teachers with a high degree of readiness for innovation are characterized by the presence of terminal values - active life, interesting work, material prosperous life, public recognition, creativity and instrumental values - independence, education, responsibility, open-mindedness.

In addition to this technique, a risk readiness diagnosis was carried out using the Schubert test. The results are shown in Fig.4.

**Fig. 4**  
The manifestation of the degree of propensity to risk teachers.



The analysis of the results presented in Fig.4. shows that the studied sample group of teachers is characterized by a sufficient variety of manifestations of the teachers degree of propensity to take risks. The minimum degree of risk appetite is presented by the teachers № 1,2,3,11,28, 32,32 and ranges from -35 to -28 points. The maximum degree of risk appetite is presented by the teachers No. 6,9, 14, 18, 22,35,58, which is from 20 to 35 points. The maximum number of points (35) was identified in the characteristics of the examinee No. 18. According to the studied indicator, the sample group has a variation of indicators  $\sigma = 16,12$ , which indicates its

heterogeneity. The results of this technique have a high degree of conjugation with the results of the questionnaire ( $p < 0.01$ ).

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## 4. Conclusions

In the article the results of diagnostics creativity and innovations of teachers of modern school are presented. It is established that the readiness to introduce innovations in professional activity of teachers and the level of their creativity depend on the motivation to focus on success, the characteristics of value orientations, the tendency to reasonable risk taking, the willingness to take responsibility in terms of risks and creativity of teachers.

Let us note the internal and external problems of difficulties for teachers in applying innovations and creativity in teaching. The external factors include problems of material and technical nature (lack of scientific and methodological literature, lack of necessary technical conditions, lack of payment for innovative activities); problems caused by the specifics of pedagogical activity (dependence of innovation on its perception by children, rejection of innovation by parents or their lack of interest, lack of understanding of colleagues, administration, lack of assistance from school psychologists, etc.); problems associated with the specifics of innovation (a large amount of information necessary for learning, lack of scientific consultants; lack of communication with colleagues from other educational institutions, etc.).

Internal factors include problems in the field of preparation for teaching (lack of sufficient knowledge in pedagogy, psychology); theoretical and practical readiness for innovation (theoretical knowledge and skills in the field of pedagogical innovation studies). It is established that the readiness to introduce innovations in professional activity of teachers and the level of their creativity depend on the motivation to focus on success, the characteristics of value orientations, the tendency to reasonable risk taking, the willingness to take responsibility in terms of risks and creativity of teachers.

In our study, we adhere to the idea of solving indicated problems through the implementation of the integrity of actions:

- axiological: development of decision-making skills;
- designing: transition scientific ideas into normative;
- constructive: implementation of all types of projects in pedagogical activity with subjects of education;
- evaluation and measurement: identification of indicators of the effectiveness of the innovation process and the quality of its results;
- reflective: understanding the experience of individual and collective innovation.

Thus, we can draw the following conclusion: the developed system of actions will significantly increase the likelihood of innovation and the use of creativity among teachers in a modern school.

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