Abstract

Scientific research education is the common pursuit of schools of higher education in China. This education mode greatly promotes the scientific research and talent training in colleges and universities. From the perspective of psychology, this paper probes into the psychological acceptance mechanism of scientific research education, and identifies the influencing factors of this education mode. First, the origin and features of scientific research education were introduced based on relevant literature. Then, a questionnaire survey and an interview study were carried out in four universities, Guangdong, China, by random sampling. Through data analysis, it is concluded that many students with high academic degrees are fully aware of and deeply involved in scientific research education; however, the teachers have not done enough to promote the students’ interests and motivations in scientific research, failing to recognize the importance of scientific research education based on the students’ psychological demand; undergraduates and master students hold that scientific research education is mainly affected by teaching attitude and style, as well as college policy and environment; doctoral students consider the cognition and attitude of students as another influencing factor of scientific research education. This research opens a new direction for improving scientific research education.

Key words: Scientific Research Education, Psychological Acceptance, Influencing Factors, Higher Education.

INTRODUCTION

Being the creative work of the system type, scientific research, its achievements are making more and more contribution to the society. Together with the more attention the society put on the scientific research, the higher institutions, as the battle fields, have done the same thing with the situation of “Both the higher institutions and the faculty doing scientific research” which caused the marginalization of the talents cultivation and the weakening of the education functions. Thus, the scientific research and the education work in the higher institutions are separating for the different directions. “Scientific Research Education” was first seen in January of 2015 from the important guiding documents of the central government on higher education and there was a systematic research on the mechanisms and functions of scientific research education.

Scientific research education has a certain historical origin. University scientific research was coming into being together with the formation of the higher education system. At the early 19th century, studies on the university scientific research were conducted aboard, and the rising of the university scientific research activities led to the arguments on the university functions by the scholars. Gasset thought that as cultivating the common people to become the professionals and culture spreading (Warner and Burkley, 2006). Jaspers pointed out that universities should cultivate the scientific attitudes of the students (Wallerstein, 2011). In China, the research on the scientific research functions of the higher institutions can be classified into three kinds, the one on the history...
research of the western universities, the one on the history research of Chinese universities and the one on the influencing factors to the universities scientific research issues (Quick et al., 1987). It was discovered through research that almost all the papers in China and abroad are on the relationship between scientific research and education, and the influencing factors of the scientific research education, but there are few challenging that from the angle of psychological acceptance by the receiving party (Gates and Arthur, 1934).

Based on the above analysis, this paper presented a simple definition of scientific research education and introduced its dominant mechanisms and analyzed the main processes and rules of the psychological acceptance adopting the method of questionnaire. The results showed the current situations of psychological acceptance on the scientific research and the influencing factors of the psychological acceptance on the scientific research education. It is hoped that this paper can provide a reference on the effectiveness improvement of the scientific research education in Chinese universities from the perspective of psychology.

ORIGIN OF THE SCIENTIFIC RESEARCH EDUCATION AND ITS MECHANISM

Scientific research education

Scientific Research

SR (Plattner and Moagi-Gulubane, 2009) short form for scientific research, normally it refers to the series of activities including the investigations, experiments, trial manufacture that were adopted to know the intrinsic nature and movement law of the objective things by using the SR means and equipments in order to provide the theoretical basis for the creation and invention of new products and new technologies, and its basic task lies on the exploring and acknowledging the unknown.

Education

Educating people means cultivation from the moral, intellectual, physical and aesthetic level to fully develop the receivers’ abilities in all aspects for the society needed talents who are mentally and psychologically healthy (Deal, 2002).

Scientific Research Education

Scientific research education (Ennsand and Zerbe, 1994) is the organic combination of scientific research and education. It refers to the teachers should treat the SR as the carrier and interwork with the education to cultivate the students’ characters, personalities and moralities during the SR activities.

Psychological Acceptance Mechanism of scientific research education

Mechanism refers to the organic construction, function and interaction, which used to be for machines but now for a work system in a general sense (Russ, 1978). Psychological acceptance mechanism of scientific research education (Santiesteban and Koran, 1977) refers to the method and mechanism out of the interactions and intersections by the elements from accepting the processes and that from the receivers’ psychological structures.

Origin of the scientific research education Mechanism

Education Mechanism during the SR processes

SR is a process of innovation and creation, but it requires extraordinary courage to face the challenges during the process because the SR is unknown. The pioneering spirit of innovation of the students can be cultivated through SR. SR is not accomplished overnight, and one theory might experience many challenges and numerous experiments, repeated proofs before it is established, then, the staff ought to focus on the process rather than the results. It requires the wholehearted input and concentration which could develop the spirits of hardworking and dedication of the students. There are a lot of procedures during the SR activities, then, it is a demanding task and tolerates zero carelessness and perfunctoriness, seeking truth from facts. One man’s power is limited and he/she needs the cooperation and support from others of the team so as to achieve the great success. Thus, SR can also cultivate the students for their scientific spirit and collectivism from the team work and cooperation.

Education Mechanism of SR Methods

Correct methods guarantee the success of SR. The general methods include analyzing, synthesizing, generalizing and deducing, but any of them will require the researchers actively
learn the principles and theories to put it into SR practice with a reasonable choice during which process the students can expand their knowledge and foster the overall planning ability, logical thinking and practical competence.

*Education Mechanism of SR Results*
During the whole process of SR, the results management and application plays an important role. Eliminating the false and retaining the true is the guideline for the results which also reveals the objective law of the things development. The above will help the students to respect the nature and form the correct outlook on life, world and values.

**ANALYSIS ON THE PSYCHOLOGICAL ACCEPTANCE MECHANISM AND INFLUENCING FACTORS OF SCIENTIFIC RESEARCH EDUCATION**

*Research on the psychological acceptance mechanism*

**Receivers’ psychological acceptance process**

(1) Psychological structures of the Receivers

The individual psychological structure is composed by the psychological process and individual psychology. And, the psychological process includes the cognition, emotion and volition (Bums, 1989) with the continuity. The individual psychology is what an individual experienced with the intricate situations and jointly affected by the living conditions and education status. Scientific research education is a dynamic process among the controls, contents, receivers and environment. The key point of the scientific research education lies on the receivers’ acceptance process which is a series of psychological changes. Then, it is very meaningful to study the cognitive rules, personality and psychological status of the receivers.

(2) Receivers’ psychological acceptance process

The process of the Receivers’ psychological acceptance can be summarized as follows: 1> Message observation – the external stimulus and the internal demand are the two factors that influencing the observation, and the proportion of these two factors should be adjusted combining the actual situations to realize the effects optimization of the scientific research education; 2> Message Retaining – normally people will retain the interesting messages to a longer time, besides, the enduring external stimulus and intensification will also strengthen the message retaining by the individuals. Thus, consolidating the educational contents of the SR education in a proper way can enhance the message retaining by the receivers and do good to the future acceptance; 3> Message Acceptance – an important part to realize the purpose of SR education. According to the self-experience and cognition, the receivers will understand, integrate, filtrate and finally accept the educational message most fit or needed. It requires the educators to emphasize the importance of the SR education and conduct the education differently as per the development requirements of the students; 4> Psychological Internalization – an important part restricting the effects of SR education. Combining the received educational messages and the original cognition, the receivers will set up a new cognition structure and transfer it into inner value orientation; 5> Behavior Influencing – the newly formed cognition will affect the original one which will lead to the new attitudes on the things and influence the behaviors against the stuff in the end.

*Rules on the psychological acceptance for the SR education for the Receivers*

(1) Motivation Rule

It is thought by the psychology that the motivation is the intention or aspiration which drives people to do the things, and the studies on the motivation rule of the receivers will promote the receivers to actively engage in the process of SR education. Needs are the motive power of the motivation for the receivers to accept the SR education whose purpose is to cultivate the personal integrity, ideology and morality of the students. The individual needs will directly affect the acceptance effect, then, the inner needs of the receivers should be emphasized and stimulated during the process of SR education.

(2) Individuality Rule

As a significant part of psychological activities, individuality is the summation of the tendentious psychological characteristics from the individuals and will be reflected through the behaviors, languages and emotions which will influence the life, studies and work greatly of the individuals. Under the people oriented political and economic environment, individuality cultivation and respect should be more
considered by the SR education.

(3) Polynomial Rule
Polynomial Rule perceives that both the educators and the receivers, receivers and other receivers are all equal and the communication and interaction between and among them should be emphasized. It is also worth stressing that the subjectivity and core status of the receivers as well as the interactivity of the SR education, that is, the SR education ought to lay attention on the interactions between the educators and receivers instead of the simple indoctrination education.

Status Survey on the Psychological Acceptance of the SR education
To better understand the psychological acceptance situations, this paper conducted a questionnaire survey and one interview study at four universities in Guangdong province by means of the random stratified sampling. In total, 872 questionnaires were given out and 854 were regained with the efficiency of 97.9%. Figure 1 indicates the academic degrees of the students and it seems that postgraduates ranks first.

Figure 1. Survey student education

Figure 2. Students with different academic qualifications have participated in research projects

![Figure 2](image)

Students participation in the SR
Figure 2 indicates the participation situation and results for the students with different academic qualifications in the SR. It shows that with the upgrade of the academic degrees, the chance for the SR project involvement increases. The smallest percentage of 5.2% comes from the undergraduates. Figure 3 shows the time spent on the SR projects by the students, and it can be seen that more doctoral students than postgraduates are spending all day time on the projects. That means the higher the academic degree is, the deeper project participation will be. Taking the interview outcome into consideration, the most common task allocated to the students is materials collecting and sorting which testifies the low level involvement of the majority students in the SR projects. With the high academic degrees, some students were given the task of drafting the test report.

Figure 3. Time survey results of students participating in research projects

![Figure 3](image)

Psychological motivation of the receivers from the SR education
The Table 1 shows the survey results on the understanding situations towards the SR
education. It is obvious that the students with higher academic degrees will have a better understanding on the SR education compared with the undergraduates who do not understand or even more (24% in total). That indicates the undergraduates will have few chance in the SR projects and the majority participants still go to the postgraduates and doctoral students.

Figure 4 shows the receivers’ motivation in participating in the SR projects. A stands for the SR achievements and more job opportunity; B stands for the knowledge seeking and unknown things breaking; C means the task fulfillment and assessment passing; D means the technical innovation and society serving; E stands for other reasons. It can be seen that option C and A distinguished themselves with the percentages of 63.2% and 52.4%, which proves the utilitarian mentality of the students in the SR projects and they are in the status of passive receiving during the process of SR education.

Figure 4. Research and education to accept the motivation of the subject to participate in scientific research projects

The methods for the Teachers ideology and morality during the SR activities

Figure 5 shows the results as described above, and it is obvious that behavioral demonstration and oral criticism education are more selected for the ideology and morality work by the teachers during the SR activities. Recalling the interview results, it is noticed that the emphasis of the ideological and moral education is on the SR methods and techniques as well as the academic integrity, not much attention on the targets and motivation of the SR activities, instead of illustrating the importance of the SR and SR education from the perspective of students’ psychological needs.

Figure 5. Teachers’ ideological and moral ways in scientific research activities

Analysis on the influencing factors of psychological accepting the SR education

Figure 6. Main factors affecting the effect of scientific research

| Understanding level      | Undergraduate | Postgraduate | Doctoral student |
|--------------------------|---------------|--------------|------------------|
| Very understand          | 10%           | 18%          | 25%              |
| understand               | 30%           | 37%          | 40%              |
| Partial understanding    | 36%           | 36%          | 31%              |
| Don’t understand         | 21%           | 7%           | 4%               |
| Very do not understand   | 3%            | 2%           | 0%               |

The methods for the Teachers ideology and morality during the SR activities

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Figure 6 shows the main factors affecting the SR education, and it is the case that the different academic degrees will have the differed opinions about the factors. Undergraduates and postgraduates hold the idea that the attitude and style of the teaching staff and the policies and environment of the universities are the main factors affecting the effect of the scientific research education, but the doctoral students believe that there is a third factor of cognition and attitude of the students. This is not only because the doctoral students get involved in more projects with deeper understanding, but also their higher cognition towards the SR and SR education.

CONCLUSION

SR education is out of the inner requirement for the higher institutions development in China. To better improve the effectiveness of the SR education in the higher institutions, this paper conducts the survey on the psychological acceptance mechanism and its influencing factors of the SR education. Here comes the conclusion as listed below:

The psychological acceptance process for the receivers on the SR education can be classified into five stages, that is, Message observation, Message retaining, Message acceptance, Psychological Internalization and Behavior Influencing. The major rules for the receivers’ psychological acceptance are the Motivation rule, Individuality rule and Polynomial rule.

With the promotion of the academic degrees, the students involvement and understanding towards the SR activities will go larger and deeper; Meanwhile, their cognition about the SR education will increase. The educators paid less attention on the targets and motivation of the SR activities and they did not declare the importance of the SR and SR education from the perspective of students’ psychological needs.

Different academic degrees will have the differed opinions about the factors. Undergraduates and postgraduates hold the idea that the attitude and style of the teaching staff and the policies and environment of the universities are the main factors affecting the effect of the scientific research education, but the doctoral students believe that there is a third factor of cognition and attitude of the students.

Acknowledgement

Dalian University of Technology “Three complete education comprehensive reform theory research special project” (SQYR201907).

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