

# Reflection and Reconstruction of University Scientific Research Function

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**Abstract** The principle of “teaching combining with scientific research” posed by Wilhelm von Humboldt in HU Berlin can be regarded as the start of the scientific research function of university, the scientific research has different status and role in different time’s university. However, the reality of university research and Humboldt’s ideal fall into a difference world. Based on the analysis of scientific research’s value orientation, this paper argues that the value demand of the socio-economic environment and the value choice of the scientific research in university is the main reason for the alienation of research and education in today’s university, and universities should attach importance to the educational nature of scientific research. Besides, the scientific research of university should take nurturing creative talents as the first function, meanwhile, undertake the other two functions: developing knowledge and serving for the social progress and economic growth.

**Key words** University; Scientific research; Educational; Value orientation

## 1 Introduction

With science and technology having a stronger and stronger influence on the development of productive forces, university scientific research is playing a more and more important role in economic growth and social development. When the scientific research of modern university displays its function in knowledge innovation and social service, it is gradually deviated from Humboldt’s ideal of teaching combining with scientific research, even appears the conflict of teaching and research in some teachers’ individual behavior. Therefore, it’s both necessary and beneficial to review the research function of university.

In the study of university research function, the relationship between teaching and scientific research has been hot issues in higher education. Study abroad is quantitative-based, through quantifying the indicators like teaching effectiveness, research results, the time of teaching and research, published papers, teacher reward and so on to carry on statistical analysis; China is mainly from the aspects of qualitative to study the relationship between teaching and research, and that the two should be harmonized and coordinated development. For instance, there are researchers based on the viewpoint of teaching combining with scientific research, put forward that scientific research back feeding teaching work should be implemented in the current university and to establish appropriate security system (Li Changzu & Feng Wen, 2009).

Different from these studies, this article focuses on the relationship between scientific research and education, and from the analysis of scientific research’s value orientation to find the reason for the alienation of university research and personnel training, in order to reconstruct the educating function of university research.

## 2 The Formation and Development of University Scientific Research Function

### 2.1 Before the 19th century: scientific research is the subsidiary activities of teaching

After the 11th century, university appeared in the Middle Ages based on the city rise and public class development. The prototype of Medieval University is the scholar guild; its main goal is not teaching activities and personnel training. Scholars’ primary purpose is to study and disseminate the profound knowledge, they engaged in religious or philosophical research, which is separated from the social reality. In the second half of the 14th century, the Renaissance, which takes promoting the liberation of humanity as the core, started in Italy. This ideological and cultural movement has had a broad and far-reaching impact on development of literature, art and science. In this environment, university started to focus on nurturing “new human”, “it is the overriding goal of university education to nurture the person with full of human nature and cultural qualities, becoming ‘gentlemen’ and ‘ruler’ ” (Zhang Yingqiang, 2000), and most of academic research is transferred to university’s outside, the specialized organizations and agencies. Therefore, outside the university, Natural Science Research during this period presented unprecedented achievement, but in the university, the scientific research

mostly is the spontaneous individual activities, the subsidiary activities that integrated in the teaching process for teaching service.

### **2.2 In the 19th century: scientific research to combine with teaching**

In the early 19th century, William von Humboldt founded the landmark HU Berlin in Germany, proposed the idea of “teaching combining with scientific research”, hold the point that science is the best means to cultivate people’s mind and spirit, and teaching is a process that needs both the teachers and students to participate in for study and exploring the truth. He pointed out that the professor’s main task is not to “teach” and the students’ main task is not to “learn”; students should engage in “research” independently, while Professor should to inspire students’ “study” interest, and to further guide and help students to do “research” work. For this reason, Hu Berlin, based on the cultivation, made scientific research as the first task of university, requiring that the teacher must be good at finding and transferring the knowledge, and teach the creative thought and the first research material, meanwhile, pass on the academic research methods and guide together. This educational philosophy soon affected other German universities, becoming its development direction.

Although the great British liberal education advocates---Newman, did not agree to give a main place for scientific research in university, he thought that universities should rely mainly on teaching, “it can not an excuse to fulfill the mission of the university, scientific research does not belong to university’s own goals, because we could immediately think of that there are many others institutions more suitable than the university as the means to explore knowledge of philosophy and expand the limits of knowledge” (John Henry Newman, 1873). However, in the late 19th century, countries around the world follow this model of university to reform the university or establish new universities, since then, the research function of university has been generally accepted, and its status and role have been fully established.

### **2.3 After the 20th century: scientific research to serve the society**

After the 20th century, scientific research has been an important function of American universities, besides, the research universities has occupied the main status in the American higher education system. Johns Hopkins University, the first research university of the US, is founded in accordance with HU Berlin, emphasizing scientific research as the core of university, and according to Humboldt’s idea of “the combination of teaching and research”, a strong graduate school is established. However, different from German universities, American universities pay more attention to the practical value of scientific research, not only setting up a large number of practical courses, but also making scientific research be closely linked to production and life for cultivating practical talents and developing useful knowledge. The Wisconsin thought is the typical idea of American universities, it advocated that the university not only has the responsibility to provide traditional education, should also carry out scientific research to promote the development of new agricultural and industrial. When Charles Van Hise was the president of University of Wisconsin, he had clearly stated that universities should “help bring knowledge to the general public”, “serve for the state”, and “service should be university’s only ideal”.

Enter the 1950s, the US established a set of “education, scientific research, production” as one university-centered economic zone, since then, university’s function expands from personnel training, scientific research, to directly serving the community. This “science in the service of society” concept had a profound impact on the world higher education, and American universities become a model for other countries to follow because of its leading position in research and academic aspects.

## **3 From Concern to Alienation: Reflection on University Research Function**

Seeing from the formation and development of university scientific research function, the principle of “teaching combining with scientific research” posed by Humboldt in HU Berlin can be regarded as the start of the scientific research function of university, However, when “teaching through research” evolved into “scientific research serve the society”, it can be said that university’s scientific research already becomes very different with Humboldt’s ideal.

### **3.1 Humboldt’s ideal: to serve the human-nurturing**

As a new humanist, Humboldt emphasizes on the training of human rationality and moral, in his view, scientific research is undoubtedly the best means to achieve this goal. So, he advocates teaching through research, training students’ critical attitude on the existing knowledge and the spirit of exploring truth, as to help them use a rational scientific approach to discover new knowledge. Regarding the teaching way, Humboldt believed that “in the university, attending lectures is only the secondary matter; it is more important to enable students work closely with the people who has with the same taste, same

age, and has self-consciously” (Zhou Chuan, 2005), therefore, compared to speaking and listening, the way through academic study to explore the unknown world is more beneficial for training students. It’s worth noting that “scientific research” in Humboldt’s eyes is a kind of philosophical speculation with a taste of “pure science”, that focused on the pure theory research of humanities and social sciences, that is why he opposed to bring those practical knowledge and skills into university education, thought that the university scientific education should not be carried out with a specific and practical purpose, but should be committed to training people’s free exploration spirit for the pursuit of truth. By the impact of Humboldt’s purely scientific concept, until the 1840s, social sciences and humanities has occupied the dominant position in HU Berlin, and the applied research and technical activities that directly meet the needs of society are often rejected.

It can be seen that Humboldt bring science into university is not developing its practical value, but to cultivate people’s mind and spirit, here, scientific research is focused on human and serve the human-nurturing. This is also the original intention of Humboldt to advocate “teaching combining with scientific research”.

### **3.2 Today’s reality: to serve the society**

Unlike Humboldt’s ideal, today’s university research is placed on a big stage to maximize its function of “serve the society”. To some extent, the function of university research to serve personnel training has been weakened.

Undeniably, scientific research is indeed as a means of cultivating people during the beginning period, focusing on the cultivation of people’s mind and character shape, to promote the overall development of human. But when Germany’s university idea spread to the US, the “useful” value that science and technology serve for industrial development has received unprecedented attention. Therefore, compared to humanities and religious theology, the natural and technical sciences which have more practical value become the leading disciplines in modern university, and the science and technology education which is to foster practical talents and develop practical knowledge and skills become very popular. Under this kind of education, “the human” is no longer a human, but “the special tool” of economic development, the university scientific research is more for the labor needs of government and community service, rather than the human development. With the popularization of higher education, University research and teaching not only failed to achieve unity, but also embarked on the opposition, the direction of conflict. Facing this situation, the famous American educator Ernest Boyer proposed a new viewpoint that divides academic research into four types: discovery, comprehensive, application and teaching. He pointed out that different types of universities should shoulder different research mission.

Boyer’s “teaching of academic research” is quite similar with Humboldt’s idea, providing a new way of thinking to resolve the conflict in teaching and research, but failed to stop the growing alienation between the university research and teaching, there are still a lot of criticism and accusations on this issue.

### **3.3 Why alienated: the reason analysis based on scientific research’s value orientation**

Why today’s reality is far from Humboldt’s ideal? Why Boyer’s new view of research can not stop the alienation? For these two issues, I think the reason can be found from the analysis of scientific research’s value orientation.

In general, scientific research with a variety of value, including academic value, economic value, social value and educational value(Gao Xinfu, 2000).The scientific research that Humboldt promoted in HU Berlin is typical of the educational value and academic value. In Humboldt’s ideal, teachers should carry on the “pure science” research which has very high academic value together with students, to achieve the purpose of training “perfect”. However, as science and technology shows an increasingly powerful magic in improving people’s material living standards, the social value and economic value of natural science research becomes evident gradually, the “Pure science” research that only with high academic value inevitably lost its dominant status. Yet, when “scientific research serve the society” was proposed by American university in the 20th century, the focus attention of university research has changed from human development to socio-economic development, the application focus of “teaching combining with scientific research” has also turned from all students to high-level graduate students. Therefore, in the external influence of social and economic environment, to meet the different needs, university scientific research no longer sticks to Humboldt’s ideal, but presents a variety of value orientation.

On the other hand, although scientific research in modern university has all the four values: academic value, economic value, social value and educational value. As the first three shows higher

interests in today's society, professors often put in more effort on those scientific research that can bring more academic reputation, social status and economic benefits. That's why Boyer's new view of research can not stop the alienation.

Therefore, ignoring the educational value of scientific research is the main reason for the alienation of university research and personnel training. This is related not only with the value demand of the university external economic environment, but also with the value choice of scientific research within the university.

## **4 Reconstruction on the Scientific Research Function of Modern University**

### **4.1 Educational: the legal basis of scientific research for the existence in universities**

Objectively speaking, scientific research in the change of university education is a positive reflection of social environment changes, performance that adopts social development, but if research in the university and out of the university research is same, people can not help questioning the existing legitimacy of the university research.

In today's society, institutions engaged in scientific research can be roughly divided into three categories: an independent research institutions, R&D departments and universities. Different subjects have different scientific values, independent research institutions emphasize the scientific value and social value of academic, R&D departments make economic value be the core orientation, and universities have all the values. Universities and specialized research institutions concerned with different objects, just as Newman said, "scientific research institutions outside of university take itself, rather than students as the main consideration", but university concerned training students. Universities and R&D departments are also not be confused, corporate R&D is concerned the recent economic and social benefits, while university scientific research need focus on long-term development of human and society, and economic value is only as a by-product of university research. So, to establish the legality of the existence of scientific research in universities, it must adhere to the educational characteristics of university research, service the target of training university of personnel, and this is also the essential difference of scientific research between the universities and other research institutions.

Therefore, university research is necessary to always grasp the basic principles of educational, serve the fundamental goal of university-trained people. In other words, any research activities that are consistent with the teaching objectives and help personnel training, should be encouraged and supported in universities, while those are inconsistent with and even contrary to the teaching objectives should be condemned and stopped.

### **4.2 The function of modern university research: nurturing human, developing knowledge, serving the society**

Although the university is different from the independent research institutions, but both in the nature of the pursuit of scientific research is the same- knowledge discovery and innovation, and this is also the basis for their legitimate scientific research. Therefore, when university research plays function of teaching people, it can't weaken the functions of knowledge discovery. Of course, in the background of the times today, university research should also fulfill their social responsibilities. In short, the modern university research should take nurturing creative talents as the first function, meanwhile, undertake the other two functions: developing knowledge and serving for promoting the social progress and economic growth.

First, as educational institutions, training is the most essential function of the University, and scientific research should be combined with the goals of training personnel, and that scientific research completely divorced from personnel training should not exist among the University. So, here, university scientific research can indirectly play its function through the service of teaching - through innovative teaching knowledge and improving teaching methods, it can also be directly involved in the training of cultivating research personnel through carrying out a variety of scientific research activities.

Second, the university as an inquiry place, such as Cai said, it should take "Researching Higher Learning" as its mission. Therefore, university research in knowledge discovery and innovation, should not only pay attention to natural science research, but also concerned about the humanities and social science research; it should development applied research that have economic value and social value, but also attach importance to basic research of high academic value.

Third, when providing services for the community, university research should be to maintain certain independence, and take university itself, the long-term development of the nation and the whole of mankind as a starting point, to avoid directly involving in more economic activities, to put more

energy into activities that help personnel development and knowledge discovery.

## 5 Conclusion

The rise and development of university scientific research is the result of that university's idea is becoming clear and university's social function expands gradually, and is a developing process that from serving for teaching only to serving for the advance in technology, the economic development and the social service at the same time. The principle of "the combination of teaching and research" posed by Wilhelm von Humboldt in HU Berlin can be regarded as the start of the scientific research function of university; the scientific research has different status and role in different time's university. Scientific research in modern universities, not only provides services for promoting social progress and economic growth, but combines with the goal of university education to train more excellent talents. Therefore, university research should adhere to its educational characteristics, and serve for achieving the goals of personnel training.

However, to change the current situation that the educational value of university research has become weaker and weaker, it's not a simple thing to deal with the relationship between teaching and research, but need to rely on the joint action of the internal and external environment of higher education system, and guide individual and community pay more attention to the importance of educational research. And establishing a sound evaluation system for university research is an important means to realize it, and it is also a key issue for future studies.

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