

The Influence of Teachers' Teaching Style on College Students' Creativity

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ABSTRACT

This article uses the questionnaire method to collect information as the data sample, and analyzes the influence of teacher-guided teaching style and teacher-dominated teaching style on college students' creativity under different initiative conditions through Pearson correlation coefficient. The study found that: in the case of students with different initiative, different teaching styles have different effects on students' creativity. When students are more motivated, there is little difference between the teacher-guided teaching style and teacher-dominated teaching style on their creativity. When students' initiative is low, the teacher-guided teaching style has a more significant impact on creativity than the teacher-dominated teaching style.

Keywords: Teacher's teaching style, College students, Creativity, Personal initiative.

1. INTRODUCTION

In the 14th Five-Year Plan, it is pointed out that innovation is in the core position in the overall modernization construction of China; it's needed to stimulate the vitality of talent innovation, deepen the reform of the talent development system and mechanism, and give full play to the role of talent as the first resource. In 2020, there were 32.853 million general undergraduate and junior college students in China, an increase of 8.37% over 2019. With the continuous expansion of the scale of college students, colleges and universities, as the training and practice base of entrepreneurial talents against the background of mass entrepreneurship and innovation, should take on the important task of cultivating the creativity of college students. At present, the lack of creativity of Chinese college students is mainly reflected in the fixed thinking, lack of scientific attitude, and weak practical ability. From the perspective of teaching subject, teachers are duty-bound to cultivate the creativity of college students. How teachers can cultivate the creativity of college students in a targeted manner is a major challenge currently faced by higher education, and it is also the key to cultivating high-level professional talents. This article aims to study the influence of different teachers' teaching styles on the creativity of college students, in order to

provide a reference for teachers to use practical teaching styles and use the best implementation strategies to cultivate students' creative ability.

2. RESEARCH SUMMARY

2.1 College Students' Creativity

The research of creativity has gone through a process of continuous systematic evolution from single dimension to many dimensions [1].

Barron and Harrington studied outstanding and generally considered personality traits and concluded that innovative personality traits include independent judgment, self-confidence, interest in difficulties, aesthetic inclination, and adventure. This single-dimensional perspective mostly summarizes creativity in intellectual factors (such as insight, imagination, dialectical thinking ability, etc.) and non-intellectual factors (such as curiosity, desire for creativity, challenge, etc.). But they ignore the influence of social environment on creativity and have limitations.

Since the 1980s, great progress has been made in creativity research, and some creativity theories have begun to focus on the systematicness of creativity [1]. Amabile puts forward the "creativity component theory", which believes that creativity is the aggregation of three factors: internal task

motivation, domain skills and creative skills, which is affected by factors such as individual internal ability and motivation, and also affected by the external environment. Sternberg believes that creativity depends on a combination of six factors: intellectual ability, knowledge, cognitive style, personality characteristics, motivation and environment. Chen Lina and Quan Fangying believe that the creativity of college students is affected by the ability of teachers, educational methods and educational concepts, university learning atmosphere and students themselves [2].

It can be seen that most people in China and foreign countries believe that creativity is the result of the comprehensive interaction of individual and external factors, that is, the influence of students' own initiative, intellectual and non-intellectual factors, and the external environment.

2.2 Teaching Style

Ji Dahai believes that teaching styles can be divided into seven types: proper guidance, metaphor, charm, passion, T-knowledge, humor, and logic. Different education styles are by no means exclusive and independent, but are complementary, interweaved and blended with other teaching styles, supporting and complementing each other, even merging with each other to form a new comprehensive style [3]. He Wen believes that teaching style is the individualized and consistent way and method adopted by teachers in teaching activities. She divides teaching styles into four types: humorous and active type, caring and sharing type, rigorous and logical type, and innovative and exploratory type. She takes 720 students from six middle schools in Shanghai, Jiangsu, and Nantong as the subjects, proving that this classification has a certain degree of reliability and validity. Wang Mo and Dong Yang believe that the mainstream teaching styles since the 1970s can be divided into: preaching type, convenient type, and Socratic type [4].

It can be seen that although scholars have different classifications of teachers' teaching styles, they can be classified into two categories: teacher-guided teaching style and teacher-dominated teaching style.

2.3 The Relationship Between College Students' Creativity and Teaching Style

Tang Qiuming, Yang Ligang and others have conducted research on the relationship between teachers' teaching styles and students' learning styles [5] [6]. Yu Yue, Zhao Lefang, Leng Yulin and others study the influence of teaching style on student performance and teaching effect. Gao Zhonghua and Xu Yan believe that teacher emotion can stimulate the creativity of college students, and emotional support can stimulate individual creativity and self-efficacy, thereby increasing individual creative behaviors [7]. He Wei uses the Williams creativity tendency scale to study the impact of school education on the creativity of college students. Wang Shuanglong studies the influence of teachers' teaching style on students' creativity, but fails to consider the factors of student initiative [8]. In terms of postgraduate education, Wu Yang and others reach a conclusion through in-depth interviews with 28 people including postgraduate tutors, postgraduates and administrative personnel in charge of postgraduate management through on-site investigations and 409 valid questionnaires, believing that there is a certain difference in the influence of the tutor's guidance style on the innovative ability of postgraduates with different initiative, which is embodied in the difference in the influence on innovative thinking and innovative behavior [9].

It can be seen that Chinese scholars don't have many researches on the dualistic relationship between teaching style and college students' creativity, and the researches on the influence of teaching style on student cultivation are mostly focused on elementary school students and high school students. Among them, elementary school training mainly focuses on the influence of teacher's teaching style on the formation of pupils' learning habits, and high school training mainly focuses on the influence of teacher's teaching style of specific subjects on students' learning effects.

To sum up, there is not much research in the Chinese literature on the relationship between the status quo and influence of teachers' learning styles and college students' creativity.

3. RESEARCH DESIGN

On the basis of sorting the related research on college students' creative ability and teacher's guidance style, this article determines the research framework of the influence of teacher's teaching

style on the creativity of students with different

initiative, as shown in "Figure 1".

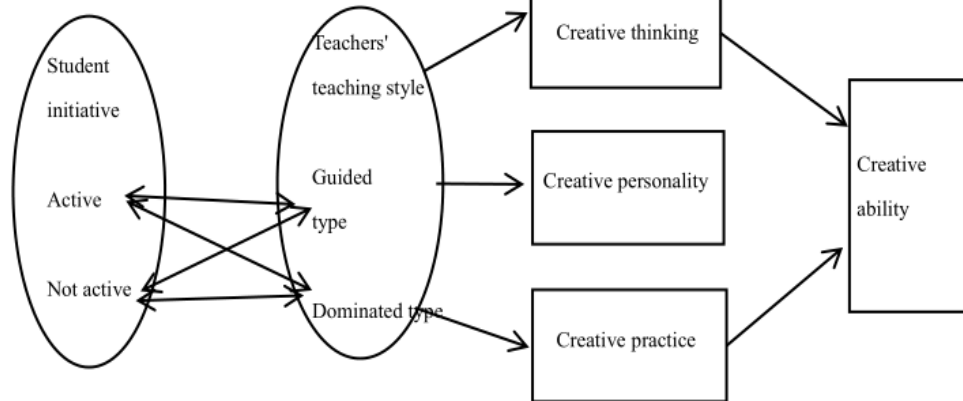


Figure 1 The research framework of the influence of teacher's teaching style on the creativity of students with different initiative.

3.1 Data Sources

The data of this study comes from a questionnaire survey. A total of 316 questionnaires were distributed, of which 308 were valid questionnaires, and the effective recovery rate was 97.46%. The sample distribution is relatively even. Among them, there are 173 students of science and engineering, accounting for 56.17%; there are 66 students of humanities and social sciences, accounting for 21.43%, and there are 67 students of arts, accounting for 21.75%.

3.2 Selection of Independent Variables

Teachers are the main body of teaching, and their teaching style is a key factor that affects the creativity of college students. Based on the related results of previous literature research, this article divides the independent variable teacher's teaching style into a guided teaching style and a dominated teaching style.

The guided teaching style means that teachers often use the form of asking questions to guide students to think independently, encourage students

to exert their creativity, and provide necessary help to guide students to solve problems independently when they encounter difficulties.

Dominated teaching style refers to the fact that teachers are in a dominant position in the learning process, and they formulate strict plans for students to complete learning tasks, and students also increase their knowledge reserves in strict requirements. A complete knowledge reserve is the basis for creativity.

3.3 Selection of Dependent Variables

The cultivation of the creativity of college students is currently the top priority of higher education. According to previous studies, the creativity of college students can be divided into creative thinking, creative personality and creative practice, as shown in "Table 1". Creativity of college students refers to the ability of college students to mobilize creative personality, exert creative thinking, carry out creative practice, and discover, analyze, and solve problems based on the accumulation of required knowledge.

Table 1. College students' creativity

College Students' Creativity	Creative thinking	Outsight
		Imagination
		Dialectical thinking ability
	Creative personality	Curiosity
		Desire for creativity
		Challenge
Creative practice		

Table 2. Descriptive analysis of dependent and independent variables

Variable	Variable name	Variable interpretation	Observed value	Average	Maximum	Minimum
Independent variable X	Teachers' teaching style	Guided teaching style X_1	308	3.60	5	1
		Dominated teaching style X_2	308	3.14	5	1
Dependent variable Y	College students creativity	Creative thinking Y_1	308	3.28	5	1
		Creative personality Y_2	308	3.21	5	1
		Creative practice Y_3	308	3.29	5	1

The "essence" of creative thinking is the mental processing process by which the human brain produces "inspiration" or "insight" [10], which is an intellectual factor. Creative personality refers to the gradual development of individuals in acquired learning activities, and the personality that is expressed and developed in creative activities belongs to non-intellectual factors [11]. Creative thinking and creative personality are both important individual factors in the formation of creativity, while creative practice is the external expression of creativity. Creative practice refers to the actions taken by college students to promote the realization of ideas after they have created creative ideas.

3.4 Condition Variable Design

The initiative of students is also a key factor in determining personal creativity. If the individual is not motivated enough, even with high creative skills and domain skills, it is difficult for him or her to obtain high-level research results [12]. The initiative of students includes the time and energy invested. Since the energy invested can't be quantified, this article only selects the indicator of time invested. This article divides into three ranges with three 45-minute classroom focused time: each class focuses on 0-15 minutes, and the focused time is within 45 minutes ($t \leq 45$); each class focuses on 15-30 minutes, and the focused time is 45 minutes to 90 minutes ($45 < t \leq 90$); each class focuses on 30-45 minutes, and the focused time is 90 minutes to 135 minutes ($90 < t \leq 135$). To facilitate subsequent analysis, this article divides initiative into higher initiative T1 ($45 < t \leq 90$, $90 < t \leq 135$) and lower initiative T2 ($45 < t \leq 90$).

4. RESEARCH METHOD

This study mainly uses Pearson's correlation coefficient to analyze the correlation between teacher's teaching style and college students'

creativity with different initiative. Pearson correlation coefficient is used to measure whether two data sets are on the same line, that is, to measure the linear relationship between the distance variables. It is suitable for measuring the linear correlation between national income and household saving deposits, height and weight, high school scores and college entrance examination scores. In the questionnaire, a scale is used when investigating the teaching style of teachers and the creativity of college students, and a quantitative analysis of the teaching style of teachers and the creativity of college students is carried out. In summary, the data collected by the questionnaire is applicable to the Pearson correlation coefficient model.

The calculation formula of Pearson correlation coefficient is:
$$r = \frac{N \sum x_i y_i - \sum x_i \sum y_i}{\sqrt{N \sum x_i^2 - (\sum x_i)^2} \sqrt{N \sum y_i^2 - (\sum y_i)^2}}$$

This article aims to explore the relationship between teacher's teaching style and college students' creativity. The initiative of students will affect the effect of teachers on creativity. Therefore, in the data analysis, this article uses SPSS software and Pearson correlation coefficient to analyze students with different initiative, namely, when the investment time is T1 ($45 < t \leq 90$, $90 < t \leq 135$) and T2 ($45 < t \leq 90$), the correlation between teachers' teaching style and students' creativity is analyzed.

5. DATA ANALYSIS

5.1 Overall Data Analysis

Teachers' teaching style (X) mainly includes: guided teaching style (X_1) and dominated teaching style (X_2). College students' creativity (Y) mainly includes: creative thinking (Y_1), creative

personality (Y_2) and creative practice (Y_3). This article first uses the Pearson correlation coefficient to calculate the correlation between independent

variables and dependent variables, as shown in "Table 3".

Table 3. Correlation analysis of teachers' teaching style (X) and college students' creativity (Y) of all students

Pearson correlation	Average	Standard deviation	Creative thinking Y_1	Creative personality Y_2	Creative practice Y_3	Guided teaching style X_1	Dominated teaching style X_2
Creative thinking Y_1	3.281	0.715	1				
Creative personality Y_2	3.206	0.710	0.705**	1			
Creative practice Y_3	3.288	0.732	0.560**	0.604**	1		
Guided teaching style X_1	3.604	1.004	0.256**	0.249**	0.334**	1	
Dominated teaching style X_2	3.139	1.026	0.207**	0.226**	0.166**	0.183**	1
Observed value N			308	308	308	308	308

As can be seen from the above table, creative thinking Y_1 , creative personality Y_2 , creative practice Y_3 , guided teaching style X_1 and dominated teaching style X_2 all show significance. On the whole, the influence of the guided teaching style on students' creativity is greater than the influence of the dominated teaching style on students' creativity.

5.2 Data Analysis of Students with Different Initiative

It can be seen from the following "Table 4" that for students with higher initiative, there is little difference between the guided teaching style and the dominated teaching style on their creativity.

Table 4. Correlation analysis of teachers' teaching style (X) and college students' creativity (Y) of students with higher initiative

Pearson correlation	Average	Standard deviation	Creative thinking Y_1	Creative personality Y_2	Creative practice Y_3	Guided teaching style X_1	Dominated teaching style X_2
Creative thinking Y_1	3.322	0.650	1				
Creative personality Y_2	3.247	0.686	0.695**	1			
Creative practice Y_3	3.341	0.700	0.523**	0.566**	1		
Guided teaching style X_1	3.703	0.935	0.242**	0.208**	0.285**	1	
Dominated teaching style X_2	3.093	0.989	0.238**	0.244**	0.172**	0.205**	1
Observed value N			259	259	259	259	259

Table 5. Correlation analysis of teachers' teaching style (X) and college students' creativity (Y) of students with lower initiative

Pearson correlation	Average	Standard deviation	Creative thinking Y_1	Creative personality Y_2	Creative practice Y_3	Guided teaching style X_1	Dominated teaching style X_2
Creative thinking Y_1	3.093	0.926	1				
Creative personality Y_2	3.080	0.829	0.684**	1			
Creative practice Y_3	3.060	0.812	0.644**	0.715**	1		
Guided teaching style X_1	3.200	1.195	0.229	0.382**	0.439**	1	
Dominated teaching style X_2	3.360	1.191	0.185	0.232	0.262	0.235	1
Observed value N			49	49	49	49	49

From the above table, it can be seen that creative thinking Y_1 , creative personality Y_2 , creative practice Y_3 , and guided teaching style X_1 are all significant and have a positive correlation. There is no correlation between the dominated teaching style X_2 and the creativity of less active students.

5.3 Comprehensive Analysis

For college students with higher initiative ($45 < t \leq 90$, $90 < t \leq 135$), whether it is a guided teaching style or a dominated teaching style, it will have a certain impact on their creativity and there is little difference in the degree of influence between the two. Because such students are more active in learning and spending more time in class, and they have a higher degree of absorption of teachers' teaching regardless of their teaching style. Teachers with a guided teaching style can guide such students' creativity, while a teacher with a dominated teaching style can help them accumulate the necessary knowledge as the basis for their creativity. For college students with lower initiative ($45 < t \leq 90$), the guided teaching style has a greater impact on their creativity, especially the creative personality and creative practice, while the dominated teaching style has a smaller impact on their creativity. Because for students with lower initiative, classes with the dominated teaching style are less attractive to them, while classes with the

guided teaching style are more attractive to them, making it easy to cause students to think and stimulate the creativity of students with lower initiative.

6. CONCLUSION

This article conducted a total of 2 questionnaire surveys. A total of 495 questionnaires were collected for the first time, but among them 342 were art students, accounting for 69.09%, which failed to comprehensively reflect the situation of all students. Therefore, in response to this problem, this article conducted a second questionnaire survey. Through the analysis and comparison of the results of the two questionnaires, the samples of the second questionnaire are more comprehensive and even, which can better reflect the influence of teachers' teaching style on the creativity of college students.

Based on the summary and analysis of the previous literature and the data analysis of the questionnaire survey, conclusions can be drawn:

Firstly, in the case of students with different initiative, different teaching styles have different effects on students' creativity.

Secondly, when students are more motivated, there is little difference between the teacher-guided teaching style and teacher-dominated teaching style on their creativity. But in the long-term development, the guided teaching style can promote the cultivation of students' creativity, while the

dominated teaching style may limit the further improvement of students' creativity.

Thirdly, when students' initiative is low, the teacher-guided teaching style has a more significant impact on creativity than the teacher-dominated teaching style. If students' initiative is low, teaching in a dominated teaching style is likely to arouse students' disgust, causing them to further lose interest and initiative. Teachers should adopt a comprehensive teaching method that focuses on the guided teaching style and combines with the dominated teaching style.

In short, with regard to the cultivation of students' creativity, teachers must first cultivate students' initiative and take the students' interests and hobbies as the guide. Teachers' teaching styles should serve the cultivation of students' creativity. Teachers should pay attention to the comprehensive use of multiple teaching styles. When facing students with different initiative, teachers can choose the best teaching style in order to better cultivate students' creative ability.

AUTHORS' CONTRIBUTIONS

This paper is independently completed by Qianqian Li.

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APPENDIX A: QUESTIONNAIRE

Research on the Influence of Teachers' Teaching Style on College Students' Creativity

This questionnaire is used for academic paper writing, and your personal information will be kept strictly confidential. The entire questionnaire will take you 2-3 minutes. Thank you for your cooperation.

Your gender [multiple choice] *

- Male
- Female

Your grade [multiple choice] *

- Freshman
- Sophomore
- Junior
- Senior
- Undergraduate and above

Type of your major [multiple choice] *

- Science and engineering
- Humanities and Social Sciences
- Arts
- Sports

Do you think the number of teachers who always ask questions to guide you in class [multiple choice] *

- Hardly any
- Less
- General
- More
- A lot

Do you think the number of teachers who just teach and dominate your learning process [multiple choice] *

- Hardly any
- Less
- General
- More
- A lot

Which type of teacher do you prefer [multiple choice] *

- Teacher who guides your thinking
- The teacher who dominates your learning

How long do you focus in three 45-minute classes [multiple choice] *

- Focus on 0~15 minutes in each class, and the focused time is within 45 minutes
- Focus on 15-30 minutes in each class, and the focused time is within 45-90 minutes

○Focus on 30-45 minutes in each class, and the focused time is within 90-135 minutes

Scenario questions, please answer quickly

I can find something that no one else can find [multiple choice] *

○Never ○Rarely ○Sometimes ○Often ○Always

I have some unrestrained ideas [multiple choice] *

○Never ○Rarely ○Sometimes ○Often ○Always

I can think about problems from different aspects [multiple choice] *

○Never ○Rarely ○Sometimes ○Often ○Always

I like to explore things I don't understand [multiple choice] *

○Never ○Rarely ○Sometimes ○Often ○Always

I would like to create something by myself [multiple choice] *

○Never ○Rarely ○Sometimes ○Often ○Always

I will do things I'm not sure [multiple choice] *

○Never ○Rarely ○Sometimes ○Often ○Always

I will not give up practice because I suspect that my idea can't be realized [multiple choice] *

○Never ○Rarely ○Sometimes ○Often ○Always

If I have an idea, I will not just stay in fantasy but try to do it [multiple choice] *

○Never ○Rarely ○Sometimes ○Often ○Always

If the teacher presents a report with science as the main body, you have found a lot of information. Please use your brain to imagine what form you can use to present what you have learned. [Fill in the blanks] *

If the teacher assigns a report with a historical event as the main body, you have found a lot of information. Please use your brain to imagine what form you can use to present what you have learned. [Fill in the blanks] *

If the teacher assigns a report with a favorite artist by you as the main body, you have found a lot of information. Please use your brain to imagine what form you can use to present what you have learned. [Fill in the blanks] *

If the teacher assigns a report focusing on a sport, you have found a lot of information. Please use your brain to imagine what form you can use to present what you have learned. [Fill in the blanks] *
