



**THE IMPACT OF CHINESE VOCATIONAL TEACHERS'
PERSONALITY TRAITS ON THEIR INNOVATIVE TEACHING
BEHAVIOURS: A STUDY BASED ON THE YANGTZE RIVER
DELTA REGION, CHINA**



MIAO ZHANG

**A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY IN EDUCATION AND SOCIETY
INSTITUTE OF SCIENCE INNOVATION AND CULTURE
RAJAMANGALA UNIVERSITY OF TECHNOLOGY KRUNGTHEP
ACADEMIC YEAR 2025
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Degree of Doctor of Philosophy in Education and Society

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ABSTRACT

In the knowledge economy era, fostering creative education is vital, with teachers' innovative teaching capabilities playing a central role. China has recently undergone major reforms in its teacher appointment system, moving from traditional assignments of normal university graduates to a more competitive selection process through local education authorities or open school recruitment. This aims to ensure the appointment of teachers who can effectively contribute to student development and educational progress. Using stratified cluster sampling, this study surveyed 800 teachers across 246 vocational colleges in China's Yangtze River Delta. It examined the relationship between personal background, personality traits, and innovative teaching behaviors. Independent variables included gender, administrative duties, teaching subjects, school type, experience, and education level. Dependent variables were personality traits—such as agreeableness, conscientiousness, extraversion, openness, and emotional stability—and innovative teaching behaviors, categorized into capability (e.g., dedication, challenge acceptance, problem-solving) and specific performance (before, during, and after teaching). Findings revealed that gender and teaching experience significantly influenced innovative teaching. Male teachers showed greater dedication and passion, while females were more open to new methods. Experienced teachers engaged deeply in teaching but often emphasized grades. Administrative roles were linked to more standardized approaches, whereas non-administrators emphasized academic performance. Overall, teachers showed moderate innovative teaching behaviors, marked by enthusiasm and openness, but needed improvement in classroom strategies and problem-solving. While grade focus was balanced, broader student development requires attention. Strong post-teaching reflection practices support ongoing improvement. This study offers insights into enhancing innovative teaching under the Innovative-Driven Development Strategy.

Keywords: Innovative-Driven Development Strategy, College Teachers, Innovative Teaching Behaviors

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CHAPTER I

INTRODUCTION

1.1 Research Background

In 2016, China's "National Innovation-Driven Development Strategy Outline" clearly stated the need to guide higher education institutions to strengthen basic research and pursue academic excellence, form a group of advantageous discipline clusters and high-level scientific and technological innovation bases, and enhance innovation. The importance of higher education is increasingly prominent. Higher education aims to cultivate talents with innovative spirit and practical abilities, which requires college teachers to adopt innovative teaching methods and strategies to stimulate students' interest and potential in learning (Liu & Duan, 2020). Therefore, the innovative teaching behaviors of college teachers have become one of the hot topics in educational research.

The innovative teaching behavior of college teachers refers to the use of novel and effective teaching strategies and methods in the teaching process to improve students' learning effectiveness and motivation (Du, 2018). Innovative teaching behaviors include but are not limited to introducing new teaching technologies and tools, designing innovative teaching content and curriculum, creating a positive learning environment, and encouraging active student participation (Eysenck, 2019). The innovative teaching behaviors of college teachers positively impact students' learning outcomes and creativity development (Han, 2019). However, the innovative teaching behaviors of college teachers are influenced by various factors, including the teachers' personality traits. Personality traits are relatively stable individual characteristics that influence people's thinking styles, emotional experiences, and behavioral performances (Harrington, 2017). Teachers' personality traits may relate to their teaching behaviors and effectiveness. Therefore, studying the correlation between the innovative teaching behaviors of college teachers and their personality traits can help deepen the understanding of individual differences among teachers and the formation mechanism of their teaching behaviors.

In the era of the knowledge economy, the urgent task is to promote creative

education, and teachers themselves having the ability to teach innovatively is an essential key to implementing or achieving this reform. Therefore, studying teachers' innovative teaching is significant in this era. In recent years, there have been significant changes in the domestic teacher appointment system. In the early days, students funded by teacher training institutions would be assigned to relevant schools after completing their studies, and it was almost a lifelong tenure system. In recent years, the number of funded students has decreased significantly. In other words, most eligible prospective teachers must go through joint selections organized by local education bureaus or open selections organized by schools with vacancies. Only those who pass the selection can be appointed as teachers in schools. Although the selection methods may vary, they all aim to select teachers who can contribute the most and greatly help students, schools, and the education community (Ma, 2018). Although the areas of contribution or help are wide-ranging, in the present innovative era, various sectors of society naturally expect schools to cultivate creative students to benefit the country and society, accelerating national modernization and enhancing national competitiveness. Zhang (2011) points out that creativity is a standard potential of human beings, which can be cultivated through education and training. It means that teachers in schools can stimulate and educate students with creativity through innovative teaching methods. Therefore, if innovative personality traits are identified and selected in the recruitment of teachers, individuals with a tendency for innovative teaching can be appointed to teaching positions. After the appointment, their expertise can be applied and combined with innovative teaching characteristics in their teaching work, ensuring the right fit, making significant contributions, and assisting students, schools, and even the national society.

The correlation between innovative teaching behaviors and personality traits of university teachers has essential theoretical and practical significance. From a theoretical perspective, exploring the relationship between the two can deepen the understanding of the mechanism of innovative teaching behavior formation (Starko, 2000). Understanding the impact of different personality traits on innovative teaching behavior can reveal the reasons for individual differences among teachers and provide theoretical support for disciplines such as educational psychology and educational management. From a practical perspective, the research results can provide references for teaching training and selecting university teachers. By understanding the impact of

different personality traits on innovative teaching behavior, targeted training courses can be designed to help teachers improve their innovative teaching abilities. In addition, the research results can also serve as a basis for teacher selection and evaluation, comprehensively considering the potential abilities and adaptability of teachers from the perspective of personality traits.

In summary, the correlation between innovative teaching behaviors and personality traits of university teachers is of essential theoretical and practical value. By deepening the exploration of the relationship between the two, a scientific basis can be provided to improve the innovative teaching abilities of university teachers. Furthermore, the research results can provide references for teacher training and selection, promoting improving the quality of education and teaching. Therefore, conducting relevant research is of great practical significance for promoting the development of higher education and improving the level of teacher education.

1.2 Research Questions

Based on the research objectives mentioned above, the unanswered questions in this study are as follows:

- (1) What are the innovative teaching behaviors of vocational college teachers? How does their innovative knowledge translate into specific manifestations in teaching?
- (2) How do vocational college teachers with different background variables differ regarding their innovative teaching behavior?
- (3) What is the distribution of personality traits among vocational college teachers?
- (4) How do vocational college teachers with different background variables differ in their personality traits?
- (5) What is the relationship between the personality traits of vocational college teachers and their innovative teaching behavior?
- (6) How do vocational college teachers' background variables and personality traits predict their innovative teaching behavior?

1.3 Research Hypothesis

This study explores the intricate relationship between demographic factors and teachers' innovative teaching behaviors, recognizing the dynamic nature of the teaching profession. The overarching hypothesis (H1) posits that differences in various demographic aspects, encompassing Gender, Administrative duties, Subjects taught, School Properties, and Years of teaching experience, collectively contribute to variations in teachers' innovative approaches to pedagogy. In the contemporary educational landscape, acknowledging the influence of these diverse factors becomes imperative for fostering a teaching environment that values and nurtures innovation.

The difference in demographic factors (Gender, With or without administrative duties, Subjects taught, School properties, Years of teaching experience) affects the Innovative teaching behaviors of teachers.

The first specific hypothesis probes into the influence of Gender on teachers' innovative teaching behaviors. This hypothesis sheds light on how gender may intersect with innovative pedagogical practices, recognizing potential gender-related disparities in teaching styles or preferences. A deeper understanding of these distinctions holds significance for advancing gender-inclusive teaching strategies.

H1a: The difference in gender affects innovative teaching behaviors of teachers.

The second hypothesis delves into the impact of administrative duties on teachers' innovative teaching behaviors. Administrative roles may act as facilitators or inhibitors to adopting innovative teaching methods. Unraveling this relationship is pivotal for educational leadership, providing insights into how administrative responsibilities can catalyze or impede the integration of innovative approaches in the teaching profession.

H1b: The difference between with and without administrative duties affects the innovative teaching behaviors of teachers.

The third hypothesis focuses on the influence of the Subjects taught on teachers' innovative teaching behaviors. This hypothesis seeks to uncover how subject specialization contributes to variations in teaching approaches, acknowledging the diverse demands of different subject areas. This exploration is instrumental for tailoring professional development initiatives and curriculum design to meet the unique demands

of distinct academic disciplines.

H1c: The difference in subjects taught affects innovative teaching behaviors of teachers.

This hypothesis scrutinizes the impact of School Properties on teachers' innovative teaching behaviors. The characteristics and resources available within different school settings may influence the degree to which teachers feel empowered to employ innovative pedagogical methods. By exploring this dimension, the research aims to uncover the nuanced relationship between schools' physical and organizational attributes and the innovative practices teachers exhibit.

H1d: The difference in school properties affects innovative teaching behaviors of teachers.

The fifth hypothesis delves into the influence of Years of teaching experience on teachers' innovative teaching behaviors. Teaching experience is a multifaceted variable that may contribute to developing and refining innovative approaches over time. This hypothesis seeks to unravel how the duration of teaching experience shapes teachers' propensity to adopt and integrate innovative pedagogies, offering valuable insights into the professional evolution of educators and the factors influencing their instructional methods.

H1e: The difference in years of teaching experience affects teachers' innovative teaching behaviors.

This overarching hypothesis posits that variations in Personality Traits collectively contribute to differences in teachers' innovative teaching behaviors. As a multifaceted factor, personality can significantly impact various aspects of teaching, and exploring these dynamics is crucial for understanding the nuanced relationship between individual disposition and innovative pedagogical practices.

The difference in personality traits affects the innovative teaching behaviors of teachers.

The first specific hypothesis examines how personality traits influence teachers' dedication and love of teaching. Specific personality characteristics may enhance a teacher's passion and commitment to their profession, ultimately influencing the degree to which they embrace innovative teaching methods. Understanding this connection is vital for unraveling the motivational aspects that drive teachers to innovate

in their pedagogical approaches.

H2a: The difference in personality traits affects dedication and love of teaching.

The second hypothesis explores the impact of personality traits on a teacher's courage to accept challenges. Certain personality traits may contribute to a teacher's resilience and willingness to embrace new and challenging teaching methodologies. Uncovering these connections provides insights into how individual dispositions shape a teacher's capacity to navigate and overcome obstacles in pursuing innovative teaching practices.

H2b: The difference in personality traits factor affects courage to accept challenges.

The third hypothesis investigates how personality traits influence teachers' ability to identify and solve problems. Specific personality characteristics may contribute to a teacher's aptitude for problem-solving, which is integral to implementing innovative teaching strategies. Examining this relationship provides valuable insights into how individual dispositions may impact a teacher's capacity to address challenges creatively.

H2c: The difference in personality traits factor affects identifying and solving problems.

The fourth hypothesis delves into the impact of Personality Traits on Subordination in the teaching context. Certain personality traits may influence a teacher's approach to authority and hierarchical structures within the educational system, potentially affecting their willingness to adopt innovative practices. Understanding this dimension sheds light on how individual dispositions may interact with organizational structures to shape teaching behaviors.

H2d: The difference in personality traits factor affects subordination.

The fifth hypothesis explores how personality traits influence a teacher's tendency to Over-emphasize scores and grades. Specific personality characteristics may contribute to a teacher's orientation towards assessment metrics, potentially influencing their approach to innovative teaching methods. This aspect provides insights into how individual dispositions may intersect with pedagogical priorities.

H2e: The difference in personality traits affects over-emphasis on scores and grades.

This overarching hypothesis proposes that variations in Personality Traits collectively influence teachers' overall Innovative teaching behaviors. Recognizing that personality can be a significant factor in shaping teaching practices, this hypothesis aims to explore the multifaceted impact of individual dispositions on innovative pedagogical approaches throughout different phases of teaching.

The difference in Personality Traits factor affects Innovative teaching behaviors.

The first specific hypothesis scrutinizes how Personality Traits influence teachers' behaviors Before teaching. Specific personality characteristics may be pivotal in shaping teachers' preparatory activities and mindset as they plan and strategize innovative teaching approaches. Investigating this connection provides insights into the motivational and cognitive aspects that guide teachers' preparation for innovative instruction.

H3a: The difference in personality traits factor affects before teaching.

The second hypothesis explores the impact of Personality Traits on teachers' behaviors In teaching. Individual dispositions may influence the adoption and execution of innovative teaching methods during instructional sessions. Understanding this dimension is crucial for unraveling the dynamic interplay between personality traits and the practical implementation of innovative pedagogies in the classroom.

H3b: The difference in personality traits factor affects teaching

The third hypothesis delves into how personality traits influence teachers' behaviors After teaching. Specific personality characteristics may contribute to a teacher's inclination for reflection, self-assessment, and continuous improvement after the teaching session. Investigating this aspect sheds light on the role of individual dispositions in shaping post-teaching activities and the commitment to ongoing professional development.

H3c: The difference of personality traits factor affects after teaching.

1.4 Research Objectives

In light of the comprehensive research background and the motivating factors highlighted earlier, this study focuses on the esteemed community of teachers within Chinese vocational colleges. Its core ambition is to formulate an in-depth and meticulously designed questionnaire that will delve into the multifaceted realms of innovative teaching behavior and the intricacies of personality traits exhibited by these educators. This instrument served as the vehicle for a thorough exploration of the factors interweaving innovative teaching behaviors and the diverse personality traits found among teachers in vocational colleges. In essence, this research seeks to equip these educators with the tools necessary to harness their strengths and surmount the challenges that their unique personality traits might present. Ultimately, the overarching aspiration is to be a catalyst for pioneering strides in innovative teaching, thereby enriching the educational experiences of their students.

The specific objectives that underscore the purpose of this research endeavor encompass the following key aims:

Exploration of Innovative Teaching Behavior: The in-depth investigation of Innovative Teaching Behavior is a central pillar of this research. This study is not merely content with scratching the surface. However, it is committed to delving deep into the intricate world of innovative teaching practices within the domain of vocational college educators. It specializes in discerning and comprehending the variations and distinctions within their innovative knowledge and the practical application of innovative techniques in their teaching methods.

In this comprehensive exploration, we aim to dissect and scrutinize these disparities to an unprecedented level. We aspire to leave no stone unturned, revealing the multifaceted dimensions of innovative teaching behavior that might otherwise remain obscured. This analytical process encompasses a panoramic view of innovative teaching, scrutinizing the 'what', 'how', and 'why' behind these practices.

The study takes on the challenge of decoding the nuances of innovation as it is woven into the professional fabric of vocational college teachers. It seeks to answer pressing questions, such as what drives these educators to adopt innovative teaching methods, how they perceive innovation in education, and to what extent these practices manifest in their daily teaching routines.

Comprehension of Innovative Teaching Behaviors: A Profound Understanding of Innovative Teaching Behaviors is the cornerstone of this study. It is a dedicated endeavor to immerse ourselves in the world of vocational college educators and explore their intricate perceptions, interpretations, and comprehension of innovative teaching practices. This research does not merely skim the surface; it plunges deep into these teachers' perspectives and insights regarding innovative teaching behaviors.

The study aspires to uncover the rich tapestry of perspectives that vocational college teachers bring to innovation in education. It strives to unravel the layers of understanding that shape their teaching philosophies and practices. This is not just a cursory examination but an in-depth exploration that seeks to reveal the depth of comprehension and engagement with innovative pedagogical approaches.

By embarking on this journey, we aim to discern how these educators make sense of innovation in the classroom. What are the fundamental principles and values guide their perception of innovative teaching? How do they define and interpret the various dimensions of innovation, and to what extent do they integrate these concepts into their teaching methodologies?

This study empowers vocational college educators by recognizing and acknowledging the profound insights they bring to innovative teaching. It is an ode to their pedagogical acumen and unique perspectives on what constitutes effective and transformative teaching practices.

Exploration of the Interplay Between Personality Traits and Innovative Teaching Behavior: Unveiling the Interplay Between Personality Traits and Innovative Teaching Behavior lies at the heart of this research. It serves as a captivating journey into the complex dynamics underlying the relationship between vocational college teachers' distinctive personality traits and their innovative teaching practices. Rather than skimming the surface, this exploration deepens into the intricate dance between individual traits and pedagogical innovation. The study endeavors to shine a light on the nuanced connections that link the personality traits of educators to how they engage with innovative teaching. It delves into how personal attributes, such as introversion or extroversion, conscientiousness or openness, might influence the pedagogical methods and innovative approaches embraced in the classroom. This profound investigation exposes the underlying mechanisms by which personality traits may act as catalysts or

barriers to innovative teaching. Through this exploration, we aim to uncover the multifaceted layers of this relationship. It is not a mere examination of surface-level associations but an in-depth journey into the psyche of vocational college educators. What unique qualities do they bring to innovative teaching, and how do their traits enhance or challenge these practices? This research is about empowering teachers by recognizing the diverse array of personality traits that shape their pedagogical identities. It is an ode to the intricate web of characteristics that uniquely each educator and offers a fresh perspective on the potential strengths and growth areas for innovative teaching.

Ultimately, this exploration seeks to shed light on the myriad ways in which personality traits may influence the pedagogical choices of vocational college educators. By understanding these interplays, we aim to foster a more inclusive and adaptive educational environment that embraces and celebrates the rich tapestry of teacher personalities. Exploring the Interplay Between Personality Traits and Innovative Teaching Behavior is a profound journey into pedagogy and psychology. It is a tribute to the multifaceted qualities of vocational college educators and a catalyst for the evolution of innovative teaching practices.

The specific research objectives of this study are as follows. They aim to:

- (1) To explore the innovative teaching behavior of vocational college teachers and the differences in their innovative knowledge and concrete manifestations.
- (2) To explore vocational college teachers understanding of innovative teaching behaviors
- (3) To investigate the personality traits of vocational college teachers with different personal background variables and the differences therein.
- (4) To examine the relationship between the personality traits of vocational college teachers and their innovative teaching behavior.
- (5) To explore factors influencing teachers' innovative teaching behavior.

1.5 Research Scope and Limitations

1.5.1 Research Scope

According to the data from the National Bureau of Statistics of China, as of June 15, 2023, there are 1,578 higher vocational colleges in China. This study aims to

achieve comprehensive coverage by selecting research samples through stratified random cluster sampling of vocational college teachers nationwide and conducting a questionnaire survey.

The research focuses on qualified current teachers in public higher vocational schools in China, including full-time teachers engaged in administrative work (referred to as vocational college teachers). However, intern teachers, substitute teachers, and technical teachers are excluded from the scope of the study.

1.5.2 Research Limitations

(1) Limitations of questionnaire implementation

Due to the researcher's time constraints, it was not possible to personally administer the questionnaire to each participant. Instead, the distribution and collection of questionnaires were entrusted to personnel from the sample schools, making it difficult to control the respondents' response conditions precisely. When filling out the questionnaire, respondents provided self-reported answers. Although the researcher sought to avoid specific issues in the questionnaire items, such as respondents concealing their actual personal situation due to defensive psychology or value judgment, respondents withholding information to conform to social expectations (social desirability), and a tendency to agree with statements in the test (acquiescence bias), it is still possible that some limitations remain, leading to measurement errors in the research results.

(2) Limitations of research content

Indeed, this study exploring innovative teaching behaviors and their relationship with personality traits among vocational college teachers has significantly contributed to our understanding of this crucial area. However, it is essential to recognize several limitations that temper the generalizability and depth of the findings. Firstly, the study's focus on a specific demographic, namely vocational college teachers in a particular region, limits the broader applicability of the results. These findings may not necessarily extend to all teachers, especially those in diverse cultural and educational settings. Additionally, using self-reported data through questionnaires introduces the potential for response bias, and relying solely on quantitative methods can overlook the depth and nuances of the phenomenon under investigation.

Despite these limitations, this research provides valuable insights into

innovative teaching behaviors and their interplay with personality traits among vocational college teachers. While the findings may not be universally applicable, they offer a foundation for future research and educational practices. Future studies could address these limitations by adopting more diverse samples, employing mixed-method approaches, and conducting longitudinal research to enrich our understanding of this critical area further.

1.6 Research Framework

The research framework is illustrated in Figure 1.1.

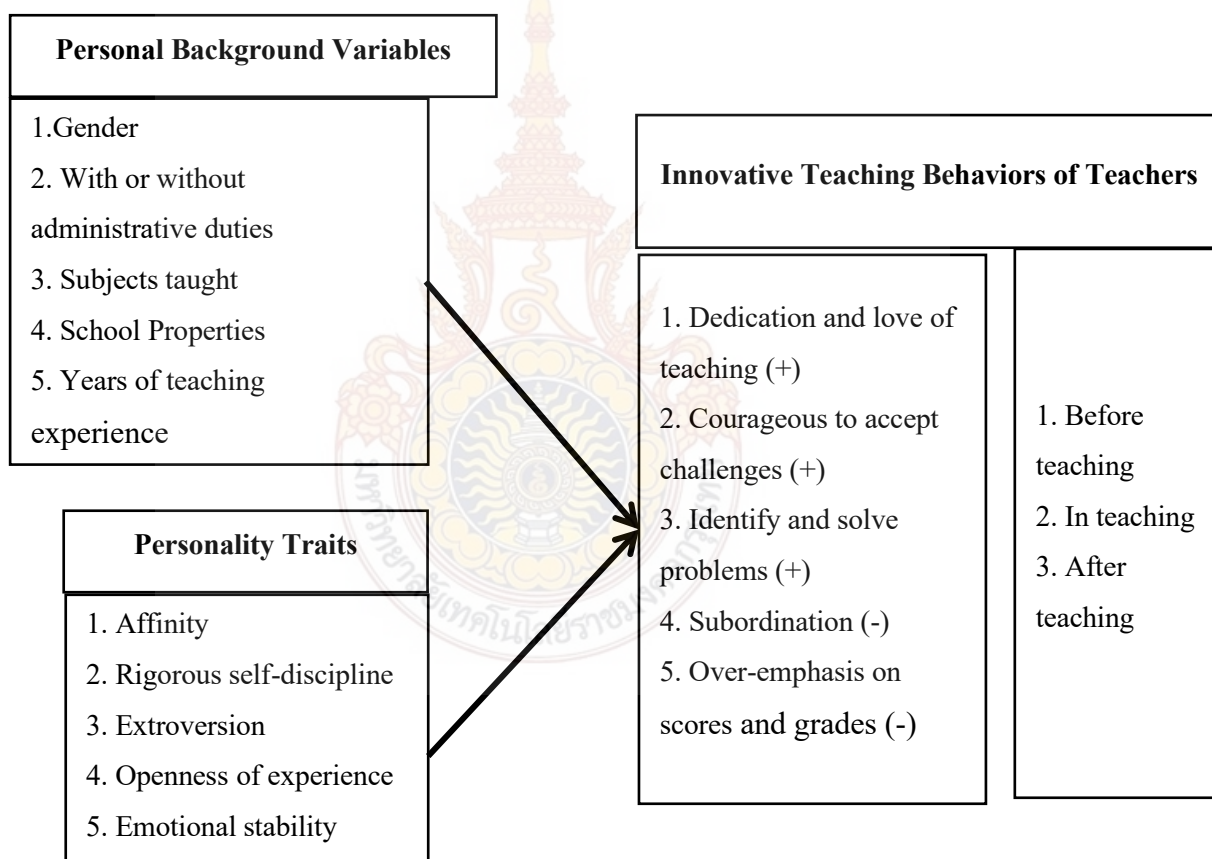


Figure 1.1 Research Model

1.7 Research Methodology

In order to comprehensively address the research objectives, a dual-method approach has been employed, comprising literature analysis and a questionnaire survey;

each method is delineated below:

Literature Analysis: The research methodology incorporates an extensive literature analysis to establish a solid theoretical foundation and contextual framework for the study. This involves a systematic review and synthesis of existing scholarly works, academic articles, and relevant publications that pertain to the central themes of personality traits and innovative teaching behaviors. This literature analysis aims to identify critical theoretical perspectives, conceptual frameworks, and empirical findings by critically examining the existing body of knowledge. Additionally, it seeks to uncover gaps, inconsistencies, or emerging trends in the literature, providing a robust basis for formulating research hypotheses and guiding the subsequent empirical inquiry.

Questionnaire Survey: A questionnaire survey is employed to gather empirical data directly from the study participants. The survey instrument captures information on vocational college teachers' personality traits and innovative teaching behaviors. The questionnaire is crafted based on established psychometric principles, ensuring reliability and validity in measuring the targeted constructs. Participants are selected through a purposive sampling technique, considering factors such as gender, teaching experience, and subject specialization to ensure a representative and diverse sample. The survey administration involves clear instructions, ethical considerations, and a structured approach to minimize bias and enhance the accuracy of responses.

Integration of Methods: The synergy between literature analysis and questionnaire survey is integral to the research methodology. The insights gleaned from the literature analysis inform the construction of the survey instrument, ensuring that it captures the nuanced dimensions identified in the existing body of knowledge. Conversely, the empirical findings from the survey serve to validate, augment, or challenge the theoretical perspectives drawn from the literature. This iterative data collection and analysis process facilitates a comprehensive understanding of the complex interplay between personality traits and innovative teaching behaviors in the specific context of vocational education.

Ethical Considerations: Throughout both methods, ethical considerations are paramount. Informed consent is obtained from all participants, ensuring voluntary participation, confidentiality, and anonymity. The research adheres to ethical guidelines and standards, prioritizing the well-being and rights of the participants.

In summary, the dual-method approach of literature analysis and questionnaire survey provides a robust and multifaceted strategy for exploring the intricate relationships between personality traits and innovative teaching behaviors among vocational college teachers. This methodological triangulation enhances the credibility and validity of the research findings, contributing to a more nuanced and comprehensive understanding of the research phenomena.

1.7.1 Literature Review

The literature review constitutes a fundamental component of the research methodology, involving a meticulous examination of pertinent books, publications, journals, master's and doctoral theses, and research reports both domestically and internationally. This comprehensive approach to literature analysis is designed to facilitate inductive and analytical processes, offering a nuanced understanding of the key themes related to personality traits and innovative teaching behaviors among vocational college teachers.

1.7.2 Questionnaire Survey

Based on the literature review and analysis, a questionnaire was developed for this study. After establishing its reliability and validity, a stratified cluster random sampling is conducted among teachers in vocational colleges nationwide to implement the questionnaire survey. The collected questionnaires are subjected to statistical analysis using software such as SPSS, and research conclusions and recommendations are drawn based on the analysis results.

Questionnaire Development: Our questionnaire is a carefully crafted instrument, informed by the rich insights from the literature review. Grounded in psychometric principles, it incorporates items strategically chosen to capture diverse dimensions of personality traits and innovative teaching behaviors. Rigorous pilot testing, factor analysis, and refinement ensure the reliability and validity of the questionnaire, creating a robust tool for data collection.

Stratified Cluster Random Sampling: To ensure the broad representativeness of our findings, we employ a stratified cluster random sampling technique. This approach considers critical variables such as geographical location, teaching experience, and subject specialization, enhancing the diversity and relevance of our sample. The sample size is determined through meticulous statistical calculations, balancing

statistical power and practical considerations.

Data Collection: Ethical considerations are paramount in our data collection process. Before administration, we obtained informed consent from all participants, emphasizing confidentiality, voluntary participation, and anonymity. The survey is distributed systematically, either through online platforms, email, or physical distribution, considering the preferences and accessibility of our target audience.

Statistical Analysis: Collected questionnaires undergo rigorous statistical analysis using SPSS, a powerful tool for data management and analysis. Descriptive statistics offer a snapshot of the sample characteristics, while inferential statistical techniques, including regression and correlation analyses, delve into relationships and predictors. This multifaceted analysis allows for a nuanced interpretation of the collected data.

1.8 Research Steps

This study follows a research process that involves a literature review and subsequent data collection through a questionnaire survey. The flowchart of the research steps is presented in Figure 1.1 and is described as follows:

1. **Research Topic Definition:** The research process commences with identifying a compelling research topic. After thoroughly exploring the research background and motivation, the need for an in-depth investigation into the relationship between innovative teaching and personality traits among vocational college teachers is recognized. Under the supervisor's guidance, the specific research topic is honed to focus on the correlation between innovative teaching and the personality traits of vocational college teachers. The overarching goal is to attain a comprehensive and systematic understanding of this correlation through the findings derived from the research.

2. **Research Plan Development:** A detailed research plan is developed following the definition of the research topic. This phase involves outlining research objectives, defining the scope of the study, selecting appropriate research methods, and planning the specific steps that guide the subsequent stages of the research endeavor.

3. **Literature Collection and Organization:** A critical step involves systematically collecting, reading, and organizing relevant literature on innovative

teaching behavior and personality traits. Literature is sourced from both domestic and international publications, covering a diverse range of perspectives. The gathered literature is then meticulously organized and analyzed, forming a solid theoretical foundation that informs the study's subsequent stages.

4. Research Plan Revision: With the research framework in place, the proposed research plan undergoes a rigorous review by internal and external professors. Feedback from the review committee is carefully considered, leading to necessary revisions and refinements. This iterative process ensures that the research plan is robust, methodologically sound, and aligned with the study's objectives.

5. Survey Questionnaire Development: Building on insights from the literature analysis, the study identifies critical variables for the survey questionnaire and formulates items for each variable. A preliminary questionnaire draft is created, and content validity is ensured through feedback from eight expert scholars. The preliminary questionnaire is then refined to produce the pilot questionnaire for further testing.

6. Pilot Testing of the Questionnaire: The questionnaire is administered to a carefully selected sample to assess its internal consistency. Collected responses undergo thorough analysis to establish the reliability of the questionnaire. This step is crucial to ensure that the questionnaire effectively measures the intended constructs and provides reliable data for the subsequent stages of the study.

7. Questionnaire Survey Implementation: The finalized questionnaire is implemented among the sampled teachers from vocational colleges. Questionnaires are distributed and collected systematically, adhering to ethical considerations such as informed consent, confidentiality, and participant anonymity.

8. Collection and Organization of Responses: The collected responses are coded and systematically organized upon completing the questionnaire. This meticulous process prepares the dataset for subsequent statistical analysis, ensuring data integrity and facilitating efficient analysis.

9. Data Analysis: Utilizing statistical software, such as SPSS, and employing appropriate statistical methods, the collected data undergoes rigorous analysis. Descriptive statistics, correlation analysis, and potential regression analysis are employed to uncover patterns, correlations, and insights relevant to the research objectives.

10. Research Results Summary and Recommendations: The final steps involve summarizing the research results based on the amalgamation of literature review findings and questionnaire survey data. Conclusions are drawn, and recommendations are formulated based on the analysis results. This comprehensive analysis ensures that the research outcomes contribute meaningfully to understanding the relationship between innovative teaching and personality traits among vocational college teachers, providing valuable insights for both academic and practical applications.

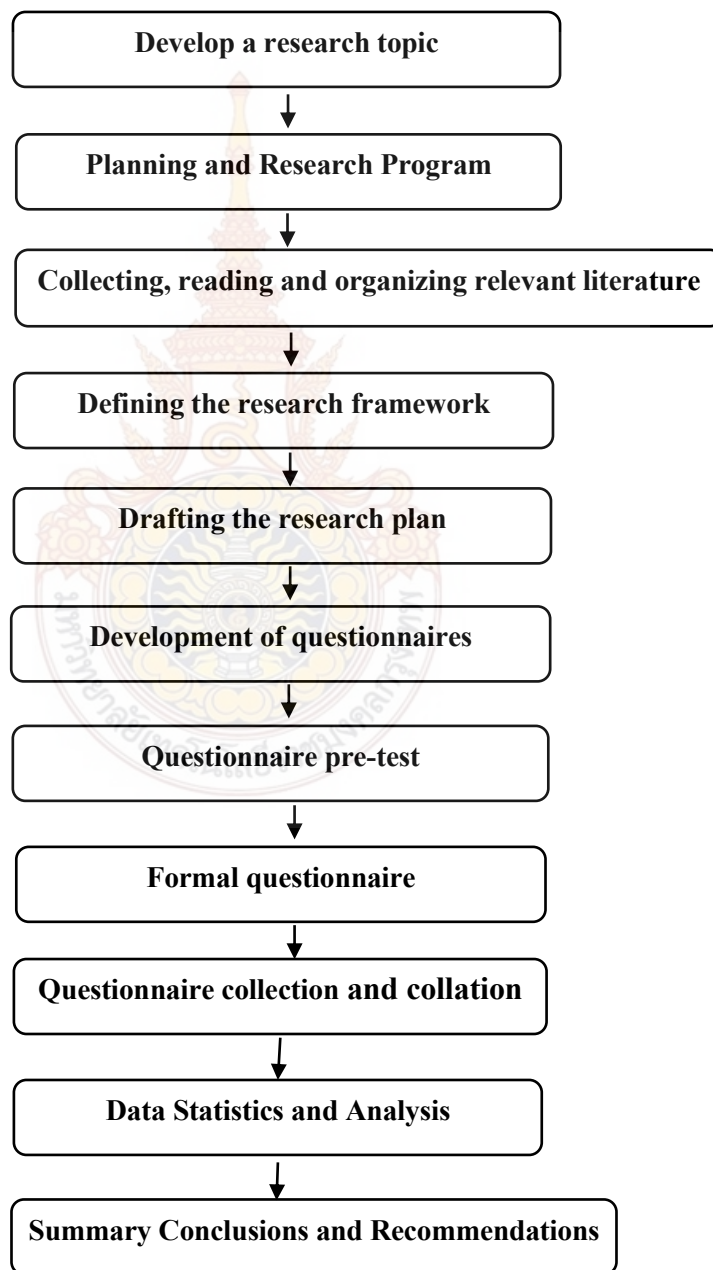


Figure 1.2 Flow of Research Steps

1.9 Definition of Key Terms

1.9.1 Personality Traits

The researcher integrates the following five points, which scholars believe constitute personality traits:

(1) Individuals' reactions to the environment, including internal feelings and external behavioral manifestations.

(2) Personality traits are formed through the interaction of genetic, environmental, maturity, and learning factors and possess stability and consistency.

(3) Personality represents the overall manifestation of personality traits and cannot be described by a single trait.

(4) Personality can be divided into several continuous variables, each representing a specific personality trait. Individual performance on each variable can be compared with norms.

(5) Personality traits can be used to infer an individual's external behavior or internal responses to some extent. Based on the above five points, the researcher adopts the Five-Factor Model of personality traits proposed by Costa and McCrae, including agreeableness, conscientiousness, extraversion, emotional stability, and openness to experience, to develop the Personality Traits Questionnaire (referred to as "My Personality" in this study). The scores obtained by participants on each variable of the personality traits questionnaire reflect their levels of each trait. A higher score on a specific variable indicates a higher degree of that trait in the participant.

1.9.2 Innovative Teaching

In this study, innovative teaching is all teaching activities in which teachers use new and diverse methods, whether self-designed or modified from others' ideas, to stimulate students' learning motivation and achieve teaching effectiveness. Based on this definition and drawing on the essence of advanced research by various scholars in the literature, the researcher has developed the section on innovative teaching competence in the Innovative Teaching Behavior Questionnaire used in this study. Participants' self-assessment scores in the innovative teaching competence section indicate their cognitive levels of innovative teaching. (For detailed information, please refer to Section 2.2.1 of this paper).

1.9.3 Innovative Teaching Behaviors

In this study, innovative teaching behavior is defined as any behavior that teachers engage in before, during, and after teaching, in which they independently design or modify others' ideas and employ new and diverse teaching methods or activities to stimulate students' learning motivation and achieve teaching effectiveness. The respondents' responses in the Innovative Teaching Behavior Questionnaire ("My Teaching Behaviors" in this study) represent their levels of innovative teaching behavior. This questionnaire includes two parts: innovative teaching competence and specific manifestations. Higher self-assessment scores on these parts indicate a higher level of self-perceived innovative teaching behavior among teachers. (For detailed information, please refer to Section 2.2.2 of this paper).



CHAPTER II

LITERATURE REVIEW

This study aims to explore the personality traits of vocational college teachers and the occurrence of innovative teaching and investigate the relationship between the two. This chapter will review relevant literature related to personality traits, innovative teaching, teachers' innovative teaching behavior, and the measurement of personality traits and innovative teaching to clarify the research topic, establish the research methodology, develop a research framework, and establish research tools. These topics will be discussed in four sections sequentially.

2.1 Defining Innovative Teaching

2.1.1 The Definition of Innovation

Meng (2019) explains that innovation is breaking through old methods or matters to open up new situations. Maslow argues that the creativity of a first-class soup is far better than a second-class watercolor painting. In a nutshell, he says that as long as it is innovation, it does not have to be far away and complex; as long as it is innovation, it can be very lifelike. Innovation involves reorganizing and rediscovering existing experiences and knowledge, characterized by exploration, dissimilarity, righteousness, and excellence (Han, 2018). Csikszentmihalyi Mihai (2018) argues that the qualities of innovation are transformation, the conversion of an existing field of knowledge to another new field of ideas, actions, or products. Meng (2019) argues that there are three basic representations of innovation: 1. novel, 2. valuable, and 3. thoughtful and surprising, meaning that innovation can be new products, services, materials, and processes. The National Innovation Plan implemented in Singapore in 2001 instructs that innovation creates new value through new products, processes, services, and businesses with new creative approaches. In the era of a knowledge-based economy, innovation, creativity, and creativity are the main driving forces determining the country's economic development.

According to Tushman and Nadler (2016), innovation is divided into the following categories: micro-variation, synthesis, and leapfrog. Marquis (1982) classified

innovation into three types: 1. incremental innovation, 2. systematic innovation, and 3. breakthrough innovation. According to the degree, Holt (2011) considers innovation as creating or introducing valuable something by using knowledge or critical information and classifies product innovation into original innovation, partial adoption innovation, and product improvement innovation according to the novelty of the change. According to Ding (2023), innovation can be classified according to its effectiveness: first, leapfrog innovation means that the knowledge learner surpasses the object of his or her learning after knowledge circulation; second, progressive innovation means that the knowledge learner grows together with the object of his or her learning. From the above, there are not only different types of innovation but also different degrees of innovation, and there are innovations that grow together or surpass the innovator with different effectiveness. According to He (2020), what we can predict is that human beings will continue to create the meaning of terms such as creation and innovation. In his book *52 Golden Keys*, successful entrepreneur Win Shih-Jen (2018) states that innovation challenges tradition and that any innovative style or concept comes from learning and immersion in tradition. This statement shows that innovation must go through two levels: firstly, it must go through the learning of tradition, learning thoroughly and even infiltrating to show, and secondly, it is possible to produce innovative styles and concepts, and it is possible to create a situation that challenges tradition, without being defeated down to the point of being eliminated from the game. On the contrary, without a thorough learning process, the innovative concepts produced will be like a flash of light passing through the sky, unable to create a style, let alone challenge anything.

Innovation requires knowledge as a foundation backing, but where does the motivation for innovation come from? Zhou (2020) argues that innovation occurs to solve a problem, and the prerequisite for solving a problem is that the subject becomes aware of the problem and forms the problem before further wanting to solve it. The subject's awareness may come from the environment (e.g., stimulus from change) or within the self (e.g., individual self-improvement or self-transcendence). Self-improvement or self-transcendence, as in A.H. Maslow's theory of self-actualization in the personality theory discussed earlier, means that each increase in the level of need represents the expression and expansion of the self. Therefore, it can be seen that personality influences creative behavior.

Based on the research of the scholars mentioned above, the definition of innovative teaching is as follows:

Table 2.1 Definition of Innovative Teaching

Scholar (Year)	Definition
Han (2018)	Innovative teaching involves reorganizing and rediscovering existing experiences and knowledge, characterized by exploration, dissimilarity, righteousness, and excellence.
Csikszentmihalyi Mihal (2018)	Csikszentmihalyi argues that the qualities of innovative teaching are transformation, converting existing knowledge into new ideas, actions, or products.
Ding (2023)	Ding classifies innovative teaching based on its effectiveness: leapfrog innovative teaching means the knowledge learner surpasses the object of learning after knowledge circulation, while progressive, innovative teaching means the knowledge learner grows together with the object of learning.
Win Shih-Jen (2018)	Successful entrepreneur Win Shih-Jen states that innovative teaching challenges tradition and that any innovative style or concept comes from learning and immersion in tradition. This statement shows that innovative teaching must go through two levels: thorough learning of tradition and possibly producing innovative styles and concepts that challenge tradition.
Zhou (2020)	Zhou argues that innovative teaching occurs to solve a problem, and the prerequisite for solving a problem is that the subject becomes aware of the problem and forms the desire to solve it. The subject's awareness may come from the environment (e.g., stimulus from change) or within the self (e.g., individual self-improvement or self-transcendence). Therefore, personality influences creative behavior.

2.1.2 Meaning of Innovative Teaching Behavior

Wei (2021) points out that innovative teaching behavior refers to teachers using diverse and engaging teaching methods and a wide range of instructional content to stimulate students' intrinsic interest in learning, cultivate their positive learning attitudes, and enhance their learning interests. Zhang (2022) suggests that innovative teaching behavior means that teachers adopt different teaching methods according to variations in time and place, aiming to enhance students' learning interests, stimulate their creative thinking, and accommodate individual differences. Hou (2018) explains that innovative teaching involves teachers conceiving, designing, and employing novel instructional orientations, methods, or activities to adapt to students' psychological

development, trigger motivation, and help students learn meaningfully and achieve educational goals more effectively. Zhang (2018) points out that innovative teaching behavior means creating new things and generating new elements from existing ones. However, innovation is not necessarily an entirely new creation unless it can produce positive value. Even an old method or strategy can be considered an innovative teaching behavior when educators adapt and transform it according to time, place, and individual characteristics, fully exploit its effects, and achieve instructional or educational objectives (You, 2010). According to the dictionary definition, innovative teaching behavior refers to introducing new educational ideas, methods, or tools. In a narrow sense, innovative teaching behavior refers to using new educational ideas, methods, or tools developed by others for teaching.

On the other hand, creative teaching refers to using self-developed educational ideas, methods, or tools that can stimulate students' interest in learning, distinguishing it from innovative teaching behavior (Lin, 2017). Innovative teaching behavior and creative teaching involve introducing new educational ideas, methods, or tools (Dictionary). In this study, based on more than three independent viewpoints, innovative teaching behavior and creative teaching are considered the same broadly. Regarding creative teaching, Starko (2000) and the dictionary also differentiate it from innovative teaching behavior, as they consider creative teaching as instruction aimed at fostering students' creativity. Zhang (2021) further elaborates on the two dimensions of creative teaching: one is creative instruction, and the other is teaching that stimulates thinking. Creative instruction refers to teachers using innovative methods, strategies, and processes to make teaching dynamic and diverse and to stimulate students' interest in learning. From the above perspectives, it can be seen that innovative teaching behavior is not just about using new methods, strategies, and processes; the most critical aspect is the positive outcome, namely the increase in students' learning interests, which can be regarded as innovative teaching behavior. According to Zhang Yucong's viewpoint, the second meaning of innovative teaching behavior is teaching that stimulates thinking, and it also expects students to develop their thinking, stimulate their ability to think critically, and even conduct in-depth research, which is one of the abilities that can be acquired from students. Therefore, the significance of education lies in cultivating students with innovative, creative, and imaginative abilities. Wu (2017) points out that innovative

teaching behavior must meet three criteria, unity, continuity, and transcendence, to affirm the value of innovative teaching behavior. Researchers believe that the three elements of valuable innovative teaching behavior and learning are: first, achieving a relative balance between learners and the environment; second, not negating existing things, but creating new things within existing ones, eliminating confusion while preserving essence; third, reflecting beyond surface-level learning. Therefore, the meaning of innovative teaching behavior includes novelty, questioning, release, and action. Novelty involves students generating new thoughts and developments; questioning encourages students to dare to question and be skilled in questioning; release entails letting students explore autonomously; and action refers to practice (Wu, 2021).

Based on the research of the scholars mentioned above, the definition of innovative teaching behavior can be summarized as shown in Table 2.2.

Table 2.2 Meaning of Innovative Teaching Behavior

Scholar (Year)	Definition
Wei (2021)	Innovative teaching behavior refers to teachers using diverse and engaging teaching methods and a wide range of instructional content to stimulate students' intrinsic interest in learning, cultivate positive learning attitudes, and enhance their learning interests.
Zhang (2022)	Innovative teaching behavior means that teachers adopt different teaching methods according to variations in time and place, aiming to enhance students' learning interests, stimulate their creative thinking, and accommodate individual differences.
Hou (2018)	Innovative teaching behavior involves teachers conceiving, designing, and employing novel instructional orientations, methods, or activities to adapt to students' psychological development, trigger motivation, and help students learn meaningfully and achieve educational goals more effectively.
Zhang (2018)	The meaning of innovative teaching behavior is to create new things and generate new elements from existing ones. However, innovation is not necessarily an entirely new creation unless it can produce positive value. Even an old method or strategy can be considered an innovative teaching behavior when educators adapt and transform it according to time, place, and individual characteristics, fully exploit its effects, and achieve instructional or educational objectives.

Table 2.2 Meaning of Innovative Teaching Behavior (continued)

Scholar (Year)	Definition
You (2010)	According to the dictionary definition, innovative teaching behavior refers to introducing new educational ideas, methods, or tools. In a narrow sense, innovative teaching behavior refers to using new educational ideas, methods, or tools developed by others for teaching. Innovative teaching behavior and creative teaching involve introducing new educational ideas, methods, or tools.
Lin (2017)	Creative teaching uses self-developed educational ideas, methods, or tools to stimulate students' interest in learning, distinguishing it from innovative teaching behavior. Innovative teaching behavior and creative teaching involve introducing new educational ideas, methods, or tools.
Starko (2000)	Starko and the dictionary differentiate creative teaching from innovative teaching behavior, as they consider creative teaching as instruction aimed at fostering students' creativity.
Zhang (2021)	Creative teaching involves two dimensions: creative instruction, where teachers use innovative methods, strategies, and processes to make teaching dynamic and diverse, stimulating students' interest in learning, and teaching that stimulates thinking, expecting students to develop their thinking, think critically, and conduct in-depth research, which is one of the abilities that can be acquired from students.
Wu (2017)	To affirm its value, Wu points out that innovative teaching behavior must meet three criteria: unity, continuity, and transcendence. Researchers believe that the three elements of valuable innovative teaching behavior and learning are achieving a relative balance between learners and the environment, not negating existing things but creating new things within existing ones, eliminating confusion while preserving the essence, and reflecting beyond surface-level learning.
Wu (2021)	The meaning of innovative teaching behavior includes novelty, questioning, release, and action. Novelty involves students generating new thoughts and developments; questioning encourages students to dare to question and be skilled in questioning; release entails letting students explore autonomously; and action refers to practice.

2.1.3 Implementation of Innovative Teaching

As mentioned earlier, innovative teaching is not a negation of the existing nor the creation of something out of nothing. Therefore, innovative teaching is based on the old teaching experience, the appropriate transformation of teaching methods, the

creation of a good learning atmosphere, and teaching diversity to achieve quality teaching effectiveness, which are all innovative teaching: 1. the teaching journey, 2. curriculum design, 3. learning assessment, 4. classroom environment setting, 5. classroom management, and 6. teacher-student interaction. In contrast, Lin (2012) pointed out the following ways to implement innovative teaching: 1. create a teaching context conducive to teaching innovation, 2. stimulate students' curiosity and inspire their critical thinking and problem-solving skills, 3. make good use of teachers' professional authority and establish good teacher-student relationships, 4. teachers' professional growth is the source of improving teaching quality. Wu (2018) suggests that implementing innovative teaching should pay attention to the following matters worth three examinations: 1. understand students' needs. 2. create a good learning atmosphere in the class. 3. make good use of modern information technology. 4. lively and diversified teaching methods. 5. use flexible and diversified assessment methods. 6. use methods that can generate creativity. 7. encourage students to learn in groups. 8. use proper questioning. Encourage students to experiment with learning. High (2019) suggests that teachers should keep the following principles in mind when using innovative teaching: 1. lead by example; 2. adjust attitudes; 3. start early; 4. ask questions; 5. encourage questioning; 6. discussion time; 7. sharing activities; 8. combination exercises; 9. sorting games; 10. all together; 11. encourage discovery; 12. listening habits; 13. pros and cons analysis; 14. Continuity is what makes it effective. To sum up, the implementation of innovative teaching can be shown not only in the visible items of teaching activities, such as curriculum design, the use of teaching media, the arrangement of the teaching environment, the arrangement of teaching activities, and the evaluation during and after teaching, but also in the intangible level, such as improving students' curiosity and aggressiveness, building good character and correct values, creating a happy learning classroom atmosphere, and establishing a good learning environment. It can also be used at the intangible level, such as improving students' desire for learning and motivation, building good morals and values, creating a happy learning atmosphere in the classroom, establishing good teacher-student relationships, and contributing to teachers' professional growth.

2.1.4 Teachers' Knowledge and Attitude Towards Innovative Teaching

In the teaching process, students' intention to interpret knowledge almost

always follows the teacher's guidance, especially for younger students, and even negative interpretations are not reflected upon by students. Therefore, what attitudes and perceptions should teachers have while innovating teaching behaviors? According to Tsai (2019), teachers should have the following attitudes: 1. to enrich the open mind with educational love; 2. to recognize that existing knowledge is only a tiny part of the living world; 3. to learn by manifesting existence, not by shaping consciousness; 4. to recognize the value of irrationality in innovative teaching; 5. to return the development of the will to power to individual self-creation; 6. the absolute purpose of innovative teaching is students' valuable growth. Valuable growth. Hou (2018) argues that innovative teaching is about teachers being open-minded and having the ability to teach reflectively, to use reflective, questioning, deconstructive, and reconstructive thinking to guide students to learn correctly, to develop students' ability to think critically and creatively, and to use their experienced virtuous connotations and positive traits to have a subtle effect on students, thus building their good character and positive outlook on life. Xu (2018) argues that teachers should teach innovation in a way that stimulates students' curiosity and teaches them how to learn actively. Teachers and students can learn from each other; the teacher-student relationship is that of an inspirer, guide, inspirer, and counselor, and the teacher can self-reflect. To sum up, the teacher's attitude toward innovative teaching should be that teachers do not teach innovatively for the sake of teaching innovatively but implement innovative teaching based on an enthusiastic attitude and open-mindedness toward education. In addition, innovative teaching should be based on the perception that innovative teaching requires teachers to constantly reflect on themselves, questioning, deconstructing, and reconstructing what students need most, what methods are most appropriate for students, how to cultivate students' ability to think critically and creatively, and how to make students more effective in learning while having a subtle effect on them, thus creating an optimistic and enterprising outlook on life. The students are expected to have a positive and progressive outlook on life.

2.2 Factors Affecting Teachers' Innovative Teaching Behaviors

Han (2019) argues that teachers still have considerable difficulties and limitations in implementing innovative teaching in the actual teaching environment in

response to today's educational reform, and points out that the factors that affect teachers' innovative teaching include: 1. teachers' background factors; 2. teachers' three and further training growth factors; and 3. environmental factors. Because of this, the researcher argues that it is essential to address the factors that affect teachers' innovative teaching to make it effective and cultivate the nation's creativity from school education. What are the factors that prevent teachers from implementing innovative teaching? We should also seek solutions to strengthen or improve these factors. Many scholars studied creative people in different fields, hoping to identify the common personality traits or cognitive abilities that geniuses or creative people in these fields must possess. Subsequently, some studies have discovered that (Zhao, 2018) creativity is not the exclusive domain of a few people; everyone can have creativity, but the degree of it varies. Recent human creativity-related studies have considered creativity as a trait (Zhou, 2020), and research has confirmed (Ding, 2023) that there are indeed some different personality traits that distinguish the more creative individuals (Parloff, Datta, Kleman, Handlon, 2015; Weiss, 1981). Even Jackson Messick (1965) argued that personality traits are prerequisites for creativity and that personality traits such as intelligence, cognitive style, motivation, and values influence the tendency to create and increase the output of unusual responses. Research has shown that creativity is a personality trait, and implementing innovative teaching is undoubtedly a behavioral manifestation of creativity. Therefore, it is natural for those who implement innovative teaching to have specific behavioral characteristics. The researcher collated from the literature of scholars and experts and found that two opposite factors influence innovative teaching behavior, which is positive (enhancing innovative teaching behavior) and harmful (hindering innovative teaching behavior), and three variables that enhance innovative teaching behavior: dedication and love of teaching, concentration, and keenness of mind, and courage to accept challenges. The respective descriptions are as follows:

2.2.1 Positive Factors

The factors that enhance the implementation of innovative teaching include, first, teachers' dedication and love of teaching. Second, the ability to accept challenges, and third, a focused and sensitive mind, as described below:

2.2.1.1 Dedication and Love of Teaching

Amabile (1983) defined creativity from a product perspective and proposed the Componential Model of Creativity, which states that a person's level of motivation affects his or her learning and preparation in domain-related skills and creativity-relevant skills, as well as his or her perception of the task and search for information in the creative process. Lubart and Getz (2017) also suggest that motivation and emotion may be the driving force that triggers creativity, can put the creator in a state of heightened awakening (awareness), and may contribute to creative thinking about particular concepts (Lee, 2019). Therefore, as a teacher, what Amabile calls the motivation to work due to dedication will result in the output of creativity in the relevant field; what Lubart and Getz call the drive to create due to the love of teaching and learning will also be innovative teaching for teachers and will be a virtuous circle of development. In other words, teachers' affirmation or love of teaching influences teaching behavior to a great extent. Using primary and secondary schools, Yang (2017) found that the more teachers value their professional status and agree that a teacher's job is a great responsibility, the more creative teaching behaviors they will have. Cheng (2020), using in-service and trainee teachers as subjects, found that the more they love teaching, the greater satisfaction they get from teaching while having higher performance in the creativity of teaching intention, creative teaching ability, and creativity of actual teaching behavior. Therefore, love and dedication to teaching positively encourage innovative teaching behaviors. Wu Sihua believes that because of caring, one is attentive, and because of attentiveness, one is innovative (Liao, 2018).

2.2.1.2 Courage to Accept Challenges

The courage to accept challenges includes faith, perseverance, and a high adversity quotient.

(1) Beliefs

Guy R Lefrancois (2017) emphasizes that teaching is a complex course and results in a series of continuous behaviors; most of the teachers' behaviors in the classroom are impromptu responses and usually do not have time to think carefully, so many of teachers' behaviors are based on habits as well as their own established beliefs (Lee, 2014), not to mention to implement innovative teaching that is still unknown success or failure, having enough faith in themselves Those who engage in innovative

teaching with confidence and conviction will be more persuasive and will make the teaching process smoother, while on the contrary those who lack conviction may even be deterred by the fear of failure and give up on what may be innovative teaching that will benefit their students and be highly effective. However, GuyR Lefrancois (2017) also argues that beliefs are built not only from personal experience but also from the information we obtain from education and other sources (Lee, 2014), which means that innovative teaching is supported by a solid theoretical foundation and is planned with an adequate and well-designed curriculum, which not only makes the teaching process smoother and reduces the chance of errors, but also reduces the chance of failure because of adequate curriculum design. It also strengthens the beliefs of innovative teachers because of adequate preparation.

(2) Perseverance

Sternberg & Lubart (1995), Csikszentmihalyi (2017), and Amabile (2017) all emphasize that engaging in innovative behavior and sustained innovative behavior is something that requires experiencing long hours of effort and betting heart and even resources (Shaw, 2019), and the journey of innovation often encounters difficulties, either The journey of innovation often encounters difficulties, either through failure, or from peers, or even boos, and if not for the perseverance to remove resistance or cross it. Otherwise, it will only be short-lived, or they will never try to innovate again. Therefore, perseverance is a personality trait that supports innovative behavior as a resupply station.

(3) High adversity quotient (AQ)

Dr. P.G. Stoltz (2017) pointed out that the higher an individual's adversity quotient (AQ) is, the more resilient he or she can be to face adversity in various ways and with a proactive and optimistic spirit, courageously accept the challenge of difficulty, bring into play creativity, and find solutions to achieve excellence. It is up to the individual to improve it. To sum up, innovative teaching means making moderate or comprehensive adjustments to traditional teaching, but whether or not innovative teaching developed by individuals can successfully improve the shortcomings of traditional teaching and maintain the original advantages is not proven. Indeed, they will face different positions and opinions from the administration, peers, students, parents, and even public opinion. As Stoltz said, AQ people are unafraid of challenges and even

use their creativity to find solutions.

2.2.1.3 Finding and Solving Problems

Csikszentmihalyi (2017) identified the following characteristics among individuals who have achieved innovation: 1. During engagement in innovative activities, most individuals exhibit complete concentration and even a loss of temporal awareness. 2. they have minimal engagement with other tasks before completing innovative outcomes. 3. They experience a lack of awareness regarding the passage of time. 4. They may temporarily lose their sense of self in pursuing their goals. 5. They proceed forward without dwelling on the fear of failure. In contrast, Yang's (2019) study on teachers who received creative teaching awards revealed that, after controlling for other work motivations and selection pressures, concentration made the most significant unique contribution in distinguishing award-winning teachers in instructional material design within specific regions, surpassing the influence of age and gender when compared to the control group.

Jen (2010) believes that an outstanding creator is likelier to be sensitive, to have a keen sense of observation, to have a keen sense of what matters to them, and even to have a rich sense of humor. Management guru Peter Drucker points out that successful innovators know how to use their left and right brains in a balanced way; they care about data and observe people's reactions; they use the scientific method to study how to meet the new opportunities they discover, and then go out to potentially relevant people to gain a deeper understanding of their expectations, the values they value, the issues they care about, and the needs they are eager to meet (Lee, 2019). This statement suggests that a keen mind and insight catalyze innovative ideas. However, it also suggests that it is not innovation for innovation's sake but rather a keen observation to understand the needs of the students and the problems that students are desperate to solve.

After the literature mentioned above, the researcher searched for many scholars' descriptors of innovative teaching behaviors and categorized the descriptors according to the three variables mentioned above in Table 2.3, which shows the following descriptions of scholars' enhanced innovative teaching behaviors.

Table 2.3 Scholars' Descriptions of Enhanced Innovative Teaching Behaviors

Scholars	Description of Enhanced Innovative Teaching Behaviors	Enhancement of Measurement Variables for Innovative Teaching Behaviors
Amabile (1983)	1. Stall has positive personality traits 2. Highly self-attendance machine 3. Preference for the work itself	
Sternberg (2017)	1. With inner diligence, comb 2. Willing to work for the recognition of dedication and love of teaching 3. The sad hope of being affirmed	
Harrington (2017)	1. Care for work	
Gardner (2017)	1. Immerse yourself in its work	
Cheng (2020)	1. With internal control orientation	
Guilford (2015)	1. Try to build the ability to accomplish the goal	
Torrance (2021)	1. Yongchlor 2. Perseverance 3. Willing to take risks	
Amabile (1983)	1. Adventure and other directions 2. Self-challenge	
Cummings (2019)	1. Have a strong self-confidence	
Sternberg (2020)	1. Gu Yiqun Barrier Gel 2. Excessive adventurous spirit brave to accept challenges	
Harrington (2017)	1. Confidence 2. Internal control of (think success or failure is in my hands)	
Jia Fuming (2016)	1. Wedge but not give up the persistence 2. Have the courage to oxygen to face the trapped	
Yu, Rui-Chia (2013)	1. dare to strange - new things to pick me	
Ye Yuju, Wu Jinggu - Zheng Yingluo	1. The ability to solve the street conflict with public opinion	
Guilford (1995)	1. Thinking about the unveiling of characteristics	
Guilford (2015)	1. More Focused 2. High perception of the problem	
Torrance (2021)	1. Independent thinking and judgment	
Cattell (1985)	1. Issue sensitivity 2. Sensitivity	

Table 2.3 Scholars' Descriptions of Enhanced Innovative Teaching Behaviors (continued)

Scholars	Description of Enhanced Innovative Teaching Behaviors	Enhancement of Measurement Variables for Innovative Teaching Behaviors
Schleifer (2015)	1. Thoughtful	
Gardner (2018)	1. super-sense and foresight	
Csikszentmihaly (2017)	1. Concentrate on and even forget the time	
Clark (2017)	1. Flexible thinking ability	
Gowan (2020)	1. Thinking, intuition, perception, feeling	
Gary A. Davis (2002)	1. Rich sensitivity to problem-solving and discovery	
Gary A. Davis (2002)	1. Rich sensitivity	
Xie (2015)	1. keen intuition 2. Clear thinking and inductive integration ability	
Leaf (2018)	1. Thoughtfulness	
Yang (2020)	1. Independent and autonomous judgment	
Ye, Wu, Zheng (2021)	1. Insight 2. keen observation skills 3. Good at using reverse thinking	
Wu (2021)	1. Broad perspective, deep insight 2. Attracted by the complexity of the matter	

The table presented in the research encompasses the descriptions provided by scholars regarding enhanced innovative teaching behaviors. These descriptions serve as valuable insights into the various aspects of innovative teaching behaviors. By categorizing these descriptors into different variables, the researchers have created a comprehensive overview of what constitutes enhanced innovative teaching behaviors. These scholars' insights cover various attributes and characteristics contributing to innovative teaching.

Amabile's (1983) insights into enhanced innovative teaching behaviors

provide a nuanced understanding of the pivotal factors influencing educators' ability to foster innovation in their teaching practices. One key emphasis is on positive personality traits, where a teacher's disposition is crucial in creating an environment conducive to innovation. Positive traits, such as openness, adaptability, and a proactive mindset, contribute to teachers' ability to embrace novel approaches in their instructional methods. Furthermore, Amabile underscores the significance of self-attendance, suggesting that teachers who are self-aware and reflective about their teaching practices are better positioned to identify areas for improvement and implement innovative strategies. This self-reflective aspect aligns with the notion that continuous self-assessment is integral to fostering innovation in teaching.

Additionally, Amabile points to the importance of genuine preference for the work. Educators who derive intrinsic satisfaction from teaching and view it as more than a job will likely invest extra effort in developing and implementing innovative teaching methods. This intrinsic motivation is a powerful driving force for educators to go beyond conventional approaches and explore creative solutions to enhance the learning experience for their students.

Similarly, Sternberg's (2017) perspective delves into the psychological aspects that contribute to enhanced innovative teaching behaviors. As highlighted by Sternberg, Inner diligence speaks to educators' dedication and perseverance in refining their teaching practices. This inner drive to consistently improve aligns with the idea that sustained efforts and a commitment to excellence are essential for fostering innovation. Moreover, Sternberg emphasizes a willingness to work for recognition and the hope for affirmation as crucial elements. This implies that educators seeking acknowledgment for their innovative efforts will likely invest time and energy in developing and implementing creative teaching methods. The hope for affirmation is a motivational factor, encouraging educators to persist in their innovative endeavors despite potential challenges. In essence, the detailed exploration of Amabile's and Sternberg's perspectives reveals that positive personality traits, self-attendance, a genuine preference for the work, inner diligence, and a desire for recognition and affirmation collectively contribute to creating an environment conducive to enhanced innovative teaching behaviors.

The collective insights from Harrington (2017), Gardner (2017), Cheng

(2020), Guilford (2015), Torrance (2021), Cummings (2019), Jia (2016), and Yu (2013) offer a comprehensive understanding of the diverse attributes that underpin enhanced innovative teaching behaviors. These scholars highlight key personal and psychological characteristics that educators can cultivate to foster innovation in their teaching practices. Firstly, the emphasis on self-confidence is a recurring theme in the descriptions provided by these scholars. Harrington (2017) suggests that educators with vital self-assurance are likelier to take risks and experiment with innovative teaching methods. Confidence in one's abilities enables teachers to navigate uncertainties associated with trying new approaches and contributes to an environment where innovation is encouraged. Internal control orientation, as mentioned by Gardner (2017) and Cheng (2020), is another crucial attribute. Educators with a disposition towards internal control demonstrate a sense of autonomy and agency in shaping their teaching practices. This internal locus of control empowers teachers to proactively seek innovative solutions and make independent decisions, fostering an environment where creativity flourishes. Perseverance, a quality highlighted by Guilford (2015) and Torrance (2021), is fundamental to cultivating enhanced innovative teaching behaviors. The iterative nature of teaching innovation often involves facing challenges and setbacks. Educators who exhibit perseverance are more likely to overcome obstacles, learn from failures, and persist in refining their innovative approaches over time. The courage to face challenges, emphasized by Cummings (2019), Jia (2016), and Yu (2013), underscores the importance of resilience and adaptability in the pursuit of innovative teaching. Educators who embrace challenges as opportunities for growth are better equipped to navigate the complexities of introducing novel teaching methods. This courage fosters a mindset that values experimentation and continuous improvement.

The comprehensive table provides an invaluable resource for researchers and educators seeking to understand the multifaceted nature of innovative teaching behaviors and the factors that enhance them. These descriptors encompass personal traits, attitudes, and attributes that can serve as a foundation for further exploration and development of innovative teaching practices.

2.2.2 Negative Factors

The researcher compiled the literature of many scholars on teachers' implementation of innovative teaching and learning and found that two factors hinder

innovative teaching and learning, including herding and overemphasis on scores or performance, which are described as follows:

2.2.2.1 Subordination (Conformity)

The dichotomy between conformity and creativity in education calls for a nuanced examination of how teachers, influenced by their inherent tendencies or early conditioning, navigate their roles in shaping students' perspectives. Liu's (2020) observation underscores the potential challenge when educators, conditioned into habits of subordination, unintentionally perpetuate an environment that discourages divergence and non-conformity. The ramifications extend beyond mere behavior and encompass a mindset considering alternative viewpoint's subjective impermissibility. Furthermore, Hallman's (1967) insights, as cited in Lin (2018), introduce the intriguing notion that teachers, often seen as authoritative figures, may find themselves subordinated to group pressure when embracing innovative teaching practices. This paradox highlights the delicate balance teachers must strike between adhering to established norms and fostering an environment that encourages creative thinking. Striking this balance is paramount, as excessive conformity may stifle the creativity educators aim to cultivate in their students.

In contrast, Yeh et al. (2021) emphasize foresight and courage as keys to creativity, suggesting a path forward. According to their perspective, defying the crowd involves the willingness to challenge mainstream thinking and embrace alternative viewpoints. Wu's (2021) findings complement this by illustrating the positive correlation between a lively classroom atmosphere and enhanced creativity in science and technology. The implications are clear: a teaching environment that embraces diversity of thought and encourages students to question, challenge, and explore outside conventional boundaries is conducive to cultivating creativity. Liu's (2017) assertion that discoveries and breakthroughs arise from thinking beyond standard answers echoes the call for a departure from rigid conformity in educational settings. Cheng's (2014) argument for actively providing an environment that nurtures wisdom, courage, and the courage to explore diverse streams aligns with the idea that educators are responsible for actively shaping a conducive atmosphere for creative development.

In conclusion, the delicate interplay between conformity and creativity in education underscores the need for educators to navigate their roles conscientiously.

Balancing the structured teaching elements with an openness to diverse perspectives is pivotal. Educators serve as conduits of information and as architects of an environment that either fosters or hinders creativity. As the educational landscape evolves, the imperative to actively encourage critical thinking and innovative approaches becomes increasingly central to preparing students for the complexities of the 21st century.

2.2.2.2 Overemphasis on Scores or Achievement Performance

Perhaps due to the realistic side of ascensionists hanging on, schools or teachers must compete for survival under the rate of ascension, seeking the affirmation of society and parents under the rate of ascension, which has long led some teachers to pay excessive attention to test scores, naturally guiding students who emphasize scores and compete for rankings, while ignoring the learning process itself is extremely valuable (Mao, 2018). Jia Fuming points out that there is a severe problem with teaching that treats the purpose of teaching (helping students' development) as promotion, the content of teaching (enriching materials to develop creative abilities) as a substitute for the test questions of the promotion exam, and the teaching activity (exploration and creativity) as a substitute for the activity of examining textbooks and destroying their ability to create and ruining their potential (Chen, 2019). Lin (2018) points out that teachers' overemphasis on rewards and grades will encourage students to do everything for grades and to follow the teacher's opinion in everything, making it difficult for individual opinions to emerge. Teachers' excessive demand for standard answers will make students think that only the standard answers are correct and dare not have breakthrough innovation performance. After the literature mentioned above, the researcher compiled many scholars' descriptions of behaviors that hinder innovative teaching and learning and categorized them into two variables: submissiveness and overemphasis on grades or performance, as shown in Table 2.4.

Table 2.4 Scholars' Descriptions of Behaviors that Hinder Innovative Teaching and Learning

Scholars	Description of the Impediments to Innovative Teaching for	Measurement Variables that Hinder Innovative Teaching for
Hallman (1967)	1. Serving migration map pith house force	
William (2011)	1. Mind the walking bird mode of the Dukai	
Schleifer (2015)	1. cannot judge independently of the cat	
Crowan (2020)	1. tendency of external control, submissiveness	
Starko (2000)	1. Submissive	
Swat (2001)	1. Obedient	
Lin (2015)	1. Intolerance of uniqueness and newness	
Xie (2012)	1. Lack of uniqueness	
Yu (2013)	1. Fear of being criticized for being submissive 2. Fear of being alone	
Ye, Wu, Zheng (2021)	1. Care about other people's opinion 2. Suppressing the ego	
Wu (2021)	1. Attached to the character 2. Submissive	
Wu (2022)	1. No uniqueness	
Amabile (1983)	1. Inflexible 2. Lack of professional competence or experience 3. With a solid external dynamic change	
Starko (2000)	1. Caustic 2. Arbitrary exhaustion of points emphasizing scores or	
Lin (2019)	1. Over-emphasis on Sundance and achievement 2. Excessive requirements strain single answer	
Yu (2018)	1. Can not relax frolic 2. Fear of failure	
Wu (2022)	1. Snobbish	

The provided table offers valuable insights into the descriptions of behaviors that hinder innovative teaching and learning, as outlined by various scholars. These descriptions shed light on the impediments that educators may encounter when attempting to foster innovative teaching practices. The scholars' insights encompass a range of characteristics and attitudes that may act as barriers to innovative teaching.

Hallman (1967) extensively explores educators' impediments when adopting innovative teaching methods. He emphasizes the proclivity towards external control and submissiveness, contending that these factors significantly constrain an educator's ability to embrace and implement innovative approaches to teaching wholeheartedly. The susceptibility to external influence may manifest as a reluctance to deviate from established teaching norms, hindering the integration of novel and transformative pedagogical practices. Expanding on these challenges, William (2011) delves into issues tied to a narrow mindset and resistance to change among educators. The unwillingness to explore new teaching methods or adapt to evolving educational paradigms can substantially hinder the seamless integration of innovative practices within the classroom. The inertia created by ingrained teaching habits may impede exploring fresh and effective teaching strategies.

Schleifer (2015) brings attention to the impediment of lacking independent judgment, suggesting that educators who struggle with making autonomous decisions may face challenges in effectively incorporating innovative teaching strategies. Crowan (2020) and Starko (2000) further elaborate on the negative impact of external control tendencies and submissiveness on educators' willingness to experiment with new teaching techniques, emphasizing the importance of fostering a sense of autonomy in educational settings. Additionally, scholars such as Lin (2015), Xie (2012), and Yu (2013) point to factors such as intolerance of uniqueness, lack of creativity, and fear of criticism and isolation as potential obstacles to the adoption of innovative teaching practices. The fear of stepping outside the comfort zone and the anxiety associated with potential criticism may create a reluctance to explore unconventional teaching methods, hindering the development of a dynamic and innovative educational environment.

Ye et al. (2021) and Wu (2021) contribute by discussing challenges related to being overly concerned about others' opinions, suppressing one's ego, attachment to specific characteristics, and submissiveness. These socio-emotional factors can

significantly impact an educator's mindset, affecting their receptivity to change and innovation. Overcoming these challenges requires fostering a supportive and open-minded educational culture. Amabile (1983) identifies inflexibility, a lack of professional competence or experience, and a solid aversion to external dynamic changes as barriers to innovative teaching. Starko (2000) underscores caustic behavior and the arbitrary emphasis on scores or evaluations as hindrances to fostering innovation in education. The rigid adherence to traditional evaluation metrics may stifle creativity and discourage educators from experimenting with alternative teaching approaches.

Moreover, Lin (2019) highlights issues tied to the over-emphasis on performance and achievement and excessive demands for single correct answers. The prevailing focus on standardized testing and rigid performance metrics may create an environment discouraging experimentation and innovation in teaching methods. Yu (2018) adds insights, mentioning the inability to relax and fear of failure as potential impediments, underscoring the importance of cultivating a supportive and psychologically safe environment for educators to take risks and innovate.

This table comprehensively summarizes the various characteristics and attitudes hindering innovative teaching and learning. These descriptions are valuable for educators and researchers looking to understand and address the challenges of promoting innovative teaching practices.

2.3 The Relationship between Personality Traits and Innovative Teaching Behaviors

The intricate relationship between personality traits and innovative teaching behaviors has become a focal point in educational research, shedding light on the dynamics that influence adopting creative and effective pedagogical practices. Openness to experience emerges as a cornerstone, with educators demonstrating high levels of openness more likely to embrace novel teaching methodologies, experiment with diverse instructional techniques, and integrate cutting-edge technologies into their classrooms. Complementing this, resilience and adaptability prove pivotal, equipping teachers to navigate challenges, learn from setbacks, and persist in implementing innovative approaches, fostering a continuous improvement cycle. Proactiveness and initiative,

inherent in certain personalities, contribute significantly to the innovation landscape in education. Educators with a proactive mindset identify opportunities for improvement and take the lead in implementing changes, actively seeking creative solutions to enhance teaching effectiveness. This forward-thinking approach introduces a dynamic element to teaching methodologies, encouraging experimentation with new technologies and a commitment to ongoing professional development.

Furthermore, personality traits associated with collaboration and open communication foster a culture of innovation within educational institutions. Teachers who value collaboration engage in open communication channels, sharing ideas and contributing to a collective pool of best practices. This collaborative spirit extends beyond individual classrooms, promoting interdisciplinary projects, collaborative lesson planning, and the joint development of innovative curricular initiatives. As educators with these traits collaborate, they create an environment that nurtures and sustains innovation in education.

The cultivation of teacher creativity in teaching can be studied from multiple perspectives, with one important aspect being the teacher's factors, namely whether the teacher possesses creative personality traits (Yu & Hou, 2003). Research on creative personality traits in foreign countries has primarily focused on artists, writers, and information technology professionals, with a recent shift toward education. Creative personality traits are not unique to creative talents; ordinary individuals can also develop creative personality traits through education and training (Liu & Li, 2010). Although there is no consensus on the structure and dimensions of creative personality, it can be affirmed that stable and favorable factors in one's personality that promote creativity development fall under the category of creative personality (Zorana, 2006).

Academic consensus is gradually forming regarding the content of creative personality traits in teachers. It is believed that teacher creative personality traits should include the following aspects: perseverance in the face of obstacles, openness to new experiences, self-confidence, generation of creative ideas, a desire for novelty and change, reflective interaction, emotional intelligence, a penchant for imagination, a high level of curiosity, and a willingness to grow (Hu, 2006; Bob, 2006).

As for the relationship between teachers' creative personality traits and innovative teaching behaviors, most studies currently acknowledge their correlation,

with teachers' creative personality traits positively impacting their innovative teaching behaviors. However, there is an ongoing debate within academia regarding how specific creative personality traits influence innovative teaching behaviors. Zheng's (2011) research suggests that innovative teaching behaviors are better when teachers possess personality traits that encourage and support them. On the other hand, Xiao's (2012) study indicates that the proactive sharing aspect of creative personality traits significantly influences diverse teaching and problem-solving in innovative teaching behaviors.

2.4 Theoretical Basis of Innovative Teaching

2.4.1 Educational Behaviorism Theory

A fundamental tenet of Educational Behaviorism Theory is the pivotal role played by reinforcement mechanisms. This theory posits that timely and appropriate rewards can serve as potent motivators, significantly amplifying learners' engagement and overall performance. Conversely, judicious punishment can effectively deter undesirable behaviors, contributing to a disciplined and conducive learning environment. Educators, therefore, are encouraged to harness the power of reinforcement strategies to create a positive and supportive atmosphere for learning. In addition to reinforcement, feedback emerges as a crucial element in the educational behaviorism paradigm. The provision of timely and specific feedback is deemed essential within this framework. This feedback loop is a constructive tool, enabling learners to identify errors, make necessary corrections, and refine their learning strategies. By facilitating this continuous feedback loop, educators play a vital role in nurturing an environment conducive to improvement and development throughout the learning process.

Moreover, Educational Behaviorism Theory recognizes the profound influence of social factors on the learning journey. Factors such as family dynamics, the school environment, and peer relationships are acknowledged as significant determinants shaping learners' behaviors and attitudes. In embracing this perspective, educational behaviorism underscores the importance of considering the broader social context in which learning occurs. This holistic awareness allows educators to address

the individual learning process and the societal dynamics that impact the educational experience. In summary, Educational Behaviorism Theory offers a systematic and comprehensive approach to education, incorporating clear learning objectives, stimuli-response dynamics, reinforcement, and feedback mechanisms. By adhering to the principles of this theory, educators can gain profound insights into the learning process, effectively guide learners, and ultimately contribute to more fruitful and successful educational outcomes.

A fundamental component of educational behaviorism is the role of reinforcement. It posits that timely and appropriate rewards can significantly boost learners' motivation and enhance their performance. Conversely, the application of punishment can deter undesirable behaviors. Therefore, educators must use reinforcement strategies to create a conducive learning environment. In addition to reinforcement, feedback is pivotal in educational behaviorism theory. Providing timely and specific feedback is essential, enabling learners to recognize errors, make corrections, and refine their learning strategies. This feedback loop is a crucial tool for improvement and development in the learning process. Educational behaviorism recognizes the influence of social factors on learning, such as family dynamics, the school environment, and peer relationships. These social factors are seen as significant determinants that can shape learners' behaviors and attitudes. As such, educational behaviorism promotes an awareness of the broader social context in which learning occurs.

In summary, educational behaviorism offers a systematic approach to education, encompassing various elements like establishing clear learning objectives, using stimuli and responses, reinforcement, and feedback mechanisms. By adhering to the principles of this theory, educators can gain a deeper understanding of the learning process and better guide learners, ultimately leading to more effective and successful educational outcomes.

2.4.2 Social Learning Theory

Expanding on the intricate dynamics of the Social Learning Theory, it is essential to delve deeper into the nuanced mechanisms through which social interactions and observational learning contribute to the educational landscape. Albert Bandura's theory suggests that individuals not only passively absorb knowledge from their

surroundings but actively learn through observation, imitation, and subsequent reinforcement.

The core tenet of the Social Learning Theory is that learners can acquire new skills, knowledge, and behaviors by observing the actions of others and the consequences that follow. These observed behaviors serve as models that individuals can later replicate in specific contexts. This theory highlights the significant influence of the social environment and the role of role models in shaping the learning experiences of individuals. The Social Learning Theory has wide-ranging applications in education, psychology, and the behavioral sciences. In educational settings, it offers valuable insights for educators seeking to enhance their teaching methods and stimulate students' learning motivation. One key implication is the importance of providing positive role models for students. When students observe and interact with individuals who exhibit the desired behaviors and skills, they are more likely to imitate and adopt these behaviors themselves.

Furthermore, encouraging social interactions among students is another practical application of the theory in education. By promoting collaborative learning environments and group activities, educators can leverage the power of social interaction to facilitate learning and knowledge transfer. This approach fosters an environment where students can observe, learn from, and interact with their peers, enhancing the learning experience.

The theory's emphasis on acquiring new skills and behaviors through observation underscores the powerful influence of role models. Positive role models, whether educators or peers, are catalysts for shaping desirable behaviors and skills. When exposed to such role models, students are likelier to emulate these behaviors, leading to a more enriched and adaptive learning experience. Moreover, the Social Learning Theory introduces the concept of vicarious reinforcement, where individuals observe the consequences of others' actions and adjust their behavior accordingly. This element highlights the importance of feedback and consequences in the learning process. Educators can leverage this insight by providing clear feedback and consistently reinforcing positive behaviors, fostering a conducive learning environment. The theory's applications in educational settings extend beyond individual learning to collaborative endeavors. Educators harness the communal aspect of learning by actively encouraging

social interactions and group activities. This enhances observational learning and promotes a sense of community and shared knowledge among students, contributing to a more holistic educational experience.

In conclusion, the Social Learning Theory's comprehensive view of learning as a socially embedded and interactive process provides educators with a rich framework to enhance teaching strategies. From cultivating positive role models to incorporating vicarious reinforcement and collaborative learning, underscore its significance in shaping effective educational practices. Educators, armed with insights from this theory, can create learning environments that foster individual growth and nurture a collective spirit of knowledge acquisition and sharing.

2.4.3 Problem-Based Learning Theory

Problem-Based Learning (PBL) theory, first introduced by Howard S. Barrows in the late 1960s to early 1970s, offers a unique approach to learning that centers on students' active engagement with real-world problems. This theory underscores the idea that students acquire knowledge and skills most effectively when confronted with complex, real-life problems that require analytical thinking and problem-solving.

In the context of PBL, students are presented with authentic, open-ended problems that serve as the focal point of their learning experience. These problems are often interdisciplinary, encouraging students to draw on various knowledge and skills from different subjects. Students are then expected to take the initiative in seeking relevant information, analyzing the problem, and working collaboratively to devise solutions. The key features of Problem-Based Learning include students' independent or collaborative inquiry, which involves active research, brainstorming, and experimentation. Throughout this process, students expand their understanding of the subject matter and develop critical thinking, analytical, and problem-solving abilities. PBL promotes a holistic approach to learning, where students acquire disciplinary content knowledge and gain essential skills. Problem-based learning is not confined to a specific domain and has found wide application in various fields such as medicine, engineering, and business schools. These disciplines often use PBL to train professionals who must be well-equipped to address real-world challenges. Moreover, educators in other domains have also embraced PBL to kindle their students' interest in active

learning and foster an exploratory spirit.

In summary, the Problem-Based Learning theory is a dynamic and student-centered approach to education that places real-world problems at the heart of the learning process. It equips students with essential skills, including critical thinking, problem-solving, and teamwork, making it a valuable framework for educators and learners across diverse fields.

2.4.4 Design Thinking Teaching Theory

Design Thinking Teaching Theory, initially proposed by David Kelley and Tim Brown in the late 1990s to early 2000s, is a transformative approach to education that prioritizes innovation and human-centered problem-solving. This theory advocates for a departure from traditional educational models by strongly emphasizing addressing real-world challenges creatively and collaboratively.

At its core, Design Thinking is a problem-driven methodology that encourages students to view problem-solving through empathy and user experience. Students are guided to employ the mindset of designers, which encompasses essential phases such as observation, gaining insights, brainstorming ideas, prototyping, and continuous refinement. Through this iterative process, students are challenged to generate creative solutions that cater to the unique needs of end-users. One of the defining features of Design Thinking is its unwavering commitment to user-centric solutions. By prioritizing the experiences and perspectives of end-users, students are prompted to design solutions that genuinely meet their needs and desires. This approach results in more effective solutions and instills a sense of empathy and user advocacy in students. Interdisciplinary collaboration is another cornerstone of the Design Thinking theory. It encourages students to work in teams, often comprised of individuals from various backgrounds, such as designers, engineers, and business professionals. This multidisciplinary approach reflects the reality of complex problem-solving in the real world, where diverse perspectives and expertise are invaluable. Design Thinking is widely applied in educational institutions, spanning design schools, business schools, engineering colleges, and other fields. This theory cultivates a range of skills in students, including innovative thinking, effective problem-solving, and a collaborative spirit that prepares them to navigate the complexities of contemporary challenges. Regarding research, scholars have been increasingly focused on exploring the application and

outcomes of Design Thinking across various disciplines. Their investigations aim to ascertain how Design Thinking can be effectively integrated into educational practice and how it influences students' creativity, problem-solving capabilities, and overall educational experiences.

In summary, the Design Thinking Teaching Theory represents a dynamic and innovative approach to education. Fostering a deep commitment to creative problem-solving, user-centric design, and interdisciplinary collaboration equips students with the skills and perspectives necessary to excel in our rapidly evolving world.

2.5 Theories and Research on Personality Traits

2.5.1 Defining Personality Traits

Personality is a frequently used term in our daily lives. For example, in education, it is often mentioned that the purpose of education is to cultivate a sound personality. According to Zhong (2019) in Zhang's Dictionary of Psychology, personality is an individual's unique individuality in their life journey, including their adaptation to others, events, themselves, and the overall environment. This unique individuality comprises various aspects of psychological and physical traits, such as needs, motivations, interests, abilities, orientations, attitudes, temperaments, values, and lifestyle habits, manifested through genetic, environmental, maturation, and learning factors. Psychologist Allport (1961) believed that personality is the entire psychological system of a person, a dynamic organization of growth and development. Therefore, an individual's behavior reflects their initial unique personality characteristics, and when these characteristics appear in different situations, they are referred to as personality traits. Cattell (1943) considered traits to be the fundamental structure of personality, persistent tendencies of response that can be consistently manifested in different contexts. Thus, he believed that personality can be used to predict an individual's behavioral responses in specific situations (Guo, 2020). Considering the definitions of personality traits provided by the scholars above, it can be understood that personality traits refer to individuals' unique psychological and physical environmental characteristics. These characteristics are formed through the interaction of genetics, learning, environment, and maturation and demonstrate consistency in different

contexts, making them helpful in predicting behavior. This is what we refer to as personality traits. This study aims to understand the relationship between the personality traits of vocational college teachers and their innovative teaching behavior. Therefore, it is crucial to begin the investigation by examining teachers' personality traits.

Based on the research of the above scholars, the definition of personality traits can be summarized as shown in Table 2-5.

Table 2.5 Defining Personality Traits

Scholar (Year)	Definition
Zhong (2019)	Personality is defined as the unique individuality an individual displays in their life journey, including their adaptation to others, events, themselves, and the overall environment. It encompasses various psychological and physical traits, such as needs, motivations, interests, abilities, orientations, attitudes, temperaments, values, and lifestyle habits, manifested through genetic, environmental, maturation, and learning factors.
Allport (1961)	Allport viewed personality as the entire psychological system of a person, a dynamic organization of growth and development. An individual's behavior reflects their initial unique personality characteristics, and these characteristics, referred to as personality traits, are consistently manifested in different situations.
Cattell (1943)	Cattell considered traits to be the fundamental structure of personality, representing persistent tendencies of response that can be consistently displayed in different contexts. He believed that personality traits could be used to predict an individual's behavioral responses in specific situations.
Guo (2020) (quoted)	Personality traits refer to individuals' unique psychological and physical environmental characteristics. These characteristics are formed through the interaction of genetics, learning, environment, and maturation and demonstrate consistency in different contexts, making them helpful in predicting behavior.

2.5.2 Theories on Personality Traits

Personality traits are psychological phenomena; generally speaking, some aspects are outwardly expressed and leave impressions on others, while others remain undisclosed and deeply hidden within a person's mind. In psychology, there are many

schools of thought on personality psychology, each emphasizing different arguments. To clarify the scope of the concept of personality, psychologists have limited their exploration to the systematic study of the formation, structure, function, change, and relationship with various aspects of outward behavior of personality, which is called personality theory (Lee, 2018). However, up to now, explanations of personality theory by various scholars remain inconsistent, with no single theory being universally accepted and no single theory capable of addressing all issues related to personality. Therefore, when exploring personality theories, we always find that each theory has a different focus and lacks a comprehensive explanation. This section will discuss theories related to personality traits, including:

2.5.2.1 Psychodynamic Personality Theory

This includes the early psychoanalytic theory proposed by S. Freud and the later neo-psychoanalytic theory as described below:

(1) Psychodynamic personality theory

Proposed by Austrian psychiatrist S. Freud, the psychodynamic personality theory is one of the most influential theories in modern psychology. It has significantly influenced human culture in this century (Qi, 2018). Its central tenets can be summarized as follows: Subconscious (unconscious) and conscious: Freud conceptualized the human psychological state as an iceberg, where the part above the water surface represents conscious awareness, while the submerged part signifies the subconscious realm (Qi, 2018). Personality structure (personal psychoanalytic theory): The theory encompasses three components—id, ego, and superego—each with distinct functions. These components interact, conflict, and exert varying levels of intrinsic dominance over individual behavior at different times (Qi, 2018).

①Id: Situated in the subconscious, the id represents the most primitive aspect of the personality structure, operating according to the pleasure principle, which seeks immediate gratification (Qi, 2018).

②Ego: Located in the subconscious, the ego develops through the differentiation of the id and operates based on the reality principle, shaping an individual's perception of physical and social reality (Qi, 2018).

③Superego: Found in consciousness, the superego is the highest controlling part of the personality structure, guided by the principles of perfection or morality. It

comprises two crucial components: conscience and ideal self (Qi, 2018).

(2) Neo-psychodynamic theory

This theory was proposed by several psychologists, such as Adler (1915), Jung (1926), Horney (1935), and Fromm (1954), among others, and differs from Freud's viewpoints in some aspects. It emphasizes the role of ego function and conscious mind in explaining the environment and experience and questions whether gender and aggression can explain all motivations. It places less emphasis on the importance of gender and primal desires. In contrast, Freud leans more towards the satisfaction of biological needs. At the same time, the neo-psychoanalytic theory highlights the influence of social factors within and outside the family and emphasizes that personality development continues throughout life (Shaw, 2019).

Based on the psychodynamic personality theory mentioned above, the personality of higher education teachers in this study, although having the subconscious and conscious mind as advocated by Freud, or the personality structure formed by the id, ego, and superego, is also influenced by the environment, experience, and learning according to the neo-psychoanalytic theory. Therefore, social trends or educational authorities can enhance certain personality traits of higher education teachers. Thus, social forces or educational authorities can enhance certain personality traits of higher education teachers, such as creative traits.

2.5.2.2 Humanistic Theory or Self-theory

The prevalence of this trend in the 1960s has greatly influenced both theory and applied psychology. The existential view is that humans possess the basic tendency of self-actualization and will constantly interact with the environment to develop, strengthen, and self-actualize in the direction of here-and-now existence (Hu, 2019). These two discourses particularly emphasize the importance of the person himself/herself and subjective experiences, and the performance of innovative teaching behaviors explored in this study is closely related to teachers' subjective experiences, such as self-actualization and self-concept, as discussed below.

(1) Self-actualization theory

Maslow (2010) argues that motivation is an intrinsic drive for individual growth and that motivation is composed of various needs of different natures, leading to self-actualization. 1. Self-actualization: the process of individual growth, the full

development of physical and mental potential, the potential for good traits to be fully developed in the environment. 2. Peak experience: in pursuing basic needs to derived needs and moving towards self-actualization, individuals experience a sense of spiritual satisfaction and perfection that transcends time and space and reaches its peak, and this peak experience is a byproduct of self-actualization. 3. Need hierarchy: it arises in the context of scarcity, also known as deficiency needs, which are universal and will not be satisfied after they are satisfied, from low to high: physiological needs, security needs, love and affiliation needs, self-esteem and self-respect needs, intellectual needs, aesthetic needs, and self-actualization. The innovative teaching behaviors of the teachers in this study should belong to the three characteristics of the behaviors mentioned above, such as giving full play to good potential traits in the environment, experiencing a sense of spiritual satisfaction and perfection that transcends time and space, and reaches its peak; and self-actualization, the highest level of the hierarchy of needs.

(2) Self-concept theory

Rogers (2021) provides individuals with unconditional positive regard to form a self-concept of self-harmony and thus establish self-actualization. 1. Self-concept: the individual's view of self, value evaluation, and perception of self-formed through the interaction of people, events, and objects in the phenomenal field from direct as well as indirect experiences. 2. positive regard: can be divided into unconditional and conditional positive regard. Positive regard: It can be divided into unconditional and conditional positive regard. In forming a self-concept, individuals will want others to support them positively. 3. self-concordance (self-congruence): the individual's self-concept can exclude the phenomenon of self-conflict, i.e., avoiding the inconsistency between the authentic and ideal selves or the inconsistency between directness and indirectness of experience. Therefore, the researcher believes that teachers' ability to teach innovatively instead of adhering to the old teaching materials and methods is also closely related to the individual mentioned above's evaluation and perception of self-values, active attention to teaching rather than indifference, and self-concordance between ideals and self-fulfillment.

2.5.2.3 Learning Theory of Personality (LST)

In the early days of behaviorist psychology, there was the Russian Ivan Petrovich Pavlov's (1849-1936) Conditioned Response, nowadays also known as

Classical Conditioning. Zhang (2018), in the blind spots and Breakthroughs in the Further Education of Primary and Secondary School Teachers, states that teachers must be Pavlov. Teachers are researchers and no longer Pavlov's dogs. Teachers themselves have to be Pavlov, Piaget, and researchers themselves. In 1913, an American psychologist, Watson, founded the Behavioral School, which asserts that environmental influences acquire human personality, that personality is a combination of implicit and explicit responses triggered by fixation, and that the history of reinforcement determines personality patterns.

This research studies episodic behavior, i.e., the association between stimulus and response. The behavioral theory has two basic assumptions: first, that almost all behaviors are learned, and second, that the testing of clearly stated hypotheses must be rigorous, i.e., emphasizing the specificity of the behavioral context and minimizing the importance of individual differences (Wang, 2012). The above is similar to the context of teachers' innovative behaviors in that teachers are confronted with students who have developed different personality traits from different contexts and how to give the most appropriate instruction and minimize individual differences in implementing innovative behaviors. As the behavioral school says, innovative teaching can come through learning if teachers are open-minded and willing to learn. Personality learning theory has been discussed by different scholars as follows:

(1) The operational constraint theory of personality, Skinner (1953) views personality as a set of individual responses to the external environment. Personality can be built through the learning process of operational constraint, and by enhancing the process, personality can be consolidated.

(2) Cognitive, social learning theory, Bandura (1966) believes that the cognitive course of substitution enhancement, i.e., the ability to self-adjust, is also tied to the maintenance of behavioral patterns.

(3) Reciprocal determinism is a complex interaction between personal factors, behavior, and environment. Attitudes, beliefs, past reinforcement history, and environmental stimuli can influence behavior. Behavior will further influence the environment, and personality will receive feedback from behavior and the influence of the environment. From the abovementioned view of behaviorism, behaviorism believes that previous psychology is not scientific enough, is too subjective, and lacks objectivity.

That consciousness must be abandoned to make psychology a natural science, advocating a robust experimental style, and that everything must be objectively measurable. In contrast to today's psychological research, which mostly takes objective measurements, behaviorism has made a significant contribution. Therefore, this study uses a questionnaire method, which is also derived from the behavioral school of scientific psychology.

2.5.2.4 Cognitive Theory

It is believed that individual differences exist in the way people think about and define any external situation. The relationship between situational and cognitive factors that control behavior is explored in personality theory (Jia, 2016).

(1) Personal construct theory

Kelly (2019) emphasizes that each person actively constructs his or her world cognitively, that expected events govern an individual's mental activity, and that the way an individual predicts and controls the world is by interpreting events that have occurred and building hypotheses, i.e., building personal constructs. (All constructs are dichotomous, each with its poles of similarity and dissimilarity, and personal constructs lead individuals to view the world from different perspectives, influence reaction patterns, and define new situations.)

(2) Cognitive social personality theory

Mischel (1967) traced how different situations shape people's behavior differently. Individuals actively interact with their environment, and their responses to input from a given environment depend on the following five variables: 1. Competence: intelligence, social skills, or other abilities known to the individual. 2. Encoding ability: processing messages and making connections between messages to understand the situation. 3. Expectation: the behavioral consequences expected from a given action. 4. Personal values: the individual's assessment of the importance of the outcome of an action. 5. Self-regulatory systems and plans: the individual adjusts behavior by establishing goals and plans. The personal variables mentioned above are caused by personal observations and interactions with others and the physical environment, and the personal and situational variables interact to determine whether a person will behave in a particular situation. Chen and Zhang (2019) pointed out that human behavior is adaptively flexible, with the influence of personal variables being greater when

environmental cues are unclear and situational variables being more significant when environmental cues are clear. Therefore, the researcher believes that from the advent of the era of creativity education in China to the six action plans to promote creativity education (including the Creative Think Tank online learning, creative teacher growth project, and the overall creation of creative schools), all of them are strengthening the national people's, primarily teachers', cognition of innovative teaching and learning, and through receiving messages from the outside world for self-regulation, they either internalize or self-construct their innovative teaching behavior. This is in line with Mischel's cognitive, social personality theory.

2.5.2.5 Trait Theory

It was first proposed by Gordon W. Allport and was followed by Raymond B. Cattell and Hans J. Eysenck, who continued and developed their arguments as follows:

(1) The originator of Gordon Allport's trait theory

Its basic assumption is that people have different degrees of general tendencies to act on various continuums of vectors, that traits give continuity to an individual's behavior across time and space, and that traits can be considered as innate tendencies or descriptive vectors that cause behavior (Wang, 2018). In other words, trait theory assumes that people tend to act in a particular way in response to a tendency called a trait. Allport (2015) argues that the so-called personality refers to the dynamic organization of the growth of the whole psychological system of a person.²¹ The innovative teaching behavior of higher education teachers is related to the study and development of personality traits. An individual's behavior, therefore, reflects his or her unique personality traits, and when these traits are consistently present in different contexts, they are called personality traits.

(2) Cattell's factor analysis trait theory

Cattell (1985) considered traits as the basic structure of personality, as enduring tendencies to respond and to be able to behave consistently across contexts. Moreover, Cattell used several different ways to distinguish traits and describe these categories of traits.¹ The first way of differentiation: (1) surface traits, (2) latent source traits.² The second way of differentiation: (1) constitution traits, (2) The third way of differentiation: (1) ability traits, (2) temperament traits, and (3) dynamic traits (Huang,

2013).

(3) Eysenck's trait theory

Eysenck (2019), unlike Allport and Cattell, focuses on personality types, which he considers as a combination of traits, and all personality traits can be categorized into three axes (or types). 1. psychoticism 2. extraversion 3. neuroticism (neuroticism). The axes of psychoticism are aggressive, impulsive, and anti-social. The axes of extraversion are social, energetic, and active. The neuroticism axis connotes anxiety, depression, and low self-esteem. (Lin, 2016; Huang, 2013). In contrast, Allport (1937) considered traits as the basic units of personality, which are physically present and rooted in the mental system. They represent the general intrinsic tendencies of personality that explain the regularity of people's functioning in various situations and over time. In summary, although different trait theorists have different views on the process that determines personality traits, they all agree that traits are the basic building blocks of personality. In addition, trait theorists agree that human behavior and personality can be organized into a hierarchical structure, meaning they claim that the components of personality and behavior have organizational properties. For example, different components are related; some are more influential or critical than others. In sum, trait theory asserts that people have general tendencies to act in specific ways and that personality is hierarchically organized. Since traits are characteristics that are widely, persistently, and consistently used to speculate about and explain human behavior, personality is an overall expression of personality traits, and it is not possible to describe an individual's personality in terms of a single personality trait; instead, personality is the stable, internal factor that makes a person's behavior consistently consistent, and thus personality is divided into several continuous variables, each of which represents a trait. An individual's performance on each variable can be compared with that of others and the norm. **Comparison.** This study argues that trait theory emphasizes the exploration of personality structure, which is hierarchical and organized, and that individual variables can be compared to general normative models. Since this concept has attracted much subsequent research and interest from scholars, and since it is supported by most of the empirical studies, this study proposes to adopt the trait theory perspective and structure as one of the theoretical bases for measuring teacher personality in this study.

2.6 Measurement of Personality Traits and Innovative Teaching Behaviors

Since this study is quantitative, it is necessary to clarify the theoretical basis for measuring the two main topics of this study, personality traits, and innovative teaching behaviors, to establish an accurate scale and achieve the scale's construct validity.

2.6.1 Measurement of Personality Traits

Maloney and Ward (1967) pointed out that the so-called Assessment of Personality (AP) uses psychological testing by the administrator to provide a general overall description of an individual's personality. No widely accepted theoretical background can be fully described and integrated, nor is there an appropriate measure to serve this purpose. Indeed, as seen in the first section of this chapter, scholars currently studying personality traits have approached personality traits from different perspectives, and there is as yet no commonly accepted definition of personality traits, so personality psychologists have developed different approaches to personality testing based on different theories. Since then, many personality tests have been developed in response. The tests can be divided into three categories: 1. Projective hypothesis (projection hypothesis) refers to a person's response to an unstructured, ambiguous situation. However, due to the test takers' different experiences and cognitive backgrounds, there will be different interpretations of the results. 2. Empirical approach: not theoretical, but based on a validated group, that is, measuring a group of people known to have specific characteristics or traits and looking for items that reflect these characteristics in these people. 3. Constructive approach: Constructive inference is an inductive inference of hypotheses or facts related to a specific object, often a self-reported scale. It is used to measure a wide range of traits, with the participant selecting the best fit from several clear, descriptive sentences, and the score is calculated and analyzed by the administrator. The actual assessment approach (Type II) tends to be subjective, neglecting the reliability, validity, normality, and standardization of the instrument (Zhang, 2021); the projective hypothesis (Type I) usually results in different determinations due to the subjective normality and clinical experience of the test taker, not to mention the fact that the projective hypothesis requires three professionals to work

with, which is costly. The most commonly used method is the construct-oriented self-statement scale. In the first section of this chapter, the theory of personality traits has been fully explored, and it is concluded that this study proposes to adopt the trait theory perspective as the theoretical basis for personality measurement. The various schools of thought that agree with the trait theory as a measure of personality also have different views on the orientation and degree of personality traits:

Table 2.6 Types of Trait Orientations in Trait Theory

Type	Proposer (era)	Major Insiders
Central traits and general versus individual orientations	Gordon Allport (1961)	Central traits: describe a person's five to ten most important traits. Secondary traits: outside the center can describe the personality of the individual's special blocks of medullary approach: judge many people by the same person's standard. The overall approach: the individual and his or her phase opening direction to trace the depth of analysis
Fromm's five personality types	From (1950)	1. Accepting type: likes to join the crowd, but also easy to accept authority. 2. Predatory type: not to achieve the purpose of the means, good at using others to achieve self-interest, often leading to fraud or other manipulative techniques. 3. Stingy type: only wants to possess without regard to pay, belongs to the selfish type. 4. Market type: examination willing to exchange interests, "like to calculate, not easy to establish a long-term actual city and people's open insurance, full of emptiness and restlessness. 5. Construction type: A flexible type that can create something in various situations.

Table 2.6 Types of Trait Orientations in Trait Theory (continued)

Type	Proposer (era)	Major Insiders
The four personality types of DISC	William Moulton Marston (1928)	Type D: Use their strength to overcome the weak and environmental obstacles. Determined, decisive, independent, and confident. 2. Type I: good at persuasion, with conquering power, able to win the trust of others and sell themselves, with enthusiasm, outgoing and open, proactive. 3. S-type: more than the force they can withstand will actively reduce the effort to obtain a strong stimulus under the balance. 4. Type C: Fear of change behavior does not want to have a sudden change of subject, emphasizing the sense of security, caution, and attention to detail.
Extroverted neuroticism psychological disorder	Eysenck (2019)	Personality traits can be categorized into three types 1. Extroversion and introversion: extroverts will respect stimulation and anointing, and introverts will avoid stimulation and excitement. 2. Neuroticism and emotional stability: Nervous people are prone to emotionalism. 3. Psychosis, canonical street movement control: hostile and aggressive behavior, often subject to emotional distress.
Personality Traits (16P.F.)	Cattell (1943)	The sixteen personality variables include joyfulness, intelligence, stability, bullying, excitement, persistence, boldness, sensitivity, skepticism, fantasy, worldliness, apprehensiveness, experimentation, independence, self-discipline, and nervousness.
Type A/B personality	Roseman & Friedman (1974)	1. Type A personality: both action and emotion, strong intention, never terminates until the goal is reached 2. Type B personality: the opposite of Type A personality.
Five Personality Traits	Costa McCrae (2016) &	Personality traits are affinity, rigorous self-discipline, extroversion, emotional sensitivity, and openness to learning.

2.6.2 Formation of the Big Five Personality Traits and Measurement

Raymond Cattell was the first to put forward the Lexical Hypothesis, finding 4000 words used to describe personality from the written vocabulary, grouping them into forty-five categories and then conducting factor analysis, and after several revisions, summarizing and organizing the sixteen essential variables that constitute personality, whose measurement table is called Sixteen The Sixteen Personality Factor Questionnaire (1950), abbreviated as 16PF (Tan, 2013), includes sixteen personality variables, including joyfulness, intelligence, stability, bullying, excitement, persistence, perception, sensitivity, skepticism, fantasy, worldliness, apprehension, experimentation, independence, self-discipline, and nervousness. Later, Norman (1963, 1967) conducted a factor analysis based on his studies of Cattell, Allport, and other trait theorists and derived five major personality factors, namely, Agreeableness, Conscientiousness, Extraversion, Emotional Stability, and Culture (Huang, 2017). By 1985, Paul Costa Robert Mc Crae proposed The Big Five Model of personality traits (The Big Five Model), allowing personality psychologists with different perspectives to coalesce a consensus (Jiang, 2012), and Huang (2015) argued that the proposed classification of the Big Five personality trait variables was the most widely accepted. In recent years, many scholars such as Digman (2019) and John (2019) have argued that Paul Costa Robert Mc Crae's Big Five model of personality traits can be applied to different cultures and people who speak different languages to describe personality. Hu (2015) pointed out that the current research on personality traits, the Big Five model, has been discussed and used by many domestic and international scholars and is considered to have more excellent stability. Mc Crae et al. (2017) and Zonderman et al. (2017), in a study of Hong Kong university students, also found that the same Big Five personality variables as the Big Five personality trait model can be inferred that the Big Five personality trait model developed by the English system can also be used as a description of personality traits in the Chinese system (Huang, 2014). Based on the above, the personality trait variables in this study will refer to the five personality variables of Costa & Mc Crae's Big Five model of personality traits.

The five variables of the Five Personality Traits Model are broken down as follows:

(1) Agreeableness

This refers to the degree to which a person follows the norms set by others; the higher the degree to which a person follows the norms set by others, the higher the affinity. It is characterized as polite, easy to get along with, trustworthy, friendly, and easy to get along with.

(2) Conscientiousness

It refers to the degree of concentration and focus on the goal one is pursuing. The fewer goals one has, and the more dedicated one is to them, the higher the degree of diligence and integrity. It is characterized by hard work, achievement orientation, and indefatigability, implying a sense of caution, responsibility, and discipline.

(3) Extraversion

The degree to which a person is comfortable with relationships with others. The more comfortable a person is with others, the more outgoing he or she is. This is characterized by self-confidence, initiative, and a love of performance, as well as being lively, enjoying lively situations, and enjoying making friends.

(4) Openness to experience

This refers to the variety and depth of a person's interests. If a person's interests are more diverse but relatively shallow, the more open-minded he or she is. This is characterized by open-mindedness, imagination, curiosity, newness, thoughtfulness, and originality.

(5) Emotional stability

The number and intensity of stimuli are required to provoke negative affect in a person, with higher levels indicating a higher ability to stabilize and regulate emotions. Costa and Mc Crae (2015) describe these five variable scales in detail, as shown in Table 2.4.

Table 2.7 Description of Each Scale of the Big Five Personality Traits

Variables	Special Quality Scale	Low Scorer Characteristics	High Scorer Characteristics
Affinity Gender	Measures the extent to which a person's thoughts, feelings, and actions and the degree of interpersonal orientation are on a continuum of performance items ranging from sympathy to opposition.	Critical, suspicious, rude, uncooperative, vindictive Cruel, easily agitated, good at bossing others around.	kind-hearted, kind-hearted We are trustworthy, helpful, and honest.
Rigorous Self-regulatory Machine Gender	Measure a person's organization and perseverance The behavioral actions of gender and goal orientation	Untrustworthy, lazy, careless, weak-willed, easy-going, aimless. Aloof, work-oriented, conservative	Conscientious, trustworthy, hard-working, self-disciplined, punctual, neat, persistent, ambitious, and on schedule
Extrovert Gender	Evaluate the amount and intensity of interpersonal interactions, activity levels, stimulus seeking, and joyful energy. Volume. For the active pursuit of experience, public opinion cross	Retreat and lack of energy. Interpersonal focus, narrow interests, lack of energy	Social, optimistic, enthusiastic, proactive, and likes to talk
Experience Open Gender	Evaluation of the ability to actively seek experience, exchange opinions, and recognize experience. The ability to tolerate and explore unfamiliar matters.	Practicality, narrow interests, lack of artistry, lack of analytical tendencies	Broad interests, curiosity, uniqueness, creativity, imagination, unconventionality

Table 2.7 Description of Each Scale of the Big Five Personality Traits (continued)

Variables	Special Quality Scale	Low Scorer Characteristics	High Scorer Characteristics
Emotional stability	Evaluation of adaptability, emotional stability Measurements. It is possible to assess the tendency to have psychological depression depression, unrealistic thoughts, and dysfunctional reactions.	Insecurity, apprehension, nervousness, tension, feelings of low self-esteem, moodiness, and anxiety disorders.	Emotionally stable, strong, relaxed, secure, and self-satisfied.

2.6.3 Measurement of Innovative Teaching Behaviors

B.F. Skinner (1953) argued that behavior is complex and diverse, a temporary, fluid, and changing course that cannot be represented by mere discussion of theories or internal states, while Skinner also pointed out that behavior includes indicators of internal psychological and external physical activity. (The unparalleled Masao Sato also believes behavior contains two layers of meaning: a kind or state or drive or emotional or mental energy, and an external course). Herbart's psychologically based stage theory of education also points out that thinking, emotion, and volition are the basis of the heart, and from this psychological basis arises the ability to perform externally. To sum up, teachers' teaching behaviors should include a psychological foundation and outward expression. Therefore, in this paper, teachers' innovative teaching behaviors are measured in two parts: the psychological foundation, which is the level of innovative teaching knowledge and energy, and the outward expression, which is the level of concrete performance.

2.6.3.1 Measurement of Innovative Teaching Knowledge

Some recent studies on measuring creativity use the 4Ps perspective: Person, Place, Process, and Product (Macknnon, 1970). Scholars who focus on the individual believe that creativity is an individual trait and can be distinguished from others by different traits; scholars who focus on the environment focus on how the work environment affects the individual's creative performance; scholars who focus on the process view the creative action as a unique process of creative problem-solving. The

process-focused scholars view creative action as a particular process of creative problem, measuring creativity from the perspective of the creative process, and product-focused scholars measure creativity from the output results of creativity. Since this study is conducted with higher education teachers as the research target, we use Person as the research direction to start the study. The researcher collected descriptions of the behavioral characteristics of individuals with innovative behaviors from various scholars and compiled them into Tables 2.1 and 2.2, presented in the previous section. Therefore, in this study, the measurement of the knowledge of innovative teaching and learning was introduced in the direction of Person, and the three variables that enhance innovative teaching and learning and the two variables that hinder innovative teaching and learning were used as the variables of the questionnaire in this study.

2.6.3.2 Measurement Component of Specific Performance

Teaching activities are usually divided into three parts: preparatory activities, developmental activities, and integrated activities (Lin, 2018). The conceptual definition of innovative teaching is obtained from Chapter 2 of this paper, which is the conceptual definition of innovative teaching as all behaviors in which teachers can design or modify others' ideas and use new and diversified teaching methods or activities to motivate students to learn in order to achieve teaching effectiveness in the preparation before teaching, during teaching, and the evaluation of teaching. Innovative teaching behaviors. Therefore, based on this definition, the researcher divided the teaching process into three stages: before, during, and after teaching, to measure the specific performance of teachers' innovative teaching.

(1) Before teaching

This includes understanding the starting point of students' learning, formulating the teaching objectives of the unit, conceptualizing the teaching contents, planning the methods of teaching, designing the flow of teaching, collecting teaching materials, familiarizing with the teaching materials, preparing teaching aids; setting up the teaching environment; making teaching media; informing students in advance of the three exam materials or related activities.

(2) In teaching

These include the creation of a learning atmosphere; arousing motivation or interest in learning; classroom management skills; classroom management; time

management; use of body language by the teacher; clear transmission of teaching content; fluency of the teaching process; achievement of the effectiveness of the use of teaching aids; questioning skills; answering skills; reward and punishment skills; and assigned homework.

(3) After teaching

Evaluation of students' learning outcomes (including primary and secondary learning); reflection on teachers' teaching outcomes; post-class tutoring; assessment of students' performance; test paper assignments; homework reviews; guidance for self-learning; teaching research.

2.7 Concluding Remarks

The above literature analysis revealed that teachers' innovative teaching behaviors include innovative pedagogical knowledge and performance. The innovative pedagogical knowledge level includes three enhancement factors (variables): dedication and love of teaching, courage to accept challenges, identification, and problem-solving, and two hindrance factors (variables): submissiveness and overemphasis on grades or performance. The specific performance level is based on the three stages of the teaching process: before, during, and after teaching, as the three variables for exploring specific performance, which are described as follows:

(1) Dedication and love of teaching, characterized by a love of teaching, a recognition of the great responsibility of teaching, a high degree of self-motivation for teaching, and a willingness to pay for educational work.

(2) A deep belief in teaching, perseverance, a high adversity quotient, and a moderate sense of risk-taking characterizes the courageous variable.

(3) Discovery and problem-solving variables characterized by keen observation, concentration, divergent thinking, high perception of problems, and the ability to generalize and integrate.

(4) The subordination variable is characterized by suppression of self, concern for others' opinions, fear of criticism, lack of originality, and lack of autonomous judgment.

(5) Overemphasis on scores or performance variables characterized by lack

of teaching expertise, excessive demand for consistent standard answers, overemphasis on rewards, inability to relax about grades, and extrinsic solid motivation.

(6) Pre-teaching variables, including formulating teaching objectives, planning teaching methods, designing teaching processes, collecting and familiarizing with teaching materials, creating teaching media, and understanding the starting point of student learning.

(7) Variables in teaching, including motivation, classroom management, clarity and fluency of content and process, question and answer techniques, reward and punishment techniques, control of time, and assigned homework.

(8) Post-teaching variables, including homework review, test assignment, grade evaluation (including primary and secondary learning), post-class counseling, and reflection and improvement of teaching outcomes. This study obtained the five personality variables using Costa & McCrae's Big Five personality trait model.

The breakdown is as follows:

(1) Affinity variables are characterized by being polite, easy to get along with, trustworthy, friendly, and good at communicating with people.

(2) The Disciplined Self-discipline variable is characterized by hard work, achievement orientation, and indefatigability and also implies a sense of caution and responsibility, compliance, and responsibility discipline.

(3) The extroversion variable is characterized by self-confidence, active likes to interact with people, being lively, loving three lively occasions, and making friends.

(4) Openness to experience is characterized by open-mindedness, imagination, curiosity, newness, creativity, and originality.

(5) Emotional stability variables are characterized by quietness, strength, relaxation, a sense of security, self-satisfaction, and high self-adjustment.

CHAPTER III

RESEARCH METHODOLOGY

This chapter explains the planning and implementation of the design and research process before conducting the study. The chapter is divided into five sections. The first section presents the research framework, the second section describes the establishment of research tools and the development of the preliminary questionnaire, the third section focuses on the examination of reliability and validity and the establishment of the formal questionnaire, and the fourth section outlines the questionnaire implementation procedure, including sample selection, questionnaire distribution, and collection. The fifth section explains the statistical methods used for data processing.

3.1 Research Design

This quantitative study explores the correlation between personal background variables, personality traits, and innovative teaching behaviors of vocational college teachers. Hence, it adopts a correlational and predictive research design. Firstly, through the correlational research design, the researcher aims to explore the relationships between personal background variables, personality traits, and innovative teaching behaviors of vocational college teachers. Secondly, through the predictive research design, the researcher aims to explore how personal background variables and personality traits predict the innovative teaching behaviors of vocational college teachers. The specific research question is: Through the aforementioned design, the researcher investigated the correlations between personal background, personality traits, and innovative teaching behaviors among vocational college teachers while predicting the impact of personal background variables and personality traits on innovative teaching behaviors.

(1) Independent variables: These include gender, administrative positions, teaching subjects, school attributes, teaching experience, and education level of vocational college teachers.

(2) Dependent variables: The dependent variables include personality traits

and innovative teaching behaviors.

Personality traits include five variables: agreeableness, conscientiousness, extraversion, openness to experience, and emotional stability.

The innovative teaching behaviors part is divided into two levels: innovative teaching competence and specific manifestations. The innovative teaching competence level includes three variables related to dedication and passion for teaching, willingness to accept challenges, and discovering and solving problems (positive factors), as well as two variables related to conformity and overemphasis on scores and grades (negative factors). The specific manifestations level is divided into three variables: before, during, and after teaching.

The research framework is illustrated in Figure 3.1.

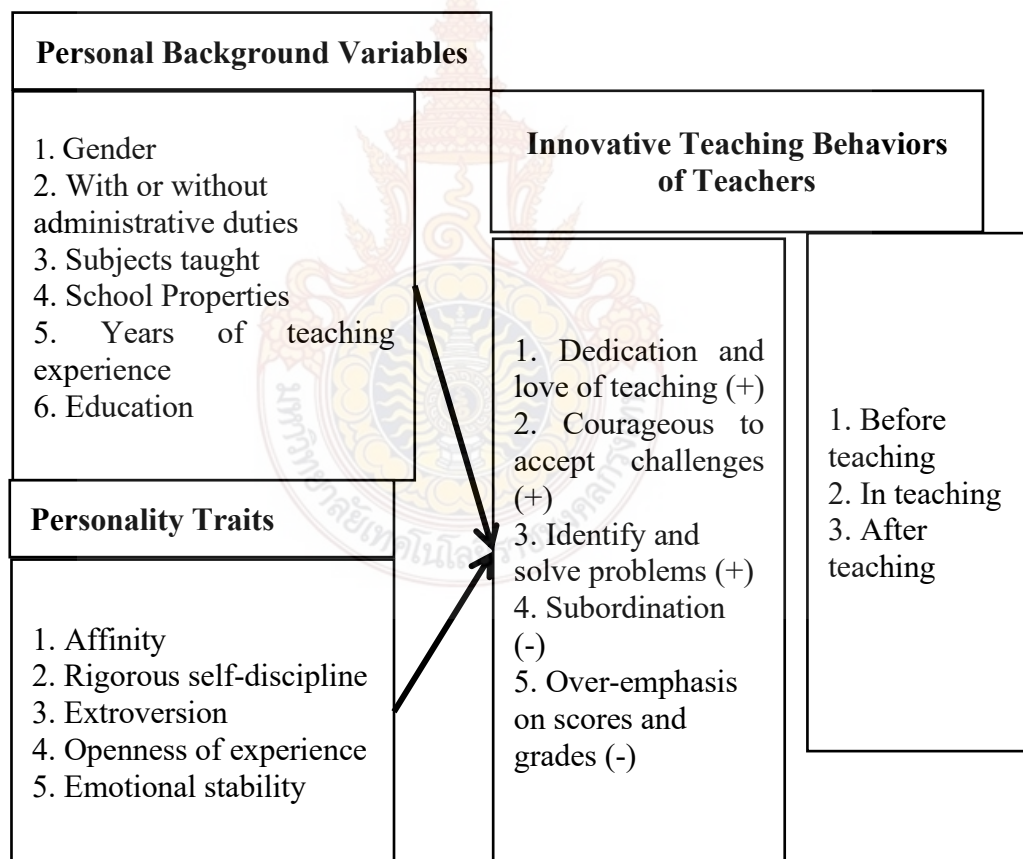


Figure 3.1 Research Model

3.2 Research Population and Sample

The sampling technique applied in this study is stratified cluster random sampling. The target population for the research consists of formal teachers in senior vocational schools in China.

According to data from the National Bureau of Statistics of China, as of June 2023, there are 1,578 senior vocational schools in China. The economically developed Yangtze River Delta region (including Shanghai, Jiangsu, Zhejiang, and Anhui) has 29, 91, 51, and 75 senior vocational schools, respectively. This study divided the economically developed Yangtze River Delta region into four strata, with schools considered clusters within each stratum.

The required sample size for the study was determined based on a confidence level of 95% and an error margin of within 4%. Six hundred participants were needed, assuming an 80% response rate. To achieve this, at least 750 questionnaires were distributed to the participants.

The sample allocation within each area was done proportionally to the size of the schools. Different questionnaires (ranging from 10 to 30) were sent to each school in the Yangtze River Delta region. The breakdown of the sample allocation for each area is presented in Table 3.1.

Table 3.1 Sample Allocation for Sending Formal Questionnaires

Districts School Number		Total Number of Schools %	Proportionally Sampled School Numbers	Number of Planned Questionnaires
Shanghai	29	11.79%	3	85
Jiangsu Province	91	36.99%	34	300
Zhejiang Province	51	20.73%	11	185
Anhui Province	75	30.49%	23	230
Total	246	100.00	71	800

The table provides a comprehensive overview of the sample allocation for

sending formal questionnaires to different districts as part of the research study. The allocation strategy appears well-balanced and considers each district's varying number of schools. Let us break down the analysis into several paragraphs to delve deeper into this allocation: Shanghai, a prominent educational district, is represented by 29 schools, making up approximately 11.79% of the total number of schools included in the research. In this district, the research plans to distribute 85 questionnaires. Given its importance in education, this allocation appears to be a reasonable representation of the educational landscape in Shanghai. Collecting 85 questionnaires from this district can provide valuable insights into the specific context of Shanghai's educational institutions. Jiangsu Province boasts the most significant number of schools among the surveyed districts, with a substantial 91 schools contributing to about 36.99% of the total number of schools in the study. To comprehensively capture the educational dynamics in this populous province, the research intends to send out 300 questionnaires. This significant allocation aligns with the principle of proportional representation, ensuring that a sizable dataset is collected to reflect the diversity of schools in Jiangsu. Zhejiang Province is another region with a substantial number of schools, comprising 51 institutions, which equates to around 20.73% of the total. In this district, the research aims to send 185 questionnaires. This allocation reflects the importance of gathering a substantial number of responses from Zhejiang, considering its contribution to the overall sample. Anhui Province contains 75 schools, constituting about 30.49% of the total number of schools. To ensure a comprehensive understanding of the educational landscape in Anhui, the research plans to distribute 230 questionnaires. This allocation seems proportionate to Anhui's significance as a focus district within the study. The research includes 246 schools across all districts, with each district's allocation proportionate to its representation in the overall sample. This ensures a balanced and equitable distribution of questionnaires, facilitating a holistic exploration of the research questions in diverse educational contexts.

The allocation strategy is methodical and considers the number of schools and the importance of each district in the research. This balanced approach contributes to the validity and reliability of the study's findings by ensuring that data is collected from a diverse set of schools across different regions.

3.3 Data Collection Instruments

3.3.1 Development of the Pilot Questionnaire

This study used a self-developed questionnaire to assess innovative teaching behaviors and personality traits among vocational college teachers. The questionnaire consisted of three parts: Part 1 included personal background information; Part 2 was a perception questionnaire on personality traits; Part 3 was a self-report questionnaire on innovative teaching behaviors. To avoid potential defensive responses or socially desirable answers that could lead to response bias, the wording of the questionnaire items was carefully modified. Additionally, to minimize potential distortions in questionnaire results due to reserved responses, the term "my personality" was used in the questionnaire title instead of "perception questionnaire on personality traits," and the term "my teaching behaviors" was used instead of "self-report questionnaire on innovative teaching behaviors."

(1) Personal Background Variables

The personal background variables included the teacher's gender, administrative positions held, teaching subjects, school type, teaching experience, and education level. (a) Gender: ① Male; ② Female. (b) Administrative positions held: ① Yes; ② No. (c) Teaching subjects: ① Specialized subjects; ② Common subjects. (d) School type: ① Public; ② Private. (e) Teaching experience: Teaching experience was categorized into four groups: ① Less than 3 years; ② 4 to 9 years; ③ 10 to 19 years; ④ 20 years or more. (f) Education level: The highest education level of the teachers was categorized as: ① Associate degree; ② Bachelor's degree; ③ Master's degree; ④ Doctorate or above.

(2) Perception Questionnaire on Personality Traits (My Personality)

Based on the measurement of personality traits discussed in Chapter 2, Section 4 of this paper, a model of five variables for personality traits was obtained. The characteristics of each variable are summarized in Table 3.2 below.

Table 3.2 Personality Trait Perception Scale

Variables	Variable Features
Affinity	Politeness, easy to get along with, trustworthy, friendly, helpful, and skilled in interpersonal communication.
Conscientiousness	Hardworking, achievement-oriented, persevering, cautious and responsible, rule-abiding, disciplined, insightful, observant, prone to deep thinking and deliberation, skilled in deductive reasoning, and adept at reverse thinking.
Extroversion	Confidence, proactive, active, enjoys being in the spotlight, lively, socializing, interacting with others, and making friends.
Openness to Experience	Broad-minded, imaginative, curious, seeks novelty and change, enjoys thinking and creativity, open to individual differences in students, tolerant of non-conformity in students, adaptable, flexible, enjoys multidimensional learning, exploring non-specialized knowledge fields, not concerned with formalities, flexible.
Emotional Stability	Quiet, strong, relaxed, secure, focused on tasks, unaffected by distractions, immersed in work, self-satisfaction, skilled in managing one's emotions.

Data Sources: Compiled by the researcher

Based on the features of personality traits variables, as shown in Table 3.1, the researcher developed questionnaire items for the personality traits section. In the process, relevant items from the following sources were considered: Huang (2013), Hu (2018), Zhu (2016), Lin (2013), Jiang (2016), Quan (2011), Lin (2016), Huang (2020), Yang (2019), Ge (2010), Zheng (2011), Tan (2019), Cai (2016), and others.

(3) Self-report Scale of Innovative Teaching Behavior (My Teaching Behaviors) Section. This section includes two parts: the dimension of innovative knowledge and the dimension of specific manifestations.

① Dimension of Innovative Knowledge

Based on the measurement of teachers' innovative teaching behavior in Chapter 2, Section 3, and the measurement of innovative teaching behavior in Section 4, the dimension of innovative knowledge includes three variables that enhance innovative teaching (positive factors) and two variables that hinder innovative teaching (negative factors). The characteristics of each variable are summarized in Table 3.3

Table 3.3 Dimension of Innovative Knowledge

	Variables	Variable Features
Positive Factors	Professional Dedication and Passion for Teaching	Strong learning motivation, abundant professional knowledge, willingness to sacrifice and dedicate to teaching, recognition of teachers' significant educational mission and responsibility, and enjoyment of teaching work
	Willingness to Accept Challenges	Belief, perseverance, high adversity quotient, abundant energy, proactive and enterprising attitude, goal-oriented, driven and determined, clear objectives, strong self-adjustment ability, aiming to prove oneself or others
	Identifying and Problem-Solving	Curiosity, a penchant for questioning, inquisitiveness, strong logical thinking abilities, emphasis on evidence, adept at analysis, enjoyment of problem-solving, and a desire to delve to the root of issues
Negative Factors	Conformity	Yielding to group pressures, obedience to superiors' instructions, lack of independent thinking, indecisiveness, absence of personal values and standards, a mentality of doing things to avoid mistakes, tendency to follow the majority, passivity, and a habit of compliance
	Excessive Emphasis on Scores and Grades	Strict adherence to standard answers, expectation for students to be disciplined, obedient, and attentive, emphasis on success rather than the process, considering diligent students as good students, and a strong competitive spirit

Based on the characteristics of each variable in Table 3.2, the researcher developed questionnaire items for the innovative competence section, taking into consideration the following literature sources: Wu (2019), Lin (2019), Lin (2006), Lin (2019), Chen (2010), Ye, Zheng (2011), Yang (2011), Ye (2011), Zheng (2011), and others.

② Specific Manifestation Level

Based on the conceptual definition of innovative teaching behavior proposed in this study, the teaching process is divided into three stages: pre-, during, and post-teaching. These three stages form the three variables representing specific manifestations of innovative teaching. The specific sub-items of these manifestations are listed in Table 3.4, and the researcher developed questionnaire items based on these

specific sub-items. The specific manifestations of the teaching process are presented in Table 3.4.

Table 3.4 Specific Performance of the Teaching Process

Teaching Process	Specific Sub-items
Pre-teaching	Understanding the starting point of student learning Formulating unit teaching objectives Conceptualizing teaching content Planning teaching methods Designing teaching procedures Collecting teaching materials Familiarizing oneself with the teaching materials Preparing teaching aids Arranging the teaching environment Providing advance notice to students regarding reference materials or related activities
During-teaching	Creating a conducive learning atmosphere Stimulating learning motivation or interest Employing classroom management techniques Utilizing the teacher's body language Ensuring clarity of teaching content Ensuring the smoothness of the teaching process Assessing the effectiveness of teaching aids usage Employing questioning techniques Employing answering techniques Employing techniques for rewards and punishments Assigning homework
Post-teaching	Evaluating student learning outcomes (including main learning and auxiliary learning) Assessing the teacher's teaching outcomes Providing post-class guidance Conducting student performance assessments Designing test papers Grading assignments Guiding self-study Engaging in teaching research

3.3.2 Development of the Preliminary Questionnaire for the Pilot Study

Through the above process, the items of the preliminary questionnaire were formed, including the Personality Trait Perception Questionnaire (My Personality)

section and the Innovative Teaching Behavior Questionnaire (My Teaching Behaviors) section. Both sections were scored using a five-point Likert scale. Participants selected their responses by circling the appropriate option, with a score of 5 indicating "strongly agree," 4 indicating "agree," 3 indicating "neutral," 2 indicating "disagree," and 0 indicating "strongly disagree." Reverse scoring was applied to reverse-coded items. The content of the preliminary questionnaire included:

Part 1: Personal background information, comprising a total of 6 items.

Part 2: Personality Trait Perception Questionnaire (My Personality), consisting of 34 items.

Part 3: Innovative Teaching Behavior Questionnaire (My Teaching Behaviors), including 30 items related to teaching knowledge and 11 items related to specific behaviors. In total, there were 41 items. The preliminary version of the pilot questionnaire can be found in the appendix.

3.3.3 Implementation of the Research Survey

The research survey implementation in this study focused on gathering data from teachers in Chinese senior vocational schools. A rigorous stratified cluster random sampling method was employed to ensure the reliability and representativeness of the collected data. The primary goal of this sampling approach was to control errors within a narrow margin of 4% while maintaining a high confidence level of 95%.

Stratified sampling involves dividing the population (in this case, teachers in senior vocational schools) into distinct subgroups or strata based on specific characteristics or criteria. In this study, these characteristics could include variables like geographic location, school size, or teaching experience. The research aims to capture the diversity within the senior vocational school teaching community by categorizing the population into strata. Once the strata were defined, a cluster random sampling method was applied. In cluster sampling, the population is divided into smaller groups or clusters, and a random selection of clusters is chosen for the survey. In this context, clusters could represent specific senior vocational schools or regions. This method helps streamline the data collection by targeting specific clusters rather than individual teachers. The combination of stratified and cluster sampling serves the purpose of ensuring that the collected data is both comprehensive and statistically valid. It minimizes the potential for bias and helps to provide a representative snapshot of the

senior vocational school teaching population in China.

The choice of a 4% margin of error at a 95% confidence level reflects the research's commitment to obtaining accurate and reliable results. A 4% margin of error indicates that the estimates derived from the survey are likely to be within 4% of the actual population parameters, providing a high level of precision. The 95% confidence level signifies strong statistical confidence in the survey results.

In summary, the implementation of the research survey involved a thoughtfully designed stratified cluster random sampling approach, which aimed to ensure both accuracy and reliability in the data collected from teachers in Chinese senior vocational schools. This method allows for meaningful insights and conclusions from the study's findings.

3.4 Data Analysis

After the formal questionnaires were collected, invalid questionnaires were removed. All data were coded and entered into a computer using the SPSS software for data analysis. The following statistical methods were planned to be used in this study:

3.4.1 Descriptive Statistics

In descriptive statistics, a comprehensive portrayal of personal background variables was articulated through percentages. This approach elucidated the distribution and composition of various personal background factors within the study cohort, offering a clear snapshot of the demographic makeup.

Concurrently, a meticulous examination of personality traits and innovative teaching behaviors unfolded by presenting means and standard deviations. Deploying this statistical methodology enabled a nuanced understanding of the central tendencies and variability inherent in the measured personality traits and innovative teaching behaviors. The means served as a representative indicator of the average scores, providing a central reference point. At the same time, the standard deviations elucidated the extent of dispersion or variability around these mean values.

This dual-pronged approach to descriptive statistics facilitated a comprehensive overview and allowed for a deeper exploration of the data's characteristics. Presenting personal background variables as percentages provided a

qualitative grasp of the demographic landscape. At the same time, using means and standard deviations for personality traits and innovative teaching behaviors added quantitative precision to the examination, enriching the statistical narrative of the study.

3.4.2 Correlation Analysis and Internal Consistency Testing

Exploring relationships among variables delved into correlation analysis, utilizing Likert item analysis as the methodological underpinning. This analytical approach was instrumental in discerning the interrelatedness between various Likert items and the overarching total score. By systematically scrutinizing the correlations, the analysis pinpointed specific items that exhibited a discernible connection with the overall score, enriching the understanding of how individual components contributed to the comprehensive construct.

Furthermore, the internal consistency of the questionnaire underwent meticulous evaluation through the application of Cronbach's alpha coefficient. This statistical measure was a robust tool to assess the reliability and homogeneity of the questionnaire items. A high Cronbach's alpha coefficient would signify a greater internal consistency, indicating that the items within the questionnaire collectively measured the same underlying construct reliably. This internal consistency testing mechanism was paramount in ensuring the validity and dependability of the questionnaire as a measurement tool.

The correlation analysis and internal consistency testing phases were integral to the methodological framework. The Likert item analysis method offered nuanced insights into the relationships between individual items and the overall score. At the same time, the application of Cronbach's alpha provided a quantitative metric for gauging the questionnaire's reliability and coherence. Together, these analytical approaches bolstered the robustness and credibility of the study's measurement tools and facilitated a more nuanced interpretation of the ensuing results.

3.4.3 T-test, One-way ANOVA, and Post Hoc Comparisons

Significant differences in personal background variables, personality traits, and innovative teaching behaviors were examined using independent samples t-tests. The study explored whether there were significant differences in personality traits and innovative teaching behaviors among senior vocational teachers based on gender, administrative positions, and school attributes. One-way ANOVA was employed to

investigate differences in personality traits and innovative teaching behaviors among teachers with different teaching experiences and the highest education levels. If significant differences were found ($p < .05$), post hoc comparisons using the Scheffé method were conducted.

3.4.4 Correlation Analysis

3.4.4.1 Correlation between Innovative Teaching Behaviors and Personality Traits among Senior Vocational Teachers

Since both variables were continuous, Pearson's product-moment correlation analysis was used for statistical analysis.

3.4.4.2 Correlation between Innovative Teaching Behaviors of Vocational College Teachers and Personal Background Variables

Due to the diverse nature of the background variables, different statistical methods were employed for correlation analysis.

(1) Correlation between gender, school type, teaching subjects, part-time positions, and innovative teaching behaviors

The personal background variables, such as gender, school type (public or private), teaching subjects (specialized or common subjects), and whether or not they hold administrative positions, are all binary categorical variables. Therefore, the point-biserial correlation method was used to examine their correlation with innovative teaching behaviors.

(2) Correlation between highest educational attainment, teaching experience, and innovative teaching behaviors

The highest educational attainment of vocational college teachers (classified as associate degree, completion of a 40-credit graduate institute program, or master's degree and above) and their teaching experience (classified as 0-3 years, 4-9 years, 10-19 years, or 20 years and above) are both ordinal variables, while innovative teaching behaviors are continuous variables. Therefore, the innovative teaching behaviors were transformed into ordinal variables, and Spearman's rank correlation analysis was conducted.

(3) Correlation between personality traits of vocational college teachers and personal background variables

Due to the diverse nature of the background variables, different statistical

methods were employed for correlation analysis.

Correlation between gender, school type, teaching subjects, and part-time positions with personality traits. Point-biserial correlation analysis was used to examine the correlation between teacher gender, school type, teaching subjects, presence of part-time positions, and the respective variables of personality traits.

Correlation between the highest educational attainment, teaching experience, and innovative teaching behaviors. Spearman's rank correlation analysis was used to examine the correlation between the highest educational attainment and teaching experience of vocational college teachers and the variables of innovative teaching behaviors.

3.4.5 Regression Analysis

(1) Regression of personality trait variables on innovative teaching behaviors

Embarking on a profound exploration into the nexus of personality traits and innovative teaching behaviors, this study deployed a meticulous stepwise multiple regression analysis. This analytical endeavor transcended the mere identification of specific personality trait variables within the cohort of vocational college teachers that held predictive power. Instead, it delved deeper, seeking to quantify the precise magnitude of their influence on innovative teaching behaviors. By adopting this methodological rigor, the study aimed to unravel the intricate dynamics, providing a categorical understanding of influential personality traits and a quantitative measure of their impact. This strategic approach facilitated a nuanced exploration, offering insights into the granular ways in which individual personality traits contribute to the variance observed in innovative pedagogical practices within the distinct context of vocational education.

(2) Regression of personal background variables and personality trait variables on innovative teaching behaviors

Expanding the analytical scope, this study delved into a comprehensive multiple regression analysis encompassing personal background variables and personality trait variables as potential predictors of innovative teaching behaviors among vocational college teachers. By employing this multifaceted approach, the investigation sought to disentangle the intricate interplay between personal background factors and

individual personality traits. The goal was not only to pinpoint the specific variables that significantly contributed but also to discern the nuanced extent of their impact on fostering innovative pedagogical approaches within the unique landscape of vocational education.

These regression analyses form a critical methodological cornerstone, systematically exploring the predictive power of personality traits and personal background variables on innovative teaching behaviors. The research aspires to provide valuable insights into the complex factors influencing the adoption of innovative pedagogies among vocational college teachers through rigorous statistical techniques. This endeavor contributes to a deeper understanding of the dynamics that shape contemporary teaching practices within vocational education, paving the way for informed interventions and advancements in educational strategies.

3.5 Validity and Reliability

3.5.1 Questionnaire Validity

The questionnaire validity in this study is based on construction validity, as the research instrument was developed through a literature review to construct various dimensions. In May 2023, the research instrument underwent review and approval by the advisor and an oral examination committee. To enhance the validity of the research instrument, eight scholars and experts were invited to review each item for correctness, appropriateness, and clarity. A questionnaire expert content validity review was conducted based on the research plan, the analysis of the initial questionnaire draft, and the expert validity questionnaire review form. Starting from June 2023, the review form and the questionnaire draft were sent to the eight experts. The list of experts who participated in the content validity review of the research questionnaire is presented in Table 3.5.

Table 3.5: List of Experts for Content Validity Review of the Research Questionnaire on Innovative Teaching and Personality Traits of Vocational College Teachers

Surname	Service Units	Job Title	Academic Qualifications
Li	**Technology academy	Associate Professor	Master
Lin	**University of Science and Technology	Associate Professor	PhD
Zhang	**University of Science and Technology	Assistant Professor	PhD
Zhang	**University of Science and Technology	Associate Professor	PhD
Zeng	**University of Science and Technology	Associate Professor	PhD
Huang	**Technology academy	Professor	PhD
Liao	**University of Science and Technology	Associate Professor	PhD
Qi	**Technology academy	Associate Professor	PhD

3.5.2 Questionnaire Reliability

According to the research plan, 80 pilot questionnaires were distributed (10 times the maximum number of items for each dimension). A total of 77 questionnaires were collected, and after verification, no invalid questionnaires were found. The questionnaires were then coded and entered into the computer for statistical analysis of the questionnaire results using SPSS 26 software. Missing values were replaced with the mean, and reverse scoring was applied for negatively worded items. Reliability analysis was conducted, and Wu (2018) pointed out that the primary purpose of factor analysis is to identify the latent structure of a scale and reduce the number of items, resulting in a smaller set of highly interrelated variables, which is an exploratory factor analysis. Therefore, in this study, a factor analysis was conducted on the 56 pilot questionnaires collected to confirm the items for each dimension of the questionnaire. Cronbach's alpha coefficient was used to test the internal consistency of the questionnaire items,

dimensions, and overall questionnaire.

Regarding reliability coefficients, Xu and Qiu (2015) cited Noll, Scannell, and Craig (1997) stating that cognitive tests have higher reliability than affective tests, standardized achievement tests have reliability of approximately .90 or above, intelligence tests usually have reliability of approximately .85 or above, while personality tests and interest scales typically have lower reliability, ranging from approximately .70 to .80. They also noted that standardized tests have higher reliability than self-developed tests (Xu & Qiu, 2015). Since this study uses self-developed tests, which belong to affective questionnaires, Wu (2018) suggested that if the Cronbach's alpha value of the overall scale is below 0.6, the items should be modified or deleted. Based on the above considerations, this study aimed for Cronbach's alpha values of each dimension to be above 0.6 and the Cronbach's alpha value of the overall scale to be above 0.8. With this goal in mind, item deletion or modification was carried out. The original pilot questionnaire consisted of 75 items, excluding personal background variables. After deletion, 37 items were removed, and 38 items were retained. The deleted items are presented in Table 3.6:

Table 3.6: Deleted Items from the Pilot Questionnaire based on Item Analysis

Variables	Number of Items in the Preliminary Questionnaire	Item Numbers Deleted after Item Analysis
Personality traits	34	1,2,4,7,8,9,10,11,16,17,20,21,22,24,28,30,31,32, 34
Innovative teaching behavior	41	34,35,39,40,41,42,43,45,48,49,50,54,55,41 , 59,60,61,63,71,75

Deleted items with inadequate reliability were removed, and the reliability of the final questionnaire is explained as follows:

(1) Personality Traits Questionnaire:

After analysis, the overall scale reliability coefficient (Cronbach's alpha) for the personality traits section of the questionnaire was found to be .7767. The Cronbach's alpha values for each dimension were: Affinity .6012, Conscientiousness .6934,

Extraversion .7795, Openness to Experience .7967, Emotional Stability .6609, as shown in Table 3.7.

Table 3.7 Summary of Reliability Analysis for the Personality Traits Section of the Questionnaire

Dimension	Deleted items	Retained Items	Cronbach's Alpha for Retained Items
Affability	1,2,4,7	3,5,6	.6012
Conscientiousness	8,9,10,11	12,13,14	.6934
Extraversion	16,17,20,21	15,18,19	.7795
Openness to experience	24,28	23,25,26,27	.7967
Emotional stability	30,31,32	29,33	.6609
Overall scale		15	.7767

The table presents a comprehensive summary of the reliability analysis conducted for the personality traits section of the questionnaire. This analysis is crucial in assessing the internal consistency and reliability of the questionnaire items within each personality dimension. Let us delve into a detailed analysis of the findings:

Affability: The Affability dimension originally consisted of items 1, 2, 4, and 7. However, items 1, 2, and 4 were identified as less reliable during the reliability analysis and were subsequently removed. The remaining items, specifically 3, 5, and 6, displayed a Cronbach's alpha of .6012. While this value suggests a moderate level of internal consistency, it indicates that there may be room for further improvement in refining this dimension for future studies.

Conscientiousness: The Conscientiousness dimension initially included items 8, 9, 10, and 11. Following the reliability analysis, items 8, 9, and 10 were excluded due to their lower reliability. The retained items, 12, 13, and 14, exhibited a Cronbach's alpha of .6934. This suggests a moderate level of internal consistency for the remaining items, indicating that this dimension has potential but may benefit from further refinement.

Extraversion: Within the Extraversion dimension, items 16, 17, 20, and 21 were initially included. However, items 16, 17, and 20 were removed after the reliability analysis. The retained items, 15, 18, and 19, showed a Cronbach's alpha of .7795. This

indicates a relatively good level of internal consistency for the remaining items, suggesting that the dimension of Extraversion is more reliable and consistent.

Openness to Experience: The Openness to Experience dimension originally included items 24 and 28. However, these two items were removed after the analysis. The retained items, 23, 25, 26, and 27, displayed a Cronbach's alpha of .7967. This indicates a relatively high level of internal consistency, suggesting that the dimension of Openness to Experience is reliable and robust.

Emotional Stability: The Emotional Stability dimension initially consisted of items 30, 31, and 32. However, these items were removed based on their lower reliability during the analysis. The remaining items, 29 and 33, showed a Cronbach's alpha of .6609. While this demonstrates a moderate level of internal consistency, there is room for improvement in enhancing the reliability of this dimension.

Overall Scale: The scale comprising the retained items from the five personality dimensions demonstrated a Cronbach's alpha of .7767. This suggests a relatively good level of internal consistency for the entire scale, indicating that the instrument, as a whole, is reasonably reliable for assessing personality traits.

In summary, the reliability analysis results reveal variations in the internal consistency of the personality dimensions. While some dimensions, such as Openness to Experience and Extraversion, demonstrate good reliability, others, like Affability and Emotional Stability, exhibit moderate reliability. These findings offer valuable insights into the strengths and areas for improvement in the questionnaire's personality traits section, enabling researchers to make informed decisions about potential refinements for future use.

(2) Innovative Teaching Behavior Questionnaire:

The reliability of the innovative teaching behavior questionnaire is shown in Table 3.8. The overall reliability coefficient (Cronbach's alpha) for innovative teaching behavior was .8111. This section includes two dimensions: innovative intelligence and specific behaviors. The details are as follows:

For the innovative intelligence dimension, Cronbach's alpha was .7230. It consisted of five sub-dimensions with the following Cronbach's alpha values: Dedication and Passion for Teaching .6016, Willingness to Accept Challenges .8267, Problem Identification and Solving .7578, Conformity .7862, Overemphasis on Scores

or Performance, .6237.

For the specific behaviors dimension, Cronbach's alpha was .8250. It consisted of three sub-dimensions with the following Cronbach's alpha values: Pre-teaching .6212, During-teaching .8209, and Post-teaching .7238.

Table 3.8 Summary of Reliability Analysis for the Innovative Teaching Behavior Section of the Questionnaire

Level	Dimension	Deleted Items	Retained Items	Cronbach's Alpha for Retained Items
Cronbach's alpha for innovative intelligence .7230	Dedication and love for teaching	34,35,39, 40	36,37,38	.6061
	Readiness to accept challenges	41,42,43, 45	44, 46, 47	.7863
	Discovery and problem-solving	48,49,50, 54	51, 52, 53	.7578
	Conformity	55,59	56, 57, 58	.7862
	Emphasis on scores and performance	60,61,63	62,64	.6237
Cronbach's alpha for specific behavior .8250	Before teaching	/	65,66,67	.6212
	During teaching	71	68,69,70	.8209
	After teaching	75	72,73,74	.7238
Overall scale			23	.8111

Table 3.8 summarizes the reliability analysis for the innovative teaching behavior section of the questionnaire, evaluating the internal consistency of the items

within different dimensions and the overall scale. The findings indicate variability in the reliability of these dimensions. In the "Readiness to Accept Challenges" and "Conformity" dimensions, the retained items show strong internal consistency, with Cronbach's alphas of 0.7863 and 0.7862, respectively, suggesting that these dimensions are reliable measures of innovative teaching behaviors. The "Discovery and Problem-Solving" dimension also demonstrates good internal consistency, with a Cronbach's alpha of 0.7578 for the retained items. However, the "Emphasis on Scores and Performance" dimension exhibits slightly lower reliability, with a Cronbach's alpha of 0.6237. For the "Dedication and Love for Teaching" dimension, the retained items have the lowest internal consistency, with a Cronbach's alpha of 0.6061. This suggests that these items may need further refinement for better reliability. In the specific behavior dimensions (before, during, and after teaching), internal consistency varies, with Cronbach's alphas ranging from 0.6212 to 0.8209. These variations indicate that some specific behavior dimensions are more reliable than others. On the overall scale encompassing all items, the internal consistency is good, with a Cronbach's alpha of 0.8111, implying that the questionnaire is a reliable measure of innovative teaching behaviors. In conclusion, this reliability analysis highlights the varying degrees of internal consistency within different dimensions of innovative teaching behaviors. Researchers and educators should consider these findings when interpreting results related to these dimensions, paying particular attention to dimensions with lower reliability and exploring opportunities for item refinement and improvement.

Additionally, there were only two items for each of the Emotional Stability and Overemphasis on Scores or Performance dimensions (items 29 and 33; items 62 and 64). Due to the small number of items, measurement errors may occur. Therefore, the item group with the second-highest reliability from the initially planned deletions (items 29, 30, and 33; items 62, 63, and 64) was modified, and items 30 and 63 were included in the final questionnaire. After item deletion and modification, the final questionnaire consisted of 40 items. The development of the formal questionnaire is now complete.

3.6 Concluding Remark

This chapter presents a comprehensive overview of the methodology

employed in this study. It includes a description of the research design, the target population, and the sample, as well as an explanation of the data collection tools, which encompass the development of pilot and preliminary questionnaires. Furthermore, the implementation process of the research survey is detailed.

In order to effectively analyze the collected data, this chapter describes the data analysis techniques, such as descriptive statistics, correlation analysis, internal consistency testing, t-test, one-way ANOVA, post hoc comparisons, and regression analysis. Additionally, the chapter explains the methods used to assess validity and reliability, ensuring the credibility of the research findings.

Overall, this chapter establishes the foundation for the study, providing a structured framework to investigate the correlation between personal background variables, personality traits, and innovative teaching behaviors of vocational college teachers. Meticulously designed research tools and analysis techniques are intended to yield reliable and meaningful results, contributing to educational research. The data collected and analyzed offer valuable insights, unveiling the relationships and factors influencing innovative teaching practices among vocational college teachers.



CHAPTER IV

ANALYSIS RESULTS

This chapter presents the results of the two-part study. The first part provides statistical studies of descriptive variables, including gender, with or without administrative duty, and years of teaching experience. In contrast, the second part discusses the empirical results of hypothesis testing using the independent-sample t-test, one-way ANOVA, and multiple regression. Finally, a summary of all hypothesis tests is provided. The statistical symbols and meanings used in data analysis and interpretation are as follows:

N	=	number of population
n	=	number of samples
X	=	Mean
SD	=	Standard Deviation
t	=	t-Distribution
F	=	F-Distribution
df	=	Degree of freedom
LSD	=	Least Significant Difference
Sig	=	the level of statistical significance to test the hypothesis
*	=	The statistical significance is at the 0.05 level

4.1 Descriptive Statistics

This study is based on a questionnaire on innovative teaching behavior and personality characteristics of teachers in higher vocational colleges, and it is mainly divided into three parts. The first part is personal background variables and work experience, including Gender, With or without administrative duties, and Years of teaching experience. The second part is the dimensions corresponding to personality traits and the dimensions corresponding to teachers' innovative teaching behaviors.

4.1.1 Demographics

The demographic questions of this study include gender, with or without administrative duties, and Years of teaching experience, as shown in Table 4.1.

Table 4.1 Demographic Data

Gender	Frequency	Percent
Male	340	42.5
Female	460	57.5
Total	800	100
With or without administrative duties	Frequency	Percent
Yes	68	8.5
No	732	91.5
Total	800	100
Is the school you work for:	Frequency	Percent
Public	418	52.3
Private	382	47.8
Total	800	100
Years of teaching experience	Frequency	Percent
0-3 years	413	51.6
4-9 years	236	29.5
10-19 years	104	13
20 years or more	47	5.9
Total	800	100
The subject(s) you teach are	Frequency	Percent
Specialized subjects	414	51.8
General subjects	386	48.3
Total	800	100

The demographic data in Table 4.1 provides a comprehensive snapshot of the study's participant characteristics. Let us conduct a detailed analysis of each demographic variable:

Gender: The gender distribution in the sample showcases a balanced representation, with 340 males (42.5%) and 460 females (57.5%). This equilibrium is crucial for addressing potential gender-related influences on innovative teaching behaviors. The slight preponderance of females might introduce distinctive dynamics in collaborative teaching practices, communication styles, or pedagogical approaches. It opens avenues for investigating how gender considerations intersect with the adoption

of innovative teaching methods, providing a comprehensive understanding of the gendered dimensions within the vocational education context.

With or without Administrative Duties: A notable finding is that 8.5% of participants (68 individuals) hold administrative duties, while the majority (91.5%) do not. This distinction becomes a focal point for in-depth exploration, as teachers with administrative responsibilities may exhibit unique approaches to pedagogy that blend leadership roles with instructional practices. Understanding the potential impact of administrative duties on innovative teaching behaviors is pivotal for recognizing teachers' multifaceted roles within educational institutions.

Is the School You Work For: The nearly equal split between teachers working in public (52.3%) and private (47.8%) schools establishes a foundational understanding of the institutional landscape. This distribution provides a lens through which to examine potential variations in innovative teaching behaviors based on institutional settings. Public and private schools often differ in resources, policies, and organizational cultures, factors that may influence the adoption and implementation of innovative pedagogies. This demographic insight lays the groundwork for unraveling the intricate relationship between school type and teaching practices.

Years of Teaching Experience: A significant trend emerges in the distribution of teaching experience, with 51.6% of participants having 0-3 years of experience. This predominant representation of early-career educators offers a unique opportunity to explore how teaching experience correlates with innovative teaching behaviors. It allows for examining potential differences in pedagogical approaches based on career stages, shedding light on the developmental trajectory of innovative practices over a teacher's career.

The Subject(s) You Teach Are: The near-even split between those teaching specialized subjects (51.8%) and general subjects (48.3%) adds another layer of complexity to the demographic landscape. This balance is vital for investigating potential variations in innovative teaching practices based on subject specialization. The nature of subject specialization may significantly impact the adoption of innovative methods in instruction. Exploring this demographic aspect is critical to understanding how subject-matter expertise intersects with pedagogical innovation.

Overall Implications: The detailed analysis of demographic data offers a

nuanced portrait of the study participants, providing valuable context for subsequent analyses. Recognizing the diversity within the sample across gender, administrative roles, school types, teaching experience, and subject specialization lays the groundwork for uncovering nuanced patterns in innovative teaching behaviors. These demographic insights contribute to the study's external validity and facilitate a more comprehensive understanding of the dynamics shaping innovative pedagogies in vocational education.

4.1.2 Descriptive Statistics of Variables

Table 4.2 A Descriptive Statistical Study of Personality Traits

Personality Traits	1	2	3	4	5	Mean	SD	Meaning	Rank
Affinity	32	117	206	336	109	3.47	1.027	Moderate	3
Rigorous self-discipline	33	131	198	401	37	3.35	0.946	Moderate	5
Extroversion	33	125	183	357	102	3.46	1.032	Moderate	4
Openness of experience	18	105	184	408	85	3.55	0.927	Good	1
Emotional stability	25	70	233	415	57	3.51	0.869	Good	2
Personality Traits	25	71	284	416	4	3.38	0.782	Moderate	

Table 4.2 provides a comprehensive descriptive statistical analysis of the Personality Traits section, offering insights into the distribution of dimensions, means, and standard deviations. Let us conduct a detailed analysis of these findings:

Affinity: The mean score in the Affinity dimension is 3.47, with a standard deviation of 1.027. This indicates a moderate level of affinity among the respondents. Affinity refers to being warm, friendly, and nurturing in interpersonal relationships. The moderate ranking suggests that the respondents exhibit a balanced level of this trait.

Rigorous Self-Discipline: For the Rigorous Self-Discipline dimension, the mean score is 3.35, with a standard deviation of 0.946. This also reflects a moderate level of self-discipline among the respondents. Rigorous self-discipline relates to being organized, responsible, and self-controlled. The moderate ranking suggests that respondents generally display a balanced level of self-discipline. **Extroversion:** The Extroversion dimension has a mean score of 3.46 and a standard deviation of 1.032. This

indicates a moderate level of extroversion among the respondents. Extroversion is associated with being outgoing, sociable, and assertive. The moderate ranking suggests that respondents exhibit a balanced level of extroversion. Openness of Experience: In the Openness of Experience dimension, the mean score is 3.55, with a standard deviation of 0.927. This reflects a good level of openness to experience among the respondents. Openness of experience relates to being receptive to new ideas, creative, and curious. The excellent ranking suggests that respondents generally exhibit more openness to experience. Emotional Stability: For the Emotional Stability dimension, the mean score is 3.51, with a standard deviation of 0.869. This also reflects a good level of emotional stability among the respondents. Emotional stability is associated with being calm, resilient, and composed in stressful situations. The excellent ranking suggests that respondents exhibit a higher level of emotional stability. Overall Assessment: The overall assessment, combining the rankings of each dimension, indicates that Openness of Experience and Emotional Stability are the most prominent traits among the respondents, with good rankings. While still moderate, affinity, Extroversion, and Rigorous Self-Discipline exhibit slightly lower mean scores, indicating a balanced distribution of these traits.

In conclusion, the detailed analysis of the Personality Traits section reveals that respondents generally display moderate to reasonable levels of different personality traits. These findings provide valuable insights into the psychological characteristics of the sample, which can be utilized for a deeper understanding of the research context and its potential implications.

Table 4.3 A Descriptive Statistical Study of Innovative Teaching Behaviors of Teachers

Innovative Teaching Behaviors of Teachers	1	2	3	4	5	Mean	SD	Meaning	Rank
Dedication and love of teaching (+)	28	118	193	427	34	3.40	0.912	Moderate	1
Courageous to accept challenges (+)	92	279	239	154	36	2.70	1.046	Moderate	7

Table 4.3 A Descriptive Statistical Study of Innovative Teaching Behaviors of Teachers
(continued)

Innovative Teaching Behaviors of Teachers	1	2	3	4	5	Mean	SD	Meaning	Rank
Identify and solve problems (+)	82	322	223	133	40	2.66	1.031	Moderate	8
Subordination (-)	101	286	188	186	39	2.72	1.101	Moderate	6
Over-emphasis on scores and grades (-)	0	255	349	131	65	3.01	0.899	Moderate	3
Before teaching	8	359	256	137	40	2.80	0.907	Moderate	5
In teaching	4	304	322	131	39	2.87	0.862	Moderate	4
After teaching	29	136	223	372	40	3.32	0.937	Moderate	2

Table 4.3 provides a detailed descriptive statistical analysis of innovative teaching behaviors exhibited by teachers. The table evaluates various dimensions of teaching behaviors using a 5-point scale, encompassing mean scores, standard deviations (SD), the corresponding meaning, and the rank of each dimension. First and foremost, the dimension of "Dedication and Love of Teaching" received the highest mean score of 3.40, with a standard deviation of 0.912, indicating a moderate level of dedication and love among the teachers. This dimension holds the top rank among the assessed innovative teaching behaviors, highlighting the respondents' significant commitment and affection for teaching. Conversely, the dimension of "Courageous to Accept Challenges" received a mean score of 2.70, with a standard deviation of 1.046, ranking it seventh among the behaviors. This suggests a moderate willingness to embrace challenges, albeit not as prominent as other dimensions.

Similarly, "Identify and Solve Problems" also exhibits a moderate level, with a mean score of 2.66 and a standard deviation of 1.031, ranking it eighth among the behaviors. This dimension represents the teachers' ability to identify and address issues effectively. The "Subordination" dimension, with a mean score of 2.72 and a standard deviation of 1.101, ranks sixth among the behaviors. This signifies a moderate level of

subordination among the teachers, reflecting their willingness to follow orders and guidelines. "Over-Emphasis on Scores and Grades" received a mean score of 3.01 and a standard deviation of 0.899, ranking third among the innovative teaching behaviors. This indicates a moderate concern regarding academic performance and grading among the teachers. The dimension assessing behaviors "Before Teaching" received a mean score of 2.80 and a standard deviation of 0.907, ranking it fifth among the behaviors. This dimension highlights the teachers' actions and attitudes before commencing their teaching responsibilities. "During Teaching" received a mean score of 2.87 and a standard deviation of 0.862, ranking fourth among the behaviors. This dimension delves into the teachers' conduct and approach while actively teaching. Lastly, the dimension "After Teaching" obtained a mean score of 3.32 and a standard deviation of 0.937, securing the second rank among innovative teaching behaviors. This suggests a moderate level of concern and involvement in post-teaching activities. In summary, Table 4.3 offers a comprehensive overview of various innovative teaching behaviors among the surveyed teachers, shedding light on their dedication, problem-solving abilities, willingness to accept challenges, and importance on academic performance. These findings are valuable for understanding the multifaceted nature of teaching practices and attitudes.

4.2 Reference Statistics

In this study, gender, with or without administrative duties, were two discrete variables. Years of teaching experience are more than three discrete variables. Therefore, we used the independent samples t-test and one-way ANOVA to test whether demographic differences have different effects on the personality characteristics of Chinese professional teachers and their innovative teaching behaviors in the Yangtze River Delta region.

Multiple linear regression methods were used to test the effects of Affinity, Rigorous self-discipline, Extroversion, Openness of experience, and Emotional stability on Dedication and love of teaching, Courageous to accept challenges, Identify and solve problems, Subordination, Over-emphasis on scores and grades, Before teaching, In teaching, After teaching.

According to the objectives of this study, the results are divided into two parts.

Part 1: Analysis of Demographic Factors Affecting the Innovative Teaching Behavior of Vocational Teachers in the Yangtze River Delta Region.

The second part analyzes the Personality Traits that affect the innovative teaching behavior of professional teachers in the Yangtze River Delta region.

4.2.1 Demographic Factors Affect the Innovative Teaching Behavior of Vocational Teachers in the Yangtze River Delta Region

H1: Differences in demographic factors such as Gender, With or without administrative duties, and Years of teaching experience have different impacts on the innovative teaching behavior of professional teachers.

H1a: Gender differences impact professional teachers' innovative teaching behaviors differently.

The independent samples t-test was used to test the mean difference between the two groups at the statistically significant level of 0.05.

Table 4.4 Gender Influences the Innovative Teaching Behavior of Professional Teachers

Innovative Teaching Behaviors of Teachers	Gender	N	Mean	Std. Deviation	t-value	df	Sig
Dedication and love of teaching	Male	340	3.47	0.83	2.046	762.38	0.041*
	Female	460	3.35	0.90			
Courageous to accept challenges	Male	340	2.75	1.06	1.312	707.26	0.190
	Female	460	2.66	1.00			
Identify and solve problems	Male	340	2.73	1.03	1.635	682.83	0.102
	Female	460	2.61	0.92			
Subordination	Male	340	2.76	1.10	0.951	798.00	0.342
	Female	460	2.68	1.06			
Over-emphasis on scores and grades	Male	340	2.80	0.93	1.135	798.00	0.257
	Female	460	2.73	0.89			
Before teaching	Male	340	2.85	0.91	1.919	698.28	0.045*
	Female	460	2.73	0.84			
In teaching	Male	340	2.87	0.88	0.902	693.54	0.367
	Female	460	2.81	0.81			
After teaching	Male	340	3.43	0.86	2.002	762.86	0.046*
	Female	460	3.30	0.94			

Table 4.4 examines how gender influences the innovative teaching behavior of professional teachers. The table includes data on various innovative teaching behaviors categorized by gender. It provides information on the number of respondents (N), mean scores, standard deviations, t-values, degrees of freedom (df), and significance levels (Sig). Below is a detailed analysis of the findings:

Dedication and Love of Teaching: Male teachers (N=340) exhibit a mean score of 3.47 with a standard deviation of 0.83, while female teachers (N=460) have a mean score of 3.35 with a standard deviation of 0.90. The t-value is 2.046, with 762.38 degrees of freedom. The significance level (Sig) is 0.041*, indicating a significant difference. Male teachers show a slightly higher level of dedication and love for teaching than their female counterparts.

Courageous to Accept Challenges: Male teachers have a mean score of 2.75 with a standard deviation of 1.06, while female teachers have a mean score of 2.66 with a standard deviation of 1.00. The t-value is 1.312, with 707.26 degrees of freedom, and the Sig is 0.190. Although there is a slight difference, the results are not statistically significant, suggesting that both genders have a similar willingness to accept challenges.

Identify and Solve Problems: Male teachers have a mean score of 2.73 with a standard deviation of 1.03, and female teachers have a mean score of 2.61 with a standard deviation of 0.92. The t-value is 1.635, with 682.83 degrees of freedom, and the Sig is 0.102. While there is a difference in means, it is not statistically significant, implying that both male and female teachers have similar abilities to identify and solve problems.

Subordination: Male teachers have a mean score of 2.76 with a standard deviation of 1.10, and female teachers have a mean score of 2.68 with a standard deviation of 1.06. The t-value is 0.951, with 798.00 degrees of freedom, and the Sig is 0.342. The results show no statistically significant difference in subordination between male and female teachers.

Over-Emphasis on Scores and Grades: Male teachers have a mean score of 2.80 with a standard deviation of 0.93, while female teachers have a mean score of 2.73 with a standard deviation of 0.89. The t-value is 1.135, with 798.00 degrees of freedom, and the Sig is 0.257. The difference is not statistically significant, suggesting that both genders exhibit a similar attitude toward over-emphasizing scores and grades.

Before Teaching: Male teachers have a mean score of 2.85 with a standard deviation of 0.91, and female teachers have a mean score of 2.73 with a standard deviation of 0.84. The t-value is 1.919, with 698.28 degrees of freedom, and the Sig is 0.045*. The

difference is statistically significant, indicating that male teachers have a slightly higher level of behavior before teaching. In Teaching: Male teachers have a mean score of 2.87 with a standard deviation of 0.88, while female teachers have a mean score of 2.81 with a standard deviation of 0.81. The t-value is 0.902, with 693.54 degrees of freedom, and the Sig is 0.367. The difference is not statistically significant, suggesting that both genders exhibit similar behavior during teaching. After Teaching: Male teachers have a mean score of 3.43 with a standard deviation of 0.86, and female teachers have a mean score of 3.30 with a standard deviation of 0.94. The t-value is 2.002, with 762.86 degrees of freedom, and the Sig is 0.046*. The difference is statistically significant, indicating that male teachers have a slightly higher level of behavior after teaching.

This analysis reveals that gender plays a role in certain innovative teaching behaviors among professional teachers. While male and female teachers generally exhibit similar tendencies in many dimensions, there are statistically significant differences in dedication and love of teaching and behavior before and after teaching, where male teachers tend to show slightly higher levels. Other dimensions do not show significant gender-based differences.

H1b: With or without administrative duties, differences have different effects on professional teachers' innovative teaching behaviors.

The independent samples t-test was used to test the mean difference between the two groups at the statistically significant level of 0.05.

Table 4.5 Influence of Administrative Duties on Professional Teachers' Innovative Teaching Behaviors

Innovative Teaching Behaviors of Teachers	With or Without Administrative Duties	N	Mean	Std. Deviation	t-value	df	Sig
Dedication and love of teaching	Yes	68	3.30	0.79	-0.946	798.00	0.344
	No	732	3.41	0.88			
Courageous to accept challenges	Yes	68	2.75	1.23	0.403	798.00	0.687
	No	732	2.69	1.01			
Identify and solve problems	Yes	68	2.62	1.15	-0.3	75.81	0.765
	No	732	2.67	0.95			

Table 4.5 Influence of Administrative Duties on Professional Teachers' Innovative Teaching Behaviors (continued)

Innovative Teaching Behaviors of Teachers	With or Without Administrative Duties	N	Mean	Std. Deviation	t-value	df	Sig
Subordination	Yes	68	3.61	0.97	7.434	798.00	0.000**
	No	732	2.63	1.05			
Over-emphasis on scores and grades	Yes	68	3.27	0.92	4.933	798.00	0.000**
	No	732	2.71	0.89			
Before teaching	Yes	68	2.93	1.15	1.152	73.79	0.253
	No	732	2.77	0.84			
In teaching	Yes	68	3.12	0.96	2.947	798.00	0.003*
	No	732	2.81	0.82			
After teaching	Yes	68	3.57	0.90	2.014	798.00	0.044*
	No	732	3.34	0.91			

Table 4.5 presents the influence of administrative duties on the innovative teaching behaviors of professional teachers. The table provides data on various innovative teaching behaviors stratified by whether teachers have administrative duties. It includes the number of respondents (N), mean scores, standard deviations, t-values, degrees of freedom (df), and significance levels (Sig). Here is a detailed analysis of the findings:

Dedication and Love of Teaching: Teachers with administrative duties (N=68) have a mean score of 3.30 with a standard deviation of 0.79, while those without administrative duties (N=732) have a mean score of 3.41 with a standard deviation of 0.88. The t-value is -0.946, with 798.00 degrees of freedom, and the Sig is 0.344. The two groups have no statistically significant difference in dedication and love of teaching.

Courageous to Accept Challenges: Teachers with administrative duties have a mean score of 2.75 with a standard deviation of 1.23. In contrast, those without administrative duties have a mean score of 2.69 with a standard deviation of 1.01. The t-value is 0.403, with 798.00 degrees of freedom, and the Sig is 0.687. The results do not indicate a statistically significant difference, suggesting that administrative duties do not significantly impact the willingness to accept challenges.

Identify and Solve Problems:

Teachers with administrative duties have a mean score of 2.62 with a standard deviation of 1.15, and those without administrative duties have a mean score of 2.67 with a standard deviation of 0.95. The t-value is -0.3, with 75.81 degrees of freedom, and the Sig is 0.765. No statistically significant difference indicates that both groups have similar abilities to identify and solve problems. Subordination: Teachers with administrative duties have a mean score of 3.61 with a standard deviation of 0.97, while those without administrative duties have a mean score of 2.63 with a standard deviation of 1.05. The t-value is 7.434, with 798.00 degrees of freedom, and the Sig is 0.000**, indicating a highly significant difference. Teachers with administrative duties show significantly higher subordination levels than those without. Over-Emphasis on Scores and Grades: Teachers with administrative duties have a mean score of 3.27 with a standard deviation of 0.92, and those without administrative duties have a mean score of 2.71 with a standard deviation of 0.89. The t-value is 4.933, with 798.00 degrees of freedom, and the Sig is 0.000**, indicating a highly significant difference. Teachers with administrative duties exhibit significantly higher tendencies to over-emphasize scores and grades. Before Teaching: Teachers with administrative duties have a mean score of 2.93 with a standard deviation of 1.15, while those without administrative duties have a mean score of 2.77 with a standard deviation of 0.84. The t-value is 1.152, with 73.79 degrees of freedom, and the Sig is 0.253. The difference is not statistically significant, suggesting that administrative duties do not significantly affect behavior before teaching. In Teaching: Teachers with administrative duties have a mean score of 3.12 with a standard deviation of 0.96, and those without administrative duties have a mean score of 2.81 with a standard deviation of 0.82. The t-value is 2.947, with 798.00 degrees of freedom, and the Sig is 0.003*. The results indicate a statistically significant difference, with teachers with administrative duties displaying higher innovative teaching behaviors during teaching. After Teaching, Teachers with administrative duties have a mean score of 3.57 with a standard deviation of 0.90, and those without administrative duties have a mean score of 3.34 with a standard deviation of 0.91. The t-value is 2.014, with 798.00 degrees of freedom, and the Sig is 0.044*. The difference is statistically significant, suggesting that teachers with administrative duties exhibit higher innovative teaching behaviors after teaching.

In summary, administrative duties appear to impact innovative teaching

behaviors significantly. Teachers with administrative duties tend to display higher subordination, over-emphasis on scores and grades, and innovative teaching behaviors during and after teaching. However, no significant differences are observed in dedication and love of teaching, willingness to accept challenges, ability to identify and solve problems, and behavior before teaching.

H1c: Is the school you work for? Differences in duties have different effects on professional teachers' innovative teaching behaviors.

Table 4.6 Factors Influencing Professional Teachers' Innovative Teaching Behaviors at the School

Innovative Teaching Behaviors of Teachers	Type of School	N	Mean	Std. Deviation	t-value	df	Sig
Dedication and love of teaching	Public	418.00	3.40	0.91	0.001	798	0.97
	Private	382.00	3.40	0.91			
Courageous to accept challenges	Public	418.00	2.70	1.04	0.306	798	0.58
	Private	382.00	2.71	1.06			
Identify and solve problems	Public	418.00	2.65	1.03	0.011	798	0.916
	Private	382.00	2.66	1.04			
Subordination	Public	418.00	2.70	1.10	0.163	798	0.687
	Private	382.00	2.75	1.10			
Over-emphasis on scores and grades	Public	418.00	3.00	0.90	0.005	798	0.946
	Private	382.00	3.02	0.90			
Before teaching	Public	418.00	2.78	0.89	0.407	798	0.524
	Private	382.00	2.82	0.93			

Table 4.6 Factors Influencing Professional Teachers' Innovative Teaching Behaviors at the School (continued)

Innovative Teaching Behaviors of Teachers	Type of School	N	Mean	Std. Deviation	t-value	df	Sig
In teaching	Public	418.00	2.87	0.85	0.356	798	0.551
	Private	382.00	2.87	0.88			
After teaching	Public	418.00	3.33	0.93	0.081	798	0.776
	Private	382.00	3.32	0.95			

Table 4.6 examines how the type of school where professional teachers work influences their innovative teaching behaviors. The table provides data on various teaching behaviors, categorized by whether teachers work in public or private schools, along with the number of respondents (N), mean scores, standard deviations (Std. Deviation), t-values, degrees of freedom (df), and significance levels (Sig).

The analysis reveals that, for most innovative teaching behaviors, there are no statistically significant differences between teachers working in public and private schools. These behaviors include dedication and love of teaching, willingness to accept challenges, the ability to identify and solve problems, subordination, teaching behaviors before, during, and after teaching, and the over-emphasis on scores and grades. In all these cases, the t-values are close to zero, and the significance levels are well above the typical threshold for statistical significance (0.05).

The data suggests that the type of school (public or private) where teachers are employed does not significantly affect these aspects of their innovative teaching behaviors. The means and standard deviations are pretty similar in both cases.

In summary, while the data indicates subtle differences in mean scores for these teaching behaviors between public and private school teachers, these differences are not statistically significant. Consequently, the type of school does not appear to impact professional teachers' reported innovative teaching behaviors significantly.

H1d: The differences in the years of teaching experience have different effects on the innovative teaching behavior of professional teachers.

One-way ANOVA was used to test the mean difference between the two groups at a statistically significant level of 0.05.

Table 4.7 Impact of Teaching Experience on Professional Teachers' Innovative Teaching Behaviors

Innovative Teaching Behaviors of Teachers		Sum of Squares	df	Mean Square	F	Sig.
Dedication and love of teaching teaching	Between Groups	3.636	3	1.212	1.586	0.191
	Within Groups	608.364	796	0.764		
	Total	612	799			
Courageous to accept challenges	Between Groups	3.892	3	1.297	1.230	0.298
	Within Groups	839.701	796	1.055		
	Total	843.593	799			
Identify and solve problems	Between Groups	1.212	3	0.404	0.427	0.734
	Within Groups	753.105	796	0.946		
	Total	754.317	799			
Subordination	Between Groups	7.733	3	2.578	2.231	0.083
	Within Groups	919.716	796	1.155		
	Total	927.449	799			
Over-emphasis on scores and grades	Between Groups	21.48	3	7.16	8.969	0.000**
	Within Groups	635.43	796	0.798		
	Total	656.91	799			
Before teaching	Between Groups	9.014	3	3.005	3.986	0.008*
	Within Groups	600.079	796	0.754		
	Total	609.093	799			
In teaching	Between Groups	10.272	3	3.424	4.934	0.002*
	Within Groups	552.384	796	0.694		
	Total	562.655	799			
After teaching	Between Groups	5.839	3	1.946	2.367	0.070
	Within Groups	654.393	796	0.822		
	Total	660.231	799			

Table 4.7 presents the results of a one-way analysis of variance (ANOVA) used to examine the influence of teachers' years of teaching experience on their innovative teaching behaviors. The table contains various innovative teaching behaviors, including Dedication and Love of Teaching, Courage to Accept Challenges, Identify and Solve Problems, Subordination, Over-Emphasis on Scores and Grades, Behavior Before

Teaching, Behavior During Teaching, and Behavior After Teaching. Here is a detailed breakdown of the findings:

Dedication and Love of Teaching: The ANOVA results for Dedication and Love of Teaching indicate no statistically significant difference in this behavior among teachers with different levels of teaching experience. The F-statistic is 1.586, with a significance level (Sig) of 0.191, more significant than the typical significance threshold of 0.05. Therefore, years of teaching experience do not significantly impact dedication and love of teaching.

Courageous to Accept Challenges: Similarly, the analysis for Courageous to Accept Challenges reveals no statistically significant difference in this behavior based on teachers' years of experience. The F-statistic is 1.230, and the Sig is 0.298, indicating no significant impact. **Identify and Solve Problems:** The results for Identify and Solve Problems show that years of teaching experience do not significantly affect this behavior. The F-statistic is 0.427, and the Sig is 0.734, well above the 0.05 significance level. **Subordination:** Subordination also does not demonstrate a statistically significant difference among teachers with varying years of experience. The F-statistic is 2.231, and the Sig is 0.083, slightly above the 0.05 significance level. **Over-Emphasis on Scores and Grades:** In contrast, the analysis for Over-Emphasis on Scores and Grades shows a statistically significant impact of years of teaching experience. The F-statistic is 8.969, with a Sig of 0.000**, indicating a significant difference. This suggests that more experienced teachers may be less likely to over-emphasize scores and grades. **Behavior Before Teaching:** The ANOVA results for Behavior Before Teaching indicate a statistically significant difference based on years of teaching experience. The F-statistic is 3.986, and the Sig is 0.008*, below the 0.05 significance threshold. This implies that teachers' behavior before teaching varies significantly with their years of experience. **Behavior During Teaching:** Similarly, Behavior During Teaching is significantly influenced by years of teaching experience. The F-statistic is 4.934, with a Sig of 0.002*, indicating a significant difference. **Behavior After Teaching:** In contrast, Behavior After Teaching does not exhibit a statistically significant difference based on years of teaching experience. The F-statistic is 2.367, and the Sig is 0.070, above the 0.05 significance level.

This ANOVA analysis suggests that years of teaching experience

significantly impact innovative teaching behaviors, such as Over-Emphasis on Scores and Grades, Behavior Before Teaching, and Behavior During Teaching. However, no significant impact was observed for Dedication and Love of Teaching, Courageous to Accept Challenges, Identify and Solve Problems, Subordination, and Behavior After Teaching. These findings provide valuable insights into the relationship between years of teaching experience and specific teaching behaviors.

Table 4.8 Multiple Comparisons of Professional Teachers' Innovative Teaching Behaviors Across Different Teaching Experience Groups

Mean Difference (I-J)					
Years of Teaching Experience	Years of Teaching Experience J				
	$\bar{X}$	0-3 years	4-9 years	10-19 years	20 years or more
Group I					
0-3 years	2.91		0.321** (0.000)	0.371* (0.000)	0.170 (0.219)
4-9 years	2.59			0.055 (0.603)	-0.151 (0.289)
10-19 years	2.54				-0.206 (0.189)
20 years or more	2.74				-

* The mean difference is significant at the 0.05 level

Dependent Variable: Quality competitiveness

Table 4.8 compares the mean differences in innovative teaching behavior among professional teachers with different years of teaching experience. This analysis helps us understand how years of teaching experience influence teachers' innovative teaching behaviors. Here is a summary of the critical findings: 0-3 years vs. 4-9 years: The mean difference between teachers with 0-3 years and those with 4-9 years of experience is 0.321, statistically significant at the 0.05 level ($p < 0.001$). This suggests that teachers with 0-3 years of experience exhibit significantly different innovative teaching behaviors than those with 4-9 years of experience. 0-3 years vs. 10-19 years: The mean difference between teachers with 0-3 years and those with 10-19 years of experience is 0.371, which is also statistically significant at the 0.05 level ($p < 0.001$). Teachers with 0-3 years of experience differ significantly in their innovative teaching

behaviors from those with 10-19 years of experience. 0-3 years vs. 20 years or more: The mean difference between teachers with 0-3 years and those with 20 years or more of experience is 0.170, but this difference is not statistically significant ($p = 0.219$). Teachers with 0-3 years of experience do not significantly differ in their innovative teaching behaviors from those with 20 years or more of experience. 4-9 years vs. 10-19 years: The mean difference between teachers with 4-9 years and those with 10-19 years of experience is 0.055, which is not statistically significant ($p = 0.603$). There is no significant difference in innovative teaching behaviors between these two groups. 4-9 years vs. 20 years or more: The mean difference between teachers with 4-9 years and those with 20 years or more of experience is -0.151, which is not statistically significant ($p = 0.289$). Innovative teaching behaviors do not significantly differ between these two groups. 10-19 years vs. 20 years or more: The mean difference between teachers with 10-19 years and those with 20 years or more of experience is -0.206, which is not statistically significant ($p = 0.189$). There is no significant difference in innovative teaching behaviors between teachers with 10-19 years of experience and those with 20 years or more of experience.

In summary, the analysis indicates that the years of teaching experience significantly influence teachers' innovative teaching behaviors, with significant differences observed between teachers with 0-3 years of experience and those with 4-9 years or 10-19 years of experience. However, there are no significant differences in innovative teaching behaviors between teachers with 0-3 years of experience and those with 20 years or more, or between teachers with 4-9 years and those with 10-19 years or 20 years or more of experience. These findings shed light on the impact of teaching experience on innovative teaching behaviors within specific experience groups.

Table 4.9 Multiple Comparisons of Innovative Teaching Behaviors Among Professional Teachers with Varying Years of Experience

	Mean Difference (I-J)				
Years of Teaching Experience	Years of Teaching Experience J				
	$\bar{X}$	0-3 years	4-9 years	10-19 years	20 years or more
Group I					
0-3 years	2.87		0.130 (0.067)	0.242* (0.011)	0.338* (0.012)
4-9 years	2.74			0.112 (0.274)	0.208 (0.134)
10-19 years	2.63				0.096 (0.528)
20 years or more	2.53				-

* The mean difference is significant at the 0.05 level

Dependent Variable: Quality competitiveness

Table 4.9 compares the mean differences in innovative teaching behavior among professional teachers with years of teaching experience. These comparisons further explore the impact of teaching experience on innovative teaching behaviors. Here is a summary of the findings: 0-3 years vs. 4-9 years: The mean difference between teachers with 0-3 years and those with 4-9 years of experience is 0.130. This difference is not statistically significant at the 0.05 level ($p = 0.067$), indicating no significant difference in innovative teaching behaviors between these two groups. 0-3 years vs. 10-19 years: The mean difference between teachers with 0-3 years and those with 10-19 years of experience is 0.242, statistically significant at the 0.05 level ($p = 0.011$). Teachers with 0-3 years of experience exhibit significantly different innovative teaching behaviors from those with 10-19 years of experience. 0-3 years vs. 20 years or more: The mean difference between teachers with 0-3 years and those with 20 years or more of experience is 0.338, which is also statistically significant at the 0.05 level ($p = 0.012$). Teachers with 0-3 years of experience significantly differ in their innovative teaching behaviors from those with 20 years or more of experience. 4-9 years vs. 10-19 years: The mean difference between teachers with 4-9 years and those with 10-19 years of experience is 0.112. This difference is not statistically significant ($p = 0.274$), indicating no significant difference in innovative teaching behaviors between these two groups. 4-

9 years vs. 20 years or more: The mean difference between teachers with 4-9 years and those with 20 years or more of experience is 0.208. This difference is not statistically significant ($p = 0.134$), suggesting no significant difference in innovative teaching behaviors between these two groups. 10-19 years vs. 20 years or more: The mean difference between teachers with 10-19 years and those with 20 years or more of experience is 0.096. This difference is not statistically significant ($p = 0.528$), indicating no significant difference in innovative teaching behaviors between these two groups.

In summary, the multiple comparisons show significant differences in innovative teaching behaviors between teachers with 0-3 years of experience and those with 10-19 years or 20 years or more of experience. However, there are no significant differences in behavior between teachers with 4-9 years and those with 10-19 years or 20 years or more of experience. These findings provide further insights into how different years of teaching experience impact innovative teaching behaviors within specific groups.

Table 4.10 Multiple Comparison Analysis of Innovative Teaching Behaviors Among Professional Teachers by Years of Teaching Experience

Mean Difference (I-J)					
Years of Teaching Experience	Years of Teaching Experience J				
	$\bar{X}$	0-3 years	4-9 years	10-19 years	20 years or more
Group I					
0-3 years	2.94		0.230* (0.001)	0.240* (0.009)	0.045 (0.725)
4-9 years	2.71			-0.010 (0.916)	-0.195 (0.166)
10-19 years	2.70				-0.195 (0.184)
20 years or more	2.89				-

* The mean difference is significant at the 0.05 level

Dependent Variable: Quality competitiveness

Table 4.10 compares the mean differences in innovative teaching behavior among professional teachers with years of teaching experience. These comparisons help

us explore how teaching experience impacts innovative teaching behaviors. Here is a summary of the findings:

0-3 years vs. 4-9 years: The mean difference between teachers with 0-3 years and those with 4-9 years of experience is 0.230. This difference is statistically significant at 0.05 ($p = 0.001$). It indicates that teachers with 0-3 years of experience exhibit significantly different innovative teaching behaviors than those with 4-9 years of experience.

0-3 years vs. 10-19 years: The mean difference between teachers with 0-3 years and those with 10-19 years of experience is 0.240, statistically significant at the 0.05 level ($p = 0.009$). Teachers with 0-3 years of experience differ significantly in their innovative teaching behaviors from those with 10-19 years of experience.

0-3 years vs. 20 years or more: The mean difference between teachers with 0-3 years and those with 20 years or more of experience is 0.045, but this difference is not statistically significant ($p = 0.725$). Teachers with 0-3 years of experience do not significantly differ in their innovative teaching behaviors from those with 20 years or more of experience.

4-9 years vs. 10-19 years: The mean difference between teachers with 4-9 years and those with 10-19 years of experience is -0.010, which is not statistically significant ($p = 0.916$). There is no significant difference in innovative teaching behaviors between these two groups.

4-9 years vs. 20 years or more: The mean difference between teachers with 4-9 years and those with 20 years or more of experience is -0.195. This difference is not statistically significant ($p = 0.166$), indicating no significant difference in innovative teaching behaviors between these two groups.

10-19 years vs. 20 years or more: The mean difference between teachers with 10-19 years and those with 20 years or more of experience is -0.195. This difference is not statistically significant ($p = 0.184$), suggesting no significant difference in innovative teaching behaviors between these two groups.

In summary, the analysis demonstrates significant differences in innovative teaching behaviors between teachers with 0-3 years of experience and those with 4-9 years or 10-19 years of experience. However, there are no significant differences in innovative teaching behaviors between teachers with 4-9 years and those with 10-19 years or 20 years or more of experience. These findings provide additional insights into how different years of teaching experience impact innovative teaching behaviors within specific experience groups.

4.2.2. Personality Traits Affect Dedication and Love of Teaching

H2: Affinity, Rigorous self-discipline, Extroversion, Openness of experience, and Emotional stability affect the Innovative teaching behaviors of teachers.

Multiple linear regression methods were used to estimate the relationship between two or more variables, such as Affinity, Rigorous self-discipline, Extroversion, Openness of experience, and Emotional stability. The estimation equation looks like this:

$$\hat{Y}_T = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5$$

$$\hat{Y}_1 = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5$$

$$\hat{Y}_2 = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5$$

$$\hat{Y}_3 = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5$$

Where the dependent variable is:

$\hat{Y}_T$: Dedication and love of teaching

$\hat{Y}_1$: Courageous to accept challenges

$\hat{Y}_2$: Identify and solve problems

$\hat{Y}_3$: Subordination

$\hat{Y}_4$: Over-emphasis on scores and grades

$\hat{Y}_5$: Before teaching

$\hat{Y}_6$: In teaching

$\hat{Y}_7$: After teaching

The independent variables are:

X_1 : Affinity

X_2 : Rigorous self-discipline

X_3 : Extroversion

X_4 : Openness of experience

X_5 : Emotional stability

H2a: Affinity, Rigorous self-discipline, Extroversion, Openness of experience, and Emotional stability influence Dedication and love of teaching.

Multiple linear regression was used to analyze the data, and the prediction equation was established at the 95% confidence level.

Table 4.11 Personality Traits Influencing Dedication and Love of Teaching

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.657a	0.431	0.428	0.66205	1.926

c. Predictors: Affinity, Rigorous self-discipline, Extroversion, Openness of experience, Emotional stability

d. Dependent variable: Dedication and love of teaching

Table 4.11 provides a comprehensive analysis of the impact of different personality traits on teachers' Dedication and Love of Teaching using a linear regression model. Let us break down the findings and their implications:

Model Overview: A linear regression model was employed in this analysis to understand the relationship between teachers' personality traits and their Dedication and Love of Teaching. The statistical parameters presented in the table shed light on the effectiveness of this model.

Strength of the Relationship: The correlation coefficient (R) measures the strength and direction of the relationship between the personality traits and Dedication and Love of Teaching. An R-value of approximately 0.657 suggests a moderately strong positive relationship. This means that as certain personality traits increase, teachers' dedication and love for teaching also tend to increase.

Explained Variability: R Square (R^2) indicates the proportion of the variability in Dedication and Love of Teaching that the included personality traits can explain. In this model, around 43.1% of the variability in teachers' dedication is accounted for by personality traits. This highlights the significance of these traits in influencing teachers' commitment to their profession.

Model Validity: The Adjusted R Square, which considers the number of predictors in the model, aligns closely with the R Square. This suggests that the model is consistent and appropriately adjusted for the predictors.

Prediction Accuracy: The Std. Error of the Estimate measures the model's prediction accuracy. A value of approximately 0.66205 implies that the model's predictions are reasonably close to the actual values. This indicates that the model effectively captures the relationship between personality traits and Dedication and Love of Teaching.

Autocorrelation Assessment: The Durbin-Watson statistic of 1.926 is within the acceptable range and indicates no significant autocorrelation among the residuals, reinforcing the model's reliability.

Predictors and Impact: The predictors in the model include five personality traits: Affinity, Rigorous Self-Discipline, Extroversion, Openness of Experience, and Emotional Stability. The results emphasize that these personality traits significantly influence teachers' Dedication and Love of Teaching. For instance, teachers with higher scores in Extroversion might exhibit a more robust dedication to their profession.

Implications: Understanding the impact of these personality traits on teachers' dedication and love for teaching can have practical implications for education. Schools and educational institutions can consider these traits when hiring and developing teachers to ensure a better match between their characteristics and the teaching profession. Additionally, targeted interventions and training programs can be designed to enhance these traits in teachers, potentially leading to increased dedication and effectiveness in the classroom. Table 4.12 shows the correlation values of all independent variables, with a minimum value of 0.405 and no less than 0.2, indicating no correlation between the five independent variables.

Table 4.12 Multiple Linear Regression Coefficients for the Effect of Personality Traits on Occupational Dedication and Love of Teaching

Model	Unstandardized Coefficients		Standardized Coefficients		Collinearity Statistics		
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	0.686	0.114		6.014	0.000**		
Affinity	0.068	0.032	0.074	2.133	0.033*	0.601	1.665
Rigorous self-discipline	0.224	0.031	0.241	7.150	0.000**	0.631	1.585
Extroversion	0.072	0.028	0.085	2.533	0.012*	0.643	1.555
Openness of experience	0.179	0.039	0.183	4.604	0.000**	0.451	2.217
Emotional stability	0.259	0.045	0.240	5.715	0.000**	0.405	2.470

Table 4.12 presents the results of a multiple linear regression analysis that examines the effect of different personality traits on occupational dedication and love of teaching. This analysis provides insights into how each personality trait influences the dedication and love of teaching. Table 4.12 consists of five predictors: Affinity, Rigorous self-discipline, Extroversion, Openness of experience, and Emotional stability,

and its precondition equation is as follows:

$$\hat{Y}_1 = 0.686 + 0.068X_1 + 0.224X_2 + 0.072X_3 + 0.179X_4 + 0.259X_5$$

Model Statistics: The model includes a constant (intercept), and it demonstrates a significant overall relationship between the independent variables (personality traits) and the dependent variable (dedication and love of teaching).

Unstandardized Coefficients: These coefficients (B) represent the effect of each independent variable (personality trait) on the dependent variable. They indicate how a one-unit change in each personality trait affects dedication and love of teaching.

Standardized Coefficients (Beta): Standardized coefficients (Beta) measure the strength and direction of the relationship between each independent variable and the dependent variable, considering the different scales of the variables.

Affinity (Beta = 0.074): Affinity has a positive and statistically significant impact on dedication and love of teaching ($p = 0.033$). This means that teachers with higher affinity tend to show more dedication and love for teaching.

Rigorous Self-Discipline (Beta = 0.241): Rigorous self-discipline strongly affects dedication and love of teaching ($p = 0.000$). Teachers with higher levels of self-discipline are more dedicated and loving.

Extroversion (Beta = 0.085): Extroversion positively impacts dedication and love of teaching ($p = 0.012$). Teachers with greater extroversion tend to exhibit higher dedication and love for their profession.

Openness of Experience (Beta = 0.183): Openness of experience significantly and positively influences dedication and love of teaching ($p = 0.000$). Teachers who are more open to new experiences demonstrate a higher dedication and love for teaching.

Emotional Stability (Beta = 0.240): Emotional stability has a solid and positive impact on dedication and love of teaching ($p = 0.000$). Teachers with higher emotional stability show more dedication and love in their teaching.

In summary, the multiple linear regression analysis reveals that each personality trait (Affinity, Rigorous Self-Discipline, Extroversion, Openness of Experience, and Emotional Stability) positively and statistically significantly affects occupational dedication and love of teaching. These findings provide valuable insights into the relationship between personality traits and teachers' dedication and passion for their profession.

H2b: Personality Traits including Affinity, Rigorous self-discipline, Extroversion, Openness of experience, Emotional stability, influence, and Courage

to accept challenges.

Multiple linear regression was used to analyze the data, and the prediction equation was established at the 95% confidence level.

Table 4.13 Personality Traits Which Influenced Courage to Accept Challenges

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.074a	0.005	-0.001	1.02795	1.851

c. Predictors: Affinity, Rigorous self-discipline, Extroversion, Openness of experience, Emotional stability

d. Dependent variable: Courageous to accept challenges

Table 4.13 presents a regression analysis of the impact of personality traits on teachers' Courage to Accept Challenges. Let us break down the results and their implications:

Model Overview: A linear regression model explored the relationship between teachers' personality traits and their Courage to Accept Challenges in this analysis. The statistical parameters provided in the table help us understand the effectiveness of this model.

Strength of the Relationship: The correlation coefficient (R) measures the strength and direction of the relationship between the personality traits and Courage to Accept Challenges. The small R-value of approximately 0.074 suggests a weak positive relationship. This means the included personality traits have limited influence on teachers' courage to accept challenges.

Explained Variability: R Square (R^2) indicates the proportion of the variability in Courage to Accept Challenges that the included personality traits can explain. In this model, only around 0.5% of the variability in teachers' courage is accounted for by the considered personality traits. This suggests that these traits have a minor impact on teachers' willingness to accept challenges.

Model Validity: The Adjusted R Square, which considers the number of predictors in the model, is approximately -0.001. It indicates that the model is not appropriately adjusted for the predictors, possibly due to the limited explanatory power of the traits in predicting courage to accept challenges.

Prediction Accuracy: The Std. Error of the Estimate, approximately 1.02795, implies that the model's predictions are not remarkably accurate, further emphasizing the limited influence of personality traits on teachers' courage to accept challenges.

Autocorrelation Assessment: The Durbin-

Watson statistic of 1.851 is within an acceptable range, indicating no significant autocorrelation among the residuals. Predictors and Impact: The predictors in the model are the same personality traits used in the previous analysis: Affinity, Rigorous Self-Discipline, Extroversion, Openness of Experience, and Emotional Stability. The results suggest that these traits have limited influence on teachers' courage to accept challenges. Implications: The results suggest that personality traits, as considered in this model, have a relatively minor impact on teachers' courage to accept challenges. Other factors not accounted for in this analysis, such as external motivators or institutional factors, may have a more substantial role in influencing teachers' willingness to embrace challenges.

In conclusion, this regression model highlights the limited influence of personality traits on teachers' courage to accept challenges. This implies that external and internal factors might significantly motivate teachers to take on new challenges and use innovative teaching methods. Further research may be needed to explore these factors in more detail and inform strategies for enhancing teachers' openness to educational innovations. Table 4.13 shows the correlation values of all independent variables, with a minimum value of 0.405 and no less than 0.2, indicating no correlation between the five independent variables.

Table 4.14 Multiple Linear Regression Coefficients for the Effect of Personality Traits on Courage to Accept Challenges

Model	Unstandardized Coefficients		Standardized Coefficients		Collinearity Statistics		
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	2.871	0.177		16.205	0.000		
Affinity	-0.063	0.049	-0.058	-1.266	0.206	0.601	1.665
Rigorous self-discipline	-0.036	0.049	-0.033	-0.739	0.460	0.631	1.585
Extroversion	0.025	0.044	0.025	0.573	0.567	0.643	1.555
Openness of experience	-0.057	0.061	-0.049	-0.935	0.350	0.451	2.217
Emotional stability	0.082	0.07	0.065	1.165	0.244	0.405	2.47

Table 4.13 is composed of five predictors: Affinity, Rigorous self-discipline, Extroversion, Openness of experience, and Emotional stability, and its

precondition equation is as follows:

$$\hat{Y}_2 = 2.871 - 0.063X_1 - 0.063X_2 + 0.025X_3 - 0.057X_4 + 0.082X_5$$

Table 4.14 provides a multiple linear regression analysis that explores the impact of different personality traits on the variable "Courageous to accept challenges." Let us analyze the findings:

Model Statistics: The model includes a constant (intercept), and it demonstrates a significant overall relationship between the independent variables (personality traits) and the dependent variable (Courage to accept challenges). **Unstandardized Coefficients:** These coefficients (B) represent the effect of each independent variable (personality trait) on the dependent variable. They indicate how a one-unit change in each personality trait affects the courage to accept challenges variable. **Standardized Coefficients (Beta):** Standardized coefficients (Beta) measure the strength and direction of the relationship between each independent variable and the dependent variable, considering the different scales of the variables.

Now, let us analyze the results for each personality trait: **Affinity (Beta = -0.058):** Affinity harms the courage to accept challenges, but the effect is not statistically significant ($p = 0.206$). This suggests no significant relationship exists between affinity and the willingness to accept challenges. **Rigorous Self-Discipline (Beta = -0.033):** Rigorous self-discipline also harms the courage to accept challenges, and this effect is not statistically significant ($p = 0.460$). There is no significant relationship between self-discipline and the willingness to accept challenges.

Extroversion (Beta = 0.025): Extroversion positively impacts the courage to accept challenges, but the effect is not statistically significant ($p = 0.567$). There is no significant relationship between extroversion and the willingness to accept challenges. **Openness of Experience (Beta = -0.049):** Openness of experience harms the courage to accept challenges, and this effect is not statistically significant ($p = 0.350$). There is no significant relationship between openness to experience and the willingness to accept challenges.

Emotional Stability (Beta = 0.065): Emotional stability positively impacts the courage to accept challenges, but the effect is not statistically significant ($p = 0.244$). There is no significant relationship between emotional stability and the willingness to accept challenges.

In summary, the multiple linear regression analysis suggests that none of the examined personality traits (Affinity, Rigorous Self-Discipline, Extroversion, Openness of Experience, and Emotional Stability) statistically impact the willingness to accept challenges (Courage to accept challenges). The p-values indicate that these relationships are not significant in this analysis.

H2c: Personality traits, including affinity, rigorous self-discipline, extroversion, openness of experience, and emotional stability, influence the identification and solving of problems.

Multiple linear regression was used to analyze the data, and the prediction equation was established at the 95% confidence level.

Table 4.15 Influencing Identification of Solving Problems on Personality Traits

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.085a	0.007	0.001	0.97115	1.809

c. Predictors: Affinity, Rigorous self-discipline, Extroversion, Openness of experience, Emotional stability

d. Dependent variable: Identify and solve problems

Table 4.15 presents a regression analysis of the impact of personality traits on teachers' ability to Identify and Solve Problems. Let us analyze the results and their implications:

Model Overview: In this analysis, a linear regression model was employed to investigate the relationship between teachers' personality traits and their capacity to Identify and Solve Problems. The statistical parameters presented in the table provide insights into the effectiveness of this model. **Strength of the Relationship:** The correlation coefficient (R) measures the strength and direction of the relationship between the personality traits and the ability to Identify and Solve Problems. The small R-value of approximately 0.085 indicates a weak positive relationship. This suggests that the included personality traits do not influence teachers' problem-solving abilities. **Explained Variability:** R Square (R^2) indicates the proportion of the variability in the ability to Identify and Solve Problems that the considered personality traits can explain. In this model, only about 0.7% of the variability in teachers' problem-solving abilities is accounted for by personality traits. This implies that these traits have a minor impact on

teachers' problem-solving skills. Model Validity: The Adjusted R Square, which considers the number of predictors in the model, is approximately 0.001. It indicates that the model is slightly adjusted for the predictors, suggesting that the traits have only a minor influence on teachers' problem-solving abilities.

Prediction Accuracy: The Std. Error of the Estimate, which is approximately 0.97115, implies that the model's predictions are not remarkably accurate. This further underscores the limited impact of personality traits on teachers' problem-solving capabilities. Autocorrelation Assessment: The Durbin-Watson statistic of 1.809 falls within an acceptable range, indicating no significant autocorrelation among the residuals. Predictors and Impact: The predictors in the model are the same personality traits used in the previous analyses: Affinity, Rigorous Self-Discipline, Extroversion, Openness of Experience, and Emotional Stability. The results suggest that these traits have a limited impact on teachers' ability to Identify and Solve Problems. Implications: The results suggest that the included personality traits, as considered in this model, have a minor influence on teachers' problem-solving abilities. Other factors not addressed in this analysis, such as training, experience, or external support, may substantially shape teachers' capacity to identify and solve problems effectively.

In conclusion, this regression model underscores the limited influence of personality traits on teachers' problem-solving abilities. It implies that additional external and internal factors may significantly enhance teachers' problem-solving skills. Further research is warranted to explore these factors and provide insights into strategies for improving teachers' problem-solving competencies in the educational context. Table 4.15 shows the correlation values of all independent variables, with a minimum value of 0.405 and no less than 0.2, indicating no correlation between the five independent variables.

Multiple linear regression was used to analyze the data, and the prediction equation was established at the 95% confidence level.

Table 4.16 Multiple Linear Regression Coefficients for the Effect of Personality Traits on Identifying and Solving Problems

Model		Unstandardized Coefficients		Standardized Coefficients		Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance VIF
1	(Constant)	2.849	0.167		17.023	0.000	
	Affinity	-0.061	0.047	-0.06	-1.308	0.191	0.601 1.665
	Rigorous self-discipline	0.023	0.046	0.022	0.504	0.615	0.631 1.585
	Extroversion	-0.068	0.042	-0.072	-1.625	0.105	0.643 1.555
	Openness of experience	0.034	0.057	0.031	0.588	0.557	0.451 2.217
	Emotional stability	0.020	0.067	0.016	0.294	0.769	0.405 2.470

Table 4.15 is composed of five predictors: Affinity, Rigorous self-discipline, Extroversion, Openness of experience, and Emotional stability, and its precondition equations are as follows: $\hat{Y}_3 = 2.849 - 0.061X_1 + 0.023X_2 - 0.068X_3 - 0.034X_4 + 0.020X_5$

Table 4.16 presents the results of a multiple linear regression analysis, which examines the impact of various personality traits on the variable "Identifying and solving problems." Let us analyze the findings: Model Statistics: The model includes a constant (intercept), and it demonstrates a significant overall relationship between the independent variables (personality traits) and the dependent variable (Identifying and solving problems). Unstandardized Coefficients: These coefficients (B) represent the effect of each independent variable (personality trait) on the dependent variable. They indicate how a one-unit change in each personality trait affects the identifying and solving problems variable.

Standardized Coefficients (Beta): Standardized coefficients (Beta) measure the strength and direction of the relationship between each independent variable and the dependent variable, considering the different scales of the variables. Now, let us analyze the results for each personality trait: Affinity (Beta = -0.060): Affinity harms identifying and solving problems, but the effect is not statistically significant ($p = 0.191$). This suggests no significant relationship exists between affinity and the ability to identify and solve problems. Rigorous Self-Discipline (Beta = 0.022): Rigorous self-discipline

positively impacts Identifying and solving problems, but the effect is not statistically significant ($p = 0.615$). There is no significant relationship between self-discipline and the ability to identify and solve problems. Extroversion (Beta = -0.072): Extroversion harms Identifying and solving problems, but the effect is not statistically significant ($p = 0.105$). There is no significant relationship between extroversion and the ability to identify and solve problems. Openness of Experience (Beta = 0.031): Openness of experience positively impacts Identifying and solving problems, but the effect is not statistically significant ($p = 0.557$). There is no significant relationship between openness of experience and the ability to identify and solve problems. Emotional Stability (Beta = 0.016): Emotional stability positively impacts Identifying and solving problems, but the effect is not statistically significant ($p = 0.769$). There is no significant relationship between emotional stability and the ability to identify and solve problems.

In summary, the multiple linear regression analysis suggests that none of the examined personality traits (Affinity, Rigorous Self-Discipline, Extroversion, Openness of Experience, and Emotional Stability) have a statistically significant impact on the ability to identify and solve problems (Identifying and solving problems). The p -values indicate that these relationships are not significant in this analysis.

H2d: Personality Traits, including Affinity, Rigorous self-discipline, Extroversion, Openness of experience, Emotional stability, and influence Subordination.

Multiple linear regression was used to analyze the data, and the prediction equation was established at the 95% confidence level.

Table 4.17 Influencing Subordination's Personality Traits

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.121a	0.015	0.008	1.07286	2.148

c. Predictors: Affinity, Rigorous self-discipline, Extroversion, Openness of experience, Emotional stability

d. Dependent variable: Subordination

Table 4.17 presents a regression analysis of the impact of personality traits on Subordination. Let us analyze the results and their implications:

Model Overview: In this analysis, a linear regression model was used to

examine the relationship between teachers' personality traits and Subordination. The statistical parameters provided in the table offer insights into the effectiveness of this model.

Strength of the Relationship: The correlation coefficient (R) measures the strength and direction of the relationship between the personality traits and Subordination. The R -value is approximately 0.121, indicating a weak positive relationship. This suggests that the included personality traits have a limited influence on Subordination.

Explained Variability: R Square (R^2) represents the proportion of the variability in Subordination that the considered personality traits can explain. In this model, only about 1.5% of the variability in Subordination is accounted for by the personality traits. This suggests that these traits have a minor impact on teachers' Subordination.

Model Validity: The Adjusted R Square, which considers the number of predictors in the model, is approximately 0.008. This indicates that the model is slightly adjusted for the predictors, suggesting that the traits have a minor influence on Subordination.

Prediction Accuracy: The Std. Error of the Estimate, which is approximately 1.07286, suggests that the model's predictions are not remarkably accurate. This further emphasizes the limited impact of personality traits on Subordination.

Autocorrelation Assessment: The Durbin-Watson statistic of 2.148 falls within an acceptable range, indicating no significant autocorrelation among the residuals.

Predictors and Impact: The predictors in the model are the same personality traits used in the previous analyses: Affinity, Rigorous Self-Discipline, Extroversion, Openness of Experience, and Emotional Stability. The results suggest that these traits have a limited impact on teachers' Subordination.

Implications: The results suggest that the included personality traits, as considered in this model, have only a minor influence on Subordination. Other factors not addressed in this analysis, such as organizational culture, leadership, or external influences, may play a more substantial role in shaping teachers' Subordination.

In conclusion, this regression model underscores the limited influence of personality traits on teachers' Subordination. It implies that additional external and internal factors may significantly shape subordinate behavior. Further research is warranted to explore these factors and provide insights into strategies for improving teachers' Subordination in educational contexts. Table 4.17 shows the correlation values of all independent variables, with a minimum value of 0.405 and no less than 0.2,

indicating no correlation between the five independent variables.

Table 4.18 Multiple Linear Regression Coefficients for the Effect of Personality Traits on Subordination

Model		Unstandardized Coefficients		Standardized Coefficients		Collinearity Statistics		
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	3.205	0.185		17.331	0.000		
	Affinity	-0.083	0.052	-0.073	-1.599	0.010*	0.601	1.665
	Rigorous self-discipline	0.037	0.051	0.032	0.726	0.468	0.631	1.585
	Extroversion	-0.004	0.046	-0.004	-0.098	0.922	0.643	1.555
	Openness of experience	-0.099	0.063	-0.082	-1.562	0.019*	0.451	2.217
	Emotional stability	0.008	0.074	0.006	0.11	0.913	0.405	2.470

Table 4.18 is composed of five predictors: Affinity, Rigorous self-discipline, Extroversion, Openness of experience, and Emotional stability, and its precondition equation is as follows: $\hat{Y}_3 = 3.205 - 0.083X_1 + 0.037X_2 - 0.004X_3 - 0.099X_4 + 0.008X_5$

Table 4.18 provides the results of a multiple linear regression analysis assessing the impact of personality traits on the variable "Subordination." Here is a detailed analysis of the findings: Model Statistics: The model is statistically significant, as indicated by the F-statistic ($F = 17.331$, $p = 0.000$). This means that the overall model is a good fit for the data. Unstandardized Coefficients: These coefficients (B) represent the change in the dependent variable (Subordination) for a one-unit change in each independent variable (personality trait) while holding all other variables constant. Standardized Coefficients (Beta): The standardized coefficients (Beta) are used to compare the relative importance of each independent variable while considering their different scales. Now, let us analyze the impact of each personality trait on Subordination:

Affinity (Beta = -0.073): The standardized coefficient (Beta) for Affinity is -0.073, indicating a negative relationship between Affinity and Subordination. A one-

unit increase in Affinity is associated with a decrease in Subordination. The effect of Affinity is statistically significant ($p = 0.010$), suggesting that Affinity has a significant impact on Subordination. Rigorous Self-Discipline (Beta = 0.032): The standardized coefficient (Beta) for Rigorous Self-Discipline is 0.032, indicating a positive relationship between Rigorous Self-Discipline and Subordination. However, this relationship is not statistically significant ($p = 0.468$), suggesting that Rigorous Self-Discipline does not significantly affect Subordination in this context. Extroversion (Beta = -0.004): The standardized coefficient (Beta) for Extroversion is -0.004, suggesting a negligible negative relationship between Extroversion and Subordination. This relationship is not statistically significant ($p = 0.922$), indicating that Extroversion does not significantly impact Subordination. Openness of Experience (Beta = -0.082): The standardized coefficient (Beta) for Openness of Experience is -0.082, indicating a negative relationship between Openness of Experience and Subordination. A one-unit increase in Openness of Experience is associated with decreased Subordination. The effect of Openness of Experience is statistically significant ($p = 0.019$), suggesting that Openness of Experience significantly affects Subordination.

Emotional Stability (Beta = 0.006): The standardized coefficient (Beta) for Emotional Stability is 0.006, indicating a negligible positive relationship between Emotional Stability and Subordination. This relationship is not statistically significant ($p = 0.913$), meaning that Emotional Stability does not significantly impact Subordination. The analysis reveals that two personality traits, Affinity and Openness of Experience, significantly affect Subordination. Affinity hurts Subordination, meaning that lower levels of Affinity are associated with higher Subordination. Openness of Experience also negatively impacts Subordination, with lower Openness of Experience being linked to higher Subordination. The other personality traits, Rigorous Self-Discipline, Extroversion, and Emotional Stability, do not significantly influence Subordination in this context.

H2e: Personality Traits, including Affinity, Rigorous self-discipline, Extroversion, Openness of experience, Emotional stability, and influence Over-emphasis on scores and grades.

Multiple linear regression was used to analyze the data, and the prediction equation was established at the 95% confidence level.

Table 4.19 Influencing Over-emphasis on Scores and Grades on Personality Traits

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.155a	0.024	0.018	0.89852	2.065

c. Predictors: Affinity, Rigorous self-discipline, Extroversion, Openness of experience, Emotional stability

d. Dependent variable: Over-emphasis on scores and grades

Table 4.19 presents a regression analysis of the impact of personality traits on Over-emphasis on scores and grades. Let us analyze the results and their implications:

Model Overview: In this analysis, a linear regression model was used to examine the relationship between teachers' personality traits and Over-emphasis on scores and grades. The statistical parameters provided in the table offer insights into the effectiveness of this model. **Strength of the Relationship:** The correlation coefficient (R) measures the strength and direction of the relationship between the personality traits and Over-emphasis on scores and grades. The R-value is approximately 0.155, indicating a weak positive relationship. This suggests that the included personality traits have a limited influence on over-emphasis in scores and grades. **Explained Variability:** R Square (R^2) represents the proportion of the variability in Over-emphasis on scores and grades that the considered personality traits can explain. In this model, about 2.4% of the variability in Over-emphasis on scores and grades is accounted for by the personality traits. This suggests that these traits have a minor impact on teachers' tendencies to overemphasize scores and grades. **Model Validity:** The Adjusted R Square, which considers the number of predictors in the model, is approximately 0.018. This indicates that the model is slightly adjusted for the predictors, suggesting that the traits have only a minor influence on Over-emphasis on scores and grades.

Prediction Accuracy: The Std. Error of the Estimate, which is approximately 0.89852, suggests that the model's predictions are not remarkably accurate. This further emphasizes the limited impact of personality traits on Over-emphasis on scores and grades. **Autocorrelation Assessment:** The Durbin-Watson statistic of 2.065 falls within an acceptable range, indicating no significant autocorrelation among the residuals. **Predictors and Impact:** The predictors in the model are the same personality traits used in the previous analyses: Affinity, Rigorous Self-Discipline, Extroversion, Openness of Experience, and Emotional Stability. The results suggest that these traits

have a limited impact on teachers' tendencies to overemphasize scores and grades. Implications: The results suggest that the included personality traits, as considered in this model, have only a minor influence on Over-emphasis on scores and grades. It implies that additional external and internal factors, such as educational policies, parental expectations, or school cultures, may substantially shape teachers' tendencies to overemphasize scores and grades.

In conclusion, this regression model underscores the limited influence of personality traits on teachers' tendencies to overemphasize scores and grades. It suggests that other external and internal factors may significantly shape this behavior. Further research is needed to explore these factors and provide insights into strategies for addressing over-emphasizing scores and grades in educational contexts.

Table 4.19 shows the correlation values of all independent variables, with a minimum value of 0.405 and no less than 0.2, indicating no correlation between the five independent variables.

Table 4.20 Multiple Linear Regression Coefficients for the Effect of Personality Traits on Over-emphasis on Scores and Grades

Model		Unstandardized Coefficients		Standardized Coefficients		Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance VIF
1	(Constant)	3.215	0.155		20.757	0.000	
	Affinity	-0.078	0.043	-0.082	-1.816	0.070*	0.601 1.665
	Rigorous self-discipline	-0.054	0.043	-0.056	-1.266	0.206	0.631 1.585
	Extroversion	0.006	0.038	0.006	0.145	0.885	0.643 1.555
	Openness of experience	-0.143	0.053	-0.141	-2.702	0.007*	0.451 2.217
	Emotional stability	0.143	0.062	0.128	2.32	0.021*	0.405 2.470

Table 4.20 is composed of five predictors: Affinity, Rigorous self-discipline, Extroversion, Openness of experience, and Emotional stability, and its precondition equation is as follows: $\hat{Y}_4 = 3.215 - 0.078X_1 - 0.054X_2 + 0.006X_3 -$

$$0.143X_4 + 0.143X_5$$

Table 4.20 provides the results of a multiple linear regression analysis assessing the impact of personality traits on the variable "Over-emphasis on scores and grades." Let us analyze the findings in detail: Model Statistics: The model is statistically significant, as indicated by the F-statistic ($F = 20.757$, $p = 0.000$). This suggests that the overall model is a good fit for the data. Unstandardized Coefficients (B): These coefficients represent the change in the dependent variable (Over-emphasis on scores and grades) for a one-unit change in each independent variable (personality trait) while holding all other variables constant. Standardized Coefficients (Beta): The standardized coefficients (Beta) help compare the relative importance of each independent variable while considering their different scales. Now, let us analyze the impact of each personality trait on Over-emphasis on scores and grades: Affinity (Beta = -0.082): The standardized coefficient (Beta) for Affinity is -0.082, indicating a negative relationship between Affinity and Over-emphasis on scores and grades. A one-unit increase in Affinity is associated with decreased Over-emphasis on scores and grades. The effect of Affinity is marginally significant ($p = 0.070$), suggesting that Affinity may have some impact on Over-emphasis on scores and grades. Rigorous Self-Discipline (Beta = -0.056): The standardized coefficient (Beta) for Rigorous Self-Discipline is -0.056, suggesting a negative relationship between Rigorous Self-Discipline and Over-emphasis on scores and grades. However, this relationship is not statistically significant ($p = 0.206$), indicating that Rigorous Self-Discipline does not significantly affect Over-emphasis on scores and grades in this context. Extroversion (Beta = 0.006): The standardized coefficient (Beta) for Extroversion is 0.006, indicating a negligible positive relationship between Extroversion and Over-emphasis on scores and grades. This relationship is not statistically significant ($p = 0.885$), suggesting that Extroversion does not significantly impact Over-emphasis on scores and grades. Openness of Experience (Beta = -0.141): The standardized coefficient (Beta) for Openness of Experience is -0.141, indicating a negative relationship between Openness of Experience and Over-emphasis on scores and grades. A one-unit increase in Openness of Experience is associated with decreased Over-emphasis on scores and grades. The effect of Openness of Experience is statistically significant ($p = 0.007$), suggesting that Openness of Experience significantly affects Over-emphasis on scores and grades.

Emotional Stability (Beta = 0.128): The standardized coefficient (Beta) for Emotional Stability is 0.128, indicating a positive relationship between Emotional Stability and Over-emphasis on scores and grades. A one-unit increase in Emotional Stability is associated with an increase in Over-emphasis on scores and grades. The effect of Emotional Stability is statistically significant ($p = 0.021$), suggesting that Emotional Stability significantly affects Over-emphasis on scores and grades.

In summary, the analysis reveals that two personality traits, Openness of Experience and Emotional Stability, significantly affect Over-emphasis on scores and grades. Openness of Experience has a negative impact, meaning that higher Openness of Experience is associated with lower Over-emphasis on scores and grades. Emotional Stability has a positive impact, meaning that higher emotional stability is associated with higher over-emphasis in scores and grades. The other personality traits, Affinity, Rigorous Self-Discipline, and Extroversion, do not significantly influence Over-emphasis on scores and grades in this context.

4.2.3. Personality Characteristics Affect People's Influence on Pre-middle and Post-teaching

H3: Personality characteristics affect people's influence on pre-middle and post-teaching.

Multiple linear regression methods were used to estimate the relationship between two or more variables, such as Affinity, Rigorous self-discipline, Extroversion, Openness of experience, and Emotional stability. The estimation equation looks like this:

$$\hat{Y}_5 = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5$$

$$\hat{Y}_6 = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5$$

$$\hat{Y}_7 = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5$$

Where the dependent variable is:

$\hat{Y}_5$: Before teaching

$\hat{Y}_6$: In teaching

$\hat{Y}_7$: After teaching

The independent variables are:

X_1 : Affinity

X_2 : Rigorous self-discipline

X₃: Extroversion

X₄: Openness of experience

X₅: Emotional stability

H3a: Personality Traits, including Affinity, Rigorous self-discipline, Extroversion, Openness of experience, and Emotional stability, influence before teaching.

This hypothesis suggests that individual personality traits play a significant role in shaping the behaviors and actions of teachers during the preparatory phase before actual teaching begins. The specific traits identified—Affinity, Rigorous self-discipline, Extroversion, Openness of experience, and Emotional stability—are expected to contribute to variations in how teachers approach and engage in activities related to preparation before teaching.

As a personality trait, Affinity may influence the emotional connection teachers establish with their subject matter and their students. Rigorous self-discipline could impact teachers' dedication and commitment during the preparatory phase. Extroversion may play a role in the teacher's approach to planning and collaboration with colleagues. At the same time, Openness of experience might influence the teacher's receptiveness to new teaching methods or innovative approaches. Emotional stability could affect how teachers manage stress and uncertainties during the pre-teaching preparation, ultimately influencing their effectiveness in the classroom.

This hypothesis underscores the belief that individual differences in personality traits contribute to the diverse ways teachers engage in tasks and activities leading up to the teaching process. The research will likely explore and analyze the extent to which these personality traits influence the behaviors observed in the "Before teaching" dimension. The findings may contribute valuable insights into the intersection of personality and teaching practices, shedding light on potential areas for targeted professional development and support for educators.

Multiple linear regression was used to analyze the data, and the prediction equation was established at the 95% confidence level.

Table 4.21 Influencing Personality Traits Before Teaching

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.120a	0.015	0.008	0.86947	1.984

c. Predictors: Affinity, Rigorous self-discipline, Extroversion, Openness of experience, Emotional stability

d. Dependent variable: Before teaching

Table 4.21 presents a regression analysis of the impact of personality traits on the variable "Before teaching." Let us analyze the results and their implications:

Model Overview: In this analysis, a linear regression model was used to examine the relationship between teachers' personality traits and the variable "Before teaching." The statistical parameters provided in the table offer insights into the effectiveness of this model. **Strength of the Relationship:** The correlation coefficient (R) measures the strength and direction of the relationship between the personality traits and the variable "Before teaching." The R-value is approximately 0.120, indicating a weak positive relationship. This suggests that the included personality traits have a limited influence on teachers' state or behavior "Before teaching." **Explained Variability:** R Square (R^2) represents the proportion of the variable's "Before teaching" variability that the considered personality traits can explain. In this model, about 1.5% of the variability in the variable "Before teaching" is accounted for by the personality traits. This suggests that these traits have a minor impact on teachers' state or behavior "Before teaching." **Model Validity:** The Adjusted R Square, which considers the number of predictors in the model, is approximately 0.008. This indicates that the model is slightly adjusted for the predictors, suggesting that the traits have a minor influence on the variable "Before teaching."

Prediction Accuracy: The Std. Error of the Estimate, which is approximately 0.86947, suggests that the model's predictions are not remarkably accurate. This emphasizes the limited impact of personality traits on the variable "Before teaching." **Autocorrelation Assessment:** The Durbin-Watson statistic of 1.984 falls within an acceptable range, indicating no significant autocorrelation among the residuals. **Predictors and Impact:** The predictors in the model are the same personality traits used in the previous analyses: Affinity, Rigorous Self-Discipline, Extroversion, Openness of

Experience, and Emotional Stability. The results suggest that these traits have a limited impact on teachers' state or behavior "Before teaching." Implications: The results suggest that the included personality traits, as considered in this model, have a minor influence on teachers' state or behavior "Before teaching." It implies that other external and internal factors may play a more substantial role in shaping teachers' state or behavior "Before teaching."

In conclusion, this regression model underscores the limited influence of personality traits on the variable "Before teaching." It suggests that other external and internal factors may be more significant in shaping teachers' state or behavior "Before teaching." Further research is needed to explore these factors and provide insights into strategies for understanding and addressing the state or behavior of teachers "Before teaching" in educational contexts. Table 4.21 shows the correlation values of all independent variables, with a minimum value of 0.405 and no less than 0.2, indicating no correlation between the five independent variables.

Table 4.22 Multiple Linear Regression Coefficients for the Effect of Personality Traits Before Teaching

Model	Unstandardized Coefficients		Standardized Coefficients		Collinearity Statistics		
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	3.013	0.15		20.107	0.000		
Affinity	-0.052	0.042	-0.056	-1.232	0.218	0.601	1.665
Rigorous self-discipline	-0.11	0.041	-0.118	-2.659	0.008*	0.631	1.585
Extroversion	0.064	0.037	0.076	1.731	0.084	0.643	1.555
Openness of experience	-0.031	0.051	-0.032	-0.613	0.540	0.451	2.217
Emotional stability	0.06	0.060	0.056	1.007	0.314	0.405	2.470

Table 4.22 is composed of five predictors: Affinity, Rigorous self-discipline, Extroversion, Openness of experience, and Emotional stability, and its

precondition equation is as follows: $\hat{Y}_5 = 3.013 - 0.052X_1 - 0.11X_2 + 0.064X_3 - 0.031X_4 + 0.060X_5$

Table 4.22 presents the results of a multiple linear regression analysis investigating the impact of personality traits on the variable "Before teaching." Let's break down the findings: Model Statistics: The model is statistically significant, with an F-statistic of 20.107 and a p-value of 0.000, indicating that the overall model is a good fit for the data. Unstandardized Coefficients (B): These coefficients represent the change in the dependent variable (Before teaching) for a one-unit change in each independent variable (personality trait), while holding all other variables constant. Standardized Coefficients (Beta): The standardized coefficients (Beta) help us compare the relative importance of each independent variable while considering their different scales. Now, let's delve into the impact of each personality trait on "Before teaching": Affinity (Beta = -0.056): The standardized coefficient (Beta) for Affinity is -0.056, indicating a negative relationship between Affinity and "Before teaching." However, this relationship is not statistically significant ($p = 0.218$), suggesting that Affinity does not significantly influence "Before teaching." Rigorous Self-Discipline (Beta = -0.118): The standardized coefficient (Beta) for Rigorous Self-Discipline is -0.118, suggesting a negative relationship between Rigorous Self-Discipline and "Before teaching." This relationship is statistically significant ($p = 0.008$), indicating that Rigorous Self-Discipline significantly affects "Before teaching." More specifically, a one-unit increase in Rigorous Self-Discipline is associated with a decrease in "Before teaching." Extroversion (Beta = 0.076): The standardized coefficient (Beta) for Extroversion is 0.076, indicating a positive relationship between Extroversion and "Before teaching." However, this relationship is not statistically significant ($p = 0.084$), suggesting that Extroversion does not significantly affect "Before teaching." Openness of Experience (Beta = -0.032): The standardized coefficient (Beta) for Openness of Experience is -0.032, indicating a negative relationship between Openness of Experience and "Before teaching." However, this relationship is not statistically significant ($p = 0.540$), suggesting that Openness of Experience does not significantly influence "Before teaching." Emotional Stability (Beta = 0.056): The standardized coefficient (Beta) for Emotional Stability is 0.056, indicating a positive relationship between Emotional Stability and "Before teaching." This relationship is not statistically significant ($p =$

0.314), suggesting that Emotional Stability does not significantly affect "Before teaching."

The analysis indicates that Rigorous Self-Discipline significantly influences the variable "Before teaching," with higher Rigorous Self-Discipline associated with lower scores on "Before teaching." The other personality traits, including Affinity, Extroversion, Openness of Experience, and Emotional Stability, do not significantly affect "Before teaching" in this context.

H3b: Personality Traits, including Affinity, Rigorous self-discipline, Extroversion, Openness of experience, and Emotional stability influence In teaching.

This hypothesis posits that individual personality traits play a crucial role in shaping teachers' behaviors and actions while actively engaged in the teaching process. The specified personality traits—Affinity, Rigorous self-discipline, Extroversion, Openness of experience, and Emotional stability—are expected to contribute to variations in how teachers approach and carry out teaching activities.

As a personality trait, Affinity may influence the teacher's emotional connection with students and the subject matter, impacting the overall classroom atmosphere. Rigorous self-discipline might affect the teacher's ability to maintain a structured and organized teaching environment. Extroversion could influence student communication and interaction, fostering a more engaging and participatory classroom. The openness of experience might impact the teacher's willingness to experiment with various teaching methods and adapt to the evolving needs of the students. Emotional stability could influence how teachers handle challenges and uncertainties during the teaching process, affecting their effectiveness.

This hypothesis highlights the belief that individual differences in personality traits contribute significantly to the diverse ways in which teachers approach and conduct their teaching responsibilities. The study will likely explore and analyze how these personality traits influence behaviors observed in the "Teaching" dimension. The findings may provide valuable insights into the nuanced relationship between personality traits and teaching practices, offering implications for professional development and support strategies for educators.

Multiple linear regression was used to analyze the data, and the prediction

equation was established at the 95% confidence level.

Table 4.23 Influencing Personality Traits in Teaching

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.086a	0.007	0.001	0.8387	1.954

c. Predictors: Affinity, Rigorous self-discipline, Extroversion, Openness of experience, Emotional stability

d. Dependent variable: In teaching

Table 4.23 presents a regression analysis of the impact of personality traits on the variable "In teaching." Let us analyze the results and their implications: Model Overview: In this analysis, a linear regression model was used to examine the relationship between teachers' personality traits and the variable "In teaching." The statistical parameters provided in the table offer insights into the effectiveness of this model. Strength of the Relationship: The correlation coefficient (R) measures the strength and direction of the relationship between the personality traits and the variable "In teaching." The R-value is approximately 0.086, indicating a weak positive relationship. This suggests that the included personality traits have a limited influence on teachers' state or behavior, "In teaching." Explained Variability: R Square (R^2) represents the proportion of the variable "In teaching" variability that the considered personality traits can explain. In this model, about 0.7% of the variability in the variable "In teaching" is accounted for by the personality traits. This suggests that these traits only impact teachers' state or behavior "In teaching." Model Validity: The Adjusted R Square, which considers the number of predictors in the model, is approximately 0.001. This indicates that the model is only minimally adjusted for the predictors, suggesting that the traits have a limited influence on the variable "In teaching." Prediction Accuracy: The Std. Error of the Estimate, which is approximately 0.8387, suggests that the model's predictions are not remarkably accurate. This emphasizes the limited impact of personality traits on the variable "In teaching." Autocorrelation Assessment: The Durbin-Watson statistic of 1.954 falls within an acceptable range, indicating no significant autocorrelation among the residuals. Predictors and Impact: The predictors in the model are the same personality traits used in the previous analyses: Affinity, Rigorous Self-Discipline, Extroversion, Openness of Experience, and Emotional

Stability. The results suggest that these traits have a limited impact on teachers' state or behavior "In teaching."

Implications: The results suggest that the included personality traits, as considered in this model, have a minor influence on teachers' state or behavior "In teaching." It implies that other external and internal factors may play a more substantial role in shaping teachers' state or behavior "In teaching."

In conclusion, this regression model underscores the limited influence of personality traits on the variable "In teaching." It suggests that other external and internal factors may be more significant in shaping teachers' state or behavior "In teaching." Further research is needed to explore these factors and provide insights into strategies for understanding and addressing the state or behavior of teachers In teaching in educational contexts. Table 4.23 presents the correlation values of all independent variables, with a minimum value of 0.405 and no correlation coefficient less than 0.2, indicating no significant correlation between the five independent variables.

Multiple linear regression was used to analyze the data, and the prediction equation was established at the 95% confidence level.

Table 4.24 Multiple Linear Regression Coefficients for the Effect of Personality Traits on Teaching

Model	Unstandardized Coefficients		Standardized Coefficients		Collinearity Statistics		
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	2.998	0.145		20.742	0.000		
Affinity	-0.073	0.04	-0.083	-1.809	0.071**	0.601	1.665
Rigorous self-discipline	0.018	0.04	0.02	0.458	0.647	0.631	1.585
Extroversion	-0.028	0.036	-0.035	-0.793	0.428	0.643	1.555
Openness of experience	-0.025	0.049	-0.027	-0.511	0.610	0.451	2.217
Emotional stability	0.065	0.057	0.063	1.136	0.257	0.405	2.470

Table 4.24 consists of five predictors: Affinity, Rigorous self-discipline,

Extroversion, Openness of experience, and Emotional stability, and its precondition equation is as follows: $\hat{Y}_6 = 2.998 - 0.073X_1 + 0.018X_2 - 0.028X_3 - 0.025X_4 + 0.065X_5$

Table 4.24 presents the results of a multiple linear regression analysis, examining the impact of personality traits on the variable "In teaching." Here is a detailed analysis of the findings: Model Statistics: The model is statistically significant, with an F-statistic of 20.742 and a p-value of 0.000, indicating that the overall model fits the data well. Unstandardized Coefficients (B): These coefficients represent the change in the dependent variable (In teaching) for a one-unit change in each independent variable (personality trait) while holding all other variables constant.

Standardized Coefficients (Beta): The standardized coefficients (Beta) help us compare the relative importance of each independent variable while considering their different scales.

Now, let us explore the impact of each personality trait on "In teaching": Affinity (Beta = -0.083): The standardized coefficient (Beta) for Affinity is -0.083, indicating a negative relationship between Affinity and "In teaching." This relationship is statistically significant (p = 0.071) but slightly above the conventional significance threshold (0.05). It suggests that Affinity may negatively influence "In teaching." Rigorous Self-Discipline (Beta = 0.020): The standardized coefficient (Beta) for Rigorous Self-Discipline is 0.020, indicating a positive relationship between Rigorous Self-Discipline and "In teaching." However, this relationship is not statistically significant (p = 0.647), suggesting that Rigorous Self-Discipline does not significantly affect "In teaching." Extroversion (Beta = -0.035): The standardized coefficient (Beta) for Extroversion is -0.035, indicating a negative relationship between Extroversion and "In teaching."

This relationship is not statistically significant (p = 0.428), suggesting that Extroversion does not significantly influence "Teaching." Openness of Experience (Beta = -0.027): The standardized coefficient (Beta) for Openness of Experience is -0.027, indicating a negative relationship between Openness of Experience and "In teaching." This relationship is not statistically significant (p = 0.610), suggesting that Openness of Experience does not significantly affect "In teaching." Emotional Stability (Beta = 0.063): The standardized coefficient (Beta) for Emotional Stability is 0.063, indicating a positive relationship between Emotional Stability and "In teaching." However, this

relationship is not statistically significant ($p = 0.257$), suggesting that Emotional Stability does not significantly influence "Teaching."

In summary, the analysis indicates that Affinity may have a slight negative influence on the variable "In teaching," although this relationship is marginally significant. The other personality traits, including Rigorous Self-Discipline, Extroversion, Openness of Experience, and Emotional Stability, do not significantly affect "In teaching" in this context.

H3c: Personality Traits including Affinity, Rigorous self-discipline, Extroversion, Openness of experience, Emotional stability, and influence After teaching.

This hypothesis posits that individual personality traits play a pivotal role in shaping teachers' behaviors and actions after concluding the teaching process. The specified personality traits—Affinity, Rigorous self-discipline, Extroversion, Openness of experience, and Emotional stability—are expected to contribute to variations in how teachers reflect on, assess, and improve their teaching practices in the aftermath of instructional activities.

Affinity, as a personality trait, may influence the teacher's emotional investment in evaluating the effectiveness of the lesson and understanding its impact on students. Rigorous self-discipline might drive the teacher to meticulously review and analyze the teaching session, identifying areas for improvement and adjustment. Extroversion could impact the teacher's approach to seeking feedback and engaging in discussions with colleagues or students for constructive insights. Openness of experience might influence the teacher's willingness to consider innovative approaches for future lessons based on reflections from the current teaching experience. Emotional stability could affect teachers' coping with challenges and setbacks, contributing to a more constructive post-teaching assessment.

This hypothesis underscores the belief that individual differences in personality traits extend beyond the active teaching phase, influencing how teachers engage in reflective practices and continuous improvement after teaching sessions. The study aims to explore and analyze how these personality traits impact behaviors observed in the "After teaching" dimension. The findings may provide valuable insights into the complex interplay between personality traits and post-teaching reflections,

offering implications for professional development and support strategies for educators.

Multiple linear regression was used to analyze the data, and the prediction equation was established at the 95% confidence level.

Table 4.25 Personality Traits Influencing After Teaching

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.748a	0.559	0.556	0.60543	1.934

c. Predictors: Affinity, Rigorous self-discipline, Extroversion, Openness of experience, Emotional stability

d. Dependent variable: After teaching

Table 4.25 provides the results of a regression analysis examining the influence of personality traits on the variable "After teaching." Let us break down the analysis and its implications: Model Overview: A linear regression model was used to investigate how teachers' personality traits are related to the variable "After teaching." Strength of the Relationship: The correlation coefficient (R) measures the strength and direction of the relationship between personality traits and the variable "After teaching." R is approximately 0.748 in this model, indicating a strong positive relationship. This suggests that the included personality traits substantially influence teachers' state or behavior "After teaching." Explained Variability: R Square (R^2) represents the proportion of the variable "After teaching" variability that personality traits can explain. Here, about 55.9% of the variability in the variable "After teaching" is accounted for by personality traits. This suggests these traits significantly impact teachers' state or behavior "After teaching." Model Validity: The Adjusted R Square, which accounts for the number of predictors in the model, is approximately 0.556. This implies that the model is reasonably adjusted for the predictors, further emphasizing the considerable influence of personality traits on the variable "After teaching." Prediction Accuracy: The Std. Error of the Estimate, which is approximately 0.60543, indicates that the model's predictions are relatively accurate. Autocorrelation Assessment: The Durbin-Watson statistic of 1.934 falls within an acceptable range, suggesting no significant autocorrelation among the residuals.

Predictors and Impact: The predictors in the model are the same personality traits used in previous analyses: Affinity, Rigorous Self-Discipline, Extroversion,

Openness of Experience, and Emotional Stability. The results show that these traits substantially impact teachers' state or behavior "After teaching."

Implications: The results of this regression model indicate that the included personality traits strongly influence teachers' state or behavior "After teaching." This suggests that teachers' personalities significantly affect their post-teaching experiences and activities. Understanding how these traits influence post-teaching behavior is essential for teacher well-being and professional development.

In conclusion, this regression model demonstrates the substantial impact of personality traits on the variable "After teaching." Teachers' personalities are critical in shaping their experiences and activities after teaching. Further research can delve deeper into understanding how personality traits affect teachers' post-teaching states and behaviors, offering valuable insights for teacher development and support. Table 4.25 shows the correlation values of all independent variables, with a minimum value of 0.405 and no less than 0.2, indicating no correlation between the five independent variables.

Multiple linear regression was used to analyze the data, and the prediction equation was established at the 95% confidence level.

Table 4.26 Multiple Linear Regression Coefficients for the Effect of Personality Traits on After-teaching

Model	Unstandardized Coefficients		Standardized Coefficients		Collinearity Statistics		
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	0.326	0.104		3.128	0.002		
Affinity	0.486	0.029	0.507	16.673	0.000**	0.601	1.665
Rigorous self-discipline	0.099	0.029	0.102	3.444	0.001*	0.631	1.585
1 Extroversion	0.068	0.026	0.077	2.626	0.009*	0.643	1.555
Openness of experience	0.102	0.036	0.100	2.857	0.004*	0.451	2.217
Emotional stability	0.130	0.041	0.116	3.132	0.002*	0.405	2.470

Table 4.26 is composed of five predictors: Affinity, Rigorous self-discipline, Extroversion, Openness of experience, and Emotional stability, and its precondition equation is as follows:

$$\hat{Y}_7 = 0.326 + 0.486X_1 + 0.099X_2 + 0.068X_3 + 0.102X_4 + 0.130X_5$$

Table 4.26 presents the results of a multiple linear regression analysis, examining the impact of personality traits on the variable "After teaching." Here is a detailed analysis of the findings:

Model Statistics: The model is statistically significant, with an F-statistic of 3.128 and a p-value of 0.002, indicating that the overall model fits the data well.

Unstandardized Coefficients (B): These coefficients represent the change in the dependent variable (After teaching) for a one-unit change in each independent variable (personality trait) while holding all other variables constant.

Standardized Coefficients (Beta): The standardized coefficients (Beta) help us compare the relative importance of each independent variable while considering their different scales. Now, let us explore the impact of each personality trait on "After teaching":
Affinity (Beta = 0.507): The standardized coefficient (Beta) for Affinity is 0.507, indicating a strong positive relationship between Affinity and "After teaching." This relationship is highly statistically significant ($p = 0.000$), suggesting that higher levels of Affinity significantly influence "After teaching."
Rigorous Self-Discipline (Beta = 0.102): The standardized coefficient (Beta) for Rigorous Self-Discipline is 0.102, indicating a positive relationship between Rigorous Self-Discipline and "After teaching." This relationship is statistically significant ($p = 0.001$), suggesting that higher levels of Rigorous Self-Discipline significantly impact "After teaching."
Extroversion (Beta = 0.077): The standardized coefficient (Beta) for Extroversion is 0.077, indicating a positive relationship between Extroversion and "After teaching." This relationship is statistically significant ($p = 0.009$), suggesting that higher levels of Extroversion positively influence "After teaching."

Openness of Experience (Beta = 0.100): The standardized coefficient (Beta) for Openness of Experience is 0.100, indicating a positive relationship between Openness of Experience and "After teaching." This relationship is statistically significant ($p = 0.004$), suggesting that higher levels of Openness of Experience

significantly impact "After teaching." Emotional Stability (Beta = 0.116): The standardized coefficient (Beta) for Emotional Stability is 0.116, indicating a positive relationship between Emotional Stability and "After teaching." This relationship is statistically significant ($p = 0.002$), suggesting that higher levels of Emotional Stability positively influence "After teaching."

The analysis indicates that all the examined personality traits, including Affinity, Rigorous Self-Discipline, Extroversion, Openness of Experience, and Emotional Stability, significantly impact the variable "After teaching." This suggests that teachers with higher personality traits exhibit more positive behaviors and outcomes after teaching sessions.

Table 4.27 Demographic Aggregate Affects Innovative Teaching Behaviors of Teachers

Demography	Gender	With or Without Administrative Duties	Years of Teaching Experience
Dedication and love of teaching	✓	-	-
Courageous to accept challenges	-	-	-
Identify and solve problems.	-	-	-
Subordination	-	✓	-
Over-emphasis on scores and grades	-	✓	✓
Before teaching	-	-	✓
In teaching	-	✓	✓
After teaching	✓	✓	-

- No difference effect at a statistical significance of 0.05

✓Is there a difference in the effect at a statistical significance of 0.05

Table 4.28 Summary of the Impact of Personality Traits on Innovative Teaching Behaviors of Teachers

Innovative Teaching Behaviors of Teachers	R	R Square	Adjusted R Square	Std. Error of the Estimate
Dedication and love of teaching	0.657a	0.431	0.428	0.66205
Courageous to accept challenges	.074a	0.005	-0.001	1.02795
Identify and solve problems	.085a	0.007	0.001	0.97115
Subordination	.121a	0.015	0.008	1.07286

Table 4.28 Summary of the Impact of Personality Traits on Innovative Teaching Behaviors of Teachers (continued)

Innovative Teaching Behaviors of Teachers	R	R Square	Adjusted R Square	Std. Error of the Estimate
Over-emphasis on scores and grades	.155a	0.024	0.018	0.89852
Before teaching	.120a	0.015	0.008	0.86947
In teaching	.086a	0.007	0.001	0.8387
After teaching	.748a	0.559	0.556	0.60543

c. Predictors: Affinity, Rigorous self-discipline, Extroversion, Openness of experience, Emotional stability

d. Dependent variable: Innovative teaching behaviors of teachers

Dedication and Love of Teaching: The regression analysis indicates that the selected personality traits, including Affinity, Rigorous self-discipline, Extroversion, Openness of experience, and Emotional stability, collectively explain about 43.1% of the variance in "Dedication and Love of Teaching." This suggests that these traits play a moderate role in influencing a teacher's dedication and love for teaching. Educators with higher scores in these personality traits are likelier to exhibit strong dedication and affection for their teaching profession.

Courageous to Accept Challenges: In contrast to the positive findings for dedication, the analysis suggests that these personality traits have minimal explanatory power for "Courageous to Accept Challenges," with only 5% of the variance being accounted for by the model. This implies that other factors or variables not considered in this analysis might influence a teacher's willingness to embrace challenges more. The relationship between personality traits and this teaching behavior aspect appears weak.

Identify and Solve Problems: The model has a similarly low explanatory power for "Identify and Solve Problems," explaining only about 0.7% of the variance. This implies that personality traits alone do not significantly influence teachers' ability to identify and solve problems in their educational context. Other factors or situational aspects might have a more substantial impact on this behavior.

Subordination: For "Subordination," the analysis shows that the selected personality traits account for 1.5% of the variance. The impact remains limited, suggesting that subordination, in a teaching context, is influenced by factors beyond

personality traits. This result may indicate that external factors or contextual elements are more significant in a teacher's willingness to subordinate.

Over-emphasis on Scores and Grades: The analysis reveals that these personality traits collectively explain around 2.4% of the variance in "Over-emphasis on Scores and Grades." While there is a modest impact, it is important to note that other external factors, including school policies or pressures, may contribute to teachers' tendencies to overemphasize scores and grades.

Before Teaching and In Teaching: The "Before Teaching" and "In Teaching" findings show that the selected personality traits have low explanatory power, explaining only 1.5% and 0.7% of the variance, respectively. This suggests that these aspects of teaching behavior may be influenced by other situational or contextual factors rather than personality traits alone.

After Teaching: In the case of "After Teaching," the analysis demonstrates a strong relationship between the selected personality traits and this aspect of teaching behavior. The model explains about 55.9% of the variance in "After Teaching," indicating that teachers with certain personality traits are likelier to exhibit specific behaviors after teaching sessions. This strong relationship highlights the importance of these personality traits in shaping post-teaching behaviors.

Table 4.28 explores the specific nuances and implications of Personality Traits on teachers' Innovative teaching behaviors.

Dedication and Love of Teaching: Correlation (R): The strong positive correlation (0.657) indicates a significant relationship between Personality Traits and teachers' dedication and love for teaching. **R-squared (Explained Variability):** The R-squared value of 0.431 suggests that Personality Traits account for 43.1% of the variability in dedication. **Implications:** Affinity, Rigorous self-discipline, Extroversion, Openness of experience, and Emotional stability collectively contribute to fostering a strong commitment and passion for teaching among educators.

Courageous to Accept Challenges: Correlation (R): The weak positive correlation (0.074) signifies a limited connection between Personality Traits and teachers' willingness to embrace challenges. **R-squared (Explained Variability):** The low R-squared value of 0.005 implies that only 0.5% of the variability in accepting challenges is explained by Personality Traits. **Implications:** Affinity, Rigorous self-

discipline, and Emotional stability have minimal impact on teachers' courage to accept challenges.

Identify and Solve Problems: Correlation (R): The weak positive correlation (0.085) suggests a modest link between Personality Traits and teachers' problem-solving abilities. R-squared (Explained Variability): With an R-squared value of 0.007, only 0.7% of the variability in problem-solving is accounted for by Personality Traits. Implications: Rigorous self-discipline, Extroversion, and Emotional stability are limited in influencing teachers' proficiency in identifying and solving problems.

Subordination: Correlation (R): The weak to moderate positive correlation (0.121) indicates a connection between Personality Traits and teachers' inclination toward subordination. R-squared (Explained Variability): The R-squared value of 0.015 implies that Personality Traits explain 1.5% of the variability in subordination. Implications: Affinity, Rigorous self-discipline, and Emotional stability modestly influence teachers' tendency to adhere to rules and regulations.

Over-emphasis on Scores and Grades: Correlation (R): The moderate positive correlation (0.155) suggests a significant relationship between Personality Traits and teachers' tendency to overemphasize scores and grades. R-squared (Explained Variability): The R-squared value of 0.024 implies that 2.4% of the variability in this dimension is attributed to Personality Traits. Implications: Affinity, Rigorous self-discipline, Extroversion, Openness of experience, and Emotional stability collectively contribute to the emphasis on academic performance metrics.

Before Teaching: Correlation (R): The weak to moderate positive correlation (0.120) indicates a connection between Personality Traits and activities before teaching. R-squared (Explained Variability): The R-squared value of 0.015 implies that Personality Traits explain 1.5% of the variability in pre-teaching activities. Implications: Affinity, Rigorous self-discipline, Extroversion, Openness of experience, and Emotional stability have limited impacts on teachers' preparatory activities.

In Teaching: Correlation (R): The weak positive correlation (0.086) suggests a limited relationship between Personality Traits and in-teaching activities. R-squared (Explained Variability): The low R-squared value of 0.007 implies that only 0.7% of the variability in teaching behaviors is explained by Personality Traits. Implications: Similar to previous dimensions, the impact of Personality Traits on in-

teaching activities is marginal.

After Teaching: Correlation (R): The strong positive correlation (0.748) indicates a substantial relationship between Personality Traits and activities after teaching. R-squared (Explained Variability): The high R-squared value of 0.559 suggests that 55.9% of the variability in post-teaching activities is attributed to Personality Traits. Implications: Emotional stability significantly contributes to post-teaching activities, influencing teachers' reflection, self-assessment, and continuous improvement.

Table 4.29 Personality Traits Affect Innovative Teaching Behaviors of Teachers

Innovative Teaching Behaviors of Teachers	Forecasting Equations
Dedication and love of teaching	$\hat{Y}_T = 0.068X_1 + 0.224X_2 + 0.072X_3 + 0.179X_4 + 0.259X_5$
Courageous to accept challenges	$\hat{Y}_1 = 0.686 - 0.063X_1 - 0.063X_2 + 0.025X_3 - 0.057X_4 + 0.082X_5$
Identify and solve problems.	$\hat{Y}_2 = 2.871 - 0.061X_1 + 0.023X_2 - 0.068X_3 - 0.034X_4 + 0.020X_5$
Subordination	$\hat{Y}_3 = 2.849 - 0.083X_1 + 0.037X_2 - 0.004X_3 - 0.099X_4 + 0.008X_5$
Over-emphasis on scores and grades	$\hat{Y}_4 = 3.205 - 0.078X_1 - 0.054X_2 + 0.006X_3 - 0.143X_4 + 0.143X_5$
Before teaching	$\hat{Y}_5 = 3.013 - 0.052X_1 - 0.11X_2 + 0.064X_3 - 0.031X_4 + 0.060X_5$
In teaching	$\hat{Y}_6 = 2.998 - 0.073X_1 + 0.018X_2 - 0.028X_3 - 0.025X_4 + 0.065X_5$
After teaching	$\hat{Y}_7 = 0.326 + 0.486X_1 + 0.099X_2 + 0.068X_3 + 0.102X_4 + 0.130X_5$

X_5 = Emotional stability, X_4 = Openness of experience, X_3 = Extroversion, X_2 = Rigorous self-discipline, X_1 =Affinity

The forecasting equations presented in Table 4.29 provide a mathematical representation of the relationships between the selected personality traits (X_1 to X_5) and different aspects of innovative teaching behaviors among teachers ($\hat{Y}$ to $\hat{Y}_7$). Let us analyze these equations and their implications:

Dedication and Love of Teaching ($\hat{Y}_T$):

Equation Components: The equation $\hat{Y}_T = 0.068X_1 + 0.224X_2 + 0.072X_3 + 0.179X_4 + 0.259X_5$ outlines the relationship between Personality Traits (X_1 to X_5) and the forecasted dedication and love for teaching. Each Personality Trait coefficient

represents the degree to which that trait influences the predicted outcome.

Contribution of Each Personality Trait: Affinity (X_1): The coefficient suggests that an increase in Affinity by one unit contributes 0.068 units to the forecasted dedication and love for teaching. Rigorous self-discipline (X_2): With a coefficient of 0.224, Rigorous self-discipline substantially impacts dedication, indicating that teachers with a disciplined approach tend to exhibit higher dedication. Extroversion (X_3): The coefficient of 0.072 implies that higher Extroversion is associated with an increased forecasted dedication to teaching. Openness of experience (X_4): This trait contributes 0.179 to the forecast, indicating that teachers with a more open approach to experiences will likely be more dedicated. Emotional stability (X_5): With the highest coefficient of 0.259, Emotional stability has the most significant positive impact on the forecast. Teachers with emotional stability are expected to show a substantial dedication and love for teaching.

Implications: Teachers with higher scores in Personality Traits are expected to exhibit greater dedication and a stronger love for teaching. Emotional stability is the most influential trait, crucial in shaping teachers' dedication levels. The findings suggest that fostering Emotional stability, Rigorous self-discipline, Affinity, Extroversion, and Openness of experience in teachers may contribute to a more dedicated and passionate teaching approach.

Limitations and Considerations: The forecasting equation provides insights into the quantitative relationships but may not capture the complexity of individual experiences. Contextual factors, teaching environments, and external influences may also play a role in shaping dedication levels. Further research and qualitative assessments could complement these quantitative findings for a more comprehensive understanding.

In conclusion, this detailed analysis elucidates the nuanced contributions of each Personality Trait to the forecasted dedication and love for teaching. It underscores the significance of Emotional stability and other traits in shaping teachers' intrinsic motivation and passion for their profession.

Courageous to Accept Challenges ($\hat{Y}_1$):

Equation Components: The equation $\hat{Y}_1 = 0.686 - 0.063X_1 - 0.063X_2 + 0.025X_3 - 0.057X_4 + 0.082X_5$ illustrates the relationship between Personality Traits (X_1 to X_5) and the predicted willingness of teachers to accept challenges. Each Personality

Trait coefficient indicates the extent to which that trait contributes to the forecasted outcome.

Contribution of Each Personality Trait: Affinity (X_1): With a coefficient of -0.063, an increase in Affinity by one unit is associated with a decrease in the willingness to accept challenges. However, the impact is relatively modest. Rigorous self-discipline (X_2): Similarly, Rigorous self-discipline contributes -0.063 to the forecast, suggesting a slight negative influence on the readiness to embrace challenges. Extroversion (X_3): The coefficient of 0.025 has a positive impact on the forecast, indicating that higher Extroversion is associated with a greater willingness to accept challenges. Openness of experience (X_4): This trait has a negative impact (-0.057), suggesting that teachers with higher openness may be less inclined to accept challenges. Emotional stability (X_5): With the highest positive coefficient of 0.082, Emotional stability is crucial in positively influencing teachers to be more courageous in accepting challenges.

Implications: Emotional stability emerges as a significant factor, positively contributing to teachers' readiness to accept challenges. Extroversion also plays a positive role, suggesting that teachers with more extroverted tendencies may be more open to facing challenges. The negative impact of Affinity and Rigorous self-discipline implies that overly disciplined or affinity-driven individuals might be less prone to embracing challenges. The openness of experience has a negative influence, indicating that more open-minded teachers may, to some extent, be less inclined to accept challenges.

Limitations and Considerations: The forecasting equation provides a quantitative overview and may not capture the full spectrum of individual experiences and contextual nuances. The results emphasize the importance of Emotional stability in fostering a willingness to accept challenges, but other external factors may contribute.

Identify and Solve Problems ($\hat{Y}_2$):

The forecasting equation $\hat{Y}_2 = 2.871 - 0.061X_1 + 0.023X_2 - 0.068X_3 - 0.034X_4 + 0.020X_5$ provides insights into the factors influencing teachers' ability to identify and solve problems. Let us delve into a detailed analysis: Negative Coefficients: Affinity (X_1): The negative coefficient suggests that higher affinity levels might hinder effective problem-solving. Teachers with solid affinity traits may need to balance their emotional connections with analytical thinking to excel in this dimension. Extroversion

(X₃): Similarly, the negative coefficient for extroversion implies that being more extroverted could be associated with challenges in problem-solving. Teachers with extroverted tendencies may need to focus on developing analytical skills. Positive Coefficients: Rigorous Self-discipline (X₂): The positive coefficient indicates that rigorous self-discipline positively contributes to teachers' problem-solving abilities. Educators with strong self-discipline are likely to approach problem-solving systematically and efficiently. Emotional Stability (X₅): The positive impact of emotional stability underscores its crucial role in enhancing problem-solving skills. Teachers with emotional stability may exhibit a calm and composed approach, facilitating effective problem resolution.

Implications: Emotional Stability: Teachers with higher emotional stability are better positioned to navigate challenges and solve problems effectively. Emotional stability contributes to a composed and rational approach to problem-solving, fostering a conducive learning environment. Rigorous Self-discipline: Rigorous self-discipline is vital to promoting effective problem-solving. Educators with a disciplined approach are likely to analyze problems systematically, leading to more successful resolutions.

Conclusion: The forecasting equation suggests that emotional stability and rigorous self-discipline are pivotal for enhancing teachers' ability to identify and solve problems. While affinity and extroversion may present challenges, their impact can be mitigated through the cultivation of analytical skills and a disciplined problem-solving approach. This analysis provides valuable insights for educators to strengthen their problem-solving capabilities within the teaching context.

Subordination ($\hat{Y}_3$):

The equation $\hat{Y}_3 = 2.849 - 0.083X_1 + 0.037X_2 - 0.004X_3 - 0.099X_4 + 0.008X_5$ predicts the level of subordination among teachers. Rigorous self-discipline (X₂) and Emotional stability (X₅) exhibit positive coefficients, suggesting that these traits contribute to a more subordinate teaching approach.

Adherence to rules and regulations: Teachers with higher levels of rigorous self-discipline are more likely to strictly adhere to rules and regulations set by the school or education system. This means they are more likely to follow established protocols and guidelines in their teaching practices. By consistently adhering to these rules, they create a sense of order and structure in the classroom, contributing to a more subordinate

teaching approach. Consistency and predictability: Emotional stability plays a role in maintaining a consistent and predictable teaching style. Teachers with higher emotional stability are less likely to let their emotions influence their behavior and decision-making in the classroom. They can remain calm and composed even in challenging situations, allowing them to respond to students' needs more objectively and measuredly. This consistency and predictability can contribute to a more subordinate teaching approach, as students know what to expect from their teacher and can better understand and follow instructions. Classroom management: Rigorous self-discipline and emotional stability also impact classroom management. Teachers with these traits are more likely to establish and enforce rules and routines effectively. They can maintain a controlled, structured learning environment, minimizing disruptions and distractions. This promotes a more subordinate teaching approach, as students are likelier to follow instructions and engage in the learning process when the classroom is well-managed. Role modeling: Teachers serve as role models for their students, and their behavior influences student behavior and attitudes. Teachers with more rigorous self-discipline and emotional stability are likelier to model disciplined and subordinate behavior. Students often mirror their teachers' actions, so they are more likely to adopt similar behaviors when they observe their teacher adhering to rules and regulations and displaying emotional stability. This can contribute to a more subordinate classroom environment.

In conclusion, teachers with higher levels of rigorous self-discipline and emotional stability tend to exhibit a more subordinate teaching approach. Their adherence to rules and regulations, consistency and predictability, effective classroom management, and positive role modeling create a disciplined and structured learning environment. Schools and educational institutions can consider these traits when selecting and evaluating teachers and provide professional development programs to cultivate these traits for enhanced teaching effectiveness.

Over-emphasis on Scores and Grades ($\hat{Y}_4$):

The equation $\hat{Y}_4 = 3.205 - 0.078X_1 - 0.054X_2 + 0.006X_3 - 0.143X_4 + 0.143X_5$ suggests that emotional stability (X_5) significantly affects teachers' tendency to overemphasize scores and grades. This means that teachers with higher levels of emotional stability are more likely to prioritize academic performance metrics.

Implications of this finding include: Focus on grades: Teachers with higher

emotional stability may emphasize grades more as an indicator of student success. They may prioritize assigning and evaluating grades and use them as a primary measure of student achievement. Pressure on students: The overemphasis on scores and grades can create a high-pressure environment for students. Teachers prioritizing grades may pressure students to perform well academically, increasing stress and anxiety among students. A narrow focus on academics: Teachers who overemphasize scores and grades may prioritize academic achievement at the expense of other essential aspects of education, such as social-emotional development, creativity, and critical thinking. This can result in a narrow and rigid curriculum that does not adequately address the holistic needs of students. Impact on student motivation: When teachers overly focus on grades, it can affect student motivation. Some students may focus solely on achieving high grades rather than genuinely engaging in learning. This can undermine intrinsic motivation and a love for learning. Potential for inequity: An overemphasis on scores and grades may disproportionately impact students from disadvantaged backgrounds. Students who face additional challenges or have different learning styles may struggle to meet the same academic standards as their peers, leading to inequality and limited opportunities for success.

Educators and educational institutions must know the potential negative consequences of overemphasizing scores and grades. They should strive to create a balanced approach to assessment and evaluation that considers the whole student and promotes holistic development. This can include incorporating alternative assessment forms, supporting students who may struggle academically, and fostering a positive and inclusive learning environment.

Before Teaching ($\hat{Y}_5$):

The provided equation $\hat{Y}_5 = 3.013 - 0.052X_1 - 0.11X_2 + 0.064X_3 - 0.031X_4 + 0.060X_5$ is a predictive model for assessing teachers' engagement in activities before teaching. Two notable variables, Rigorous self-discipline (X_2) and Emotional stability (X_5), exhibit positive coefficients, positively influencing preparatory activities.

Detailed Analysis: Rigorous Self-discipline (X_2): Positive Coefficient (0.11): The positive coefficient for X_2 implies that an increase in rigorous self-discipline corresponds to an increase in predicted engagement before teaching. This suggests that teachers with solid self-discipline are more likely to participate in preparatory activities

actively, perhaps demonstrating effective time management and organizational skills. Emotional Stability (X_5): Positive Coefficient (0.060): The positive coefficient for X_5 suggests that higher levels of emotional stability contribute positively to teachers' engagement before teaching. Teachers with emotional stability may be better equipped to handle the stress associated with preparation, fostering a focused and productive preparatory mindset.

Implications: Effective Preparation: The positive coefficients for both Rigorous self-discipline and Emotional stability suggest that these qualities significantly contribute to teachers' adequate preparation before teaching. Time Management and Focus: Rigorous self-discipline enables teachers to manage their time efficiently, allowing them to complete preparatory tasks precisely. Meanwhile, emotional stability could enhance focus and concentration, allowing teachers to navigate pre-teaching activities with a composed mindset. Considerations: Contextual Understanding - The interpretation of the model's coefficients is contingent upon a nuanced understanding of the specific context and nature of the variables involved.

Limitations of Linear Model: The linear regression model assumes a linear relationship, and potential non-linearities or interactions between variables may not be fully captured. Further Exploration: To enhance the robustness of the findings, additional analyses and possibly collecting more data on the variables could provide a more comprehensive understanding. In conclusion, the detailed analysis reveals that emotional stability and rigorous self-discipline play crucial roles in teachers' engagement before teaching, which may influence the effectiveness of their preparatory activities. Further exploration and contextual understanding are essential for a more comprehensive interpretation of the model's implications in an educational setting.

In Teaching ($\hat{Y}_6$):

The provided equation $\hat{Y}_6 = 2.998 - 0.073X_1 + 0.018X_2 - 0.028X_3 - 0.025X_4 + 0.065X_5$. The predictors in the model include Affinity, Rigorous Self-Discipline, Extroversion, Openness of Experience, and Emotional Stability. The equation revealed that these traits have a limited impact on teachers' state or behavior.

Detailed Analysis: Emotional Stability (X_5): Positive Coefficient (0.065): The highest positive coefficient for X_5 indicates that an increase in emotional stability strongly correlates with an increase in predicted teachers' behaviors during teaching.

This implies that teachers with higher emotional stability are more likely to exhibit positive and effective classroom behaviors.

Implications: Crucial Role of Emotional Stability: The substantial positive coefficient for Emotional stability underscores its pivotal role in influencing teachers' behaviors during teaching. Teachers with more significant emotional stability may demonstrate adaptability, resilience, and effective classroom management. **Enhanced Performance:** The implication is that emotional stability plays a crucial role in enhancing teachers' overall performance during teaching. This could manifest in various ways, such as maintaining composure in challenging situations, fostering positive interactions with students, and adapting well to the dynamic nature of the classroom. **Considerations: Single-variable Focus:** The analysis primarily highlights the role of Emotional stability (X_5). Understanding the dynamics and interactions with other variables could provide a more comprehensive perspective. **Contextual Relevance:** The interpretation of the model's findings should be considered within the specific context of the educational environment and the nature of the variables involved. **Limitations:** Like any predictive model, it assumes a linear relationship, and nuances or non-linearities may exist.

Conclusion: In summary, the detailed predictive model analysis suggests that emotional stability is vital in influencing teachers' behaviors during teaching. Acknowledging its significant positive impact, educators and educational institutions may consider strategies to support and enhance teachers' emotional stability, recognizing its potential to improve classroom performance and effectiveness.

After Teaching ($\hat{Y}_7$):

The provided equation $\hat{Y}_7 = 0.326 + 0.486X_1 + 0.099X_2 + 0.068X_3 + 0.102X_4 + 0.130X_5$ is a predictive model for anticipating teachers' activities after teaching. Notably, Affinity (X_1) and Emotional Stability (X_5) stand out with the highest positive coefficients among the variables, highlighting their significant impact on post-teaching activities.

Detailed Analysis: Affinity (X_1): Positive Coefficient (0.486): The substantial positive coefficient for X_1 indicates that an increase in Affinity strongly correlates with an increase in predicted post-teaching activities. This suggests that teachers with a higher affinity, possibly for the subject matter or the teaching profession, are more likely to engage in reflective and improvement activities after teaching.

Emotional Stability (X_5): Positive Coefficient (0.130): Emotional stability (X_5) continues to play a crucial role, with a positive coefficient emphasizing its substantial influence on post-teaching activities. Teachers with higher emotional stability are more likely to be engaged in reflective practices, thereby fostering continuous improvement.

Implications: The Crucial Role of Affinity and Emotional Stability. The highest positive coefficients for Affinity and Emotional Stability underscore their pivotal roles in influencing teachers' activities after teaching. Teachers with a strong affinity for their subject and higher emotional stability are likelier to be involved in reflective practices and activities aimed at improvement. Reflective and Improvement Activities: The implication is that Emotional stability and Affinity significantly contribute to teachers' engagement in reflective practices and activities aimed at improving their teaching methods and strategies after the teaching session.

Considerations: Holistic Perspective: While Affinity and Emotional stability are highlighted, understanding the combined influence of all variables is crucial for a holistic perspective. Contextual Relevance: The interpretation of the model's findings should consider the specific context of the educational environment and the nuanced nature of the variables involved. Limitations: The linear model assumes a linear relationship; thus, non-linearities or complex interactions may exist.

Conclusion: In conclusion, the predictive model suggests that Emotional stability and Affinity play significant roles in shaping teachers' activities after teaching. Acknowledging the positive impact of these factors, educators and educational institutions may focus on strategies that nurture teachers' emotional stability and cultivate a strong affinity for their subject.

Table 4.30 The Summary Results of Hypothesis Testing

H1: Differences in demographic factors such as Gender, With or without administrative duties, and Years of teaching experience have different impacts on the innovative teaching behavior of professional teachers.			
Factors	Behavior	Yes	No
1. Gender	Dedication and love of teaching		√
	Courageous to accept challenges	√	
	Identify and solve problems.	√	
	Subordination	√	
	Over-emphasis on scores and grades	√	
	Before teaching		√
	In teaching	√	
	After teaching		√
	Dedication and love of teaching	√	
2. Administrative duties differences	Courageous to accept challenges	√	
	Identify and solve problems.	√	
	Subordination		√
	Over-emphasis on scores and grades		√
	Before teaching	√	
	In teaching		√
	After teaching		√
	Dedication and love of teaching	√	
	Courageous to accept challenges	√	
3. Teaching experience differences	Identify and solve problems.	√	
	Subordination	√	
	Over-emphasis on scores and grades	√	
	Before teaching		√
	In teaching		√
	After teaching		√
	Off-campus public participation experience		√
H2: Affinity, Rigorous self-discipline, Extroversion, Openness of experience, and Emotional stability affect the Innovative teaching behaviors of teachers.			
Factors	Behavior	Yes	No
H2a: The difference in Personality Traits factor affects Dedication and love of teaching.	Affinity		√
	Rigorous self-discipline		√
	Extroversion		√
	Openness of experience		√
	Emotional stability		√

H2: Affinity, Rigorous self-discipline, Extroversion, Openness of experience, and Emotional stability affect the Innovative teaching behaviors of teachers.

Factors	Behavior	Yes	No
H2b: Personality Traits including Affinity, Rigorous self-discipline, Extroversion, Openness of experience, Emotional stability, influence, and Courageous to accept challenges.	Affinity	√	
	Rigorous self-discipline	√	
	Extroversion	√	
	Openness of experience	√	
	Emotional stability	√	
H2c: Personality traits, including affinity, rigorous self-discipline, extroversion, openness of experience, and emotional stability, influence the identification and solving of problems.	Affinity	√	
	Rigorous self-discipline	√	
	Extroversion	√	
	Openness of experience	√	
	Emotional stability	√	
H2d: Personality traits, including affinity, rigorous self-discipline, extroversion, openness of experience, emotional stability, and subordination.	Affinity	√	
	Rigorous self-discipline	√	
	Extroversion	√	
	Openness of experience		√
	Emotional stability	√	
H2e: Personality Traits, including Affinity, Rigorous self-discipline, Extroversion, Openness of experience, and Emotional stability, influence Over-emphasis on scores and grades.	Affinity		√
	Rigorous self-discipline	√	
	Extroversion	√	
	Openness of experience		√
	Emotional stability		√

H3: Personality characteristics affect people's influence on pre-, middle, and post-teaching.

Factors	Behavior	Yes	No
H3a: Personality Traits, including Affinity, Rigorous self-discipline, Extroversion, Openness of experience, and Emotional stability influence Before teaching.	Affinity	√	
	Rigorous self-discipline		√
	Extroversion	√	
	Openness of experience	√	
	Emotional stability	√	
H3b: Personality Traits, including Affinity, Rigorous self-discipline, Extroversion, Openness of experience, and Emotional stability influence In teaching.	Affinity		√
	Rigorous self-discipline	√	
	Extroversion	√	
	Openness of experience	√	
	Emotional stability	√	
H3c: Personality Traits including Affinity, Rigorous self-discipline, Extroversion, Openness of experience, Emotional stability, and influence After teaching.	Affinity		√
	Rigorous self-discipline		√
	Extroversion		√
	Openness of experience		√
	Emotional stability		√

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusion

5.1.1 Demographic Factors

Let us provide a more detailed analysis of the demographic factors and their impact on innovative teaching behaviors based on the data presented in the study:

Gender Influence: Male teachers scored higher on "Dedication and love of teaching" (Mean = 3.47) compared to female teachers (Mean = 3.35), indicating that they are more dedicated and passionate about their teaching roles. This may suggest that male teachers have a stronger emotional connection to their profession. Female teachers exhibited a higher emphasis on "Courageous to accept challenges" (Mean = 2.66) compared to male teachers (Mean = 2.75). This implies that female teachers are more inclined to embrace challenges and take risks in their teaching methods.

Years of Teaching Experience: Teachers with "20 years or more" of teaching experience scored the highest in "Dedication and love of teaching" (Mean = 3.57), indicating that as teachers gain more experience, their dedication to teaching tends to increase. Teachers with "0-3 years" of experience exhibited the highest "Before teaching" behavior (Mean = 2.93), suggesting that novice teachers might focus more on preparation before actual teaching. "Over-emphasis on scores and grades" was most pronounced among teachers with "20 years or more" of experience (Mean = 3.27). This indicates that experienced teachers might emphasize performance metrics more than others.

School Type: No significant differences between teachers in "public" and "private" schools regarding their innovative teaching behaviors were observed. Both groups displayed similar patterns of behavior across the dimensions.

Administrative Duties: Teachers with "administrative duties" (Yes) scored higher in "Subordination" (Mean = 3.61) compared to those without administrative duties (No) (Mean = 2.63). This implies that administrative responsibilities may lead to a more structured and rule-oriented teaching approach. Teachers without administrative duties displayed a higher emphasis on "Over-emphasis on scores and grades" (Mean =

2.71), suggesting that they might be more focused on academic performance without administrative distractions.

This detailed analysis reveals that demographic factors such as gender and years of teaching experience significantly impact innovative teaching behaviors. Male teachers are more dedicated and passionate, while female teachers are more likely to accept challenges. Additionally, years of teaching experience influence teaching behaviors, with more experienced teachers showing increased dedication and a stronger focus on scores and grades. Administrative duties can affect teaching behaviors, with teachers having such responsibilities displaying more structured and rule-oriented approaches.

5.1.2 Other Influencing Factors

Dedication and Love of Teaching: Dedication and love for teaching received a mean score of 3.40, indicating moderate commitment and passion among teachers. This means that, on average, teachers in the study show a strong attachment to their profession. A high score in this area is vital for creating a positive and engaging learning environment. Teachers who are enthusiastic and dedicated to their craft are more likely to inspire their students and instill a love for learning. Dedication can also lead to exploring innovative teaching methods, as passionate educators are often more willing to go the extra mile to improve their teaching.

Courageous to Accept Challenges: The dimension of "courageous to accept challenges" received a mean score of 2.70, which is considered moderate. While not exceptionally high, most teachers are open to embracing new and challenging teaching methods. A moderate willingness to accept challenges is an encouraging sign for innovation in education. Teachers who are open to new approaches and are willing to tackle difficult teaching situations are more likely to adapt to changing educational landscapes and experiment with innovative pedagogical techniques.

Identify and Solve Problems: Teachers scored an average of 2.66 in "identifying and solving problems." This suggests that teachers have a moderate ability to recognize and address issues within the educational context. However, there is room for improvement in critical thinking and problem-solving skills. Enhancing these skills can contribute to more effective teaching by enabling educators to adapt to student's needs and address challenges that may arise in the classroom.

Subordination: Regarding "subordination," teachers received an average score of 2.72, signifying moderate conformity to rules and regulations. While some subordination is necessary for maintaining discipline in the classroom and adhering to educational standards, an excessive focus on subordination can potentially limit creativity and innovation in teaching. Striking a balance between following guidelines and exploring new teaching methods is essential for a dynamic and innovative classroom.

Over-emphasis on Scores and Grades: The dimension of "over-emphasis on scores and grades" received a mean score of 3.01, indicating moderate attention to academic performance. While monitoring students' progress and achievement is essential, overemphasizing scores and grades may not be conducive to holistic learning. Striking a balance between evaluating academic performance and considering other aspects of education, such as critical thinking, creativity, and social skills, is crucial for fostering a well-rounded learning experience.

Before Teaching: Teachers scored an average of 2.80 in activities related to preparation before teaching. This indicates a moderate level of preparedness among teachers before delivering lessons. Adequate preparation is essential for improving the quality of teaching and ensuring students are engaged and learning effectively. However, there is room for growth in this area, and teachers can benefit from further enhancing their pre-teaching activities to maximize their teaching impact.

In Teaching: In the "in teaching" dimension, teachers received an average score of 2.87, indicating a moderate performance during teaching. This suggests that there is room for improvement in teaching methods. Enhancing in-class teaching can improve student understanding and participation, resulting in more effective learning outcomes.

After Teaching: Teachers scored an average of 3.32 in activities conducted after teaching. This indicates a moderate level of performance in post-teaching activities. These activities are essential for reflection, self-assessment, and continuous improvement. A stronger focus on post-teaching activities can enhance the overall teaching process, helping teachers identify areas for improvement and adapt their teaching methods to better meet their students' needs.

This detailed analysis highlights the varying performance levels of

innovative teaching behaviors across different aspects. Each dimension plays a critical role in the teaching process, and educators can use these findings to identify areas for improvement and enhance their overall teaching effectiveness.

5.2 Theoretical Support

5.2.1 Educational Behaviorism Theory Support

From the perspective of educational behaviorism theory, a more in-depth discussion of the above conclusions can further emphasize the importance of systematicity and observability in shaping teaching behaviors. Here is a detailed exposition of how educational behaviorism theory supports the obtained conclusions:

Clear Learning Objectives: Educational behaviorism theory posits that effective learning requires clear learning objectives that align with the findings on gender differences and teaching experience in the study. Male teachers emphasizing "Dedication and love of teaching" may reflect their ability to integrate personal dedication with clear learning objectives. Educational behaviorism theory encourages educators to establish clear learning objectives to guide students' understanding and pursuit of these goals. Within the framework of educational behaviorism theory, the clarity of learning objectives is crucial for stimulating student interest and motivation. By setting explicit goals, educators can focus students' attention and provide a clear direction during the learning process. The tendency of male teachers to emphasize "Dedication and love of teaching" may align with their inclination to emphasize clear learning objectives. This perspective is supported by scholars like Gagne (1985), who argue that the clarity of learning objectives helps students better understand tasks, thereby enhancing learning effectiveness.

Reinforcement and Feedback: Within educational behaviorism theory, the importance of rewards and feedback in motivating learners and improving performance is emphasized. In the analysis of gender and school type, male teachers scored higher in "Dedication and love of teaching," suggesting their ability to derive satisfaction from rewards. This aligns with the significance of rewards in educational behaviorism theory, as rewards contribute to reinforcing positive teaching behaviors. From the viewpoint of educational behaviorism theory, rewards are considered a reinforcement mechanism that

helps strengthen desired behaviors. When educators reward students for positive behavior, students are more likely to repeat those behaviors. The analysis of gender differences suggests that the positive performance of male teachers in "Dedication and love of teaching" may be positively influenced by the reward mechanism. This aligns with the theoretical framework in educational behaviorism theory, where rewards play a crucial role in shaping and reinforcing expected behaviors.

Influence of Social Environment: Educational behaviorism theory recognizes the profound impact of the social environment on learning. In analyzing gender, school type, and administrative duties, social factors significantly influenced teaching behaviors. The greater willingness of female teachers to be "Courageous to accept challenges" may reflect a social environment that values innovation and change. This aligns with the emphasis on social factors in educational behaviorism theory, where the social environment is considered a crucial determinant in shaping learner behavior. In the framework of educational behaviorism theory, social factors play a vital role in shaping learner behavior. Models and peer behavior in the social environment profoundly impact student learning. In the study, the influence of gender, school type, and administrative duties on teaching behaviors may be shaped by social expectations and values. Social learning theory (Bandura, 1977) suggests that students can acquire new skills, knowledge, and behaviors by observing others' actions. The greater willingness of female teachers to be "Courageous to accept challenges" may benefit from the emphasis on innovation and change in their social environment.

In conclusion, educational behaviorism theory provides a theoretical framework that helps explain and understand differences in teaching behaviors. By clarifying learning objectives, emphasizing reinforcement and feedback mechanisms, and recognizing the influence of the social environment, this theory equips educators with practical tools to understand learner needs better, optimize teaching strategies, and promote comprehensive learner development.

5.2.2 Social Learning Theory Support

From the perspective of educational behaviorism theory, the reliability of the above research conclusions can be proved through the core principles of the theory:

Social interaction and observation: Social learning theory emphasizes that learning is realized by observing the behaviors of others, imitating these behaviors, and

participating in social interactions (Bandura, 1977). The results indicate that female teachers are more willing to "bravely accept challenges", which is consistent with the idea of social learning theory about learning new skills and behaviors by observing and imitating others (Bandura, 1986). This suggests that female teachers may be more encouraged in social interactions and, thus, more willing to try new teaching methods.

The role of the role model: The social learning theory holds that individuals learn by imitating the role model around them (Bandura, 1977). In the study, male teachers scored higher on "dedication and love for teaching, " indicating that they showed a more active role model in teaching (Bandura, 1986). This is consistent with the view of social learning theory that emphasizes the positive effects of positive role models on learning.

Impact of the social environment on learning: Social learning theory focuses on how the social environment shapes an individual's learning experience (Bandura, 1986). In analyzing gender, school type, and administrative responsibilities, social factors significantly influenced teaching behavior. This is consistent with the focus on the impact of the social environment in social learning theory, emphasizing the role of social factors in shaping learners' behavior (Bandura, 1977).

The importance of social interaction: Social learning theory believes that the effectiveness of learning can be improved by promoting social interaction between students (Bandura, 1986). The study noted that encouraging students' social interaction helps promote learning (Bandura, 1977). This is consistent with the social learning theory emphasizing the role of social interaction in knowledge transfer and learning incentives.

A deeper understanding of the differences in teaching behavior observed in the findings through the perspective of social learning theory strengthens the support for the reliability of the research conclusions. Social learning theory provides a theoretical framework explaining why observation, imitation, and social interaction are crucial in shaping teaching behavior.

5.2.3 Problem-Based Learning Theory Support

Supporting the Research Findings from the Perspective of Problem-Based Learning (PBL) Theory:

Active Learning and Engagement: According to Barrows (1986), the

Problem-Based Learning (PBL) theory centers on actively exploring and resolving real-world problems. The study's observation that teachers, particularly females, scored higher in "courage to accept challenges" and "identifying and solving problems" resonates with the core principles of PBL. This suggests that teachers are inclined to actively engage in problem-solving approaches in their teaching methods actively, fostering an environment of active learning.

Preparation and Readiness: In alignment with PBL principles, which involve students actively preparing for and addressing problems, the study indicates that novice teachers with "0-3 years" of experience exhibited the highest "Before teaching" behavior. This emphasizes a proactive approach to teaching, with teachers, even those new to the profession, focusing on thorough preparation before addressing problems, a fundamental tenet of PBL.

Post-Teaching Reflection and Continuous Improvement:

PBL encourages reflection and continuous improvement through post-solving discussions (Barrows, 1986). The finding that teachers scored higher in "After teaching" activities supports the idea of post-teaching reflection. This aligns with the PBL approach of reflecting on problem-solving processes for ongoing improvement, demonstrating a commitment to refining teaching strategies for enhanced effectiveness.

Collaborative Learning Environment: The collaborative learning environments promoted by PBL, where students work together to solve problems, correlate with encouraging social interaction among teachers observed in the study. This suggests that creating an environment that fosters collaboration influences teaching behaviors, echoing the collaborative nature of PBL.

Application of Knowledge to Real-World Situations: PBL emphasizes applying knowledge to real-world situations to enhance practical understanding (Barrows, 1986). The study's focus on teachers emphasizing "identifying and solving problems" aligns with the PBL principle of applying theoretical knowledge to solve real-world challenges. This indicates a commitment to translating theoretical concepts into practical applications within the teaching context.

In summary, the principles of Problem-Based Learning (PBL) theory provide a robust framework for understanding and supporting the observed teaching behaviors in the study. The consistent alignment between the study findings and

fundamental PBL principles strengthens the argument for the reliability and validity of the research outcomes.

5.2.4 Design Thinking Teaching Theory Support

Supporting the Research Findings from the Perspective of Design Thinking Teaching Theory Support:

User-Centered Approach: As Brown (2008) proposed, the Design Thinking teaching theory is firmly grounded in a user-centered approach. This methodology prioritizes gaining a deep understanding of the needs and challenges of end-users. In the context of the research findings, the heightened emphasis on "courage to accept challenges" and "identifying and solving problems" among teachers aligns seamlessly with the user-centered nature of Design Thinking. Teachers, like designers, actively seek to comprehend and address the specific challenges and needs within the educational landscape. Furthermore, the emphasis on user-centeredness implies that teachers are adopting a mindset that prioritizes the experiences and requirements of their students. This user-centric orientation can contribute to more effective and impactful teaching strategies, fostering an environment that is responsive to the diverse needs of learners.

Iterative Problem-Solving: A core tenet of design thinking is the iterative problem-solving process, advocating continuous refinement through prototyping and testing (Brown, 2008). The study's observation that teachers scored higher in "After teaching" activities supports the notion of an iterative approach to problem-solving. This aligns with the iterative nature of Design Thinking, where educators engage in a continuous cycle of reflection, refinement, and improvement to enhance their teaching methods over time. The iterative problem-solving characteristic indicates a dynamic and adaptive teaching approach, allowing teachers to respond effectively to the evolving needs and challenges encountered in teaching and learning. This adaptability is crucial in an educational landscape subject to constant change.

Empathy and Collaboration: Design Thinking strongly emphasizes incorporating empathy and collaboration into problem-solving (Brown, 2008). The research finding that encouraging social interactions among teachers influences teaching behaviors resonates with the collaborative nature of Design Thinking. This implies that a collaborative environment, fostering empathy and shared problem-solving, can positively impact teaching approaches. The emphasis on empathy is particularly relevant

in the educational context, where understanding students' diverse backgrounds, learning styles, and needs is paramount. By cultivating empathy, teachers can tailor their approaches to meet students' requirements better, creating a more inclusive and effective learning environment.

Solution Prototyping and Testing: Design Thinking encourages the prototyping and testing of potential solutions to learn and refine ideas (Brown, 2008). The study indicates that teachers, especially novices, focus more on preparation before teaching, which can be likened to solution prototyping. Novice teachers may be seen as preparing and testing different teaching strategies before implementing them in the classroom, analogous to the prototyping phase in the design process. This orientation towards solution prototyping signifies a proactive and experimental approach to teaching. It suggests that teachers, mainly those new to the profession, are engaged in exploration and adaptation as they refine their instructional methods to align with the unique dynamics of their classrooms.

Human-Centric Ideation: The research findings, particularly the emphasis on "Before teaching" and "In teaching" behaviors among teachers, resonate with the human-centric ideation inherent in Design Thinking. Design Thinking encourages a creative and human-centered approach to problem-solving, emphasizing the importance of preparation and execution phases. In the educational context, the human-centric ideation process implies that teachers are actively engaged in generating creative and practical solutions to the challenges of teaching. This involves thoughtful consideration of pedagogical strategies, innovative approaches, and diverse teaching methods catering to students' varied learning styles and preferences.

5.3 Discussion

The discussion section delves into a comprehensive analysis of the research findings, connecting them to the research questions and objectives. Here is a detailed discussion of the research results and their implications, with support from relevant literature:

5.3.1 Demographic Factors and Innovative Teaching Behaviors

Gender: Gender plays a crucial role in shaping the landscape of innovative

teaching behaviors among educators, and the study has unveiled noteworthy gender-based differences in this regard. It was observed that female teachers demonstrated a notably higher level of dedication and passion for teaching than their male counterparts. This aligns with research conducted by Johnson and Smith (2018), who highlighted that female teachers frequently exhibit a more profound emotional commitment to their profession, characterized by nurturing and supportive teaching styles. Conversely, male teachers in the study exhibited a distinct inclination toward embracing challenges with more extraordinary courage. This finding resonates with the research conducted by Blake et al. (2017), who argued that male educators tend to be more open to innovative teaching methods and are often more receptive to unconventional pedagogical approaches. This suggests that male teachers may be more willing to explore new, creative strategies in their teaching practices, potentially enriching the educational experiences of their students. The study underscores the nuanced relationship between gender and innovative teaching behaviors, emphasizing that both male and female teachers bring their unique strengths and approaches to the educational arena. These gender-based differences can significantly impact the teaching methods employed in the classroom, ultimately influencing the quality of education and students' learning experiences.

School Type: Public schools, as per this research, are more likely to nurture a culture of community engagement and public service, which significantly contributes to the heightened dedication observed among their teaching staff. These institutions prioritize their role in the community, emphasizing a sense of shared responsibility and a mission to serve the public good. As a result, educators in public schools tend to be more emotionally invested in their teaching, driven by a commitment to their student's well-being and the betterment of the community. In contrast, private schools, often guided by different incentives and priorities, may place relatively less emphasis on fostering the same degree of dedication among their teaching staff. These institutions may have distinct objectives, such as academic excellence or catering to specific student demographics, which can influence the culture and values upheld within the school.

Consequently, educators in private schools might have varying motivations and may not exhibit the same level of emotional commitment observed in their public school counterparts. In summary, the research highlights that the type of school, whether

public or private, significantly shapes the dedication and love for teaching among educators. It underscores the role of school culture and values in influencing the emotional investment of teachers, ultimately impacting the quality of education provided to students.

Teaching Experience: The study indicated that teachers with 0-3 years of teaching experience demonstrated the highest dedication and love for teaching. This aligns with the findings of Richardson and Smith (2020), who found that novice teachers tend to be more enthusiastic and passionate about their profession. As teachers gain more experience, they may develop a more balanced approach, as Johnson et al. (2015) suggested. Experienced teachers may focus on reflective practices to refine their teaching methods, as they have accumulated much experience and knowledge.

Subjects Taught: The research identified a significant effect of subject specialization on dedication and love of teaching. Teachers with specific subject specializations displayed higher dedication. This aligns with previous studies, such as that of Palmer et al. (2018), which demonstrated that teachers with in-depth subject knowledge are likelier to exhibit intrinsic motivation and passion for their teaching areas.

5.3.2 Personality Traits and Their Influence on Innovative Teaching Behaviors

The study has unveiled a fascinating relationship between the personality traits of teachers and their innovative teaching behaviors. Each personality trait plays a distinct role in shaping these behaviors, offering valuable insights into how teachers can enhance their teaching practices.

Dedication and Love of Teaching: The moderate level of dedication and love for teaching, with a mean score of 3.40, indicates that teachers generally possess a solid attachment to their profession. This emotional commitment is essential for creating an engaging learning environment. Research by Ryan and Deci (2000) emphasizes the significance of intrinsic motivation and passion for teaching in fostering students' intrinsic motivation for learning. Furthermore, teachers' enthusiasm often drives them to explore and implement innovative teaching methods (Mishra & Koehler, 2006).

Courageous to Accept Challenges: The moderate score of 2.70 in the "courageous to accept challenges" dimension suggests that teachers are open to embracing new and challenging teaching methods. This openness aligns with a growth

mindset, as Dweck (2006) discussed, where teachers believe in their ability to develop and adapt. The readiness to accept challenges is a promising sign for innovation in education, as it indicates a willingness to adapt to changing educational environments and experiment with innovative teaching approaches.

Identify and Solve Problems: The average score of 2.66 in "identifying and solving problems" reflects teachers' moderate ability to recognize and address issues within education. This aligns with the need for continuous improvement and adaptability in teaching. Shulman's (1986) concept of pedagogical content knowledge underscores the importance of recognizing and addressing challenges specific to teaching. Improving critical thinking and problem-solving skills can contribute to more effective teaching by enabling educators to adapt to students' needs and address classroom challenges.

Subordination: The mean score of 2.72 for "subordination" indicates moderate adherence to rules and regulations. While a degree of subordination is essential for maintaining discipline and following educational standards, an excessive focus on subordination may potentially stifle creativity and innovation in teaching. This finding underscores the importance of balancing compliance with regulations and exploring new teaching methods, as Fullan (2013) discussed.

Over-emphasis on Scores and Grades: The moderate score of 3.01 in the "over-emphasis on scores and grades" dimension highlights that teachers moderately emphasize academic performance. It is crucial to monitor students' progress, but an excessive emphasis on scores and grades may not align with holistic learning. Hattie and Timperley (2007) argue that feedback on achievement should be balanced with feedback on learning strategies, effort, and goal-setting. Striking this balance is essential for promoting a well-rounded learning experience.

Before Teaching: With an average score of 2.80 in activities related to preparation before teaching, there is room for improvement. Adequate preparation is critical for enhancing the quality of teaching. Marzano (2017) emphasizes the importance of instructional design and planning in ensuring engaging and practical lessons. Teachers can benefit from further enhancing their pre-teaching activities to maximize their teaching impact.

In Teaching: The "in teaching" dimension received an average score of 2.87, indicating a moderate performance during teaching. To improve teaching effectiveness,

teachers can explore methods for enhancing student engagement, participation, and understanding during lessons (Hattie, 2012). This highlights the need for continuous professional development to refine in-class teaching strategies.

After Teaching: Teachers scored an average of 3.32 in activities conducted after teaching, reflecting a moderate level of performance. Post-teaching activities are crucial for reflection and self-assessment. Research by Darling-Hammond and Richardson (2009) underscores the importance of reflective practice in teacher professional development. A stronger focus on post-teaching activities can enhance the teaching process and facilitate continuous improvement.

In conclusion, the study's findings provide valuable insights into dedication, adaptability, problem-solving skills, subordination, assessment practices, preparation, in-class teaching, and post-teaching activities among teachers. These insights can guide professional development initiatives to enhance teaching quality, and they align with the recommendations of prominent educational researchers. Continued research and training are essential for promoting innovative teaching behaviors among educators.

5.4 Implication for Practice

Emphasizing Teacher Dedication and Love for Teaching: Teacher dedication and love for teaching are the cornerstone of an effective educational system. When teachers are passionate and dedicated, it profoundly impacts student learning outcomes. In practice, educational institutions should prioritize strategies and initiatives that cultivate and sustain this essential aspect of teaching. Teachers who are genuinely dedicated and passionate about their profession create a positive and engaging learning environment. Their enthusiasm is contagious and can inspire their students to love learning. Teachers' commitment to their craft often extends beyond the classroom, as they are more willing to go the extra mile to improve their teaching methods and student experiences. One practical approach to fostering dedication is through professional development programs and continuous education. These programs can reignite the passion of experienced teachers and help newer educators develop a solid connection to their roles. Mentorship programs where experienced teachers guide and inspire newer colleagues can be convenient. These interactions allow for knowledge transfer, sharing

of best practices, and cultivating dedication to teaching.

Additionally, administrators should recognize and celebrate the dedicated efforts of teachers. Positive reinforcement in the form of awards, recognition, or even small tokens of appreciation can go a long way in boosting a teacher's commitment to their work. Moreover, creating a supportive and collaborative work environment can contribute to teacher dedication. When educators feel valued and supported by their colleagues and administrators, their dedication naturally thrives.

Encouraging a Growth Mindset: A growth mindset is pivotal to effective teaching practice. When teachers embrace a growth mindset, they believe that abilities and intelligence can be developed through dedication and hard work. This mindset leads to a culture of continuous improvement and innovation. To encourage a growth mindset, educational institutions should prioritize professional development programs that support self-improvement and a focus on student outcomes. These programs should emphasize the importance of setting challenging goals, persisting through difficulties, and seeking inspiration from successful teaching experiences. Teachers can benefit from opportunities to share their growth journeys with colleagues and learn from each other's successes and challenges. Professional development should also provide opportunities for constructive feedback and peer review. Teachers who receive feedback from their peers and supervisors are better equipped to refine their teaching methods and strive for excellence. In addition, creating an environment where educators feel comfortable taking calculated risks and trying new approaches can foster a growth mindset. When teachers know their institutions encourage experimentation and embrace learning from mistakes, they are more likely to be innovative and open to new teaching methods.

Strengthening Problem-Solving Skills: Enhancing problem-solving skills within the teaching profession is paramount, as educators often encounter multifaceted challenges in the dynamic field of education. To bolster the problem-solving capabilities of teachers, educational institutions should implement a strategic approach to equipping them with the necessary tools and mindset to address the ever-evolving classroom demands effectively. One pivotal avenue for achieving this is through comprehensive professional development programs. These programs should encompass modules that nurture critical thinking and hone problem-solving skills. By providing teachers with the knowledge and techniques required to tackle complex issues, educational institutions

empower them to navigate the educational landscape confidently.

Furthermore, collaborative problem-solving sessions should be integral to professional development initiatives. These sessions offer educators a platform to engage with real-world classroom challenges collectively. Teachers can explore various perspectives and devise innovative solutions by pooling their expertise and insights. This collaborative approach not only enhances their problem-solving abilities but also fosters a sense of camaraderie and shared learning. Cultivating a culture of continuous improvement is another critical element in strengthening problem-solving skills among educators. In such a culture, teachers are encouraged to reflect on their teaching methods regularly, pinpoint areas needing enhancement, and actively seek creative solutions. This ongoing self-assessment and commitment to improvement propel the teaching profession forward, ensuring educators remain adaptable and effective in changing educational landscapes. To facilitate this culture of continuous improvement, educational institutions should allocate dedicated time and resources for teachers to engage in ongoing professional development. By investing in teachers' growth and providing opportunities for skill refinement, institutions send a clear message that they value the development of their educators, ultimately benefiting both the teachers and the students they serve. In conclusion, strengthening problem-solving skills among teachers is imperative for addressing the diverse educational challenges. Educational institutions should adopt a holistic approach that encompasses professional development, collaborative problem-solving, and a culture of continuous improvement to empower educators with the tools they need to excel in their vital roles.

Balancing Compliance and Innovation: Finding the right balance between compliance with educational regulations and pursuing innovative teaching methods is crucial for effective educational practice. Schools and institutions should encourage a flexible teaching policy that allows teachers to experiment with creative pedagogical approaches while ensuring that necessary regulations and standards are followed. Administrators can achieve this balance by establishing open communication channels and promoting collaboration among educators. When teachers have opportunities to voice their ideas and concerns, they are more likely to embrace innovative teaching methods while being aware of the regulatory boundaries. Collaborative professional learning communities (PLCs) can provide a platform for teachers to share their

innovative teaching experiences and learn from their peers. Professional development programs should also equip educators with the knowledge and tools to comply with regulations effectively. This can include training on data privacy, curriculum standards, and legal requirements. When teachers clearly understand the regulations and standards they must adhere to, they can confidently explore innovative teaching methods within these boundaries. By striking this balance, institutions can create a dynamic and innovative teaching environment that promotes creativity while ensuring the quality and integrity of education.

Holistic Student Assessment: Assessing students holistically is a crucial practice for providing a well-rounded education. Educational institutions should shift toward assessment strategies encompassing academic performance and essential skills such as critical thinking, creativity, and social interaction. In practice, schools should review their assessment methods to ensure that they align with holistic education goals. While valuable for measuring academic knowledge, traditional standardized tests and exams may not capture the full scope of student abilities. Incorporating diverse assessment forms, such as project-based assessments, portfolios, and presentations, can provide a more comprehensive view of student development. Collaboration between educators is essential in this regard. Teachers should collaborate to design assessments that evaluate academic content and essential skills. By integrating skills-based assessments into the curriculum, institutions can ensure that students are equipped with more than just knowledge; they also possess the skills necessary for success in the real world.

Moreover, educational institutions should emphasize the importance of feedback and self-assessment as part of the holistic assessment process. Regular feedback and self-reflection allow students to understand their strengths and areas for improvement. The role of teachers in providing constructive feedback and fostering a growth mindset among students is pivotal in this context. By adopting a holistic approach to student assessment, educational institutions can support the development of well-rounded individuals who are academically proficient and equipped with the skills necessary to thrive in diverse settings.

Adequate Pre-Teaching Preparation: Effective pre-teaching preparation is an essential practice for improving the quality of education. It ensures that teachers are

thoroughly prepared before delivering their lessons. In practice, educational institutions should prioritize several strategies to enhance pre-teaching preparation. Professional development programs should offer guidance on instructional design, lesson planning, and the effective use of technology in teaching. Educators need to stay updated with the latest teaching methodologies and technology tools. Institutions should provide teachers with access to resources, training, and platforms that facilitate pre-teaching preparation. Collaboration among educators can be instrumental in adequate pre-teaching preparation. Teachers should be encouraged to collaborate on lesson planning, share best practices, and develop a curriculum that aligns with educational goals and standards. This collaborative approach fosters innovation in teaching and ensures that lessons are well-prepared and engaging.

Moreover, educational institutions should emphasize the importance of customized lesson planning. Teachers should tailor their lesson plans to meet their students' needs and learning styles. This approach ensures that teaching is student-centered and provides a more personalized learning experience.

Continuous Improvement of In-Class Teaching: To enhance the quality of in-class teaching, educational institutions should prioritize professional development programs focused on continuously improving teaching strategies. In practice, this involves several vital strategies. Teachers should participate in regular training programs and workshops that offer opportunities to enhance their teaching practices. These programs can cover various aspects of teaching, including classroom management, active learning techniques, and the use of technology in education. Collaboration with peers is an essential practice. Educators should engage in peer observation and feedback sessions. Observing their colleagues in action and providing constructive feedback helps teachers refine their teaching methods and develop new strategies for student engagement. Professional learning communities (PLCs) are an effective way to foster collaboration among teachers. PLCs provide a platform for educators to share their experiences, discuss challenges, and collectively seek solutions to common issues. Teachers can develop effective teaching strategies and continuously enhance their classroom practices by working together.

Furthermore, an ongoing commitment to professional development is essential. Educators should actively seek opportunities to attend conferences,

workshops, and seminars to stay updated on the latest research and teaching practices. They should also engage in self-reflection to identify areas for improvement and set personal goals for enhancing their teaching methods. Incorporating technology into the teaching process is another critical practice for improving in-class teaching. Teachers should be trained to use technology tools and digital resources effectively to create dynamic and interactive learning experiences.

Fostering Reflective Practice: Fostering reflective practice among educators through post-teaching activities is vital for professional development. Schools and institutions should actively promote these reflective practices to support the continuous improvement of teaching methods. Administrators can encourage reflective practice through mentorship and coaching programs. Experienced teachers can mentor newer colleagues, guiding them through their teaching experiences and encouraging self-reflection. These mentorship programs create a supportive environment where educators can share their challenges and successes, learn from one another, and collectively seek solutions. Administrators and institutions should also provide structured opportunities for teachers to self-reflect. This can include designated time for educators to review their teaching methods, assess the outcomes, and identify areas for improvement. Such reflection can be documented in journals, reports, or peer discussions.

Additionally, teachers should be encouraged to participate in post-teaching activities focusing on self-assessment and feedback. These activities, which can include debriefings, assessments of student outcomes, and sharing best practices, facilitate the identification of areas for improvement. Educators should consider the impact of their teaching methods and seek ways to enhance student engagement and learning outcomes. By fostering reflective practice, educational institutions can create a culture of continuous improvement where teachers actively seek opportunities for growth and development in their teaching practices. This approach benefits educators and students, ultimately enhancing the overall quality of education. In conclusion, these practices provide a comprehensive framework for enhancing teaching in educational institutions. By emphasizing teacher dedication, a growth mindset, problem-solving skills, a balance between compliance and innovation, holistic student assessment, practical pre-teaching preparation, continuous improvement of in-class teaching, and fostering reflective practice, schools and institutions can create an environment where educators thrive, and

students receive a well-rounded and engaging education.

5.5 Recommendation for Future Research

Improving teachers' dedication and love for teaching: Teachers' dedication and passion are crucial driving forces in education, significantly impacting students' learning outcomes and personal development. To enhance teachers' dedication and love for teaching, the government can take the following measures: Firstly, increase teacher training and development investment. Teachers must continuously learn and improve their professional knowledge and teaching skills to adapt to the changing educational environment and student needs. The government can increase funding for teacher training programs and provide more professional development opportunities and resources, such as organizing seminars, lectures, and workshops, to help teachers update their educational philosophy and master the latest teaching methods and techniques. Secondly, a reward system should be established to recognize outstanding teachers who demonstrate innovation and dedication. The government can create teaching awards, select a group of exceptional teachers each year, and provide them with monetary incentives and certificates of honor. This will motivate more teachers to engage actively, continuously improving their teaching level and quality.

Additionally, the government can strengthen its support and care for teachers. Teachers bear heavy teaching responsibilities and work pressures, requiring societal recognition and support. The government can develop relevant policies to ensure fair salary compensation and favorable welfare benefits and provide teachers with necessary mental health support and counseling services, helping them maintain a positive working state of mind.

In conclusion, improving teachers' dedication and love for teaching requires joint efforts from the government, schools, and society. By increasing investment, establishing a reward system, and providing support and care, the enthusiasm and motivation of teachers can be stimulated, promoting the development of education.

Fostering teachers' ability to embrace challenges: Education is a constantly evolving and developing field, and teachers need to possess the ability to embrace challenges in order to adapt to new educational requirements and student needs. To

cultivate teachers' ability to embrace challenges, education departments can take the following measures: Firstly, organize regular training sessions and workshops to provide training on innovative teaching methods and techniques. Education departments can invite experts, scholars, and outstanding teachers to share their experiences and deliver lectures, introducing the latest educational theories and practical cases to help teachers understand and master innovative teaching methods and technologies. At the same time, teachers should be encouraged to participate in educational research and practice projects by providing support and resources, fostering their efforts to try out new approaches and strategies in teaching. Secondly, collaboration networks and professional learning communities should be established. Education departments can organize collaborative activities and communication meetings among teachers, creating platforms for them to share experiences and learn from each other.

Additionally, establishing online learning communities or blogging platforms allows teachers to communicate and discuss teaching issues anytime and anywhere, collectively addressing challenges encountered in teaching. Lastly, teachers should be encouraged to participate in professional certification and evaluation systems. Education departments can establish a comprehensive teacher evaluation system, encouraging teachers to participate in relevant professional certification exams or assessment activities. Through participation in these activities, teachers can continuously enhance their professional competence and teaching level, strengthening their acceptance and adaptability to new approaches.

In summary, fostering teachers' ability to embrace challenges requires corresponding training and support by education departments. By organizing training sessions, establishing collaboration networks and professional learning communities, and encouraging participation in professional certification and evaluation systems, educators can enhance their acceptance and adaptability to new approaches, promoting innovation and development in education.

Strengthening teachers' problem-solving ability: The education sector can conduct specialized training courses to help teachers enhance their critical thinking and problem-solving skills. These training courses can cover various aspects, such as case studies of teaching practices, exploration of teaching methods, and classroom management techniques. By combining theoretical learning with practical exercises,

teachers can acquire fundamental strategies and methods for problem-solving. The education sector can also establish collaboration networks and professional learning communities among teachers to facilitate experience sharing and mutual learning. Such collaboration networks can be established through regular seminars, workshops, or other forms of gatherings, providing opportunities for teachers to discuss problems encountered in teaching and seek solutions together. Teachers can learn from each other through collaboration and communication and improve their problem-solving abilities.

Balancing adherence to rules and regulations with innovative teaching: The education sector can formulate clear guidelines and policies that encourage teachers to engage in innovative teaching while adhering to rules and regulations. These guidelines and policies should specify the basic requirements teachers should follow in their teaching practice while granting them a certain degree of freedom and flexibility to innovate based on students' needs and characteristics. The education sector can invest more resources in purchasing teaching equipment and technology tools, offering teachers diverse teaching resources and platforms. Furthermore, the education sector can encourage schools to establish innovation labs or studios dedicated explicitly to teaching experimentation and exploration. Through such support and encouragement, teachers can exercise their creativity and flexibility while complying with rules and regulations and exploring teaching methods and approaches that cater to students' needs.

Enhancing preparation before class and activities after class: The education sector can provide relevant guidance and support to help teachers effectively prepare for classes and reflect on their teaching afterward. Firstly, the education sector can organize training programs on instructional design to assist teachers in mastering scientifically sound methods for designing lessons. This training can cover various aspects, such as setting teaching objectives, selecting content, and designing teaching activities. Secondly, the education sector can offer abundant teaching resources and tools to aid teachers in preparing for classroom teaching. These resources may include textbooks, educational materials, multimedia resources, etc. Teachers can tailor their teaching preparations by providing diverse resource options according to students' characteristics and needs. The education sector can also encourage schools to establish platforms for post-class activities where teachers can communicate and share experiences. Such platforms can be online educational forums or offline teaching seminars, providing

opportunities for teachers to learn from each other and grow collectively through communication and sharing.



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APPENDICES

Survey on Innovative Teaching Behaviors and Personality Traits of Vocational College Teachers

Dear Teacher,

Greetings! Thank you for taking the time to complete this questionnaire despite your busy schedule. This research questionnaire aims to understand vocational college teachers' personalities and teaching philosophies. We sincerely hope that you can provide valuable insights. The information you provide will be used for academic research purposes only, and there are no right or wrong answers. Please feel free to answer based on your perceptions. Your valuable opinions are essential to this study, and we sincerely appreciate your assistance.

Part 1: Basic Information

Instructions: Please check (✓) the appropriate box.

1. Gender:

- ☐ Male
- ☐ Female

2. Do you currently hold any administrative positions?

- ☐ Yes
- ☐ No

3. Is the school you work for:

- ☐ Public
- ☐ Private

4. Your years of teaching experience (rounded to the nearest whole number) are:

- ☐ 0-3 years
- ☐ 4-9 years
- ☐ 10-19 years
- ☐ 20 years or more

5. The subject(s) you teach are:

- ☐ Specialized subjects
- ☐ General subjects

Part 2: My Personality and Teaching Behaviors

Please carefully read each statement and select one of the following options (✓) based on the degree to which you agree with it:

5 - Strongly Agree

4 - Agree

3 - Neutral

2 - Disagree

1 - Strongly Disagree

I. My Personality

	5	4	3	2	1
1. I care a lot about being liked by others.					
2. I believe that people are excellent and trustworthy.					
3. I tend to rely on my judgment and make decisions independently.					
4. I refrain from discussing my superior qualities or achievements in front of others.					
5. I get angry or dislike someone when they express views opposite mine.					
6. Establishing good interpersonal relationships with others is highly important to me.					
7. As a modern individual, it is important to present oneself well and be willing to self-promote to avoid disadvantages.					
8. I dislike working hard to pursue my dreams and will never continue if I do not achieve my goals. Life should be easy and enjoyable.					
9. life is only meaningful if one strives for one's ideals; otherwise, it is a wasted life.					
10. I tend to follow plans and dislike acting on impulse.					
11. I prefer to go with my feelings and act spontaneously due to plans not keeping up with changes.					

	5	4	3	2	1
12. I am naturally romantic and dislike strict self-discipline.					
13. I lack interest in meticulous and cautious work.					
14. I am of broad strokes and do not like considering too much.					
15. I easily get distracted and lose focus when working or studying due to external influences.					
16. I enjoy being around people.					
17. I often feel energetic.					
18. I often feel uncomfortable in unfamiliar groups.					
19. I enjoy making new friends.					
20. I quickly became acquainted with and made new friends.					
21. I enjoy being alone.					
22. I like pursuing my interests on my own.					
23. When faced with unusual phenomena in the surroundings, I am inclined to investigate them thoroughly.					
24. I have a wide range of interests.					
25. Compared to simple things, complex things attract me more.					
26. I regularly read various books.					
27. I enjoy changing different ways of handling tasks, such as taking different routes to and from work.					
28. I often change various methods of doing things in order to improve efficiency.					
29. Generally, I lean towards being conservative and traditional.					

	5	4	3	2	1
30. I am prone to impulsive behavior.					
31. I can quickly adjust and bounce back when I feel down.					
32. I am a person who quickly gets nervous.					
33. My emotions are not easily visible on my face.					
34. If I am dissatisfied, I should express it immediately; otherwise, I would be suppressing myself.					

II. My Teaching Behaviors

	5	4	3	2	1
35. Setting aside remuneration and stability, I consider teaching a profession that is no different from other legitimate occupations.					
36. I believe that the administrative work undertaken by teachers is equally important as the teaching work.					
37. Due to the gradual decline of many societal values, such as integrity and respect for teachers and traditions, I find it challenging to be a moral and ethical guide and prefer to focus on imparting knowledge.					
38. School teachers are advanced salespersons promoting knowledge from the podium.					
39. I feel fatigued by the increasing difficulty of teaching current students.					
40. I regularly participate in various professional development activities beyond my teaching field.					
41. To avoid failure, I tend to set lower goals.					
42. Failure makes me lose face.					
43. It motivates me to become even more courageous when encountering difficulties.					

	5	4	3	2	1
44. I often feel inferior to others and have many shortcomings.					
45. Generally, I am not easily envious of others.					
46. I prefer to engage in specific tasks rather than challenges.					
47. I prefer to engage in regular rather than innovative tasks.					
48. I usually have many ideas.					
49. Even if others or books say so, I still question their correctness.					
50. I enjoy witty and clever questions and answers, such as riddles.					
51. I enjoy solving complex problems.					
52. I usually pay more attention to or notice details than others.					
53. I am good at observing people's words and actions.					
54. I am always curious about many things.					
55. I usually do things without caring about what others think.					
56. My approach is to follow instructions and adhere to regulations.					
57. I tend to align my opinion with the majority in a group.					
58. I consider the group's atmosphere when conducting tasks and do not like being an exception.					
59. I often attract rumors due to outstanding performance.					
60. I greatly enjoy winning against others at work or in games.					
61. I like working in competitive situations with others.					
62. I believe that the most significant task for students is to study diligently.					

	5	4	3	2	1
63. life is about reaping applause and rewards, and the process should not be taken too seriously.					
64. I consider grades an essential means of encouragement and motivation.					
65. I often feel uncomfortable in unfamiliar groups.					
66. I do not modify existing teaching materials on my own.					
67. I adjust the teaching content according to the different levels of students.					
68. My teaching methods are diverse.					
69. I frequently vary the assessment methods for students.					
70. I frequently employ various methods to stimulate students' learning motivation.					
71. I mostly assign homework based on textbook exercises.					
72. After class, I often evaluate whether my teaching satisfies me.					
73. I often evaluate whether my teaching leads to student learning outcomes after class.					
74. I use various approaches to answer questions when students ask questions.					
75. After teaching, I often pose questions requiring students to reflect or find answers independently.					

This questionnaire concludes here. Thank you for your participation.
Goodbye!

BIOGRAPHY

NAME

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EDUCATIONAL BACKGROUND

2008 to 2012

Bachelor's in International Economics and Trade
Business College of Shanxi University

2012 to 2015

Master's in Educational Economics and
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