

# Doctoral Qualification Examination System Research Literature Review

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**Abstract:** Doctoral education, representing the pinnacle of talent development within higher education, serves as a quintessential showcase of a nation's higher education and research benchmarks. This study undertakes empirical research by examining the evolution and transformation of doctoral qualifying examinations in Western developed countries, while also scrutinizing the pilot initiatives of such examinations in China. The objective is to delve into the implications for doctoral education cultivation in the country, ultimately striving to elevate the quality and international standing of doctoral education.

**Keywords:** Doctoral qualifying examination; Doctoral education

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## 1. Introduction

Doctoral education, constituting the apex of talent cultivation within higher education, epitomizes the aggregate sophistication and depth of a nation's higher educational landscape and scientific research caliber. It bears the profound historical mandate to nurture elite individuals poised to drive societal advancement and national progression, while concurrently assuming the pivotal role of catalyzing national knowledge innovation and fortifying the construction of higher education as a cornerstone for establishing an academically robust nation<sup>[1]</sup>.

During the past 45 years since the implementation of China's reform and opening-up policy, Chinese graduate education has traversed an extraordinary developmental trajectory, achieving historic breakthroughs and progress. This advancement has furnished a solid human resource foundation for the nation's modernization endeavors<sup>[2]</sup>. In terms of the scale of higher education, China now occupies a position among the world's leading nations. Nevertheless, there remain considerable deficiencies in the quality of education and training for high-level talents, such as doctoral students. In 2010, the China Doctoral Quality Analysis Task Force published the "China Doctoral Quality Report", which elucidated that, when compared to the advanced global standards of higher education, Chinese doctoral dissertations exhibit substantial gaps in the literature review, theoretical depth, and original innovation<sup>[3]</sup>.

In the context of globalization, countries encounter increasingly homogeneous challenges and issues. Investigating the doctoral education systems in developed nations holds substantial practical value for China during its phase of social transformation. Western doctoral education, refined over more than a century, has reached a commendable level of maturity. It offers numerous exemplary practices in quality control, with the doctoral qualifying examination being the most critical and symbolically significant institutional guarantee. This study aims to examine the evolution and practical application of doctoral qualifying examinations in higher education institutions within Western developed nations, with a focus on the United States. By critically analyzing their established models and accrued experiences, and subsequently juxtaposing these with pertinent aspects of China’s prevailing doctoral training framework, this research endeavors to discern viable directions for refining China’s doctoral education paradigm during its ongoing social transformation phase. Particular emphasis will be placed on identifying strategies and methodologies that bolster the quality and internationalization of doctoral education.

At present, scholarly inquiry into the doctoral qualifying examination system in China predominantly consists of historical retrospectives examining its evolutionary trajectory. Such studies typically emphasize the compilation and analytical scrutiny of policy documents or the delineation of research advancements within circumscribed domains. These endeavors often exhibit a propensity for speculative and comparative analytical approaches. Given this backdrop, the current research endeavors to conduct a meticulous and systematic review of both domestic and international scholarly findings of the doctoral qualifying examination. This study will concentrate on empirical research trends and evidence-based evaluations, thereby addressing the existing gap in comprehensive reviews within this specific domain.

## 2. Existing research on doctoral qualifying examinations

### 2.1. Research methods

This article adopts a systematic methodological research paradigm that combines thematic analysis and content analysis to systematically review and organize the collected journal literature on the doctoral qualification examination.

#### 2.1.1. Literature collection

The literature selected for this study was sourced from three major Chinese data platforms—China National Knowledge Infrastructure (CNKI), Wanfang Data Knowledge Service Platform, and VIP Information—as well as the Web of Science Core Collection, an English-language search platform. Employing advanced search techniques, a total of 256 academic papers on the topic of “Doctoral Candidates’ Qualifying Examinations” that have been officially published were collected (**Table 1**).

**Table 1.** Literature search queries and results from different databases

Database	Search query	Search results
VIP Information	“Doctoral Student” and “Qualification Exam”, synonym extension	36 Papers
China National Knowledge Infrastructure (CNKI)	Topic: “Doctoral Students” and “Qualification Examinations”	113 Papers
Wanfang Data Knowledge Service Platform	Topic: “Doctoral Students” and “Qualification Examinations”	87 Papers
Web of Science Core Collection	Topic: Doctoral Qualification Examination	20 Papers
Total	256 Papers	

### **2.1.2. Literature screening**

A three-tiered literature vetting process was executed on the 256 documents amassed in the preceding phase. Initially, redundancy was mitigated by employing NoteExpress bibliographic software to remove 85 duplicate articles. Subsequently, leveraging preliminary assessment outcomes, in-depth scrutiny of titles and abstracts ensued for the remaining entries, culminating in the removal of 18 articles deemed extraneous to both the research focus and the discourse on doctoral qualification exams. In the concluding stage, a meticulous full-text examination was undertaken to fortify the precision of this verification exercise. This entailed dividing two exhaustive reviews, during which an additional 14 articles were removed due to their inconsistency with doctoral qualifying examinations or owing to ambiguous propositions. Post-screening, a corpus of 139 validated references materialized, ready for further scholarly exploration.

## **2.2. Content analysis**

The doctoral qualification examination system is an important means for colleges and universities to ensure the quality of postgraduate training, which is widely implemented in the United States, Canada, South Korea, Hong Kong, Taiwan, China, and other countries and regions <sup>[4]</sup>. The doctoral qualification examination is generally conducted during the mid-term of the doctoral program, aiming to evaluate the doctoral students' substantive knowledge and professional academic skills and assess their ability to perform subsequent research. Qualification exams often adopt written, oral, or a combination of both methods, emphasizing the assessment of students' abilities in understanding, application, analysis, synthesis, and evaluation. Qualified candidates have the opportunity to be promoted from PhD students to PhD candidates, enter the research stage of their thesis, and conduct subsequent research <sup>[5]</sup>.

### **2.2.1. Establishment of the doctoral qualification examination system in the United States**

Huang Haigang meticulously examines both the horizontal and vertical dimensions of doctoral education in the United States <sup>[6]</sup>. He contends that, over the years, American doctoral education has undergone numerous transformations in areas such as admissions, curriculum design, qualifying exams, and dissertation requirements. These changes have significantly contributed to the advancement of national science and the cultivation of high-caliber talents, making doctoral education one of the most distinguished components of the American higher education system. As early as the late 1970s, most institutions in the United States began implementing a doctoral qualifying examination system. This exam typically occurs one year after enrollment and does not exceed two years. The content includes two comprehensive exams on foundational theories and one on basic and applied specializations. The format can be written, oral, or a combination thereof. Typically, the failure rate for doctoral qualifying exams at various universities ranges from 10% to 25%, while some prestigious institutions may have a failure rate of 30% or higher. Yang Geng et al. analyzed this high failure rate and suggested that it helps balance the control of doctoral student numbers with quality assurance, thereby enhancing the competitiveness of doctoral students on a macro level <sup>[7]</sup>. The ultimate goal is to cultivate high-quality, high-level talents.

Yang Geng believes that the doctoral qualification examination system in graduate education in the United States is built on the support of its diversified training philosophy and unique campus management and teaching system. It is an inevitable product of quality control for high-level talent cultivation and the ultimate result of the organic combination of social demand and higher education. Wei Huafei analyzed that there are four

main reasons for the formation of the doctoral qualification examination system in the United States: the sharp increase in the number of doctoral admissions, the decline in the quality of doctoral admissions, inadequate external quality control, and the doctoral admission application system<sup>[8]</sup>.

The implementation of the doctoral qualifying examination system in the United States has had a profound and far-reaching impact on American higher education institutions. Firstly, the introduction of this exam has facilitated the development and refinement of a diverse training model at the institutional level. Secondly, the elimination mechanism inherent in these qualifying exams has established a relatively stable balance between the quantity and quality of doctoral students, ensuring that they possess the requisite academic research literacy and capabilities. Thirdly, at the operational level, the system takes into account the unique characteristics of various schools and disciplines, providing a platform for tailored instruction and independent teaching management.

### **2.2.2. Empirical research on doctoral qualifying examinations abroad**

Early empirical research on doctoral qualifying examinations in China was often based on researchers' personal experiences of studying for a Ph.D. or pursuing academic exchanges at foreign universities, as well as materials collected and organized from the doctoral training programs of these institutions. Zhou Longbao, Wang Qingqi, and Jin Guodong conducted investigations during their studies at the University of Wisconsin-Madison, focusing on the graduate training programs in the College of Engineering and Agricultural and Applied Economics<sup>[9-11]</sup>. They described the doctoral qualifying examination as "another major screening process after admission to the graduate program."

In the later empirical research, the doctoral qualification examination will be used as an effective means to deeply analyze the quality assurance system of doctoral education in foreign universities. Chen Yue and Zhai Yue believe that the doctoral qualification examination at UC Berkeley has detailed regulations in terms of conditions, requirements, procedures, and arrangements, which have important reference value for the cultivation of doctoral students in Chinese higher education institutions<sup>[12]</sup>. It is suggested to strengthen the course evaluation before the doctoral qualification examination, reposition the purpose of the doctoral qualification examination, clarify the requirements and implementation process of the doctoral qualification examination, develop a doctoral assessment plan based on disciplinary fields, strengthen the supervision mechanism of the doctoral qualification examination, and enhance the process mechanism of "application assessment" for doctoral students. Xiao Wenhong believes that a sound internal guarantee system for the quality of doctoral education is fundamental to improving the quality of doctoral education<sup>[13]</sup>. The doctoral education guarantee system in the United States has integrity and adaptability. Zhou Wenwen analyzed the quality assurance system for doctoral students at North Carolina State University in the United States and pointed out that preparing and taking qualification exams is a necessary part of doctoral programs in the United States, and is also an important feature of doctoral education in top research universities<sup>[14]</sup>.

### **2.2.3. The mode of doctoral qualifying examinations abroad**

Wei Huafei sorted out several main modes of the doctoral qualification examination in the United States from three aspects: content, form, and results, by collecting and organizing cases from some universities in the United States<sup>[15]</sup>. In terms of content, there are broad knowledge-oriented and thesis-oriented types, with representative universities including Cornell University, University of Wisconsin, Columbia University,

Harvard University, University of Pennsylvania, University of Georgia, and so on. Formally speaking, there are instant and cumulative types, represented by universities such as the University of California, Berkeley, the University of Connecticut for Science and Engineering, Stanford University, the Department of Aeronautics and Astronautics at the Massachusetts Institute of Technology, and the University of Michigan. From the results, there are elimination and promotion types, represented by the University of California, Berkeley.

Yu Shulin et al. reinterpreted the doctoral qualification examination from the perspective of promoting learning evaluation as an embedded mechanism for scientific research training and promoting learning and research<sup>[16]</sup>. They believed that the purpose of the examination should be to promote the learning and research of doctoral students, rather than to grade their learning and research abilities, nor to terminate the doctoral learning process of some students and eliminate them as a filtering mechanism. For this reason, the role of the doctoral qualification examination should be repositioned, process-oriented, adopt diversified formative assessment methods, and focus on its role in guiding and driving doctoral research.

### **3. Pilot implementation of doctoral qualifying examinations in China**

In recent years, some universities in China have acknowledged the deficiencies and limitations of the current mid-term assessment system for doctoral students and have begun to introduce and pilot the doctoral qualifying examination system. Examples include Tsinghua University, Southwest University, East China Normal University, Beijing Normal University, Southeast University, and others as pioneers in this reform exploration.

Yang Geng and Yang Jian conducted a feasibility analysis on the implementation of the doctoral qualifying examination system in China, concluding that there is a solid foundation for its feasibility in terms of organization, content, philosophy, and quantity assurance. They recommend establishing an independent examination agency, broadening the scope of the examination content, and adopting flexible examination formats to implement the doctoral qualifying examination system in China. Starting from 2003, all doctoral students admitted to Tsinghua University, whether they are general Ph.D. candidates or direct-entry Ph.D. candidates are required to participate in both oral and written qualifying examinations. This approach not only raises the quality standards for direct-entry Ph.D. candidates but also avoids issues related to repetition or inconsistency between the content of the qualifying examination and coursework. Zhuang Zhuo et al. discussed the curriculum development and management model in solid mechanics doctoral education, comparing the degree programs of Tsinghua University with those of the Massachusetts Institute of Technology (MIT) and the University of Illinois at Urbana-Champaign (UIUC)<sup>[17]</sup>. They suggested consolidating foundations while fostering originality, reforming existing teaching content, incorporating courses reflecting new research directions, enhancing the cultivation process management, and establishing a quality assurance system. Since 2015, East China Normal University has piloted a qualifying examination system for doctoral candidates in certain training units. The university has endowed this examination with dual attributes as a “touchstone” and a “whetstone,” playing multiple roles in stimulating, motivating, promoting learning, and encouraging research among doctoral students.

Based on the experience of implementing the doctoral qualification examination at the Chinese Academy of Sciences, Guan Hua and Jia Baoyu put forward the following suggestions for the implementation of the doctoral qualification examination in China: the doctoral qualification examination should be a necessary part of the doctoral quality assurance system; Two models for fully implementing the doctoral qualification

examination system; A comprehensive and high-quality curriculum system is the foundation, and a strict elimination mechanism is the key<sup>[18]</sup>.

#### **4. Implications for doctoral education in China**

The text analysis conducted by Yu Shulin and Qiao Xuefeng on the doctoral training programs of more than 30 “985 Project” universities and some “211 Project” universities in mainland China shows that most mainland higher education institutions adopt a mid-term assessment system, with only Tsinghua University, Southwest University, East China Normal University, and Beijing Normal University starting to implement the doctoral qualification examination system. In the implementation of the doctoral qualification examination system in China, attention should be paid to: changing concepts and consciousness, repositioning the role of the examination; Adopting diversified formative assessment methods; Highlighting the “research-oriented” nature of exams; Paying attention to the “procedural” nature of the doctoral qualification examination system. Luo Yingzi and Qu Futian analyzed the shortcomings of the mid-term assessment system, proposal report system, and comprehensive examination system in the management of the doctoral education process in China<sup>[19]</sup>. They suggested using the doctoral qualification examination as a substitute, focusing more on the evaluation of scientific research quality and ability, improving the quality control of the thesis, and enhancing the innovation ability of doctoral students.

The doctoral qualifying examination system boasts a rich historical background in the Western world, having undergone continuous refinement and perfection through practical application. It has played a pivotal role in enhancing the quality of doctoral education and nurturing high-caliber talents. Introducing and implementing a doctoral qualifying examination system tailored to China’s unique national conditions emerges as a promising endeavor to propel the reform of doctoral education within the country.

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