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Exploring the Impact of Teachers' Intrinsic Motivation on Innovative Teaching Practices: The Mediating Role of Teacher Engagement in Beijing Colleges and Universities

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Abstract: The rapid development of technology and globalization has created an urgent need for educational institutions to adopt innovative teaching practices that promote critical thinking, creativity, and problem-solving. In the context of higher education in Beijing, this study examines how intrinsic motivation influences teachers' adoption of innovative teaching practices, with teacher engagement serving as a mediating factor. Using a quantitative research approach, data were collected from a sample of 500 teachers in 20 colleges and universities in Beijing, and Structural Equation Modeling (SEM) was employed to analyze the relationships among intrinsic motivation, teacher engagement, and innovative practices. The results reveal that intrinsic motivation has a significant positive effect on innovative teaching practices, both directly and indirectly through teacher engagement. This finding underscores the importance of fostering teacher engagement alongside intrinsic motivation to maximize innovation in teaching. By highlighting the mediating role of engagement, this study contributes valuable insights for educational policy and management practices aimed at enhancing instructional quality in Chinese higher education.

Keywords: Intrinsic motivation, teacher engagement, innovative teaching practices, higher education, educational policy and management practices

1. Introduction

In recent years, the rapid development of technology, globalization, and evolving educational demands have placed significant pressure on educational institutions to foster innovation in teaching practices (Ball, 2021). Traditional approaches to teaching are increasingly viewed as inadequate in preparing students for the challenges of a modern, interconnected world (Ordu, 2021). Consequently, there is an urgent need for teaching methods that are not only effective in conveying content but also engage students in critical thinking, creativity, and problem-solving (Bani-Hamad et al., 2021). Educational institutions in China, especially in metropolitan areas like Beijing, are at the forefront of this transformation, as they are tasked with adapting to the shifting demands of both local and international educational standards.

Within the framework of higher education in China, there is a strong emphasis on improving teaching quality and developing innovative pedagogical strategies to meet the diverse needs of students (He et al., 2021). Innovative teaching practices, such as problem-based learning, collaborative learning, and the integration of digital tools, are seen as crucial in achieving these goals (Supena et al., 2021). However, innovation in teaching does not happen in isolation; it requires a supportive environment and, more importantly, motivated teachers who are willing to take risks and explore new teaching methods.

Intrinsic motivation among teachers is one of the key factors influencing their willingness to adopt innovative teaching practices (Yu et al., 2021). Unlike extrinsic motivation, which is driven by external rewards like salary or promotions, intrinsic motivation is fueled by personal satisfaction, interest, and a sense of accomplishment (Cho et al., 2021). Teachers who are intrinsically motivated often demonstrate higher levels of creativity, commitment, and resilience in their work (Layek et al., 2024). Research suggests that intrinsically motivated teachers are more likely to engage in innovative practices because they find personal satisfaction and meaning in improving their teaching methods and outcomes for students (Calderón et al., 2020).

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In addition to intrinsic motivation, teacher engagement plays a pivotal role in the adoption of innovative teaching practices. Teacher engagement is the extent to which teachers are involved, enthusiastic, and committed to their work (Shu, 2022). Engaged teachers are more likely to invest time and effort in designing and implementing new instructional strategies (Woodcock et al., 2022). The link between teacher motivation, engagement, and innovation is especially relevant in the context of Beijing's colleges and universities, where educational reforms have created both opportunities and challenges for teachers.

Despite growing interest in improving teaching quality through innovation, many teachers still rely on traditional, lecture-based methods that may not fully meet the needs of modern students. A critical challenge in the field of education is understanding what drives teachers to adopt innovative practices and how educational institutions can foster an environment that supports such initiatives (Kilag et al., 2023). Research has shown that intrinsic motivation is a significant predictor of teacher effectiveness and innovation (Cao et al., 2020). However, the pathway through which intrinsic motivation translates into innovative teaching is not fully understood, particularly in the context of higher education in China.

Moreover, while intrinsic motivation is essential, it may not be sufficient on its own to bring about innovative teaching practices. Teacher engagement is a factor that influences whether motivated teachers implement new and creative methods in their classrooms. Engaged teachers are more likely to be persistent, proactive, and open to experimenting with different approaches to teaching (Chen et al., 2021). Therefore, exploring the relationship between intrinsic motivation, teacher engagement, and innovative teaching practices is crucial for developing a deeper understanding of how to promote effective teaching strategies in Beijing higher education institutions.

In the context of Beijing colleges and universities, various factors can affect teacher motivation and engagement, including institutional policies, cultural expectations, and workload pressures. As Beijing is a major educational hub, the city's universities are subject to intense scrutiny and competition, both domestically and internationally. This environment creates unique pressures and incentives for teachers, making it an ideal context for studying the dynamics of motivation, engagement, and innovation. Despite the importance of this topic, few studies have specifically examined the interplay between intrinsic motivation, teacher engagement, and innovative teaching practices in Chinese higher education settings.

This study addresses this gap by investigating how intrinsic motivation among teachers influences their engagement and, in turn, how this engagement impacts their likelihood of adopting innovative teaching practices. The findings of this research have the potential to inform educational policies and management practices in Beijing colleges and universities, helping to create environments that foster both teacher satisfaction and instructional innovation.

2. Literature review

2.1 Studies on the relationship between intrinsic motivation of teachers and innovative teaching practices

Numerous studies have highlighted a positive relationship between teachers' intrinsic motivation and their adoption of innovative teaching practices, underscoring how intrinsic motivation fosters a supportive environment for educational creativity and experimentation.

Stumbrienė et al., (2024) conducted a survey-based study and found a strong correlation between intrinsic motivation and innovative teaching behaviors. The study argued that teachers who were driven by an internal desire to improve their teaching methods were more likely to engage in experimentation and adaptation of new strategies in the classroom. The study highlighted how intrinsically motivated teachers were not only more open to incorporating innovative pedagogical techniques but also more persistent in refining their approaches to suit student needs. According to the study, this internal drive allowed teachers to perceive challenges as opportunities for growth, which in turn cultivated a mindset that embraced innovation. The findings contribute to a growing body of evidence suggesting that intrinsic motivation is a critical component in fostering a culture of innovation within educational settings, as it empowers teachers to continuously seek out and implement novel teaching practices.

Kussainova et al., (2024) conducted a mixed-methods study exploring the impact of intrinsic motivation on teaching innovation among school teachers. The study examined how intrinsic motivation influenced teachers' willingness to depart from traditional methods and embrace new, creative approaches to teaching. The findings demonstrated that teachers with high levels of intrinsic motivation displayed a greater propensity for adopting innovative techniques, such as project-based learning and technology integration. The study highlighted that intrinsically motivated teachers were more likely to invest time and energy in developing customized lesson plans and engaging activities, which not only improved student engagement but also enhanced the overall learning experience. The study emphasized that intrinsic motivation served as a powerful enabler, driving teachers to go beyond routine teaching practices and explore instructional methods that were more effective and dynamic. By focusing on the intrinsic motivation of teachers, the research provided valuable insights into how inner drive and personal satisfaction in the teaching profession can contribute to sustained educational innovation.

Tulyakul et al., (2022) conducted an in-depth qualitative study to examine how intrinsic motivation influences the

willingness of teachers to implement innovative teaching practices. The findings indicated that teachers who were intrinsically motivated, driven by a deep-seated commitment to student learning and personal satisfaction in their work, were more inclined to take risks and experiment with new teaching methods. The study observed that these teachers often prioritized student engagement and critical thinking, which led them to explore alternative instructional strategies, such as inquiry-based learning and interdisciplinary projects. Unlike their extrinsically motivated counterparts, who tended to rely on traditional methods to meet external expectations, intrinsically motivated teachers demonstrated a higher degree of autonomy in their teaching practices. This autonomy was linked to a greater openness to innovation, as they were not bound by a need for external validation or rewards. The study concluded that intrinsic motivation serves as an essential foundation for innovative teaching, as it fosters a sense of freedom and creativity that is less influenced by institutional constraints and more focused on the intrinsic rewards of teaching itself.

In conclusion, these studies demonstrate a consistent finding across multiple studies: intrinsic motivation is a vital factor in promoting innovative teaching practices. When teachers are driven by an internal desire to excel in their profession, they are more likely to adopt and persist with innovative methods, enhancing the educational experience for students.

2.2 Studies on the relationship between intrinsic motivation of teachers and teacher engagement

Several studies have explored the positive influence of intrinsic motivation on teacher engagement, establishing a significant relationship between these two concepts.

Pourtousi & Ghanizadeh (2020) conducted a study investigating how intrinsic motivation among teachers affects their levels of engagement in educational activities. The study found that teachers who reported high levels of intrinsic motivation, such as a genuine passion for teaching, a commitment to student growth, and a desire to make a difference in their students' lives, were more engaged in their professional duties. Engagement was measured through indicators such as willingness to take on additional responsibilities, actively participating in school improvement initiatives, and consistently seeking professional development opportunities. The findings suggest that when teachers are driven by an internal desire to teach and feel a sense of purpose in their work, they are more likely to display higher levels of engagement. This engagement manifests not only in classroom-related activities but also in their enthusiasm for contributing to the broader school community. The study highlights the importance of intrinsic motivation in fostering a more dynamic and committed teaching workforce, emphasizing that teachers who find personal meaning in their work are naturally inclined to invest more energy and effort in their roles.

Vojáčková (2020) conducted a study that examined the role of intrinsic motivation in sustaining teacher engagement and focused on the internal factors that kept teachers actively engaged in their roles. The study revealed that teachers who were intrinsically motivated, those who felt a deep sense of personal satisfaction and fulfillment from teaching, showed consistently high levels of engagement, regardless of external rewards or recognition. The results indicated that intrinsically motivated teachers were more resilient and better able to maintain their enthusiasm and commitment over extended periods. These teachers were also more likely to exhibit proactive engagement behaviors, such as creating innovative lesson plans, seeking constructive feedback, and mentoring new teachers. The study underscores the role of intrinsic motivation as a foundational element that fuels teachers' long-term engagement, even in the absence of immediate rewards or incentives. By focusing on the internal satisfaction derived from teaching itself, the study demonstrates how intrinsic motivation can be a sustaining force for teacher engagement over the course of a career.

Zhang et al. (2021) explored the direct relationship between intrinsic motivation and teacher engagement by examining how personal satisfaction and internal fulfillment influence teachers' active participation in their roles. The study found that teachers with high levels of intrinsic motivation, those who derived personal joy and a sense of achievement from their teaching, demonstrated significantly higher engagement in their professional duties. The study defined engagement through behaviors such as enthusiasm for lesson planning, dedication to individualized student support, and consistent involvement in school activities. The findings indicated that intrinsically motivated teachers were not only more attentive in their classrooms but also more likely to invest additional time and effort into refining their teaching practices and supporting their students' needs. This study provided strong evidence that intrinsic motivation has a direct and positive impact on teacher engagement, suggesting that when teachers feel internally driven by the joy of teaching itself, they are more inclined to fully commit to their responsibilities. The research reinforces the importance of intrinsic motivation as a key factor that encourages teachers to remain actively engaged, thereby enhancing both their own professional satisfaction and their contributions to the educational environment.

In conclusion, these studies consistently show a strong link between teachers' intrinsic motivation and their engagement. These findings highlight intrinsic motivation as essential for sustaining teacher engagement, ultimately benefiting both educators and the broader school community.

2.3 Studies on the relationship between teacher engagement and innovative teaching practices

The relationship between teacher engagement and innovative teaching practices has garnered attention in educational research, with several studies highlighting a positive connection between the two.

Ji (2021) examined the link between teacher engagement and their propensity to adopt innovative instructional methods. The findings revealed that teachers who reported higher levels of engagement were more likely to implement novel teaching techniques, including the integration of technology and student-centered activities. The study argued that engaged teachers have greater motivation and enthusiasm for exploring and applying new instructional methods, which in turn positively impacts their classrooms. The study concluded that teacher engagement serves as a critical factor in fostering a culture of innovation in education, as engaged teachers are more inclined to seek out and experiment with new teaching practices to enhance student learning.

Harper-Hill et al. (2022) explored the influence of teacher engagement on the adoption of innovative teaching practices. The study assessed their engagement levels and the frequency of innovative teaching approaches they employed. The research showed that teachers who consistently demonstrated high levels of engagement were significantly more likely to adopt and maintain innovative practices compared to those with lower engagement levels. The study suggested that engaged teachers possess a greater sense of personal investment and commitment to their profession, which drives them to continuously improve and experiment with new teaching methods. The study highlighted that engagement fosters a growth mindset among teachers, encouraging them to embrace innovative strategies that improve learning outcomes. This research contributed to the growing body of evidence suggesting that teacher engagement is a vital component of sustained educational innovation.

Carmical (2024) explored the impact of teacher engagement on the adoption of creative instructional techniques in school settings. The study found that highly engaged teachers not only employed a wider variety of innovative teaching practices but also reported higher levels of satisfaction and effectiveness in their instructional methods. The findings revealed that engaged teachers were more willing to take risks and experiment with unconventional teaching techniques, such as project-based learning and flipped classrooms, because they felt a strong sense of purpose and confidence in their roles. The study concluded that engagement acts as a catalyst for creativity in teaching, as it empowers teachers to move beyond traditional methods and explore instructional innovations that enhance student engagement and achievement. The study underscores the importance of fostering teacher engagement as a means to drive educational innovation and improve instructional quality.

These studies underscore a consistent finding in the literature: teacher engagement has a positive influence on the adoption and maintenance of innovative teaching practices. Engaged teachers, motivated by a sense of purpose and commitment, are more likely to implement new and creative approaches to teaching, which ultimately enriches the learning experience for students. These findings support the argument that enhancing teacher engagement is crucial for promoting innovation in education, as engaged teachers play a pivotal role in driving instructional advancements that benefit both students and educational institutions.

3. Research methodology

3.1 Research design

This study aims to examine the influence of intrinsic motivation on innovative teaching practices, with teacher engagement as a mediating variable, among teachers in colleges and universities in Beijing. To achieve this objective, a quantitative research methodology is employed, as it allows for a structured approach to measure relationships among variables and enables statistical analysis of large datasets.

The study utilizes a quantitative research method to investigate the relationships among intrinsic motivation, teacher engagement, and innovative teaching practices. Quantitative research is well-suited for studies that aim to establish measurable relationships between variables and to generalize findings to a larger population. In the context of this study, a quantitative approach provides a systematic framework to test the hypothesized relationships between intrinsic motivation, teacher engagement, and innovative practices through statistical analysis. This method also enables the assessment of the mediating effect of teacher engagement, allowing the study to analyze not only the direct influence of intrinsic motivation on innovative teaching practices but also the indirect influence through teacher engagement.

Quantitative research methods offer several benefits, including objectivity, replicability, and the ability to handle large datasets. Given that this study involves a relatively large sample of teachers from multiple institutions, a quantitative approach provides the necessary rigor and efficiency to manage and analyze the data. Additionally, quantitative methods are particularly effective for studies that involve testing theoretical models, such as the relationship between intrinsic motivation, teacher engagement, and innovative practices. By employing structured questionnaires and statistical techniques, this study can produce reliable and generalizable results that contribute to a deeper understanding of the dynamics between motivation, engagement, and innovation in teaching.

The decision to select a quantitative research method for this study is based on several factors. First, the study aims to test specific hypotheses regarding the relationships among intrinsic motivation, teacher engagement, and innovative teaching practices. Quantitative research is particularly suited for hypothesis testing, as it allows researchers to quantify variables and examine the strength and direction of relationships using statistical tools. This aligns well with the objectives of the study, as the goal is not merely to describe but to explain and predict how intrinsic motivation and engagement contribute to innovation in teaching practices. Second, a quantitative approach allows for the collection of data from a large sample of teachers, enhancing the generalizability of the findings. By using structured questionnaires,

the study can gather standardized data that can be compared across individuals, institutions, and demographic groups. This is particularly important in a study involving multiple colleges and universities, as it enables an examination of trends and patterns across different contexts within Beijing higher education system. The use of a quantitative method also facilitates the analysis of mediating effects, as statistical techniques like Structural Equation Modeling (SEM) can be employed to explore the role of teacher engagement as a mediator between intrinsic motivation and innovative practices. And quantitative methods provide a degree of objectivity and replicability that is essential for empirical research. By using established measurement scales and statistical analysis techniques, this study ensures that the results are not biased by subjective interpretations and can be replicated in future research. This methodological rigor strengthens the validity and reliability of the findings, contributing to a robust understanding of the factors that influence innovative teaching practices in higher education.

The study explores the impact of teachers' intrinsic motivation on innovative teaching practices with the mediating role of teacher engagement in Beijing colleges and universities based on the following flow of the research process in Fig. 1.

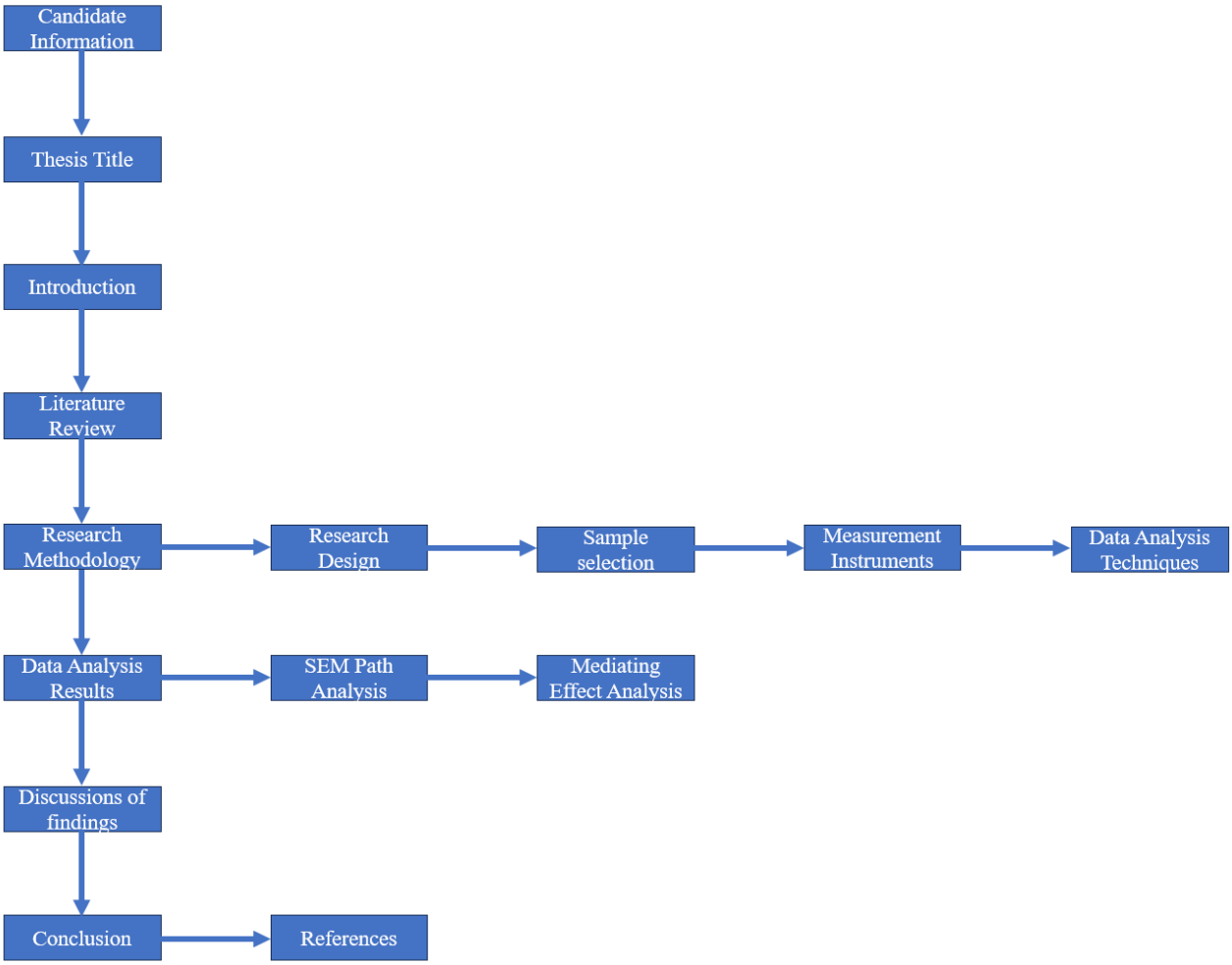

Figure 1. Research process

3.2 Sample selection

The study focuses on teachers from 20 colleges and universities in Beijing, China. Based on human resource data from these institutions in 2024, there are a total of 34,290 teachers across these 20 colleges and universities. Due to practical and statistical considerations, it is neither feasible nor necessary to survey the entire population. Instead, the study employs a random sampling method to select a representative sample of 500 teachers from the population of 34,290 teachers. Random sampling is chosen to ensure that each teacher in the population has an equal chance of being selected, thereby minimizing selection bias and enhancing the generalizability of the findings.

The sample size of 500 teachers is deemed sufficient based on statistical principles that guide sample size determination for quantitative studies. A sample of this size allows for robust statistical analysis and ensures that the study has adequate power to detect significant relationships among variables. Additionally, a sample of 500 is manageable in terms of data collection and analysis, allowing the research team to obtain a comprehensive dataset without

overwhelming logistical constraints. By using a representative sample, the study ensures that the findings can be generalized to the larger population of teachers in Beijing higher education institutions, thereby enhancing the external validity of the results. After 500 questionnaires were distributed online through WJX questionnaire design and distribution platform in China to teachers for a month from 15, November to 15 December in 2024 in 20 colleges and universities in Beijing city, China, the study successfully collected the valid 500 sets of data from questionnaires.

3.3 Measurement instruments

To measure the constructs of intrinsic motivation, teacher engagement, and innovative teaching practices, the study employs a structured questionnaire consisting of Likert-scale items. The survey questionnaire items are adapted from scales developed by previous scholars to ensure that the measurements are reliable and valid. Each item is scored on a 9-point Likert scale, ranging from 1 (strongly disagree) to 9 (strongly agree), which allows for a fine-grained assessment of respondents' attitudes and behaviors.

The use of a 9-point Likert scale is intentional, as it provides a broader range of response options, enabling respondents to express subtle differences in their levels of agreement or disagreement. This granularity helps capture nuanced perceptions and attitudes, particularly important when measuring intrinsic motivation and engagement, which may vary significantly across individuals.

By using validated scales from previous studies, the research ensures that the measurement instruments are both reliable and valid, reducing the likelihood of measurement errors. These scales have been tested in prior studies and found to accurately reflect the constructs being measured, which adds credibility to the findings of this study.

3.4 Data Analysis Techniques

Once data collection is complete, the study employs a combination of descriptive statistics and Structural Equation Modeling (SEM) for data analysis. Descriptive statistics are used to summarize the demographic characteristics of the sample, such as age, gender, teaching experience, and academic discipline. These statistics provide a foundational understanding of the sample, allowing for an analysis of potential demographic influences on intrinsic motivation, engagement, and innovative teaching practices.

The primary analytical technique for testing the research hypotheses is Structural Equation Modeling (SEM). SEM is a powerful statistical tool that allows researchers to examine complex relationships among variables, including direct and indirect effects. In this study, SEM is particularly useful for testing the hypothesized mediating role of teacher engagement in the relationship between intrinsic motivation and innovative teaching practices. By modeling these relationships simultaneously, SEM provides a comprehensive analysis of how intrinsic motivation influences innovation both directly and indirectly through teacher engagement.

4. Data analysis results

The study utilized SEM path analysis through the AMOS 28.0 to analyze the impact of intrinsic motivation of teachers on innovative teaching practice as well as check the mediating role of teacher engagement in Beijing Colleges and Universities. The specific SEM path coefficients of latent variables of the study, including intrinsic motivation of teachers, teacher engagement and innovative teaching practices are presented in Fig. 2.

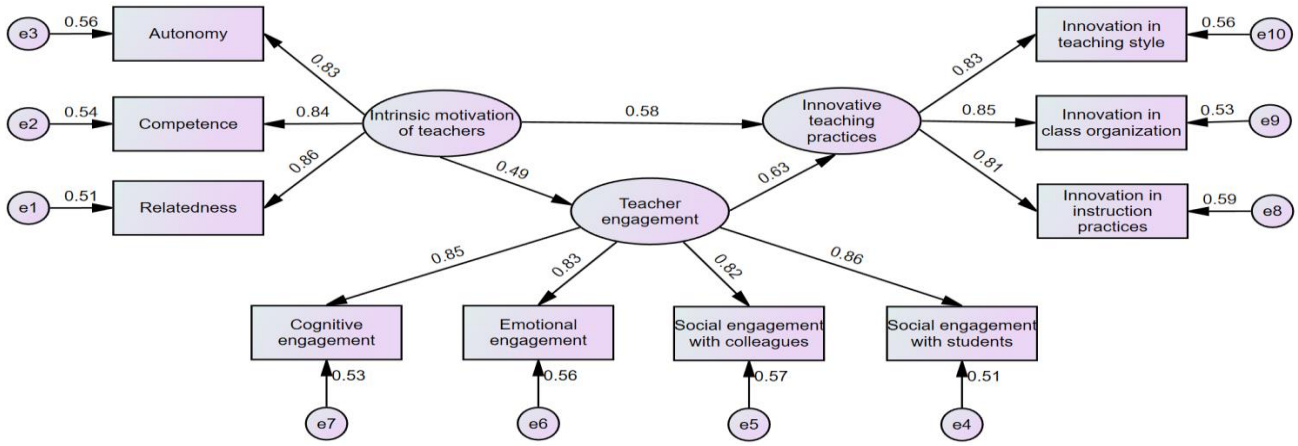

Figure 2. SEM path analysis

The specific path coefficient results are presented in Table 1.

Table 1. Path coefficient results

Path	Estimate	S.E.	C.R.	P-value	Std Path coefficient
Intrinsic motivation-->Innovative teaching practices	0.694	0.066	10.515	***	0.582
Intrinsic motivation-->Teacher engagement	0.628	0.061	10.295	***	0.486
Teacher engagement--> Innovative teaching practices	0.744	0.067	11.104	***	0.628

The study explores the relationships among intrinsic motivation, teacher engagement, and innovative teaching practices among teachers in Beijing colleges and universities, employing Structural Equation Modeling (SEM) to provide quantitative insights into these dynamics.

Based on data in Table 1 and Fig. 2, the path coefficient from intrinsic motivation to innovative teaching practices is 0.694 with a standardized path coefficient of 0.582, indicating a strong positive relationship. This result suggests that teachers' intrinsic motivation, which is their internal drive and satisfaction derived from teaching itself, is a robust predictor of their willingness to implement innovative teaching methods. The significance of this path, indicated by a high Critical Ratio (C.R.) of 10.515 and a p-value below 0.001, confirms the reliability of intrinsic motivation as a key facilitator of teaching innovation. This strong positive effect implies that when teachers are intrinsically motivated, they are not only more inclined to adopt new educational technologies and methodologies but are also more effective in engaging students in creative and critical learning processes.

Similarly, the path from intrinsic motivation to teacher engagement shows a significant positive coefficient of 0.628, with a standardized path coefficient of 0.486. This highlights how intrinsic motivation also plays a crucial role in fostering high levels of engagement among teachers. The statistical significance of this relationship is confirmed by a C.R. of 10.295 and a p-value less than 0.001. Engaged teachers, as suggested by these results, are those who are enthusiastic, committed, and emotionally involved in their professional roles, which is crucial for sustaining effort and persistence in teaching. The data underscores the importance of intrinsic motivation as a foundational element that not only directly influences innovative teaching but also acts through enhancing teacher engagement.

Besides, the strongest direct effect within the model is observed from teacher engagement to innovative teaching practices, with a path coefficient of 0.744 and a standardized path coefficient of 0.628. The significance of this path is validated by the highest C.R. in the model at 11.104 and a p-value indicating strong statistical significance. Engaged teachers, characterized by high levels of involvement and commitment, are more likely to employ diverse pedagogical strategies that include innovative teaching techniques, such as problem-based learning, collaborative approaches, and the integration of digital tools into the curriculum.

To check the mediating effect of teacher engagement, the study employed bootstrapping method and acquired the following results presented in Table 2.

Table 2. Mediating effect analysis results

Standard effect	Path	Effect coefficient	95% confidence interval		S.E.	P-value
			Lower	Upper		
Total effect	Intrinsic motivation-->Innovative teaching practices	0.887	0.836	0.938	0.026	***
Direct effect	Intrinsic motivation-->Innovative teaching practices	0.582	0.535	0.629	0.024	***
Indirect effect	Intrinsic motivation-->Teacher engagement-->Innovative teaching practices	0.305	0.262	0.348	0.022	***

Based on data in Table 2, the total effect of intrinsic motivation on innovative teaching practices is robust, with an effect coefficient of 0.887, reflecting both direct and indirect influences. When comparing the direct effect of intrinsic motivation on innovation, which has an effect coefficient of 0.582, with the indirect effect mediated by teacher engagement at 0.305, it becomes evident that teacher engagement substantially enhances the capacity of intrinsic motivation to foster innovative practices. This indirect effect, with its confidence interval ranging from 0.262 to 0.348 and a low standard error of 0.022, signifies a statistically significant contribution to innovation in teaching practices. The proportion of the total effect that is mediated by teacher engagement amounts to approximately 34.4% (0.305/0.887),

underscoring that while intrinsic motivation directly promotes innovation, a significant portion of its effect is realized through the heightened engagement of teachers. This finding emphasizes the importance of cultivating environments that enhance teacher engagement as a pathway to leveraging the full potential of intrinsic motivation in driving educational innovation.

5. Discussions of Findings

The findings of this study highlight significant relationships between intrinsic motivation, teacher engagement, and innovative teaching practices among teachers in Beijing colleges and universities. Using Structural Equation Modeling (SEM), the study provides a quantitative analysis of how intrinsic motivation impacts innovative teaching practices both directly and indirectly through the mediating effect of teacher engagement.

The data analysis results reveal a strong positive direct effect of intrinsic motivation on innovative teaching practices, with a path coefficient of 0.694 and a standardized path coefficient of 0.582. This significant effect (C.R. = 10.515, $p < 0.001$) suggests that when teachers are intrinsically motivated, driven by internal satisfaction, enjoyment, and a personal commitment to teaching, they are more likely to adopt innovative teaching methods. Intrinsically motivated teachers, who find personal fulfillment in their work, are more open to implementing new instructional strategies and experimenting with pedagogical approaches. This aligns with the work of Klaeijsen et al. (2018), who found that teachers with high intrinsic motivation were more likely to engage in creative teaching practices. Al-Mansoori et al. (2019) also noted that intrinsically motivated teachers invested more time and energy in developing engaging lesson plans, which improved the overall learning experience for students. The strong effect observed in this study reaffirms previous research that intrinsic motivation is a critical driver of teaching innovation.

Furthermore, the path from intrinsic motivation to teacher engagement shows a significant positive relationship, with a path coefficient of 0.628 and a standardized path coefficient of 0.486 (C.R. = 10.295, $p < 0.001$). This indicates that teachers who are motivated by intrinsic factors, such as a passion for teaching and a genuine commitment to student learning, are more engaged in their roles. Engagement, in this context, includes enthusiasm, commitment, and emotional involvement in the teaching profession. These findings align with those of Skinner et al. (2012), who found that intrinsically motivated teachers reported higher levels of engagement, demonstrating resilience, enthusiasm, and a willingness to take on additional responsibilities. Similarly, Wait (2017) noted that teachers with high intrinsic motivation showed greater commitment to refining their teaching practices, which underscores the role of intrinsic motivation as a foundational element that enhances engagement.

Besides, the strongest relationship observed in the model is between teacher engagement and innovative teaching practices, with a path coefficient of 0.744 and a standardized path coefficient of 0.628 (C.R. = 11.104, $p < 0.001$). This suggests that engaged teachers, those who are emotionally invested and enthusiastic about their work, are more likely to employ innovative instructional methods. Engaged teachers are more proactive in designing creative and student-centered learning experiences, such as problem-based learning and the integration of digital tools. This finding is consistent with the work of Nadelson et al., (2015), who found that highly engaged teachers adopted and maintained innovative teaching practices at a higher rate than less engaged teachers.

To further investigate the mediating role of teacher engagement, the study employed a bootstrapping method. The total effect of intrinsic motivation on innovative teaching practices was found to be 0.887, with both direct (0.582) and indirect effects (0.305) being statistically significant. The indirect effect, mediated by teacher engagement, represents approximately 34.4% of the total effect, suggesting that teacher engagement significantly enhances the influence of intrinsic motivation on innovation. This finding highlights the importance of teacher engagement as a mediating factor; while intrinsic motivation directly promotes innovative teaching, a substantial portion of its effect is channeled through heightened teacher engagement. This reinforces the conclusions of previous studies, such as those by Ji (2021), which emphasize the role of engagement as a critical pathway through which intrinsic motivation impacts teaching innovation.

6. Conclusion

In conclusion, this study underscores the crucial role of intrinsic motivation and teacher engagement in promoting innovative teaching practices among college and university teachers in Beijing. The findings reveal that intrinsic motivation significantly impacts teachers' willingness to adopt new and creative teaching methods. However, this study also highlights that intrinsic motivation alone is not sufficient to maximize innovation; teacher engagement serves as a vital mediating factor that amplifies the effect of intrinsic motivation on teaching innovation. Structural Equation Modeling (SEM) analysis shows that while intrinsic motivation has a direct effect on innovative practices, a substantial portion of this influence is channeled indirectly through teacher engagement, with 34.4% of the total effect mediated by engagement. These insights suggest that fostering both intrinsic motivation and engagement is essential for creating a teaching environment conducive to innovation. Educational institutions aiming to enhance teaching quality should focus on policies and practices that boost teachers' intrinsic motivation and engagement, thereby encouraging sustained educational innovation. This study contributes to the growing body of research on teacher motivation, engagement, and innovation, offering valuable implications for educational policy and practice aimed at improving instructional quality in Chinese higher education settings.

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Conflict of Interest

The authors declare no conflicts of interest.

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