



# Research on Frontier Issues of Graduate Student Guidance Relationship – Based on Big Data Visualization Analysis

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**Abstract.** In this study, the visualization software Citespace5.8R3, a bibliometric tool, was used to visually analyze the data and literature searched by the keywords “postgraduate student-student relationship”, “university teacher-student relationship” and “guided student relationship” in the database of China National Knowledge Network (CNKI) from 2010 to 2021. The author, research institution and keyword contribution map in the research field of mentoring relationship for graduate students were drawn. Combined with the high frequency keywords, centrality and frequency of big data statistics, the hot issues in the field of Chinese graduate mentee relationship are analyzed, and the hot topics in the research of Chinese graduate mentee relationship are predicted based on the salience rate index of salience words combined with secondary literature retrieval.

**Keywords:** visual analysis · Citespace · big data statistics · mentorship relationship

## 1 Introduction

In graduate education, the relationship between mentees is very important for graduate study, scientific research, ideological and moral development and life. In order to improve the theoretical system of this field, this study draws the knowledge map of mentee relationship through bibliometrics research method, summarizes the research hotspots and predicts the two frontier topics through visual analysis.

## 2 Literature Review and Research Hypothesis

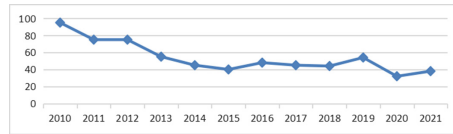
### 2.1 Data Sources

In this study, literature data retrieval was conducted on the China National Knowledge Network (CNKI) database with the keywords of “postgraduate teacher-student relationship”, “university teacher-student relationship” and “guided student relationship”, and the search scope was set to be from January 1, 2010 to December 31, 2021. A total of 609 eligible literatures were retrieved. Besides conference papers, editorial editorials, advertisements, etc., 500 literatures were selected as sample data for this study.

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**Fig. 1.** Annual analysis Chart published from 2010 to 2021

## 2.2 Research Methods

In this study, the methods of visualization analysis of scientific knowledge graph and bibliometrics of big data were selected, and the Citespace5.8R3 software developed by Dr. Chaomei Chen based on Java computer programming language was used for visualization analysis. Citespace is an information visualization software widely used in the field of scientometrics. It has the functions of citation analysis, literature citation analysis and author citation analysis, which can mainly explore the research hotspot, research frontier and research trend of a certain research field [1].

## 3 Results and Analysis

### 3.1 Annual Analysis of Literature Publication

With the keywords of “graduate student-student relationship”, “university student-student relationship” and “mentoring relationship”, the research conducted statistics by searching relevant literatures from 2010 to 2021 on China National Knowledge Network, and selected the annual analysis chart of 2010–2021 (Fig. 1).

As can be seen from Fig. 1, the number of papers published in 2010 (95) is the highest in the past twelve years. Although the number of published papers has been on the decline, the Ministry of Education has been issuing new documents in recent years, such as the Opinions on Fully Implementing the Responsibilities of Postgraduate Tutors to Cultivate Talents in 2018 and the Guidance Opinions on Strengthening the Reform of the Construction of University Teachers in the New Era in 2021. It can be seen that the research field of the relationship between graduate students and students in China is not outdated. Therefore, it is worthwhile to analyze and study the previous literature in order to provide ideas for future research.

### 3.2 Analysis of Authors and Institutions

#### 3.2.1 Core Author Analysis

There are 131 nodes and 18 connections in the CiteSpace5.8R3 map, with a density of 0.0021. According to the number of connections and cooperative knowledge map, the cooperative relationship between researchers in the field of guidogenic relationships is weak. According to the core author graph, the most outstanding core authors, i.e., high-yield authors (more than  $N$  published papers), are obtained according to Price formula ( $N = 0.749\sqrt{MAX}$ ) in this field [2]. According to the calculation, the core author should publish more than 2 papers. Combined with Fig. 2 and Table 1, it can be concluded that there are authors with a large number of publications, but no cooperative network has been formed.



greater the influence. As can be seen from Fig. 3, “teacher-student relationship” is the largest node, under which 255 related studies such as “higher education” and “education quality” are formed. The second node is “universities”, under which there are 124 related studies on “tutors”, “utilitarianism” and so on. In addition, the nodes formed by other keywords, such as “harmony” and “alienation”, also reflect the core views of the researchers on the mentoring relationship.

From the time direction of the emergence of the keywords, as Table 1, it can be concluded that in 2010, building a harmonious relationship between teachers and students to solve the problem of alienation of the relationship between teachers and students in colleges and universities is the research focus. In the process of research, I began to pay attention to such issues as harmonious campus and humanistic feelings. In 2011, in the continuous research on the current situation of the analysis of the factors affecting the relationship between teachers and students, put forward the quality of education, interpersonal relations, etc. In 2013, it began to reflect on the new teacher-student relationship under the background of new media. In 2015, some scholars analyzed the utilitarianism of the relationship between teachers and students in private universities. In 2017, it was proposed to solve teacher-student conflicts and build teacher ethics in the Internet + era. In 2019, some scholars put forward trust and respect for the ethics of teachers and students. In 2021, he discussed Lide and cultivating people.

The key words of guiding students in colleges and universities (Top 20 excerpts). It can be seen that the keywords with node frequency of more than 10 are teacher-student relationship, colleges and universities, harmony, construction, countermeasures, graduate students, mentee relationship, tutors, higher education and current situation. Keywords with a value of more than 0.1 centrality can become keywords or turning points in knowledge networks.

According to Fig. 3 combined with the secondary literature analysis, it can be found that the research hotspots of the mentoring relationship in colleges and universities mainly focus on the current situation of the mentoring relationship, the influencing factors of the mentoring relationship and the countermeasures of the alienation of the mentoring relationship.

Firstly, the current situation of mentee relationship. Some scholars have pointed out three types of mentoring relationship and its alienation: one is boss-employee type,

**Table 1.** List of Key words of guiding Students in Colleges and Universities (Top 20 excerpts).

Ranking	Frequency	Centrality	Year of first appearance	Key word
1	255	0.90	2010	Teacher-student relationship
2	124	0.18	2011	Current situation
3	56	0.07	2013	New media
4	32	0.05	2015	Private university
5	26	0.01	2017	Internet
6	21	0.06	2019	Ethics of teachers and students
7	19	0.06	2021	New era

which is manifested as utilitarianism and tension between teachers and students; The second is the free and loose type, which is manifested as the cold desertification; The third is the parent-child type, which is simplified [4]. Some scholars point out that today's teacher-student relationship begins to integrate too many other factors, showing a mixed state of multiple relationship levels. It includes "partnership", "superior-subordinate relationship", "brotherly relationship" and so on [5].

On the whole, these problems are mainly manifested as: graduate students' satisfaction with the teacher-student relationship declines; Low frequency of teacher-student communication; The relationship between teachers and students is not close enough; Some teachers' moral sense weakened, students' sense of self-discipline decreased, and the teacher-student relationship gradually drifted apart [6].

Second, the influencing factors of mentoring relationship. Some scholars have pointed out that utilitarianism diluted teachers' professional mission and responsibility, leading to the tension of mentee relationship [7]. Some scholars pointed out that under the background of diversified information channels, students have more and more channels to acquire knowledge, which directly shakes the authority of teachers in the minds of students [8]. Some scholars point out that the popularity of the Internet has caused the lack of face-to-face communication between teachers and students, and the affection between teachers and students has weakened [9]. Some scholars point out that the popularization of higher education has led to a serious imbalance in the teacher-student ratio and a lack of good communication between teachers and students [10]. Some scholars point out that due to the imperfection of school system construction, teachers' professional ethics have not been paid enough attention [11]. Some scholars point out that the learning initiative, learning and scientific research ability of postgraduates will have an impact on their personal achievements and teachers' style of learning, which will influence the guidance and opinions of their tutors, and further affect the teacher-student relationship [12]. Some scholars pointed out that most students are the only child and do not like restraint. They will regard teachers' education as "intervention" and "control", which is not conducive to the construction of teacher-student relationship [13].

In essence, scholars analyze the influencing factors of the relationship between teachers and students mainly from four dimensions: environment, system, teachers and students. The main content is that with the rapid development of national economy, the traditional way of getting along with college teachers and students and their views have an impact on each other, leading to the lack of clear guidance for teachers and students in the face of various disharmonious factors in the new environment, forming many unfavorable factors affecting the normal development of teacher-student relationship.

Thirdly, the dissimilation countermeasure of the relationship between students and students. For the establishment of mentoring relationship, some scholars point out that it is necessary to create a classroom atmosphere of teaching and learning and encourage students to become the subject of learning and scientific research. Some scholars point out that teachers can make use of modern means to achieve effective communication between teachers and students [14]. Some scholars pointed out that training high-quality teachers is an important guarantee to improve teacher-student relationship satisfaction [15]. Some scholars stress that students should fulfill their obligations, respect teachers

and actively study [16]. Some scholars point to reforming the internal management of universities, including incorporating the teacher-student relationship into the teacher-student evaluation system [17].

Generally speaking, the countermeasures put forward by scholars to the alienation of tutor relationship are mainly from the macro and micro aspects. On the macro level, they mainly improve the graduate training system, promote the legalization of teacher-student relationship, and then restrict the teacher-student communication in a harmonious and normal relationship. Microscopically, it requires teachers' guidance level and moral quality, or requires students to set up initiative consciousness and fulfill student obligations.

### 3.3.2 Analysis of Frontier Hot Spots

By judging and analyzing the hot keywords and salient words obtained by the map, the frontier hot issues in the field of subject research can be further determined [18] (Fig. 4). Through the analysis and classification of the literatures belonging to the salient words, the two frontier topics of the relationship between Chinese graduate tutors in the future are predicted.

First, new teacher-student relationship in the new era. As the core role of colleges and universities, teachers should respond to the essential requirements of building a harmonious socialist society. The new-type teacher-student relationship in the new era emphasizes the cooperative relationship of trust, respect, care and appreciation. Some scholars point out that the new teacher-student relationship is conducive to cultivating the innovation ability of graduate students; It can help teachers and students understand each other and develop together. It is helpful for graduate students to set up the correct three views [19]. Therefore, constructing the feasible path of the new teacher-student relationship becomes the trend and focus of the future research on the relationship of graduate student guidance.

Second, the construction of postgraduate tutors' ethics. The Ministry of Education issued the "Opinions on Fully Implementing the Responsibility of Postgraduate Tutors

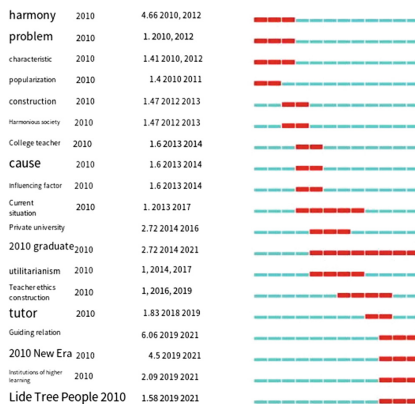


Fig. 4. The map of highlighting words of mentoring relationship

to cultivate morality and cultivate people”, which pointed out that postgraduate tutors are the key force of postgraduate training in China and shoulder the mission and responsibility of cultivating high-level innovative talents. It is necessary to realize that tutors are the first responsible person for postgraduate training and strengthen the construction of postgraduate tutors’ ethics. Some scholars point out that the ideological and political quality of some college teachers is weakened, their professional ability is blurred, the social service polarization and the teacher-student relationship is sub-healthy. Therefore, solving the problem of the construction of teachers’ ethics and strengthening the construction of graduate tutors’ ethics has become a research hotspot of the relationship between graduate students and mentors.

## 4 Conclusion

In this study, the bibliometric tool Citespace5.8R3 visualization software was used to map the contribution of authors, research institutions and key words in the research field of mentoring relationships for Chinese postgraduate students. On this basis, it explores the research hotspot of the mentoring relationship for Chinese graduate students, namely, the current situation of the mentoring relationship, the influencing factors of the mentoring relationship and the alienation strategy of the mentoring relationship. And carry on the prominent word analysis, forecast the research frontier of the mentoring relationship of graduate students, that is, the new type of teacher-student relationship in the new era and the construction of graduate tutors’ ethics.

The visualization knowledge map is used to analyze the progress of the research on the relationship of graduate student guidance, which will provide practical basis and research ideas for the research on the relationship of graduate student guidance in China. First, through the review of the authors of this article, it is found that the research field of graduate mentee relationship in China presents an interdisciplinary research trend, and the authors of this article include pedagogy, psychology and many other fields. Secondly, through the review of the author’s articles, it is found that the research on the relationship between graduate mentees has gradually changed from a speculative study to a study combining theory and practice, and more and more articles are based on empirical analysis. Thirdly, from the perspective of the article content, with the development of information technology, the research on the relationship between graduate students and mentees has also presented distinct characteristics of The Times. How to construct the teacher-student relationship in line with ethics and educational rules in the era of artificial intelligence has become a new research trend.

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