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Analysis Of Influencing Factors on The Teaching Competence of Junior Middle School Teachers

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Abstract

This study examines the teaching competence of junior middle school teachers focusing on its core dimensions and background influences. This study surveyed junior middle school teachers in District M, Zhuhai City, China, using a randomized sampling technique and quantitative research methodologies based on the onion model theory. A survey involving 240 teachers across four schools was conducted using a validated teaching competence scale. Data were analyzed with descriptive statistics, confirmatory analysis, and group comparisons. Results show that teaching competence among teachers falls between moderate and high levels, with significant variations across gender and grade levels. Four key dimensions emerged: knowledge literacy, teaching ability, professional quality, and personal traits. Personal traits and teaching ability demonstrated the strongest correlations with overall competence. The findings suggest that professional development should prioritize strengthening teachers' knowledge literacy and personal traits, while promoting balanced growth in teaching skills and professional qualities. This study contributes insights for enhancing teacher education and continuous professional development in secondary education.

Keywords: teaching competence, knowledge literacy, teaching ability, professional quality, personal traits

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Faktor Analisis Yang Mempengaruhi Kecekapan Pengajaran Guru Sekolah Menengah Rendah

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Abstrak

Kajian ini meneliti kecekapan pengajaran guru sekolah menengah rendah dengan memberi tumpuan kepada dimensi teras dan faktor latar belakang yang mempengaruhinya. Kajian ini melibatkan guru-guru sekolah menengah rendah di Daerah M, Bandar Zhuhai, China dengan menggunakan teknik persampelan rawak dan kaedah kuantitatif berasaskan teori model "*onion*". Satu tinjauan yang melibatkan 240 guru dari empat buah sekolah telah dijalankan menggunakan skala kecekapan pengajaran yang telah disahkan. Data dianalisis menggunakan statistik deskriptif, analisis pengesahan (*confirmatory analysis*) dan perbandingan kumpulan. Keputusan menunjukkan bahawa tahap kecekapan pengajaran guru berada pada tahap sederhana ke tinggi melalui variasi ketara berdasarkan jantina dan tahap gred. Empat dimensi utama dikenal pasti: literasi pengetahuan, kebolehan mengajar, kualiti profesional, dan ciri peribadi. Ciri peribadi dan kebolehan mengajar menunjukkan korelasi paling kuat dengan kecekapan keseluruhan. Dapatan ini mencadangkan bahawa pembangunan profesional harus memberi keutamaan kepada pengukuhan literasi pengetahuan dan ciri peribadi guru, di samping menyokong perkembangan seimbang dalam kemahiran mengajar dan kualiti profesional. Kajian ini memberi sumbangan kepada peningkatan pendidikan guru dan pembangunan profesional berterusan dalam pendidikan menengah.

Kata kunci: ciri peribadi, kecekapan pengajaran, kebolehan mengajar, kualiti profesional, literasi pengetahuan

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1.0 Introduction

Junior middle school teachers, as practitioners of junior middle school education, will directly affect the knowledge and culture of the middle school students and other aspects of the quality. Accurately grasping the level of teaching competence of junior middle school teachers in the new era can not only provide a powerful reference for improving the level of teacher management but also provide a reliable basis for improving the quality of the teaching force and thus the quality of junior middle school education (He,2020). An increasing number of studies have shown that teacher competence has a direct impact on student learning outcomes, which is important not only for individual students but also for schools and countries(Sudargini, Y., & Purwanto, A.2020;Podungge, R., Rahayu, M., Setiawan, M., & Sudiro, A. ,2020;Pardede, M.,et al.,2024).

An increasing amount of research indicates that teacher competency has a direct impact on teacher performance (Kanya, Fathoni, & Ramdani, 2021; Karim et al., 2021; Yang & Chang, 2023). However, other studies also show that low teacher efficacy necessitates increasing teacher capacities in order to enhance educational quality outcomes (Riwukore & Habaora, 2021). In China, junior middle school teachers face increasing workloads, high levels of stress, and subpar performance (Gao, Y.J., 2022). For example, some school administrators believe that some teachers are unable to fulfill their teaching responsibilities because of factors like shorter tenure and less teaching experience (Ou, C.L., 2022); a lack of knowledge about new educational approaches; a lack of ambition among teachers; and a lack of self-improvement and career aspirations (Xie, D.N., 2022). On the other hand, even while teachers believe they are competent, many believe that their leaders' job performance reviews are prejudiced and unduly simplistic (Hua, A.N., 2024). Regarding teaching competency, Chinese leaders and educators have differing views (Zhou, L., Wang, J., Liu, Z., 2023). Chinese teachers and leaders exhibit significant cognitive differences regarding teachers' teaching competency, which is one reason they face different situations and adopt varying coping strategies. Given the current state of education, key questions emerge: What competencies should educators establish? What is their essence? These concepts require clear definition to be effectively applied and measured. Exploring the core competencies of contemporary junior middle school teachers and integrating these principles into school development strategies holds significant practical value. The structural framework and core indicators of junior middle school teachers' teaching competencies not only reflect school development strategies but also embody the foundation and entry points of the school's mission. This determines the structural form, operational model, and guiding function of the school's teacher competencies. Therefore, in the context of the new era, understanding the types of competency and performance concepts that educators and leaders should cultivate is crucial.

Although teacher competence is widely studied, less evidence exists on Chinese junior middle schools, especially in M District, Zhuhai.In the reality life, differences in teachers' teaching competence by demographic factors may affect classroom quality and equity. So identifying

competence dimensions and influencing factors provides actionable guidance for teacher training and school improvement. This study measured the teaching competence of junior middle school teachers in M District，Zhuhai , Guangdong Province, China, aiming to understand the current situation of junior middle school teachers' teaching competence, reveal the problems of junior middle school teachers' teaching competence, explore the influencing factors of junior middle school teachers' teaching competence, and, on the basis of this study, put forward an effective strategy to improve the teaching competence of junior middle school teachers.

2.0 Literature Review

There is currently no widely agreed-upon definition of teaching competency. Many scholars have defined "teaching competency" in different ways. Because different scholars have different ideas about what competency is, there are many definitions of teaching competency. According to Olson (2000), teacher competency is the collection of professional values, skills, and knowledge that each teacher possesses and that are linked to the implementation of successful teaching. Researchers Xu (2004) claim that teacher competency is a qualitative assessment of the significant quality of teacher activity, as stated by Broke and Stone (Mulyasa, 2012). Being competent is described as acting reasonably to achieve the required objectives while adhering to the anticipated circumstances. Some scholars define teacher competency as the collection of skills, behaviors, and knowledge that educators need to accomplish learning goals. Determining the teacher competences is one of the most crucial steps in developing a competency-based teacher education program (Musfah, 2011). Yan (2016) asserts that teaching competency is the result of several different competency components. The phrase "teacher competency" describes the special qualities that can distinguish high-achieving instructors from regular teachers in the context of teaching and learning in schools (He and Xiong, 2015; Chen, 2017). He's (2020) definition of teaching competency was used in this study. To properly accomplish teaching objectives, a teacher must possess teaching competency. It distinguishes exceptional educators from mediocre ones (He, 2020).

Different scholars have also made different discoveries regarding the elements of teacher teaching competency. Olson (2000) thinks teacher competency is a component of each teacher's unique personality, a prerequisite for effective teaching, and the primary training objective of teacher education programs. Xu(2004), He and Xiong (2015), and Chen (2017)think teacher competency include personal qualities, including aptitude, self-awareness, drive, and associated personality traits, are mostly included. Yan (2016) pointed out that teaching competency includes personality traits, values, motivation, teacher ethics, teaching skills, professional knowledge, etc., that teachers need to possess in order to successfully accomplish teaching objectives. The information is more focused. Competency is defined as a reasonable behavior to accomplish the necessary goals in compliance with the expected conditions (Mulyasa, 2012). According to this study, competency is the quantifiable knowledge, skill, personality, and attributes that can differentiate excellent performance from mediocre performance at work.

Given persistent challenges such as low salaries, extended working hours, challenging students, and suboptimal teaching environments, the overall teaching competency of primary and secondary school educators in China remains at a moderate level, with noticeable disparities across regions and individuals. Zhou (2020) found that teachers demonstrated above-average performance in professional competence and student engagement, yet highlighted the need for improvement in interpersonal communication, job commitment, information literacy, and personal attributes.

One of the elements influencing the accomplishment of learning and educational objectives in schools is teacher competency. According to Spencer, LM, and Spencer, SM (1993), teacher competency is regarded as a crucial selection tool for potential teachers and provides parameters for teacher development and advancement. In order for a teacher to assess, plan, diagnose, and suggest changes to the educational environment, teacher competence is crucial (Stofflett, 1994). According to the study, the implementation of inclusive education curricula was significantly impacted by the methodological, evaluation, and motivational competency of TVET teachers (Abba, & Rashid, 2020). In addition, subject-specific research has significantly expanded the scope of teaching competency studies (Zhang, 2020; Lv, 2021; Li, 2021; Lin, 2022; Tang, 2023). To enable more precise assessment across different career stages and specialized domains—particularly digital competence—researchers have also developed targeted evaluation instruments (Jonas & Anders, 2019; Sulaiman & Ismail, 2020; Swank et al., 2021; Dirsa et al., 2022; Gümüş & Kukul, 2023). In the past twenty years, researchers have developed complex models of teacher competence that conceptualize a wide range of cognitive and affective-motivational traits that educators require to carry out their jobs well (Blőmeke & Kaiser, 2017; Holzberger et al., 2021).

There has been a wealth of research on the dimensions of teacher competence both domestically and internationally, but there has been no research on the competence of junior middle school teachers in Zhuhai City. This study, based on the Chinese context and the actual situation of junior middle school teachers in District M of Zhuhai City, adapts the teaching competence measurement tool developed by He (2019) for primary and secondary school teachers to study the teaching competence of junior middle school teachers in District M of Zhuhai City, thereby filling the research gap in this area.

The research applied the onion model. It is shown in Figure 1. The onion model describes competencies as a layered structure that radiates outward. At the core are traits and motives, followed by outward expansion that includes self-image, attitude, values, knowledge, and abilities. The outer layers are relatively easy to develop and assess, as they pertain to external knowledge and skills. In contrast, evaluating and understanding the inner layers becomes increasingly challenging, involving fundamental personality traits and motivations (Sadvika, 2024).

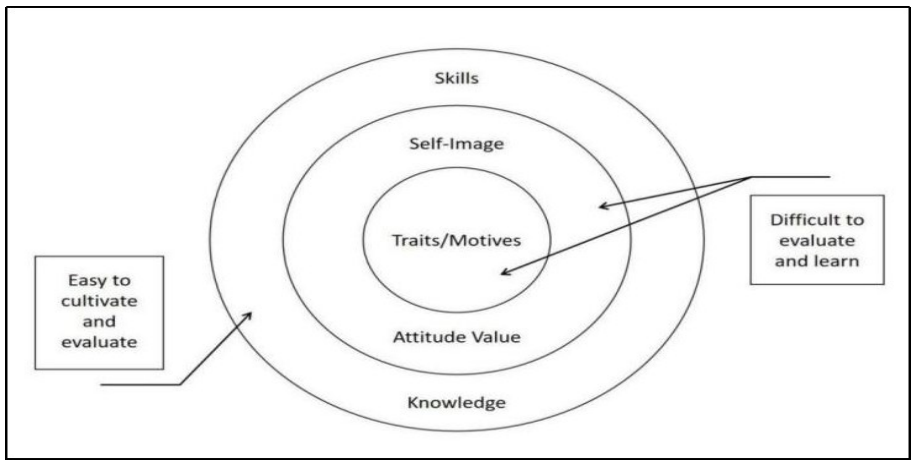

Figure 1: The Onion Model

Source: Spencer & Spencer (1993)

Furthermore, the onion model is thought to be more applicable because of its understandable structural features and a hierarchical description of competency criteria (Christian & Vu, 2021). It clearly distinguishes between the difficulties in assessing and developing competency components. Thus, there is a precise alignment between the theoretical underpinnings of the onion model and the index parts and connotations of the competency model for middle school teachers.

2.1 Research Objectives

The research objectives are following.

i. To identify the dimension of teaching competency scale.
ii. To identify the factor of demographic affect teaching competency.
iii. To describe the level of the teaching competency.

3.0 Methodology

This study is a quantitative study, a randomized sampling technique was applied, and a paper-based questionnaire was used to collect the data. After data collection, the data were analyzed using statistical software such as SPSS and Amos. The main methods used to analyze the data included confirmatory factor analysis, independent sample t-tests, and one-way analysis of variance (ANOVA).

3.1 Participants

Junior middle school teachers in District M of Zhuhai City were selected for the survey, and the pilot study was conducted in BT junior middle school in District M. The form of the survey was to commission the principal to distribute paper questionnaires in the assembly, and after completing the questionnaires, they were collected on the spot. The actual study was conducted in four junior

middle schools: School A, School B, School C, and School D in District M. The form of the survey was to commission the principal to distribute paper questionnaires in assemblies or at grade meetings, and after completing the questionnaires, they were collected on the spot. Finally, the formal test obtained valid questionnaires from 240 teachers. The basic profile of the subjects is shown in Table 1.

Table 1: Basic Information on Participants (N=240)

Type of subjects		Number of people	Percentage（%）
Gender	Male	115	47.9
	Female	125	52.1
Teaching experience	1-5 years	43	22.5
	6-15 years	30	7.9
	16-20 years	21	8.8
	More than 21 years	146	60.8
Degree	Junior College	4	1.7
	Bachelor’s degree	219	91.2
	Master’s degree or above	17	7.1
Subject	Chinese	30	12.5
	Math	46	19.2
	English	46	19.2
	Physics	30	12.5
	Chemistry and biology	27	11.3
	History and geography	25	9.4
	Others	36	15.9
Professional title	No	32	13.3
	the second -grade teacher	39	16.3
	the first -grade teacher	112	46.7
	the sub - senior teacher and above	57	23.7
Head teacher	Yes	80	33.3
	No	160	66.7
Grade	Grade 7	68	28.3
	Grade 8	85	35.4
	Grade 9	87	36.3

3.2 Instrument

The researcher adapted and formed a new teaching competency questionnaire for junior middle school teachers based on the teaching competency questionnaire for junior middle school teachers compiled by He (2019), combined with the results of the interviews. The questionnaire consisted of four dimensions: knowledge literacy, teaching competence, professional qualities,

and personal traits, with a total of 48 items. It is a five-point scale, i.e., 1 means "extremely non-conforming," 2 means "less conforming," 3 means "uncertain," 4 means "relatively conforming," and 5 means "fully conforming.".The knowledge literacy dimension consisted of 8 questions, the teaching ability dimension consisted of 13 questions, the professional quality dimension consisted of 13 questions, and the personal traits dimension consisted of 14 questions.

3.3 Procedure

From October to November 2023, the researcher conducted interviews with three principals, four directors of instruction, and four frontline junior middle school teachers in District M, Zhuhai City, Guangdong Province, China, and thematically analyzed the data. Data transcripts, data cleaning, coding, and theme development are the four steps in data analysis, as suggested by Miles & Huberman (2002), Seidman (2019), and Creswell (2012). Data interpretation is the initial step in the process. The cleansing of the data is the second step. Data that includes speech patterns, word repetitions, and sentences that aren't relevant to the study can be eliminated by data cleaning. Coding is the third procedure. Theme development is the next step in the data analysis process. When three to nine topics were established, the theme generation process was halted, per Creswell's (2012) recommendations.At last, determine the appropriate dimensions of junior middle school teachers' instructional competence. In December 2023, on the basis of the junior middle school teachers' instructional competence questionnaire compiled by He(2019), and combining with the results of the interviews, it will be adapted to form a new questionnaire, which was used to predict the BT junior middle school in District M, Zhuhai City. Then, the questions were deleted through statistical analysis to form the official Questionnaire on Teaching Competence of Junior Middle School Teachers. The formal survey was conducted from December 2023 to January 2024 in four junior middle schools sampled in District M, Zhuhai City, Guangdong Province, China. After obtaining informed consent from school leaders and teachers, the survey was administered in groups at the school level. A paper-based questionnaire was distributed to teachers for completion, and subjects were asked to respond carefully and independently according to the instructions. It took about 10 minutes for the subjects to complete all the questionnaires, and all questionnaires were submitted on the spot. Finally, the valid questionnaires obtained were statistically analyzed using AMOS 24.0 and SPSS 21.0 software.

3.4 Reliability and validity analysis of teaching competence of junior middle school teachers

For the study to yield meaningful results, the validity and reliability of the scales utilized are crucial. They play a significant role in ensuring that the study yields insightful findings (Sürücü & Maslakçı, 2020). Through statistical analysis, the alpha coefficient of knowledge literacy in this measurement is 0.915, the alpha coefficient of teaching competence is 0.943, the alpha coefficient of professional qualities is 0.936, and the alpha coefficient of personal traits is 0.947. 0.957 is the alpha coefficient of this total scale, all of which indicate that the reliability of this scale

is good (Wu, 2010). The reliability of the teaching competency scale is shown in Table 2. The Teaching Competence Scale for Junior Middle School Teachers consists of four latent variables: the first latent variable is knowledge literacy, with eight measurement items; the second latent variable is teaching competence, with 13 measurement quantities; the third latent variable is professional quality, with 13 measurement items; and the fourth latent variable is personal characteristics, with 14 measurement items.

Table 2: Results of Reliability Analysis of Formal Questionnaire

Research variables	dimension	Number of item	Cronbach a	Total Cronbach a coefficient for the scale
Teachers' teaching competence	Knowledge literacy	8	0.915	0.957
	Teaching ability	13	0.943	
	Professional quality	13	0.936	
	Personal traits	14	0.947	

By using AMOS 24.0 statistical software to conduct the confirmatory factor analysis of junior middle school teachers' teaching competence, the confirmatory factor analysis measurement model of junior middle school teachers' teaching competence scale was obtained, as shown in Figure 2.

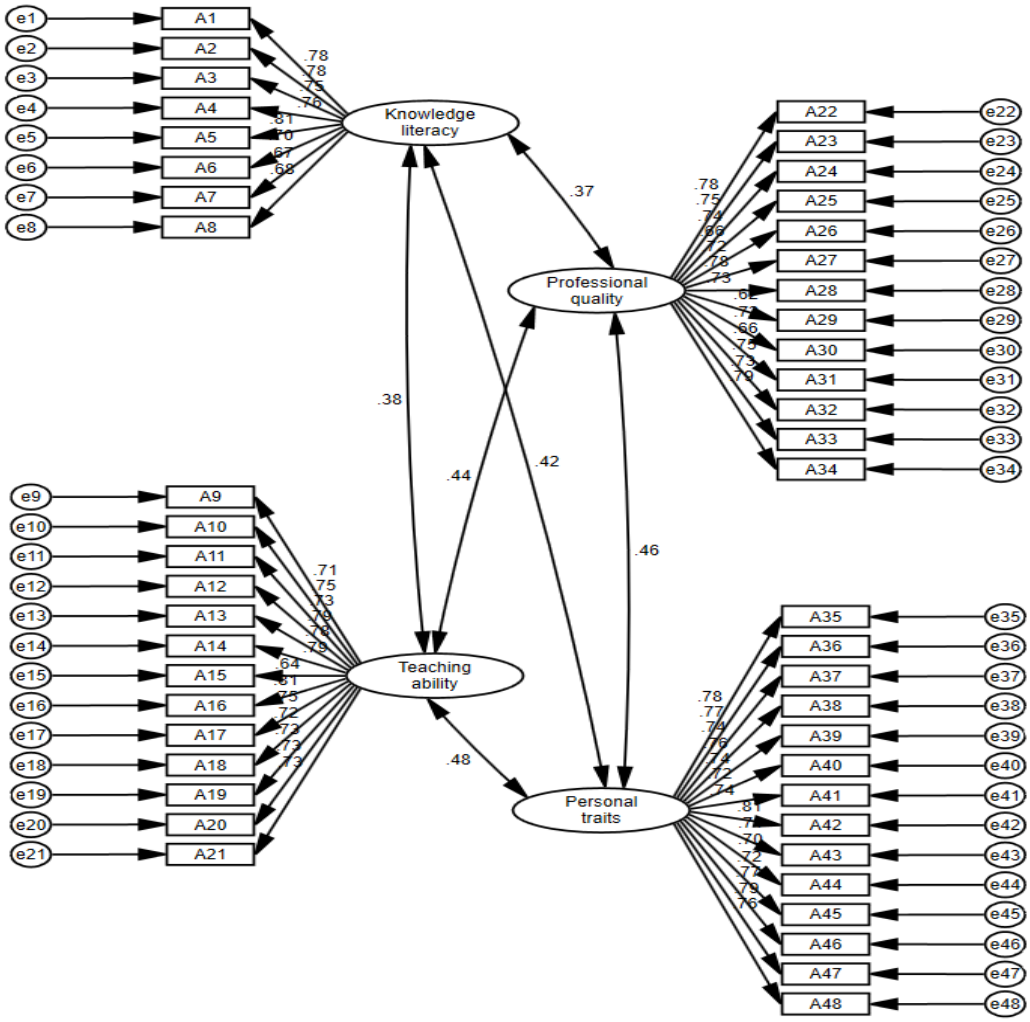

Figure 2: Confirmatory Factor Analysis Measurement Model for the Middle School Teachers' Teaching Competence Scale

This study evaluates the convergent validity of a measurement model using standardized factor loadings, combined reliability of latent variables, and mean variance extracted from latent variables. Factor loading (FL) measures the impact of measurement error and how well a measurement indicator captures underlying latent variables. A factor loading between 0.50 and 0.95 indicates a good basic fit and effective representation of latent variables. Composite Reliability (CR) evaluates the degree of consistency among observed variables measuring the same latent variable. A higher CR indicates a stronger internal correlation between measures. Mean Variance Extracted (AVE) measures the construct validity of a latent factor, indicating how well it explains variance resulting from measurement error(Wu,2010). As shown in Table 3,it was found that the standardized factor loadings of the 48 measures on the corresponding latent variables in the middle school teachers' teaching competence scale range from 0.621 to 0.814. This is a lot higher than the minimum requirement of 0.50, and all of them are statistically significant at the 0.001 level, which means they are strongly merging. Secondly, the combined

reliability of the latent variables is in the range of 0.907–0.948, which is also significantly greater than 0.70, showing high internal consistency. Again, the mean variance extracted from the latent variables ranges from 0.529 to 0.564, which is also greater than the criterion of 0.50 (Wu, 2010). The parsimony fit index, relative fit index, and absolute fit index are all within the range of reference values, and the overall goodness of fit of the model is good.

Table 3: Convergent Validity Analysis of Teaching Competency Scale for Middle School Teachers

Structural dimension	Items	Factor loading	Combined Reliability (CR)	Average Variance Extraction (AVE)	Goodness of Fit
Knowledge literacy	A1	0.778	0.907	0.550	RMSEA=0.034 AGFI=0.802 GFI=0.828 CFI=0.965 NFI=0.856 TLI=0.961 CMIN/DF=1.274 PNFI=0.773
	A2	0.777			
	A3	0.754			
	A4	0.760			
	A5	0.807			
	A6	0.702			
	A7	0.667			
	A8	0.677			
Teaching ability	A9	0.714	0.942	0.556	
	A10	0.748			
	A11	0.733			
	A12	0.792			
	A13	0.781			
	A14	0.792			
	A15	0.642			
	A16	0.814			
	A17	0.752			
	A18	0.724			
	A19	0.727			
	A20	0.729			
	A21	0.727			
Professional quality	A22	0.777	0.936	0.529	
	A23	0.746			
	A24	0.743			
	A25	0.661			
	A26	0.719			

	A27	0.780			
	A28	0.727			
	A29	0.621			
	A30	0.724			
	A31	0.664			
	A32	0.748			
	A33	0.735			
	A34	0.789			
Personal traits	A35	0.776	0.948	0.564	
	A36	0.771			
	A37	0.742			
	A38	0.758			
	A39	0.739			
	A40	0.724			
	A41	0.744			
	A42	0.808			
	A43	0.710			
	A44	0.702			
	A45	0.723			
	A46	0.767			
	A47	0.786			
	A48	0.759			

As shown in Table 4,the square root of the mean variance extracted for each latent variable is significantly greater than the correlation coefficient of that latent variable with the other variables.In the case of professional qualities, for example, the square root of the mean variance extracted is 0.727, and in terms of horizontal comparisons, this value is greater than its correlation coefficient with knowledge literacy (0.374) and its correlation coefficient with teaching ability (0.437). The value is also greater than its correlation coefficient with personal traits (0.464) in terms of longitudinal comparison. Therefore, the Junior Middle School Teachers' Teaching Competency Scale used in this study has good discriminant validity.

Table 4: Discriminant Validity of Teaching Competency Scale for Middle School Teachers

Latent variables	1	2	3	4
1.Knowledge literacy	0.742			
2.Teaching ability	0.378	0.746		
3.Professional quality	0.374	0.437	0.727	
4.Personal traits	0.419	0.477	0.464	0.751

Note:The black body value on the diagonal is the root mean square of AVE value

The Teaching Competence Scale for Junior Middle School Teachers constructed in this study passed the confirmatory factor analysis, and the theoretical model has good goodness of fit, reliability, and validity. Objective, scientific, and reasonable conclusions can be drawn from the measurement of teachers' teaching competence through this scale.

4.0 Research Results

4.1 The dimensions of teaching competence

In this part, descriptive statistics of the teaching competence of junior middle school teachers in District M of Zhuhai City were conducted to understand their characteristics. As can be seen from Table 5, the mean value of middle school teachers' teaching competence (M = 4.37) is between "comparatively compliant" and "fully compliant," with a tendency toward "comparatively compliant." The mean value of knowledge literacy (M = 4.40) is slightly lower than that of professional qualities (M = 4.42), teaching competence (M = 4.4), and personal traits (M = 4.34), and it is in the range between "relatively conforming" and "fully conforming," with a tendency toward "relatively conforming."

Table 5: Descriptive Statistics of Teaching Competence for Junior Middle School Teachers (N=240)

Items	Minimum value	Maximum value	Mean	Standard deviation
Teachers' teaching competence	3.15	5	4.37	0.39
Knowledge literacy	2.38	5	4.32	0.57
Teaching ability	2.85	5	4.40	0.50
Professional quality	2.77	5	4.42	0.51
Personal traits	2.93	5	4.34	0.54

4.2 The factor of demographic affect teaching competence

This part focuses on how different middle school teachers' teaching competence is in relation to background variables. It does this by using independent t-tests or one-way ANOVA, the Least Significant Difference (LSD) method for comparisons after the fact, and an overall test of the significance of the F-value to echo.

4.2.1 Differences in gender

An independent sample t-test was taken to explore the differences among teachers of different genders by treating teaching competence and its dimensions as test variables and gender as a

grouping variable. From the t-test results in Table 6, it can be seen that all the knowledge literacy scores of male junior middle school teachers are greater than those of female teachers, and there is a significant difference, while there is no difference in the rest of the factors.

Table 6: Differences in Teaching Competence, Job Performance, and Organizational Support for Middle School Teachers in Gender

Dimension	Male（N=115）		Female（N=125）		T value	P value
	Mean	Standard deviation	Mean	Standard deviation		
Teaching competence	4.42	0.36	4.33	0.42	1.691	0.092
Knowledge literacy	4.42	0.46	4.24	0.64	2.512*	0.013
Teaching ability	4.43	0.48	4.36	0.52	1.039	0.300
Professional quality	4.44	0.49	4.40	0.53	0.639	0.523
Personal traits	4.39	0.50	4.30	0.57	1.28	0.202

Note: * indicates p<0.05

4.2.2 Differences in grade

According to the grade status of junior middle schools in M District, Zhuhai, which can be divided into three categories: seventh grade, eighth grade, and ninth grade, a one-way ANOVA was conducted. It is learned from Table 7. There are significant differences in teaching competence, teaching ability, professional quality, and personal traits among different grades.It demonstrates that in terms of teaching competency, knowledge literacy, teaching ability, professional quality, and personality qualities, teachers in grades 8 and 9 considerably outperformed teachers in grade 7.

Table 7: Descriptive Statistics of Teaching Competence for Junior Middle School Teachers

Dimension	Grades			F	p
	Grade7(n=68	Grade8(n=84)	Grade9(n=88)		
Knowledge	4.18±0.61	4.34±0.51①	4.42±0.56①	3.627	0.028
Teaching ability	4.25±0.54	4.45±0.45①	4.46±0.49①	4.016	0.019
Professional character	4.23±0.59	4.48±0.43①	4.50±0.49①	6.689	0.001
Personal traits	4.18±0.56	4.39±0.54①	4.42±0.51①	4.402	0.013
Teachers' teaching	4.21±0.45	4.42±0.34①	4.45±0.37①	8.464	<0.001

①Indicates a a significant difference from Grade 7 ratio

4.2.3 Correlation of dimensions of teaching competence of middle school teachers

In this section, correlation analysis was used to explain the relationship between knowledge literacy, teaching competence, professional qualities and personal attributes, and teaching competence. The results are shown in Table 8. From Table 8, it can be seen that intellectual literacy, teaching competence, professional qualities, and personal attributes are significantly and positively correlated with teaching competence. From Pearson's correlation coefficient, it is known that the correlation coefficient between personal traits and teaching competence (r = 0.803) is the largest, followed by the correlation coefficient between teaching ability and teaching competence (r = 0.756), followed by the correlation coefficient between professional qualities and teaching competence (r = 0.749), and the lowest correlation coefficient between knowledge literacy and teaching competence (r = 0.656).

Table 8: Correlations of Teaching Competence for Junior Middle School Teachers (N=240)

Dimension	Teachers' teaching competence				
	①	②	③	④	⑤
①Knowledge literacy	1				
②Teaching ability	0.363**	1			
③Professional quality	0.364**	0.411**	1		
④Personal traits	0.414**	0.454**	0.424**	1	
⑤Teachers' teaching competence	0.656**	0.756**	0.749**	0.803**	1

Note: **indicates P<0.01①Knowledge literacy②Teaching ability③Professional quality④Personal traits⑤Teachers' teaching competence

5.0 Discussion

Knowledge literacy, teaching ability, professional quality, and personal traits are the four dimensions of teachers' teaching competence that this study found. These findings are similar to those of Zhang(2020),He and Kang(20222);Lin (2022), Tang (2023), and Yu(2023), but they differ from those of Jonas & Anders (2019),Jamilah Sulaiman, Siti Noor Ismail (2020), Li (2021), Lv (2021), Julia et al. (2022), Hu(2023), Tian et al.(2023). First, there may be a geographical difference in the research object—some studies are conducted in China, while others are conducted in other countries—but there may also be variations in the research findings within a single study conducted in China.

The second issue is the range of research subjects; although primary and secondary school teachers are the focus of this study, middle school teachers are the subject of other studies. Finally, it might have something to do with the subjects that the research subjects teach. While previous studies concentrated on junior middle school teachers in a certain subject, this study was conducted on junior middle school teachers.Although the dimensions of this study are the same as those of Zhang (2020), there are differences in the items and levels. In terms of

knowledge literacy, both this study and Zhang (2020) show that it is the weakest area, indicating that teachers should keep up with the times, continuously learn, and improve their knowledge literacy. However, in the other three dimensions, the results of this study are ranked from top to bottom as professional qualities, teaching abilities, and personality traits. Zhang (2020)'s study results are ranked from top to bottom as personality traits, professional qualities, and teaching abilities. This suggests that educational administrative departments should focus on improving teachers' knowledge literacy, emphasize training in teachers' knowledge structures, and provide more effective channels through policy to guide teachers in striving to enhance their knowledge literacy.

The results of this study, which are consistent with those of Feng (2021), Tang(2023), Hu (2023), Li(2023), and Yu (2023), but not with Lin(2022), show that there is a disparity between men and women in junior middle school teachers' knowledge literacy. The study population's geographical disparities may be the cause of these variations. Another reason for the existence of the above difference may be that female teachers have limited time and energy, and they may be unable to compare with male teachers in terms of the expansion aspect and the breadth of their knowledge. Because many female teachers, in addition to putting their time and energy into their work, also have to take on heavier family responsibilities, and many of them are also mothers of two children, relatively less time and energy is spent on the expansion of knowledge. This reminds education administrators to pay attention to gender differences, especially in terms of knowledge and literacy. When arranging teacher training, flexible and effective training plans can be developed based on these characteristics.Similar to Zhang(2020) and Li (2023), this study discovered that middle school teachers' teaching competencies varied according to grade levels.The reason for these differences may be that the teaching tasks in grades 8 and 9 are relatively heavy, with the baccalaureate in grade 8 and the midterm in grade 9, so teachers in these two grades will pay more attention to their own knowledge base and their own professional development and try to find ways to accomplish their tasks better and make themselves better. Many of the teachers in the ninth grade have been teaching the ninth grade for a long time, and they are more experienced after years of practice.There are significant differences in teaching competence across grades and across the four dimensions, which reminds school administrators to pay attention to these grade differences and to consider teachers' professional development when assigning work, so that they can have a good experience of cyclical teaching work.

According to the results of the study, overall, in terms of teaching competence, junior middle school teachers are in the middle to high level. The scores on the knowledge literacy and personal attributes dimensions were slightly lower than those on professional quality and teaching competence, reflecting that teachers could further improve on the development of knowledge literacy and personal attributes. The dimension of professional quality had the highest score. It indicates that the status of junior middle school teachers in District M is good in terms of professional pursuit. Their pursuit is good; they have the career aspiration of being a teacher who

is loved by students, and they have firm career beliefs and their own career plans. In terms of professional attitudes, they have the enterprising spirit of wanting to continuously expand their knowledge and improve their skills. Their professional emotions are in good condition. The score of the teaching ability dimension is the second in rank. This indicates that junior middle school teachers in M District perform well in grasping the content and pace of teaching in the classroom, choosing teaching methods, arranging the content of teaching, verbal expression, and information acquisition and processing.The study shows some practical implications. Teacher training programs should integrate personal trait development and knowledge literacy cultivation.Schools should strengthen teachers' abilities through cross-grade rotation. In addition, it may be necessary to implement gender-biased policies to provide female teachers with reasonable and feasible professional development opportunities.

6.0 Recommendations

Combined with the results of the study, the following recommendations are made. First, improve teachers' knowledge literacy. This study found that teachers are relatively weak in terms of practical and general knowledge of the subjects they teach, especially in the natural sciences, humanities, and social sciences. School education and teaching administrators can strengthen the expansion of knowledge in these areas according to the different characteristics of each subject and provide a platform to guide teachers to learn in a targeted manner. For female teachers, schools should support them to expand their knowledge and guide them to learn how to reasonably balance work, family, and self-improvement. At the same time, it is recommended that every teacher should be allowed to teach from grade 7 to grade 9 as much as possible, which is conducive to the systematic development of teachers' subject knowledge and the development of the teaching profession.

Second, emphasize the development of teachers' personal traits. The results of this study show that teachers' scores are relatively weaker in terms of expressiveness, democracy, objectivity, sensitivity, persistence, planning, self-confidence, and communication skills of leaders. School education and teaching administrators can develop teachers' personal traits in the following ways: First, to understand teachers' needs, to think in a win-win mode, and to pay attention to their feelings and aspirations. Second, establish a good and smooth communication channel, focus on problem solving, and deal with the relationship between leaders and teachers. Third. Provide enough platforms for teachers to develop and guide them to participate more in the development and construction of the school.

Third, coordinate the development of teachers' teaching abilities. The results of this study show that teachers are relatively weaker in laying out scientific and reasonable-graded assignments, grasping students' learning conditions, mobilizing students to actively participate in the classroom, following up with students after class, and teaching students according to their abilities. School education and teaching managers can guide teachers to take advantage of school-based training

activities, each different subject, for the characteristics of the subject, together to explore these aspects of the problem, combined with their own actual situation, to find out the appropriate methods to promote the overall development of teachers' teaching ability.

Fourth, pay attention to the balanced development of teachers' professional qualities. The profession of teacher is one with strong autonomy, and they need room for independent play. School leaders should fully trust and support teachers and help them gain a sense of achievement. This helps them develop a good professional attitude and be more willing to accept challenging work tasks. By giving teachers a constant sense of achievement, they are guided to have higher professional aspirations!

7.0 Conclusion

Based on the results obtained from the survey and the related analysis and discussion, the following conclusions can be drawn: The overall level of teaching competence of junior middle school teachers in District M of Zhuhai City is in the middle to upper range. There are differences in teaching competence by gender, and grade . Male teachers scored significantly higher in knowledge literacy (mean) than female teachers. Teachers in grades 8 and 9 scored significantly higher than teachers in grade 7 in teaching competence, knowledge literacy, and professional qualities. The scores (means) of teachers in grade 9 were significantly higher than those of teachers in grade 7 in terms of teaching ability and personal traits. Knowledge literacy, teaching ability, professional qualities, and personal attributes are significantly and positively correlated with teaching competence. Their correlations with teaching competence in descending order are personal traits, teaching ability, professional qualities, and knowledge literacy.

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9.0 Conflict of interest

Authors declare that there is no conflict of interests regarding the publication of the paper.

10.0 Author contribution

The authors confirm contribution to the paper as follows: study conception and design: Author Liang Bixia, Author Mimi Mohaffyza Mohamad; data collection: Author Liang Bixia,Author Zhou Zhuosen; analysis and interpretation of results: Author Liang Bixia, Author Mimi Mohaffyza Mohamad, Author Zhou Zhuosen; draft manuscript preparation: Author Liang Bixia. All authors reviewed the results and approved the final version of the manuscript.

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