

Action Research on the Curriculum Development of Geographical Practice Power Competence of Senior High School Students with Tangxi Ancient Town as Curriculum Resources*

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Abstract—Geographical practice power competence is the quality and action ability of students in a series of practical activities such as investigation, investigation and experiment. Based on the curriculum development of the Tangxi Ancient Town, this study takes action research as the approach to cultivating students' systematic geographic practice ability in a familiar and real geographical situation. In the process of implementation, students should give full play to their dominant position and follow the scientific and operable principles. Finally, four geography course resources are developed around the ancient town, providing diversified methods for geography teaching. It not only enriches the teaching content, but also improves the students' geographical practice power competence.

Keywords—curriculum development; geographical practice power competence; senior high school students; geography teaching

I. INTRODUCTION

The 2017 edition of high school geography curriculum standards proposed four core qualities of geography, namely, "harmony between man and earth", "synthetic thinking", "regional cognition" and "geographical practice power competence". The first three core qualities are closely related to the main line and the nature of traditional high school geography courses in China, most of which are familiar to geography teachers. Although the content of "geographical practice power competence" is not new, the concept is new, and it is determined for the first time in China. Besides, the elevation of geographic practical ability to the core quality is unprecedented [1]. The core quality not only focuses on students' ability to acquire knowledge, but also emphasizes how to internalize knowledge and skills into students' psychological quality and key ability. As time goes by, knowledge will be forgotten and skills will be strange. But in the process of practice, students can obtain a more profound

and inherent ability through observation, discovery, questioning, inquiry and a series of performance. Geographical practice power competence is the necessary quality of lifelong benefit of students.

It is an effective way to explore how to cultivate the practical ability of senior high school students in geography by combining the training of practical ability of geography with action research, and it is also a geography teaching method that combines theory with practice [2]. After consulting a large number of literatures and materials, the authors found that in terms of the current practical ability of geography teachers to carry out action research, foreign countries started earlier, covered a wide range of contents, and the evaluation system for the practical ability of geography is relatively complete [3] [4]. But the domestic researches concentrates in the theory level, and there are few research unified with the geography teaching practice, which started late. In addition, there are too many unpredictable situations in the implementation process of curriculum development based on action research, and teachers are required to practice, reflect and modify in various ways according to students' learning conditions, so the real reference materials are limited.

Therefore, the cultivation of students' practical geographic ability, a specific geographic teaching problem, and action research, a scientific method, can be organically combined, which can not only play a good guiding role in the cultivation of students' practical geographic ability, but also enrich the results of action research carried out by geography teachers.

II. RESEARCH METHODS

A. Research Background and Objects

Zhejiang province has been a test area for the New Scheme of College Entrance Examination for nearly five years. Throughout the five years of the geographical examination questions, it is not difficult to find that each

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year there are test questions about students' geographical practice power competence. However, the scoring rate of this type of questions has been often low, so students are afraid of the geographic practicability type of questions.

Tangxi, an ancient town with a long history, was founded in the northern song dynasty. It was among the richest in Ming and Qing dynasties as the first of "ten famous towns in south China" Not as famous as Zhouzhuang and Wuzhen though, her soul and roots are still alive, full of vigor and vitality. The Tangxi ancient town is the starting point of the Grand Canal in Hangzhou. Being passed through the Grand Canal, the ancient town has been associated with the canal in its birth and growth. Since the tang dynasty, the ancient town teems with locate and is one of the four largest Loquat producing areas in China. Superior natural conditions make the town famous in the world for its Loquat. Therefore, apart from the canal, Loquat is another calling card of the ancient

town. In addition, not far from the ancient town, there is the Chaoshan mountain scenic area, which is famous for winter sweet. When the flower is in full bloom there are thronged with tourists. Thus, it can be seen that the Tangxi ancient town has rich and close geographical resources to be developed, and they are of high development value. In the four places for task practice, only the Chaoshan mountain scenic area requires tickets and free entrance will be allowed with a local citizen card.

B. Research Methods

Structural model of action research is preliminary adapted in the methods of action research in this course. That is, the circular learning mode of discovering problems, determining problems, conceiving plans, implementing plans, reflecting, revising plans and implementing plans again [5], as shown in "Fig. 1":

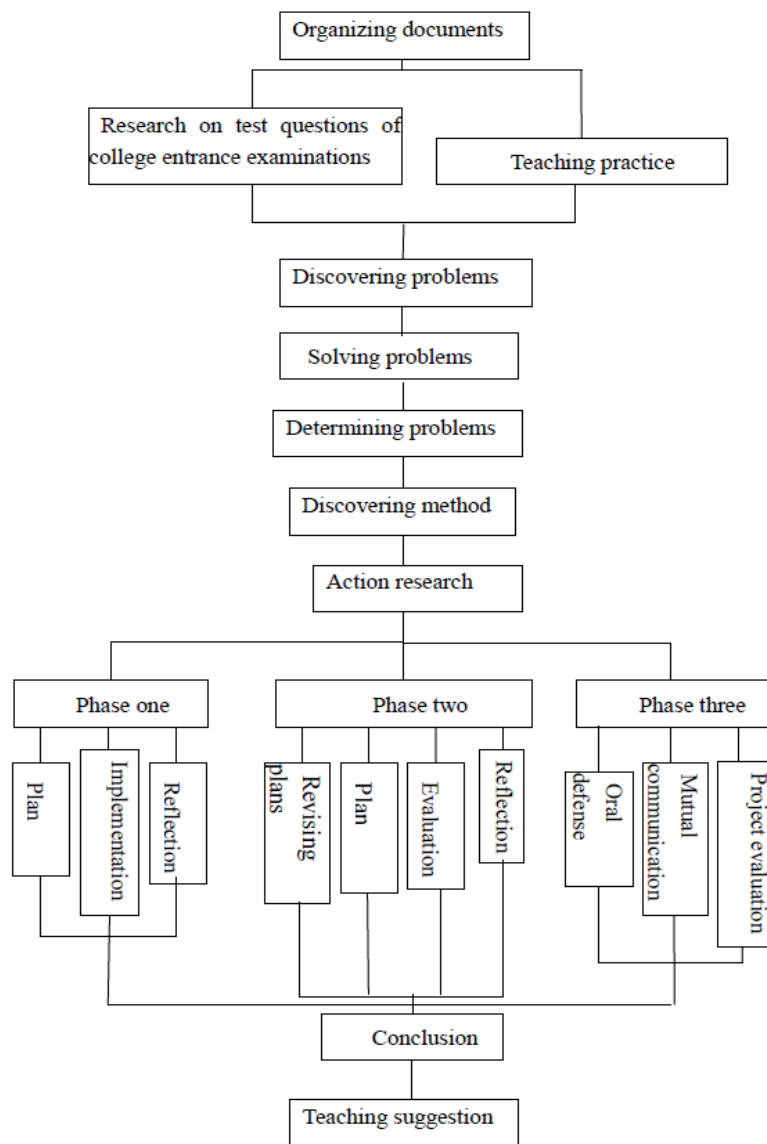


Fig. 1. Flow chart of course development.

III. ACTION RESEARCH PROCESS, RESULTS AND DISCUSSION

A. The First Round of Action Research

1) *Posing a problem:* The research object of this course development is the students in the second year of H middle school in Zhejiang province. The students in this school have a poor foundation and lack of motivation in geography learning. However, due to the situation of college entrance examination, a considerable number of students still choose geography in their college entrance examination. Based on the above background, the authors find that indoor classroom learning cannot attract students' interest, nor can it meet the requirements of the new college entrance examination, or cultivate students' inner core qualities of geography. Therefore, it is decided to quote the geographical things around students and develop the curriculum resources related to geography, including a series of humanities, natural and regional sustainable

development curriculum resources. On the one hand, the Tangxi ancient town is only 10 kilometers away from the school, with convenient transportation of many buses going directly there. On the other hand, the students of this school have a good understanding of the ancient town and have visited it. Therefore, the development of curriculum resources of this ancient town can help students understand the beauty of the ancient town.

2) Drawing up a research plan

a) *Activity preparation:* On the basis of the voluntary principle, the teacher made appropriate adjustments. The class was divided into 4 activity groups (5-6 members per group). The two leaders were elected from each team and the task of field trip needs to be assigned to the groups. Its contents include the development status of the ancient town, the history of the rise and decline of the canal, the cultivation of Tangxi Loquat, and the development of the Chaoshan mountain scenic area. Details are shown in "Table I".

TABLE I. SUB-CURRICULUM OF THE TANGXI ANCIENT TOWN CURRICULUM DEVELOPMENT

Types	Economy		Transportation	Tourism culture
<i>sub-curriculum</i>	First, analyzing the favorable conditions, production characteristics and problems of tang-planted Loquat; Second, thinking about how to realize the sustainable development of Tangxi Loquat.	Exploring the rise and decline of Tangxi ancient town and understanding the life of villagers in the ancient town.	First, making a brief analysis of the role of the grand canal in different periods and the reasons for its decline; Second, analyzing the development direction of the canal.	First, understanding the current situation of the development of the Chaoshan mountain scenic area, and putting forward the tourism development and planning scheme.
<i>Mainstay</i>	These should be according to the basic knowledge and curriculum standards			

b) Implementation steps

- Assigning inspection tasks

The teacher can introduce the goal and the task of this field investigation activity and completes the propaganda work so as to stimulate the participating enthusiasm of student within half of the class time.

- Clearing matters for attention

The student safety education should be strengthened to emphasize student safety in the field investigation. Students are required to observe discipline and traffic rules; actively participate in activities make timely record; carefully collate the data and presented the results in groups in the end. There should be a reward system for outstanding teams.

- Determining inspection route
- Field investigation

Students should be the subject and teachers act as guides and provide necessary help for students.

- Achievements display and communication

Results were presented in a variety of ways, including survey reports, essays, and interpretation of landscape pictures and editing video, to show the beauty of the ancient town that students feel with hearts.

c) *Carrying out actions:* The action was set on a weekend day, with a total run of about half a day. Students assembled at the school and arrive at the Tangxi Ancient Town by bus, after which they began the research activity in groups.

d) *Practical observation and reflection:* Some achievements have been made at this stage of action research. In the process of carrying out geographical practice activities, students stimulate their interest in learning, discover geographical things in life, and experience the real geographical situation around them. But there are many problems, which are mainly as follows:

- Teachers don't know enough about students' learning. Although students in the second year of senior high school have a certain basic knowledge of geography after a year of study, they have never participated in field geography practice activities. Therefore, some

of them were seriously distracted and forgot their tasks, thus wasting a lot of time.

- The teacher's professional knowledge of geographical science is not solid and the preparation of the content of practical activities is not sufficient, therefore the content beyond the preset cannot be well explained. Practical tasks are too broad for students to operate easily.
- The activity organization of the practice is not reasonable. In the process of organizing activities, teachers fail to give effective guidance, which leads to students not being very clear about their tasks and not knowing how to start.
- The half-a-day period of practical activity is too short. Due to the large number of activities designed, it is quite difficult to complete all the tasks in half a day's time when students regard the implementation of geographical practice activities as a play and do not pay attention to it.
- The level of students' practical ability in geography has not been evaluated fairly and objectively. Some students were very active in the process of carrying out this practical activity. They observed and investigated according to the task requirements, and then completed the task list. However, since they are group-based learning community, the performance of the team members was not assessed.
- The results are not satisfactory. The completion of the practical task list is not optimistic, and only part of the contents are sparingly filled up. To cope with the task assigned by the teacher, some groups just casually wrote a few words unrelated to the topic to have a muddling through.

B. The Second Round of Action Research

1) Modifying the action plan

a) Relearning geographical knowledge to increase knowledge reserve: First of all, the organizer consulted materials and books, discussed problems with geography teachers, and consulted local teachers and other teachers in the geography group, so as to relearn knowledge related to geology, geomorphology and the organization of geographical practice activities in advance. Secondly, the organizer communicated with the group leader to understand the practical difficulties students encounter in the process of completing the task. Then, in the process of geography group lesson preparation, the opinions and suggestions of the geography group teachers were listened to. In view of the above problems, program design, organizing activities and homework design were modified and improved.

b) Teaching tasks were carried out in batches and sufficient time was reserved for students: The students did not complete the relevant records and descriptions during the implementation of the first action and practice due to the large number of tasks and tight time. Therefore, before going out to practice activities, first of all, the teacher should consult relevant materials online, and supplement the basic knowledge in class. On the other hand, the teacher must be really involved and the task should be divided into two sessions. The sub-curriculum of the economy is supposed to be completed in the first session and that of transportation and tourism culture in the second, to make sure the time is sufficient.

c) Modifying sub-curriculum tasks to make them more explicit (see "Table II").

TABLE II. SUB-CURRICULUM OF THE TANGXI ANCIENT TOWN CURRICULUM DEVELOPMENT

Types	Economy	Transportation	Tourism culture	
<i>sub-curriculum</i>	1. Analyzing advantages of Tangxi in Loquat planting in combination with the local natural geographical characteristics. 2. Visiting local farmers to understand the production characteristics and problems in the growing process of Loquat. Discussing how to realize the sustainable development of Tangxi locate based on the present situation of Tangxi locate production,	1. Consulting materials to understand the rise and decline history of Tangxi ancient town and its reasons. 2. Investigating the main living conditions and main economic sources of the names of the ancient towns and villages.	1. Making brief analysis of the role of the grand canal in ancient and modern times and the reasons for its decline 2. Taking a boat ride and enjoying the scenery along the canal 3. Giving reasonable suggestions for the development direction of the canal	1. Consulting materials to understand the characteristics and development status of the Chaoshan mountain scenic area. 2. Investigating the tourism development and planning direction of the scenic area in the past five years.
<i>Mainstay</i>	This should be according to the basic knowledge and curriculum standards			

2) *Field trip:* The first session of students was sent to complete the tasks of the course on economy in various ways, such as communicating with Loquat farmers, visiting Loquat production bases, and understanding the types and

sales of locating products. While visiting the Tangxi ancient town, students observed the living conditions of local villagers and exchange with each other about their findings.

The second session of students was sent to complete the tasks of the course on transportation and tourism culture in two groups. The first group cruised along the Beijing-Hangzhou Grand Canal from Wulinmen wharf to the ancient town to observe the water quality of the canal and the vegetation landscape on both sides. The second group went to the cushion mountain scenic spot management committee to understand the characteristics and status quo of the development of the scenic spot and observed the infrastructure construction around the scenic spot.

3) *Practical observation and reflection*: The second practical attempt of action research has made great progress compared with the first one. Students' geographical practice ability, comprehensive thinking ability and the team awareness and cooperation awareness formed in such

learning process have been well reflected. Students' enthusiasm to participate in geographical practice activities has been significantly improved, which is mainly reflected in the orderliness of group activity and improved degree of participation in each group.

In the first stage of practice, random evaluation, instead of objective and fair evaluation was given to students in the process of practical activity guidance, which did not play an encouraging role. In the second stage of practice, some literature standards were referred to and corresponding evaluation standards were selected with the help of other teachers in the geography group, including self-evaluation and objective and fair evaluation of students by members of the same group. The standards are shown in "Table III".

TABLE III. EVALUATION OF LEARNING RESULTS MADE IN THE RESEARCH ON "TANGXI ANCIENT TOWN" [6]

Evaluation content	Evaluation criterion	Self-evaluation	Group evaluation	Teachers' evaluation
<i>Material</i>	A. Complete data, clear division of labor in the process of collecting data			
	B. The data are relatively complete, and the team has a reasonable division of labor in the process of collecting data.			
	C. The data are incomplete and scattered, and the division of labor is not clear in the process of data collection.			
<i>Report</i>	A. The reports are diversified in form and substance in content, with pictures and explanations. Supplementary contents are provided by group members in effective response to the questions of other students.			
	B. The report form is single, the content is not sufficient, and the focus is not prominent. There were few supplements in the group, and they were able to answer a few questions.			
	C. The report form is single, and the report content is off-topic, simple and unfocused. There are no supplementary contents in the group and no additional questions can be answered.			
<i>Written report on learning achievements</i>	A. The written report is neatly written and organized, with diverse contents and forms, and completed by each team member.			
	B. The written report is neatly written and not well organized, which is completed by a few team members.			
	C. The written report is neatly written, unorganized and completed by a single team member.			
<i>Score</i>				

^a Instructions for completing the evaluation form: The full mark of the evaluation form is 100, and each item has three grades: A represents 30 points; B represents 20 points; and C represents 10 points. The comprehensive grade of 80-100 is excellent, 60-79 qualified, and below 60 unqualified [6] [7].

4) *Excellent achievements display*: Sub-curriculum on Tangxi loquat

a) *Favorable natural conditions for Loquat planting in Tangxi*: Natural factor: Located in Hangjiahu plain, Yuhang district of Hangzhou city has a typical plain water network area, dotted with rivers, lakes and ponds. The soil is deep and fertile. The sufficient heat, moderate rainfall, long sunshine during the growing season all provides favorable climatic conditions so it is especially suitable for the growth and development of Loquat.

Socio-economic factor: Yuhang has a long history of cultivating loquat with rich experience. According to historical records, as early as in the Sui dynasty Tangxi began to plant Loquat, so fruit farmers have rich experience; Tangxi has convenient river and land transportation, with multiple expressways, national highways, provincial

highways leading to Hangzhou, 15 kilometers away and water buses can reach Wulinmen directly from Tangxi ancient town; Famous for its high popularity and good quality, Tangxi Loquat is a local characteristic product enjoying historical reputation at home and abroad.

b) *Production characteristics and conditions of loquat*: Fruit farmers in Tangxi area have selected and bred a number of fine varieties including three major ones — "Ruantiaobaisha", "Dahongpao", "Jiajiao", "Yangdun", "Baozhu", among which the variety "Ruantiaobaisha" rivals the best, and it is worth the name of gem in loquat and quality variety of national treasure. The production situation in recent years is shown in "Table IV".

TABLE IV. PRODUCTION OF TANGXI LOQUAT FROM 2015 TO 2018

Time	Cultivated area	Yield
2015	15000 mu	5000 ton
2016	15000mu	1000 tons
2017	15000 mu	5500 tons
2018	15000 mu	3900 tons

The Loquat produced is generally sold in three forms. The first is centralized sales. There are three centralized sales blocks from Tangxi town and one near Linping Mountain. The second is combining with Agritainment. The Tangxi Loquat festival is held in May every year. At this time, local farmers will recommend 25 Loquat picking points and draw up an electronic map of Tangxi Loquat picking for the convenience of tourists. The third is selling to fruit merchants and retail supermarkets in Hangzhou.

From 2015 to 2018, the yield of lookout was not stable, especially in 2016 when the yield dropped to the lowest value. In 2016, Hangzhou was hit by a severe cold wave, which led to a huge reduction in the production of Loquat, causing heavy losses to fruit farmers and a loss of 4,000 tons of Loquat. With the decrease of production, the price will rise correspondingly. The price of Loquat in 2016 and 2018 is much higher than that in the same period.

C. The Third Round of Action Research

On the basis of the first two rounds of action research, students' geographic practical quality has been continuously improved, their understanding of the course content deepened, and the materials and information obtained have also been increasing, so the third round of action research has been carried out:

1) Oral defense of students

Student 1: Can Loquat be planted in the north?

Answer: Loquat likes light, warm climate and soil with moist and well-drained fertilizer, and is slightly tolerant of shade. The slow-growing fruit is slightly cold-resistant, but not for severe cold. Since the temperature can drop to below 0°C in North China, it is not suitable for loquat planting there.

Student 2: Do people in North China have access to loquat?

Answer: Yes. But it won't be much because Loquat is a fresh fruit, and not easy to preserve.

Student 3: Why did locate yield in 2016 decline so dramatically?

Answer: In the winter of 2016, Hangzhou was hit by an extremely cold air, which caused flowers and fruits to be frozen, and the continuous freezing rain aggravated the problem. The early spring and cold spell in late spring, made the situation of Loquat even worse, and greatly reduced production.

Student 4: What can be done to resist cold wave and ensure stable yield of Loquat?

Answer: First, smoking can be adopted to prevent frost. Smoking can also be used to resist cold in cold waves in

winter. Second, part of the seedlings can be covered by greenhouses to increase the temperature and resist cold. Third, better seeds can be cultivated to enhance the ability of tree species to resist low temperature and cold wave.

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2) *Discussion on the sustainable development of Tangxi Loquat*: First, cultural connotation should be excavated to roll out various tourist routes, including beautiful countryside tour, intangible cultural heritage parent-child tour and ancient town cultural tour so as to attract customers from afar. Second, technological revolution should be a guide. On the one hand, the Internet can be made use of to draw an electronic map for Agritainment in Tangxi, for the convenience for tourists to navigate with one key. On the other hand, technology can also be used to keep locked fresh longer. Third, the fruit should be treated with intensive processing to develop its nutritive value and prolong the production chain. Products can be Loquat leaf extract and Loquat wine, etc. Fourth, fine varieties should be cultivated to improve its ability of frost resistance and damage resistance. Fifth, publicity should be strengthened to improve the popularity of Loquat, so that it can be sold overseas with the improvement of transportation and refrigeration technology.

3) *Course evaluation*: The content of this course is very close to the life of students. There are Loquat gardens at the home of some students, and they are very familiar with the production of neighboring loquats. They are familiar with the concept of planting, packaging, marketing and their parents' concepts, which is conducive to their in-depth understanding of the whole Tangxi Loquat industry. After knowing that the grape was planted around the chosen mountain, Students realized that the category and acreage of agricultural products are decided by the market. They searched data and analyzed the locational conditions of Loquat growth with the knowledge of geography they had learned. On this basis, they had a clearer understanding of the Loquat planting they were familiar with and the development trend of the lookout industry in the future. They realized that many unstable factors existed in the planting and marketing of Loquat at present, and the economic benefits of planting Loquat were extremely unstable. To solve these problems, the students used their knowledge of geography to discuss positive solutions and give suggestions for the construction of their hometown. In the defense link, the students answered the questions reasonably, indicating that they had done a lot of preparation work in private. Through the learning in this process, students have been trained to acquire and analyze information, which not only improves the ability of combining theory with practice and solving practical problems, but also exercises the spirit of bearing hardships and standing hard work.

IV. CONCLUSION AND SUGGESTIONS

A. Conclusion

The purpose of this research is to enable high school students living a repetitive life every day to go out of the school to comprehend and understand the geographical phenomena and knowledge around them, and then use the perceived geographical things to learn and comprehend the geographical knowledge in books, so as to improve students' interest in learning geography. Its significance is mainly reflected in the following aspects. First, through the action research on the cultivation of students' practical ability of geography, the cultivation of students' practical ability of geography and the relevant research on action research carried out by geography teachers have been enriched. Second, the high school geography classroom teaching has been optimized. The situational teaching method is used to integrate students' emotions, implement the requirements of paying attention to the cultivation of students' practical ability of geographically proposed in the new curriculum standard, and implement the core quality of geography.

Finally, according to the objectives and requirements of the activity, courses, four geography and field practice courses were developed, namely, "Exploring the beauty of ancient towns and feeling the Jiangnan Watertown", "Development of Tangxi Loquat industry", "History of the rise and decline of the canal" and "The Chaoshan mountain scenic area". Among them, the course "History of the rise and decline of the canal" are presented in the form of landscape pictures, in combination with text and video commentary; "Exploring the beauty of ancient towns and feeling the Jiangnan Watertown" and "The Chaoshan mountain scenic area" are presented in the form of investigation report; and "Development of Tangxi Loquat industry" is in the form of investigation reports and defense and questions.

Due to the author's lack of knowledge and ability, in the development of field practice courses, the designed courses also had some shortcomings, such as relatively single content and insufficient in-depth excavation. The ability to control practical activities is insufficient. Meanwhile, the evaluation of students' practical ability is subjective and lacks of more detailed quantitative evaluation.

B. Suggestions

Therefore, in order to overcome the above problems, suggestions are as follows. First, the comprehensive quality of geography teachers should be improved, especially for the study of geographical theory knowledge. The comprehensive quality of teachers determines whether the field practice can be carried out well. Second, both the geography teachers and the school leaders should implement the new geography curriculum standards, strengthen the development and utilization of geography curriculum resources, and provide support for the development of activities.

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