

A Study of Geographic Gifted Students Getting Rid of "Plateau Phenomenon" in Senior Three of High School*

Yanhua Xu

College of Resource Environment and Tourism
Capital Normal University
Beijing, China

Guiyu Wang**

No.1 High School of Pidu
Chengdu, China
**Corresponding Author

Abstract—In this study, eight geographic gifted students from School P of Sichuan Province were selected as the experimental group and eight other students as the control group to analyze their recent performance in important examinations. From this, the conclusion can be drawn that they have been trapped into the "plateau phenomenon". Subsequently, through analysis and interviews, the reasons for their "plateau phenomenon" were obtained, and then the feasible measures to help them get out of the "plateau phenomenon" were put forward. After implementation, the experimental group went out of the "plateau phenomenon".

Keywords—geographic gifted students; geographic review in senior three; plateau phenomenon

I. INTRODUCTION

As early as 1973, there appeared a large-scale and very formal "Experimental Plan of Education Research for National Primary Schools Gifted and Excellent Children" (Wang Zhende, 1981; 1994; Huang Longxing & Wang Caiwei & Zhang Desheng, 2010). Taiwan's legislation on education for gifted and excellent students has been becoming more and more standardized (Huang Longxing & Wang Caiwei & Zhang Desheng, 2010).

Many researchers focus on how to discover and cultivate gifted students (Lin Yanji, 2010). In terms of training, people's attention is mainly concentrated on curriculum and teaching (Lin Yanji, 2010), psychology (Lin Yanji, 2010; Tian Yimin & Xu Lijuan, 2014; Li Weiqing, 2011; Huang Wenwen & Cai Dianmo, 2005; Hou Zhentang & Zhang Yuting, 2010; Huang Yangting, 2007; Cai Shuoying, 2009) and family (Huang Longxing & Wang Caiwei & Zhang Desheng, 2010).

In terms of curriculum, the existing research mainly focuses on science courses (Hou Yaling, 2010; Hou Yaling, 2013), Chinese (writing) courses (Ke Yiwen & Lai Cuiyuan, 2009; Li Shiqun, 2017; Cai Mingying, 2011), gender

*This study is part of the research results of the project "Research on Geography Micro-lectures Teaching in Senior High School Based on Science-Oriented Teaching Theory", which belongs to scientific subsidy tasks for general education in Sichuan Province funded by Sichuan Provincial Education Letter No. 446 [2014].

education courses (Cai Shuoying & Huang Peixiu, 2009), mathematics courses (Liu Zheyuan & Liu Xiangtong, 2008; Cai Mingfu & Chen Chenru, 2013; Xu Jiarong & Wu Yuyi, 2010); music and art courses (Zhang Minfang, 2006; Chen Chenru, 2008; Huang Yangting, 2007), but in the existing ones, no research related to geographical gifted students in Senior Three has been found. Psychological studies mainly focus on creativity (Tian Yimin & Xu Lijuan, 2014), emotional intelligence (Hou Zhentang & Zhang Haoting, 2010), scales (Li Weiqing, 2011; Li Weiqing, 2011), affection (Hu Zongguang, 2010; Zou Xiaolan, 2010, Tian Yimin & Xu Lijuan, 2014) and many other aspects. However, for the time being, no research has been found on the "plateau phenomenon" of gifted students, or on how gifted students get out of the "plateau phenomenon" in the process of geography review in Senior Three.

Therefore, the main task of this study is to make suggestions for the gifted students of geography to get out of the "plateau phenomenon" in the Senior Three review. The specific questions need to be answered are: (1) What are the geographic gifted students like? (2) What is the state of geographical gifted students entering the plateau phenomenon in the review of Senior Three? What are the possible reasons? (3) How should geographic gifted students get out of the plateau phenomenon after they enter the review in Senior Three? What's the effect?

II. RESEARCH METHOD

A. Research Objects

In this study, 16 liberal arts students in Senior Three of School P in Sichuan Province were selected as the subjects of study (gifted students in geography). Their geographical knowledge and skills were particularly good, and their qualifications were relatively excellent compared with those of the surrounding students or student groups. In the group they belong to, their geographical learning was characterized by active geographical thinking and excellent geographical learning results. As the object of study, their common characteristics were: the geography scores had been excellent in the first semester of Senior Three, but the results of five consecutive time-limited training in the second semester of

Senior Three had been declining (or unchanged). In this study, they were coded by No.1-16. Among them, No. 1-8 was the experimental group and No.9-16 was the control group.

B. Research Path

This study mainly adopts questionnaire, observation, interview, and quasi-experimental research methods. In the course of the study, the test situation of the experimental group students in the third stage of the examination in the District was first counted and obtained. Secondly, by observing and interviewing the experimental group, this study found out the reasons for the plateau phenomenon in their geography learning at this stage. Thirdly, on the basis of the reasons, the quasi-experimental method was adopted to try to help the experimental group out of the "plateau phenomenon". Finally, their average results in the first semester, five consecutive time-limited training in the second

semester, and the average scores in the three nearly standardized important examinations, namely, the district-level stage examination, the Chengdu diagnostic examination and the alliance examination of Chengdu famous school, would be used to verify whether they have stepped out of the plateau period.

III. RESULTS AND DISCUSSION

A. The Statistical Result and Analysis of the Basic Situation of the Experimental Group in the Last Major Examination

In order to confirm that the selected samples have entered the plateau phenomenon, this study randomly selected 16 geographic gifted students in the class as the research objects, and compared their average scores in the first semester with the average scores in the second semester of five consecutive time-limited exercising as shown in "Table I".

TABLE I. COMPARISON OF THE AVERAGE SCORES OF THE FIRST SEMESTER OF 16 GIFTED STUDENTS AND THE AVERAGE SCORES OF FIVE CONSECUTIVE TIME-LIMITED EXERCISES IN THE SECOND SEMESTER

No.	Average Results of the First Semester	Average Results of Five Consecutive Time-limited Exercises in the Second Semester	The Difference Between the Average Results of Five Consecutive Time-limited Exercises in the Second Semester and the Average Results of the First Semester
1	75	60	-15
2	78	73	-5
3	74	66	-8
4	80	71	-9
5	70	54	-16
6	75	64	-11
7	74	68	-6
8	80	71	-9
9	70	65	-5
10	78	77	-1
11	70	60	-10
12	72	55	-17
13	77	58	-19
14	70	60	-10
15	74	55	-19
16	72	73	1

Through the comparison of the above results, it can be found that among the 16 gifted students, except for the fluctuations of the No.10 and No.16, the scores of other students have more than 5 points decline. There are as many as eight students who have dropped by more than 10 points. In the end, did they have no enough knowledge mastery? Or was there a problem with their psychology?

In order to find out the real reasons for the "plateau phenomenon" of the class gifted students, the author divided the above 16 students into two groups, No.1-8 as the experimental group and No. 9-16 as the control group. In addition, the author set up the analogous knotty card in the form of the first simulated test questions of Chengdu as follows. Because the written analysis of the examination questions will show whether students can master the questions judgment, memory, blank filling or not in the sensory function and central function, methods, emotions, and attention, as well as attention (Do you have anything to say about psychology? On the basis of theory, this paper

defines the direction of the four kinds of survey statistics, which is not clear, and this is the place where you really need to highlight your own characteristics.), in the card, the author set up four columns: examination error, knowledge memory error, filling error and failure to work out them absolutely. For the convenience of statistics, the author counted all the test questions. For those examination questions that failed to be given full marks, the author remarked them as "1". Through statistics, it can be found that: (1) The eight students in the experimental group scored relatively high in the choice questions. The main problems they presented in the choice questions were examination errors, followed by filling errors, knowledge memory errors. It rarely happened that one wouldn't do anything at all. It can be inferred that the gifted students have fewer knowledge problems in the process of reviewing the selected questions in geography, but relatively more problems in examining and filling; (2) the eight students in the experimental group scored relatively low on the comprehensive questions. Taking the 36 questions as an example, the main problems they presented

in the comprehensive questions of this set of testing questions were the incomplete knowledge memory, and the second was the mistakes in filling in, and then the hasty examination of the questions. And few questions cannot be solved at all.

B. Observation, Interview, and Analysis of Experimental Group

After data statistics and analysis, this study observed and interviewed the experimental group in order to find out the reasons for their plateau phenomenon at this stage.

Through classroom observation, it was found that 37.5% of the excellent students showed the phenomenon of inattention, fatigue and even sleeping in class. Twenty-five percent of the top students were afraid of getting information from the graph. 37.5% of the top students worked very hard, but failed to obtain very satisfactory results.

In addition to classroom observation, the author made use of weekend time to communicate with students No. 1-8 in a collective and face-to-face way. In the process of communication, students told about the real situation in the recent process of geography learning.

Student A said: I have been busy studying geography every day, but I always feel that I don't know anything during the exam. Even now, I'm wondering if I have a problem with my IQ in geography.

Student B said: I have spent more time in geography than before, but my grades still didn't go up, on the contrary, they declined. Sometimes I understand what I've reviewed, but I'm wrong when I do it, especially in the comprehensive questions.

Student C said: I feel that geography class is not as lively and interesting as before. I always spend it in the course of problem-making. I want to sleep when I see the simulated test paper.

Student D said: I always think my grades are very good, so I have never studied. Unexpectedly, the result has dropped a lot.

Student E said: I feel good when I do the multiple choice questions, but when I do the comprehensive questions, I get confused, and I always feel that I can't find the way to solve the problems.

Student F said: I heard that after the first mock exam, the scores tend to be stable, so when I saw my grades, I thought there would be no need to continue studying.

Student G said: I work hard every day, but the more exercises problems I completed, the worse my grades would be.

Student H said: I don't know why I can't concentrate in class, and I'm always distracted when I strive to solve the questions.

According to the above data presentation, observation and interview results, it can be found that these gifted students have different degrees of plateau phenomenon.

1) *Plateau phenomenon in data:* Through data analysis, it can be found that the plateau phenomenon presented by gifted students is mainly manifested in the lack of concentration and that the method of dealing with geographical phenomena and geographical problems has not been really completed. Moreover, it is only through reciting knowledge items to review. Of course, it also implies improper practice methods, so, it is barely to break through the bottleneck constraints.

2) *Plateau phenomenon in observation:* Through observation, it can be inferred that the gifted students have lower interest in learning at the plateau period, and even have negative emotions. In the face of some difficulties, gifted students may lose the courage and confidence to improve. In addition, some students may be in an upward accumulation stage, so, the progress range cannot be shown from the surface of the results.

3) *Plateau phenomenon in interviews:* Through interviews, it can be deduced that the psychological and physiological problems of the gifted students exposed during the plateau period undoubtedly; the improper learning and practice methods also showed absolutely, and even this phenomenon posed new challenges to the teachers' classroom to some extent.

C. Reasons for "Plateau Phenomenon" of Geographical Gifted Students in Senior Three Review

Based on the above analysis, this study concludes that the main reasons for the "plateau phenomenon" in Senior Three geography review are as follows:

1) *The method of test-taking skills in college entrance examination has not really been formed yet:* Because the current system of college entrance examination questions is based on curriculum standards and examination syllabus, the training of geography review preparation for college entrance examination is mainly based on curriculum standards and the required skills and methods in the college entrance examination syllabus, which focus on the four abilities of college entrance examination. However, gifted students are influenced by age and environment. So, at this time, the moderating effect is not obvious, and the methods of test-taking skills for college entrance examinations have not yet been formed.

2) *The influence of psychological and physiological fatigue period:* Due to long-time and intense study, gifted students generally have greater learning intensity than other students, so they will show psychological and physiological fatigue at this stage. Therefore, the phenomenon of inattention, fatigue and even weariness of learning also occurs from time to time. In addition, due to the influence of the physiological fatigue period, memory traces often can't be strengthened, or even weakened and disappeared. Influenced by the physiological fatigue period, there may also be interactive effects of multiple memory traces, so that knowledge can be forgotten.

3) *Incorrect motives*: Influenced by the psychological and physiological fatigue period, gifted students' interest in learning has been gradually weakening, and their desire and driving force for learning are also weakening, resulting in the boredom of learning. In addition, some gifted students have too high expectations of themselves, which leads to the too high level of excitement, thus consistently resisting review results.

4) *Poor will power*: With the passage of time, many gifted students are anxious, even self-indulgent because of one or two exam failures. Even if there is a big decline, there are still some gifted students immersed in past success and feel too self-satisfied.

5) *No enough performance in the process of quantitative change*: Because the practice process of advanced skills needs a process of mastering skills concepts, demonstration, feedback, and reasonable time allocation, so as to reach a higher level, this process needs a very long-time accumulation. If there is no qualitative change in the accumulation process, it may lead to a plateau phenomenon.

D. The Targeted Attempt of Geographical Gifted Students to Get Out of the "Plateau Phenomenon" in the Senior Three Review

In view of the above situation, the author compares the experimental group and the control group mentioned above. The specific operation methods are as follows:

1) *Seat change*: The headteacher tend to be accustomed to gathering students with good grades in a group, while students with poor grades in a group. According to Bandura's thought, students have the characteristics of highly imitative learning and different results of substitution reinforcement. Competition among gifted students during their growth period has resulted in varying degrees of impairment of self-confidence. Therefore, the author assigns the eight students in the experimental collective to different groups in the geography classroom, in order to achieve the reward-based substitution reinforcement.

2) *ARCS model in classroom teaching*: In view of the problems of mental and physiological fatigue and unhealthy motivation of gifted students, the author introduces Keller's ARCS model. The specific steps in class are shown in the table below (see "Table II"):

TABLE II. TEACHING STRATEGIES TO STIMULATE MOTIVATION PROPOSED BY ARCS MODEL

Component of Motivation	Corresponding Strategies
Attracting and maintaining attention	1. Attracting students' attention through the novel or unexpected teaching methods 2. Stimulating lasting curiosity with questions that may evoke mystery 3. Maintaining the attention of students by changing teaching presentation
Promoting relevance	1. Improving the perception of usefulness by clarifying how teaching relates to personal goals 2. Providing opportunities to match learners' motivations and values in self-learning, leadership and collaboration occasions 3. Teaching to increase familiarity on the basis of learners' previous experience
Building confidence	1. Creating positive expectations of success by clarifying teaching objectives and objectives. And also allowing learners to set their own goals. 2. Giving students the chance to successfully accomplish challenging goals. 3. Letting learners control their learning reasonably.
Generating satisfaction	1. To cause natural consequences by providing learners with opportunities to use new learning skills 2. Making use of positive consequence strategies, such as implicit praise in the absence of natural results. 3. Ensuring fairness by keeping consistency and matching results with expectations

In the whole teaching process, although it is for all students, the content and method of setting-up can basically be for students at different levels.

3) *Counseling gifted students with psychological content*: In view of the individual differences in the group of gifted students, the author divides the counseling for gifted students into two aspects: psychology and skills.

a) *Psychological aspects*: Influenced by the long-standing idea of waiting and depending on others, even the gifted students' practical ability is very poor. In view of this situation, the author conducts extra-curricular psychological counseling for the eight students by introducing the learning pyramid theory, so that students can understand that deep memory comes from deep experience and how important

the speaking and doing are in order to improve their enthusiasm and initiative.

For students with anxiety, the author uses individual conversation method to make them realize that they have bad emotions and to analyze the causes of such bad emotions followed by guiding them to make self-suggestion, catharsis, self-transfer, adaptation, and self-comfort. For a small number of students with weak willpower, the author guides them to exercise to control their willpower. In view of the complacent students, the author trains them through the relevant operational methods of moral dilemma, so as to reduce their pride as much as possible.

b) *Skills coaching*: The gifted students also have some skills deficiencies, and the best way to train their skills is to cultivate their creative thinking. In this regard, the author mainly carries out both in and out of class at the same time.

In the classroom, the author intentionally enlightens the students of the experimental group through the ARCS model to mobilize their enthusiasm and initiative; for the cultivation of knowledge and skills, process and methods, the author expands a practical material divergently, at the same time, carries out aggregate targeted training, and then uses this material to guide students to do self-proposition and problem-solving game-based training to improve their creativity.

4) *Using the micro-lectures based on science-oriented teaching theory to carry out personalized teaching guidance:* The author makes full use of "micro-lectures" as an independent learning resource to help students do self-construction. The micro-lectures used in this study are based on science-oriented teaching theory. Based on scientific psychology and empirical research, it is a micro-lectures resource developed under the guidance of pedagogy, which absorbs the research results of behaviorism learning psychology, cognitive learning psychology and information processing psychology. In this study, according to the actual differences of the above-mentioned experimental objects, the key and difficult problems in the process of geography

teaching are recorded in a simple and in-depth way to help the elite students with different deficiencies to conduct personalized counseling, so as to really help them turn difficulty into easiness, abstraction into concreteness, so that the relevant geographical knowledge can be more easily accepted and understood by students, and also help those who fail to understand well in the classroom to watch and digest repeatedly after class.

E. Effects

After several weeks of continuous attempts, in order to test the results, the average results of the first semester, five consecutive time-limited exercises in the second semester, and the average results of the three nearly standardized major examinations, namely, the district-level stage examination, the Chengdu diagnostic examination and the alliance examination of Chengdu famous school, will be used to verify whether the students have stepped out of the Plateau period.

According to the data, the results of the gifted students in the experimental group (No. 1-8 in the table below) and the control group (No. 9-16 in the table below) are as follows:

TABLE III. COMPARISON OF SEVERAL RESULTS

No.	Average Results of the First Semester	Average Results of Five Consecutive Time-limited Excises in the Second Semester	Average Results of Three Tests Which Are Nearly Standardized with the First Mock Test in Chengdu
1	75	60	82
2	78	73	84
3	74	66	80
4	80	71	88
5	70	54	83
6	75	64	84
7	74	68	80
8	80	71	79
9	70	65	75
10	78	77	78
11	70	60	68
12	72	55	65
13	77	58	67
14	70	60	66
15	74	55	67
16	72	73	78

On the whole, the progress of the experimental group is greater than that of the control group, and the apparent effects of the experiment can be seen by discarding the progress of the learning process and its own factors.

IV. CONCLUSION

This study explores the problem of geographical gifted students going out of "the plateau phenomenon" in senior three reviews. It is found that the real reasons for the "plateau phenomenon" in the third year of senior high school are that the methods of examining skills in college entrance examination have not really been formed, the influence of psychological and physiological fatigue period, the incorrect motivation, the poor quality of will and the lack of enough performance in the quantitative process. Through the research, the conclusions are drawn that: seat replacement,

ARCS model in classroom teaching, psychological content guidance for geographical gifted students, and personalized teaching guidance based on science-oriented teaching theory can help geographical gifted students out of the plateau phenomenon in the third year of senior high school review.

However, it has to be admitted that this study is only a quasi-experiment, and many independent variables (including latent variables) in the experiment are not taken into account, which may bring uncertainty to the research results. In addition, is this method applicable to other groups? Is this method applicable to other disciplines? Therefore, in the follow-up study, these issues will be given full consideration, and the greater efforts for the gifted students of geography will be offered to assist them to get out of the plateau phenomenon in the review of Senior Three so that more people in need can get assistance.

V. ACKNOWLEDGMENT

This study is part of the research results of the project "Research on Geography Micro-lectures Teaching in Senior High School Based on Science-Oriented Teaching Theory", which belongs to scientific subsidy tasks for general education in Sichuan Province funded by Sichuan Provincial Education Letter No. 446 [2014]. This research has been supported by many leaders, experts, and colleagues. Thank you for all of your support. Thanks for the support and guidance provided by the Sichuan Academy of Educational Sciences. Thanks again for the joint efforts and specific help of every teacher in the research group.

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