

Construction and Empirical Research on the Competency Model of Postgraduate Tutors in Colleges and Universities Under Distance Learning Environment

^aYu Xiang¹, Jianmin Liu^{2,1,3*}

(^airene.x@qq.com, jianminliu2007@163.com*)

¹ Guangxi University of Finance and Economics, Nanning 530005, China

² Liuzhou Institute of Technology, Liuzhou 545000, China

³ Guangxi Key Laboratory of Big Data in Finance and Economics, Nanning 530005, China

Abstract. In the swiftly evolving landscape of higher education, the fusion of globalization and digitalization has propelled distance learning to the forefront, reshaping the pedagogical landscape. This paradigm shift, especially prevalent in graduate education, presents a mosaic of opportunities and challenges. China, with its exponential rise in graduate students and tutors as of 2022, epitomizes the expansive growth in higher education. However, the surge in distance learning platforms necessitates a meticulous evaluation of the competencies vital for graduate mentors to excel in virtual teaching environments. This study analyzes the Competence Model of mentor competency, aiming to empower mentors to navigate these complexities adeptly., aiming to empower mentors to navigate these complexities adeptly. Moreover, by harnessing the potential of big data and artificial intelligence, the research endeavors to unravel innovative approaches in optimizing mentor-student interactions in remote learning environments. Leveraging big data analysis methods, this study seeks to decode the nuances of online interactions, providing mentors with precise insights into students' learning behaviors, academic needs, and psychological states. Through the lens of the mentor competency model, this research illuminates a path forward, ensuring that graduate students receive exceptional mentorship in virtual environments, thereby redefining the contours of contemporary education.

Keywords: Remote Education; Graduate Tutors; Competency Model

1 Introduction

In today's era of globalization and digitization, distance learning, as an education method highly dependent on technology, is rapidly transforming the traditional education paradigm. However, with the continuous expansion of distance learning, the roles and competencies of university graduate tutors in remote learning environments are encountering new challenges. With the rapid development of China's economy and society, graduate education has been growing steadily. By the end of 2022, the total number of graduate students in China had reached 3.65 million, with 550,000 doctoral students and an equal number of tutors. Graduate education in China has entered a fast track of development. Therefore, constructing a competency model for university graduate tutors that adapts to the characteristics of distance learning not only has a positive impact on improving the quality and effectiveness of distance learning but also poses

new requirements and challenges for the development of educational technology. This research will incorporate big data analysis methods to explore the interaction between tutors and students in online learning environments, studying tutors' competency in remote learning settings, thereby enhancing the quality and effectiveness of online education. It aims to provide efficient academic guidance and personalized support, offering empirical references for the field of educational technology.

2 Theoretical Foundation and Conceptual Definitions

2.1 Research Theories

The concept of "competency" was first introduced by American social psychologist McClelland (1973)^[1]. He argued that factors such as academic achievements, intelligence, and aptitude tests cannot predict one's career or life accomplishments accurately. McClelland proposed that assessing individuals using competency traits could yield more precise measurement results. Spencer and Spencer (2008) defined competency as "underlying characteristics distinguishing individuals who excel from those who perform at average levels in a particular job or organization, primarily including motivation, attitude or values, knowledge, or skills in a specific domain"^[2]. Picciano and Dziuban (2007) blended learning from multiple perspectives, including pedagogical, technological, and organizational aspects^[3]. Moore and Kearsley (2011) discusses the competencies tutors need to effectively engage with learners across various distance education models. This alignment between competency models and industry positions has enriched and refined the theoretical framework and research methods, leading to a more comprehensive understanding of competencies in various professional contexts^[4]. Zhu, Hu, and Yu (2020) point out ongoing globalisation processes call forth a need to foster students' intercultural competences and language skills^[5]. Scherzinger and Brahm (2023) argued that linguistic competences, critical consciousness, cooperation skills and knowledge of bilingual education research can be seen as important but also expandable competences for bilingual education teachers^[6]. Ma, Chen, Guo, Fan, and Lai (2023) argued that by creating a community of tutors and students, we promote the establishment of complementary strengths and synergistic and innovative tutoring relationships^[7]. Tutors should be good at conveying bright future visions to students, understand students' life, study, etc., and establish emotional communication; if students encounter difficulties in scientific research and innovation, tutors should give more care and support and respect the different needs of students to motivate them and stimulate the generation of innovative thinking.

2.2 Concept of Competency Indicators

In this study, the selection of indicators was primarily based on mature competency scales. Through a comprehensive literature review, seven competency indicators were chosen, and their specific concepts are outlined below: Ethics (Noddings, 2018)^[8], Academic Level (Clark, 1989)^[9], Academic Attitude (Csikszentmihalyi, 2015)^[10], Teaching Implementation (Brookfield, 2015)^[11], Interpersonal Management (Darling-Hammond, 2017)^[12], Self-development (Schön, 2017)^[13], Academic Innovation Ability (Christensen, Horn, & Johnson, 2009)^[14].

3 Research Design

This study employed a literature analysis method, building on relevant research findings to outline the preliminary content of competencies for graduate tutors in applied universities. A questionnaire structure on the competencies of graduate tutors was developed. Subsequently, a survey was conducted among 10 graduate tutors and 240 master's students at Guangxi University of Finance and Economics. During the survey, respondents anonymously selected the competency traits they believed graduate tutors should possess and assigned importance values to them. The questionnaire consisted of two parts:

The first part provided an overview of the research objectives and content, including basic information such as gender and the current year of study for the master's students.

The second part constituted the core of the questionnaire, adopting a Likert scale format with five response options indicating satisfaction levels, ranging from 1 to 5 points. The survey focused on five dimensions, elaborated into 24 items, analyzing the ethical integrity, academic proficiency, scholarly attitude, teaching implementation, interpersonal management, self-development, and academic innovation capabilities of graduate tutors in applied universities.

4 Results and Discussion

In this survey, the target population consisted of graduate students in applied universities. Considering the relatively recent establishment of these universities as degree-granting institutions, the scale of the graduate student population, and the research requirements, a total of 250 questionnaires were distributed. After the collection process, 242 questionnaires were deemed valid, resulting in an effective response rate of 96.8%. The structural analysis of the collected valid samples is as follows:

4.1 Gender Composition

Among the surveyed group, females accounted for over 60%, totaling 153 individuals, constituting 63.22% of the surveyed population. Males comprised 89 individuals, representing 36.78% of the surveyed population.

4.2 Grade Composition

Within the surveyed graduate student population, 123 students were in their first year, constituting 50.83% of the total sample, while 119 students were in their second year, making up 49.17% of the total sample.

4.3 Reliability and Validity

4.3.1 Reliability Analysis

Reliability analysis assesses the reliability and accuracy of quantitative data responses. A Cronbach's Alpha coefficient above 0.8 indicates high reliability, between 0.7 and 0.8 signifies good reliability, between 0.6 and 0.7 indicates acceptable reliability, and below 0.6 suggests relatively poor reliability (Table 1).

Table 1. Cronbach Reliability Analysis

Items	Sample Size	Cronbach α Coefficient
28	242	0.962

The reliability coefficient value obtained was 0.962, exceeding 0.9, indicating a very high quality of data reliability. This demonstrates that the research data can be utilized for further analysis with confidence.

4.3.2 Validity Analysis

Validity analysis assesses whether the research items are reasonable and meaningful. Factor analysis, a data analysis method utilizing indicators such as KMO value, communalities, variance explained, and factor loading coefficients, comprehensively validates the level of data validity (Table 2).

Table 2. KMO and Bartlett 's Test

KMO Value		0.916
Bartlett 's Sphericity Test	Approximate Chi-Square	6488.776
	df	378
	p Value	0.000

As observed from the table, all communalities corresponding to the research items are higher than 0.4, indicating that information related to the research items can be effectively extracted. Additionally, the KMO value is 0.916, surpassing 0.6, signifying that the data can be effectively extracted for information. Furthermore, the variance explained rates for the seven factors are 20.47%, 18.18%, 13.45%, 9.12%, 7.54%, 6.30%, and 4.53%, respectively. After rotation, the cumulative variance explained rate is 79.584%, which is greater than 50%. This implies that the information content of the research items can be effectively extracted.

4.3.3 Factor Analysis

In this study, confirmatory factor analysis (CFA) was conducted on the seven factors and 24 items. The valid sample size for this analysis was 242, which exceeded ten times the number of items, ensuring an adequate sample size for the analysis. In terms of the measurement relationships, the absolute values of standardized loadings are all greater than 0.6 and exhibit significance, indicating a good measurement relationship.

4.3.4 Determination of Competency Indicator Weights

After analyzing and calculating the evaluation indicators of graduate tutors' competency, the weights of various levels of indicators for graduate tutors' competency were obtained. Ultimately, an evaluation system for the weights of graduate tutors' competency indicators was constructed (Table 3).

Table 3. Competency Indicators for Graduate Tutors

Competency Indicators for Graduate Tutors	Weight
Ethics	14.61
Academic Level	17.76
Academic Attitude	14.39
Teaching Implementation	17.74
Interpersonal Management	14.22
Self-development	10.58
Academic Innovation Ability	10.70

Based on the aforementioned competency model indicators and their corresponding weight coefficients, it is evident that the most crucial qualities for graduate tutors in applied universities are their academic expertise and teaching implementation skills. Following closely are their moral ethics and interpersonal management abilities, while students' expectations regarding tutors' self-development and academic innovation abilities rank lowest.

5 Conclusions

In the realm of higher education, graduate tutors play a pivotal role in shaping the academic journey of students. To ensure effective tutoring, it is essential to establish clear competency indicators that guide their professional development. In this study, we examined eight key competency indicators for graduate tutors, each weighted according to their perceived importance.

5.1 Academic Level and Teaching Implementation: Foundations of Excellence

Academic Level: A profound academic understanding equips tutors to guide students with expertise and precision. Consequently, the emphasis on Academic Level, with a weight coefficient of 17.76, underscores the imperative of deep subject matter expertise.

Teaching Implementation: Effective translation of theoretical knowledge into accessible, engaging lessons epitomizes superior teaching. Such implementation, reflecting the weight coefficient of 17.74, ensures that knowledge resonates with students, fostering active engagement and meaningful learning experiences.

5.2 Moral Ethics and Interpersonal Management: Pillars of Trust

Moral Ethics: Ethical integrity forms the bedrock of academic institutions. Upholding moral ethics, with a coefficient weight of 14.61, is indispensable. Students are more receptive to learning when guided by tutors they can trust implicitly.

Interpersonal Management: Interpersonal finesse in handling diverse personalities, conflicts, and communication channels fosters a supportive atmosphere. Tutors proficient in interpersonal management (weight coefficient: 14.22) create an open dialogue, encouraging collaborative learning and effective student-tutor relationships.

5.3 Self-development and Academic Innovation Ability: Spheres of Growth

Self-development: Continuous self-improvement is pivotal in an ever-evolving educational landscape. Tutors investing in personal and professional development (weight coefficient: 10.58) exhibit adaptability and resilience, essential traits in an environment marked by change.

Academic Innovation Ability: In the digital age, innovation in teaching methodologies is non-negotiable. Tutors with academic innovation ability (weight coefficient: 10.70) harness creative approaches, integrating technology, collaborative projects, and experiential learning.

In summary, the weighted competency model underscores the multifaceted nature of graduate tutor roles in applied universities.

6 Strategies and Recommendations

6.1 Enhancing Academic Level and Teaching Implementation:

Organize workshops and seminars focusing on advanced topics within their disciplines. Provide training in diverse teaching methods, including interactive lectures, case studies, and hands-on demonstrations. Provide technical support and training to ensure tutors can effectively utilize these platforms for engaging teaching implementation.

6.2 Upholding Moral Ethics and Improving Interpersonal Management

Conduct workshops on ethical decision-making, focusing on real-world scenarios in academic settings. Use case studies and role-playing exercises to help tutors navigate ethical dilemmas. Foster a culture of transparency and accountability through open discussions on moral ethics.

6.3 Promoting Self-Development and Academic Innovation

Establish grants or funding opportunities dedicated to tutors' professional development. Encourage tutors to attend conferences, workshops, and specialized training sessions related to their disciplines.

In summary, the construction of the graduate tutor team is a systematic project that encompasses various aspects of university work. Therefore, conducting research on the construction of the graduate tutors' competency model can provide effective suggestions for the moral education of graduate tutors. This, in turn, contributes to nurturing qualified socialist builders and successors for the country and society, effectively carrying out moral education work with remarkable outcomes.

Funding: This research was funded by the National Alliance for Graduate Education Development in Applied Universities (AGED2022YB23), the 2023 Professional Ethics and Teacher Conduct Construction Special Project of Guangxi University of Finance and Economics (2023SD12). Support from Guangxi First-class Discipline Statistics Construction Project Fund and Guangxi Key Laboratory of Big Data in Finance and Economics.

References

- [1] McClelland. (1973). Testing for competence rather than for" intelligence.". *American psychologist*, 28(1), 1.
- [2] Spencer, L. M., & Spencer, P. S. M. (2008). *Competence at Work models for superior performance*: John Wiley & Sons.
- [3] Picciano, & Dziuban. (2007). *Blended Learning: Research Perspectives: Blended Learning: Research Perspectives*.
- [4] Moore, & Kearsley. (2011). *Distance education: A systems view of online learning*: Cengage Learning.
- [5] Zhu, Hu, & Yu. (2020). Construction of a competency evaluation model for engineering graduate tutors taking Chongqing Jiaotong University as an example. *Journal of Chongqing Jiaotong University (Social Science Edition)*, 20(5), 105.
- [6] Schön. (2017). *The reflective practitioner: How professionals think in action*: Routledge.
- [7] Ma, Chen, Guo, Fan, & Lai. (2023). The influence of transformational tutor style on postgraduate students' innovative behavior: the mediating role of creative self-efficacy. *International Journal of Digital Multimedia Broadcasting*, 2023.
- [8] Noddings, N. (2018). *Philosophy of education*: Routledge.
- [9] Clark. (1989). The academic life: Small worlds, different worlds. *Educational Researcher*, 18(5), 4-8.
- [10] Csikszentmihalyi, M. (2015). *The systems model of creativity: The collected works of Mihaly Csikszentmihalyi*: Springer.
- [11] Brookfield. (2015). *The skillful teacher: On technique, trust, and responsiveness in the classroom*: John Wiley & Sons.
- [12] Darling-Hammond. (2017). Teacher education around the world: What can we learn from international practice? *European journal of teacher education*, 40(3), 291-309.
- [13] Scherzinger, & Brahm. (2023). A systematic review of bilingual education teachers' competences. *Educational Research Review* 100531.
- [14] Christensen, Horn, & Johnson. (2009). *Disrupting Class: Disruptive Innovation Will Change the Way the World Learns*. *Education Review*.