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The Interplay of Talent, Interest, and Teaching Competence: A SEM-PLS Analysis of Pre-Service Mathematics Teachers

[1*] Herani Tri Lestiana, [2] Santika Lya Diah Pramesti

[1] Bachelor's Program in Mathematics Education, Universitas Islam Negeri Siber Syekh Nurjati Cirebon, Indonesia.
[2] Bachelor's Program in Mathematics Education, Universitas Islam Negeri K.H. Abdurrahman Wahid Pekalongan, Indonesia.

*Corresponding Author e-mail: herani@uinssc.ac.id

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Abstract

Based on Expectancy-Value Theory, talent and interest are often assumed to relate to individual competence. However, few studies have examined talent, interest, and competence simultaneously using SEM-PLS. This study analyzed the direct and indirect relationships among talent, interest, and the teaching competence of prospective mathematics teachers using SEM-PLS. The participants were 87 fifth-semester students in the Mathematics Education Department at UIN Siber Syekh Nurjati Cirebon. Data were collected through an interest questionnaire, a talent test, and teaching-competence observations. The results indicated that talent had a positive but non-significant effect on interest ($\beta = 0.487$; $p = 0.127$) and teaching competence ($\beta = 0.236$; $p = 0.531$). Interest showed a negative but non-significant effect on teaching competence ($\beta = -0.243$; $p = 0.289$). The mediation test also showed that interest did not significantly mediate the effect of talent on teaching competence ($\beta = -0.118$; $p = 0.369$). The R^2 values were 0.237 for interest and 0.059 for competence, suggesting that the model explained a limited proportion of variance. These findings imply that teaching competence is more likely shaped through experience and social interaction in educational settings than as a direct outcome of talent or interest. The lack of significant relationships highlights the complexity of teaching-competence development. Practically, teacher education institutions should support talent and interest exploration while strengthening competence development through structured mentoring, early career exploration workshops, and systematic talent identification.

Keywords: Interest; Prospective Mathematics Teachers; SEM-PLS; Talent; Teacher Competence

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INTRODUCTION

Mathematics education plays an important role in developing students' logical, analytical and systematic thinking abilities. The quality of mathematics teachers greatly influences the development of these thinking skills (Astiati & Ilham, 2025; Kooloos et al., 2022; Saputra, 2024; Yang & Kaiser, 2022). Prospective mathematics teachers need to comprehend professional competencies, including the understanding of mathematics topics and how to convey the material well, creatively, and effectively in the classroom (Hidayat et al., 2024; Mighfar et al., 2024). In addition, pedagogical competence is also an important skill that teachers must have, including the ability to manage the learning process, including making lesson plans, implementing learning

activities, providing evaluations, and understanding student characteristics (Vîşcu et al., 2023). These two competencies greatly determine how teachers carry out the learning process in the classroom (Yang & Kaiser, 2022).

However, some previous studies revealed that many teachers struggle with the competency issues. A study by Radite and Retnawati (2023) showed that the mathematics teachers' competencies were low, with the average score is 33.8 out of 100. In addition, a systematic review by (Cevikbas et al., 2024) pointed that half of the studies they analyzed (50%, n=10) informed that pre-service and in-service teachers across countries have difficulties in designing mathematics lessons. Podkhodova et al. (2020) studied about mathematics teachers' professional competence and the result showed 24% teachers were in level I (the lowest level), 44% teachers were in level II, 9% teachers were in level III, and 23% did not succeeded in performing the basic level of professional competence. Lumbantoruan and Male (2022) also reported that teachers only have 20% pedagogical competency readiness and 10% professional competency readiness, which results in 80%-90% difficulty in implementing learning activities. Other studies also exposed that teachers are still found to have difficulty understanding the subject (Sandriyani et al., 2021) or showing low interest and motivation in the teaching profession (Halimahturrafiah & Marsidin, 2023; Widyastono, 2013).

According to Expectancy-Value Theory developed by Wigfield and Eccles (2000), individuals' interest on academic tasks and trust in their capability (talent) may affect their motivation to deal with particular academic tasks. This theory provides a basis framework to examine how talent, interest, and competence in teaching correlate to each other.

Talent is an innate potential that allows someone to master knowledge or skills in a particular field more easily after going through a learning and practice process (Skuza et al., 2022). Talent is a special ability in a certain domain that is carried since birth that makes it easier for someone to learn (Erlangga et al., 2024). This ability will develop well if it gets the right stimulation. In mathematics education, cognitive talent is very important because it is closely related to the ability to understand and teach mathematical concepts, while affective talent is related to their emotional readiness and commitment to the teaching profession. Reasoning, one form of talent, is the ability to process, connect, and draw conclusions from data or information provided (Asfar et al., 2021). Mathematics teachers must have verbal and quantitative reasoning skills, where both abilities are included in the cognitive talent domain. Prabawanto (2023) shows that critical thinking skills and cognitive domain management contribute significantly to the quality of understanding and teaching. In addition, Sarjana and Kertiyani (2022) also confirmed that verbal ability is related to mathematics performance. On the affective side, a teacher must have the ability to process emotions during learning activities (Gramipour et al., 2019), as well as commitment to their profession. Emotional control and commitment to the teaching profession have been proven to support successful teaching. A study by Wang et al. (2025) found that emotional regulation has a significant effect on teacher motivation and performance.

On the other hand, interest is an internal drive that makes individuals feel engaged and interested in something. According to Eccles and Wigfield (2002), interest is a form of pleasure and comfort for someone when doing an activity or

pleasure in a particular field. In this context, prospective teachers' interest in mathematics greatly determines the extent to which they will be motivated to learn all the competencies needed to become mathematics teachers and develop professionally. A research by Caspi and Gorsky (2024) shows that the quality of mathematics teaching has an impact on student interest. Moreover, a study by Harefa (2023) shows that high interest in learning is directly proportional to increased student learning outcomes in mathematics courses. On the other hand, low interest in becoming a teacher can affect how teachers carry out their duties as educators (Widyastono, 2013). Therefore, it is necessary to explore the relationship between the interests and competencies of prospective mathematics teachers.

Many previous studies have highlighted the influence of one variable on competence by using correlation or regression analysis, for example the influence of learning interest on academic results (Harefa, 2023), or talent on mathematical intelligence (Asbury et al., 2023; Patmawati & Prabawanto, 2022). There is a study by Wahidy and Fitria (2021) which investigated the role of interests and talents in the competency skills, yet their participants were school students. In addition, many studies have examined the correlation between different combination of variables such as teachers' motivation, competence, and performance (Bastian et al., 2022; Halimahturrafiah & Marsidin, 2023; Sandriyani et al., 2021; Septin et al., 2024) or discussed the importance of interest and motivation in academic success and its relation to career choice (Farisi et al., 2023; Shahid et al., 2022). However, limited studies simultaneously examine the relationship between talent, interest, and competence of prospective mathematics teachers by using SEM-PLS model. Therefore, to address this gap, by using SEM-PLS model this study aims to (1) analyze the direct relationship between talent, interest, and competence of prospective mathematics teachers, (2) analyze the indirect relationship between talent and competence, through interest as a mediator. It is expected that the results of this study can provide practical implications in the process of recruitment, curriculum design, and development of prospective mathematics teachers to be more in line with the potential and needs of the world of education.

METHOD

Research Design

The research is a quantitative study with a correlational design. The quantitative approach was chosen to test the relationship between the variables of talent, interest in becoming a mathematics teacher, and the competence of prospective mathematics teachers of prospective mathematics teachers statistically. The hypothetical model of the direct and indirect relationship between talent, interest, and competence of prospective mathematics teachers can be seen in Figure 1.

This model presents the hypothetical relationship between talent, interest, and mathematics teaching competence. Based on Expectancy-Value Theory (Wigfield & Eccles, 2000), individuals with strong interest and talent may influence their performance. Thus, mathematics teacher talent and interest of being a mathematics teacher are hypothesized to have a correlation to mathematics teaching competence. Moreover, interest is posited to mediate the relationship between talent and competence as it is hypothesized that individuals with talent in a specific field will have interest, and thus will affect the competence.

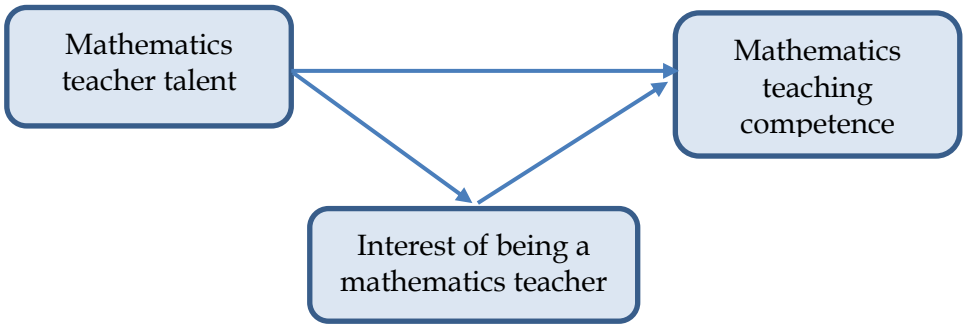

Figure 1. The Hypothetical Model

Population and Sample

The population in this study were all students of the Mathematics Education Department of UIN Siber Syekh Nurjati Cirebon. The participants of this study were 87 active students in the fifth semester. The sampling technique used was purposive sampling, with the criteria of currently taking the Microteaching course and willing to be respondents and follow all research procedures. The sample size follows the "10-times rule" for SEM-PLS, suggesting that the minimum sample size is ten-times the maximum number of indicators associated to any latent variables in the model (Jhantasana, 2023; Kock & Hadaya, 2018). According to Table 1, the maximum number of the latent variable is four. Thus, the number of participants included in this study meets the minimum sample size for SEM-PLS.

Data Collection

The data was collected by using questionnaires, tests, and observations. To measure interest in becoming a mathematics teacher, there were a total of 21 statement items. The domain of interest includes three aspects, namely cognitive, conative, and affective aspects (Ainley & Ainley, 2011; Hidi & Renninger, 2020). According to Amir (2017), cognitive aspect includes the understanding and knowledge of the teaching profession; affective aspect involves feelings of pleasure, enthusiasm, and interest in the teaching profession; and conative aspect is the desire and intention to behave in accordance with the teaching profession.

To collect the data of talent, there were two instruments used, namely a multiple-choice questionnaire and test. In the questionnaire to measure talent in the affective aspect, the indicators used included (1) emotion, namely emotional stability and the ability to manage feelings in the context of learning, and (2) commitment, namely the level of dedication and responsibility towards the teaching profession. The test instrument aims to measure students' talents in two domains, namely quantitative reasoning and verbal reasoning. Quantitative reasoning contains basic mathematical questions that aim to measure the ability to understand and solve mathematical problems, while verbal reasoning aims to measure the ability to understand and draw conclusions from the verbal information provided. This talent assessment instrument was adopted from the research of Manfaat (2019), who has developed a talent measurement tool with high validity and reliability

Observations were conducted to assess student competency in two aspects, namely pedagogical competency and professional competency. Pedagogical competency is the ability to design, implement, and evaluate effective learning. Indicators assessed in the pedagogical aspect include learning preparation, skills in opening learning, skills in using learning approaches/strategies, skills in making

variations, questioning skills, skills in using media/learning aids, skills in closing learning, and learning evaluation. Professional competency is mastery of subject matter and the ability to develop material according to the needs of students. Indicators assessed in the professional aspect include the quality of material mastery and the quality of material delivery. There are a total of 52 observation items arranged based on professional teacher competency indicators according to Perdirjen GTK No. 2626 of 2023. A summary of indicators for each variable is presented in Table 1 below.

Table 1. Indicators of Each Variable

Talent (B)		Interest (M)		Competency Variable (K)	
Indicator	**Code**	**Indicator**	**Code**	**Indicator**	**Code**
Verbal reasoning	B1	Cognitive	M1	Pedagogical competence	K1
Quantitative reasoning	B2	Affective	M2	Professional competence	K2
Emotions	B3	Conative	M3		
Commitment	B4				

After being developed, the instrument of teaching interest and teaching competence were validated to five experts in mathematics education and educational psychology experts (lectures) regarding its content and language. The validation average scores were 3.59 and 3.71 out of 4 for the instrument of teaching interest and teaching respectively. There were some suggestions related to its language, for example the suggestion to use more understandable sentences. After the improvement, the instrument of teaching interest and teaching competence were piloted on 27 students to determine their validity and reliability. The teaching interest and teaching competence instruments showed Cronbach's Alpha results of 0.813 and 0.855, respectively, indicating an acceptable reliability (>0.7) as stated by (Taber, 2018). The validity analysis using Pearson product-moment correlation showed that all $r_{result} \geq r_{table}$ (0.4438), indicating that all the items in the instruments are valid. Based on the results of the instrument pilot test, it can be concluded that the teaching interest and teaching competence instruments are valid and reliable.

Data Analysis

The analysis was carried out statistically using Structural Equation Modeling Partial Least Squares (SEM-PLS) analysis with the help of software SmartPLS 4 to identify the strength and direction of the relationship between variables. This method was chosen because it is able to test complex relationships between latent variables and their indicators simultaneously. The evaluations carried out in the SEM-PLS analysis include:

a. Evaluation of Measurement Model (Outer Model): Includes testing the validity and reliability of indicators.
b. Structural Model Evaluation (Inner Model): Includes determination coefficient (R^2) test and path coefficient significance test, the role of mediating variables, and model fit.
c. Common Method Bias: To find out whether the analysis results are influenced by common method bias

RESULTS AND DISCUSSION

Results

Path model diagram from the variables of talent, interest, and competence of prospective mathematics teachers and their respective indicators are presented in Figure 2. The results of the SEM-PLS analysis to determine the relationship between talent and interest, interest and competence, and talent and competence are described in the following sections.

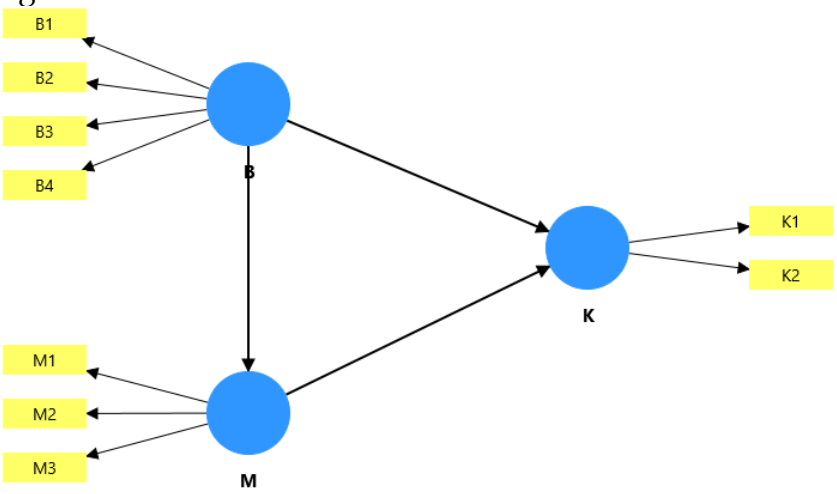

Figure 2. Path Model

Measurement Model

Figure 3 summarize the result of the measurement model, involving outer loadings and path coefficients. The outer loading results show the closeness of the correlation between the indicator and its latent variable. The higher the outer loading, the closer the relationship between an indicator and its latent variable. If the outer loading value is more than 0.7, the indicator is considered to be closely correlated with its latent variable and can be used to predict the value of its latent variable (Hair et al., 2022). In the results shown in Table 2 and Figure 3 that show there are several correlation values between 0.6 - 0.7, namely the outer loading values B1, B2, and M3. According to Byrne (2016) and Hair, et al. (2022), the outer loading value between 0.6 - 0.7 is still acceptable.

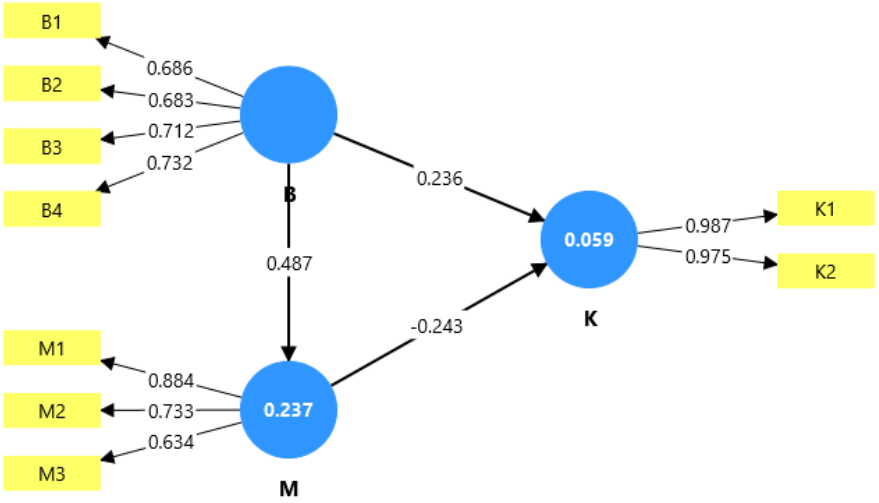

Figure 3. Outer Model Result Diagram

Table 2. Outer Loadings Results

Indicator	B (Talent)	K (Competence)	M (Interest)
B1	0.686		
B2	0.683		
B3	0.712		
B4	0.732		
Q1		0.987	
K2		0.975	
M1			0.884
M2			0.733
M3			0.634

In addition, the Composite reliability (rho_c) value can also be used to indicate the internal consistency value of a construct or variable as a whole. A high Composite reliability value indicates that the indicators in each variable are interrelated and can measure each of these variables. As can be seen in Table 3, although there are values less than 0.7 in the Cronbach Alpha and Composite reliability (rho_a) results, according to Hair et al. (2022) the range of reliability values of 0.6 - 0.7 indicates that the indicator is still acceptable for use in measuring variables. The Composite reliability value (rho_c) shows that all internal consistency values are more than 0.7. This shows that the indicators in the talent, interest, and competence variables have good reliability. For validity, the value of the average variance extracted (AVE) which shows the convergent validity value must have a minimum value of 50% (Hair et al., 2022). Competence and interest variable have AVE score 57.4% and 96.3% respectively. Even though the AVE value of the talent variable is 49.6%, it can be roundup to 50%.

Table 3. Construct Reliability and Validity Results

	Cronbach's Alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
B (Talent)	0.665	0.670	0.796	0.496
K (Competence)	0.962	1.048	0.981	0.574
M (Interest)	0.677	0.860	0.799	0.963

Structural Model

Figure 4 shows the results of testing the structural model or inner model, including the R^2 Value and the P values. R^2 value or the coefficient of determination in the structural model can be used to determine how much one variable contributes to another variable. In Table 4, it is obtained that the R value^2 on the interest variable 0.237 and on the competency variable 0.059. This shows that the talent variable can only contribute or explain the interest variable by 23.7%, while the talent and interest variables can explain or contribute to the competency variable by 5.9%.

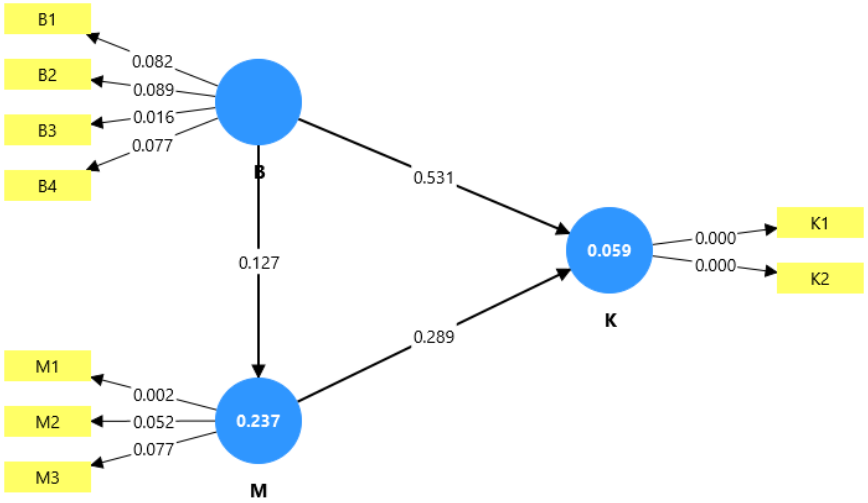

Figure 4. Inner Model Result Diagram

After knowing the R value², then the path coefficient value and significance level will be tested to determine whether the influence of each variable is significant or not. A positive path coefficient value indicates a positive relationship or influence, and vice versa. If the P values <0.05, it can be concluded that one variable has a significant effect on the other variables.

Table 4. Results of the Determination Coefficient R^2

	R-square	R-square adjusted
K	0.059	0.012
M	0.237	0.218

The test results are in Table 5 shows that all P values > 0.05. This shows that talent does not significantly affect competence, talent does not significantly affect interest, and interest does not significantly affect competence. It is known that the path coefficient value (original sample) of talent on competence is 0.236, meaning that talent has a positive effect, but not significantly, on competence. The path coefficient value (original sample) of talent on interest is 0.487, meaning that talent has a positive effect, but not significantly on interest. The path coefficient value (original sample) of interest on competence is -0.243, meaning that interest has a negative effect but not significantly on competence.

Table 5. Path Coefficient Test Results

	Original sample (O)	Sample mean (M)	SD	T statistics	P values
B → K	0.236	0.203	0.376	0.626	0.531
B → M	0.487	0.453	0.319	1.527	0.127
M → K	-0.243	-0.160	0.229	1.061	0.289

Based on the results of the mediation test on Table 6, information is obtained related to the indirect influence of talent variables on competency variables, through the intermediary variable of interest. The value obtained in the original sample is -0.118 and P values 0.369. These results indicate that the interest variable does not significantly mediate the relationship between talent and competency variables.

Table 6. Results of Specific Indirect Effects Test

	Original sample (O)	Sample mean (M)	SD	T statistics	P values
B → M → K	-0.118	-0.100	0.132	0.898	0.369

Model fit analysis is used to determine whether the result or model of the relationship between the variables obtained fits with the data or not. According to Table 7, although the SRMR value indicates that the model does not fit, other key model fit indicators (d_ULS, d_G, and NFI values) shows acceptable ranges. This difference in results is possible in SEM-PLS analysis, especially in models with complex variables or small sample sizes. Hair et al. (2022) suggests that model fit evaluation should involve various fit indices. In addition, the interpretation of other results such as d_ULS and d_G is suitable for evaluating composite-based models. Therefore, as the d_ULS, d_G, and NFI indices indicate model adequacy, the model of the relationship between the variables of talent, interest, and teaching competence is still considered fit with the data. The reference source used in determining the parameter values of the model fit is Wiyono (2020). Furthermore, the Goodness-of-Fit (GoF) index calculation, obtained from the square root of the multiplication of the AVE mean and R square mean, showed a result of 0.32, categorized as medium size according to Wetzels et al. (2009), indicating that the model created is quite good and fits the existing data.

Table 7. Model Fit Analysis

	Saturated model	Estimated model	Parameter	Interpretation
SRMR	0.153	0.153	<0.1	Not Fit
d_ULS	1.050	1.050	>0.05	Fit
d_G	0.289	0.289	>0.05	Fit
NFI	0.582	0.582	Approaching 1	Fair

Common Method Bias

The common method bias test refers to the Inner VIF (Inner Variance Inflated Factor) results in the SEM PLS output. According to Kock (2015), the inner VIF value for each variable must be <3.3 to indicate that a study is not affected by common method bias. The Inner Model VIF results in Table 8 show that the inner VIF value for each variable is <3.3, thus concluding that this study is free from common method bias.

Table 8. Common Method Bias Analysis (Inner VIF)

	B	K	M
B		1.311	1.000
K			
M		1.311	

Discussion

This study aims to analyze the relationship between talent, interest in becoming a mathematics teacher, and the competence of prospective mathematics teachers in prospective mathematics teacher students using Partial Least Squares Structural Equation Modeling (PLS-SEM) analysis. The results of this study indicate that

although there is a positive relationship between the variables of talent, interest, and competence, the relationship is not statistically significant.

Talents and Interests

The relationship between talent and interest shows a positive direction, although not significant. Theoretically, individuals who have talent in a field tend to show greater interest and allow individuals to learn faster (Spies et al., 2022). However, the results of this study reveal that this potential does not automatically have a significant effect on interest. In this case, the relation between talent and interest may be indirect or moderated by external factors, such as social support, instructional experience, or educational culture (Lee, 2021). The non-significant path suggests that participants' interest in teaching profession may develop independently of their talent. Although students with high mathematical abilities tend to show good academic performance, the tendency to choose and remain in the teaching profession is greatly influenced by affective and environmental aspects (Fitria, 2023), not just by talent.

Interest and Competence

The SEM-PLS analysis showed an unexpected negative and non-significant relationship between interest and teaching competence. This finding supports the study of Septin et al. (2024), revealing that motivation, a concept similar to interest, has no positive and no significant effect to teachers' performance. This discovery suggests that high interest to be a teacher does not necessarily contribute to high teaching competence. Even though students are interested in becoming mathematics educators, many factors such as learning facilities, constructive feedback, and the social and family environment can impact the development of teaching competence. If these factors do not support students' interest in becoming mathematics teachers or educators, then the influence of interest may be insignificant on competence. For instance, the participants may show an interest to become a mathematics teacher, yet the learning environments distracts them, or an unexpected reason appears in the teaching competence assessment. As the result, they cannot show their real competence in the teaching practice.

This result contradicts the Expectancy-Value theory that interest is generally seen as a strong driver in developing competence because interest encourages active involvement in learning (Renninger & Hidi, 2015). Interest in becoming a mathematics teacher that is not accompanied by opportunities for self-actualization—such as support for the learning environment and appropriate training—is not enough to produce good mathematics teacher competence (Madina et al., 2022). Although initial interest in a field encourages individuals to learn, the direct relationship between interest and long-term competence is often mediated by learning strategies, self-regulated learning, and self-efficacy (Xu et al., 2024). In other words, interest does not necessarily result in competence without any training and self-reflection mechanisms. This strengthens the possibility that interest in becoming a mathematics teacher alone is not strong enough to result in increased competence of prospective mathematics teachers.

Talent and Competence

The relationship between talent and competence also shows a positive but insignificant direction. This finding emphasizes that talent as a basic potential does not always directly result in competence. This result is in line with the statement of

Williams and Hodges (2023), that competence requires structured practice, consistent feedback, and experience to develop. Talent is only the beginning of potential success; without proper development, this potential may not be utilized optimally.

In the context of teacher education, math talent refers to basic cognitive abilities such as logical thinking, conceptual understanding, and problem-solving skills that are the foundation for mastering and teaching mathematics effectively. Several studies have shown that cognitive talent alone is not enough to ensure success in the teaching profession (García-Martínez et al., 2021). For instance, participants who have a great cognitive ability may not show a good teaching competence if they lack of confidence, or they never practice their teaching skills. Thus, the insignificant correlation between talent and teaching competence is not necessarily anomalous. Rather, it reflects that intrinsic and extrinsic support, continuous practice, and adaptive curriculum are essential for the competence of prospective mathematics teachers to be formed comprehensively.

Indirect Influence (Interest Mediation)

The mediation analysis in this study showed that interest did not significantly mediate the relationship between mathematics teacher talent and teaching competence. Interest may act as a potential mediator, but its influence is not strong enough or might be hampered by other variables not included in the model, such as self-efficacy, achievement motivation, or external support (Bandura, 2001; Eccles & Wigfield, 2023). Another possible factor affecting this insignificant mediator role is professional identity development, which determines how prospective teachers explore their roles and responsibilities as teachers, and determines how much interest influences their teaching competence.

Overall, the results of the SEM-PLS analysis indicate that the model proposed in this study has low predictive power (R^2=5.9%), which indicates that there are other variables that may be more dominant in explaining participants' competency as prospective mathematics teachers. There are some possible explanations to this result. The small size of sample possibly limits variability in responses. Moreover, the teaching competency observations were conducted over a limited period, which may not represent comprehensive competence development. As an example, unanticipated reasons appeared during the assessment process – such as sickness or personal problems – may affect their performance, leading to inaccuracy in portraying participants' true competences.

The results of this study can be explained using the Expectancy-Theory value framework (Figure 5), proposed by Wigfield and Eccles (2000), that achievement or performance is influenced by various factors such as social influences, cognitive processes, motivational beliefs, task value, and expectancy for success.

Furthermore, a research by González et al. (2023) emphasized that the competence of prospective mathematics teachers is more influenced by practical teaching experience, self-reflection, and mentor guidance, compared to cognitive factors or initial interest alone. In other words, competencies develop through experience and social interaction in the educational environment, not as a direct result of talent or interest. In this context, if the learning environment does not optimally support the development of prospective teachers' skills and competencies, then talents and interests will not develop into real competence.

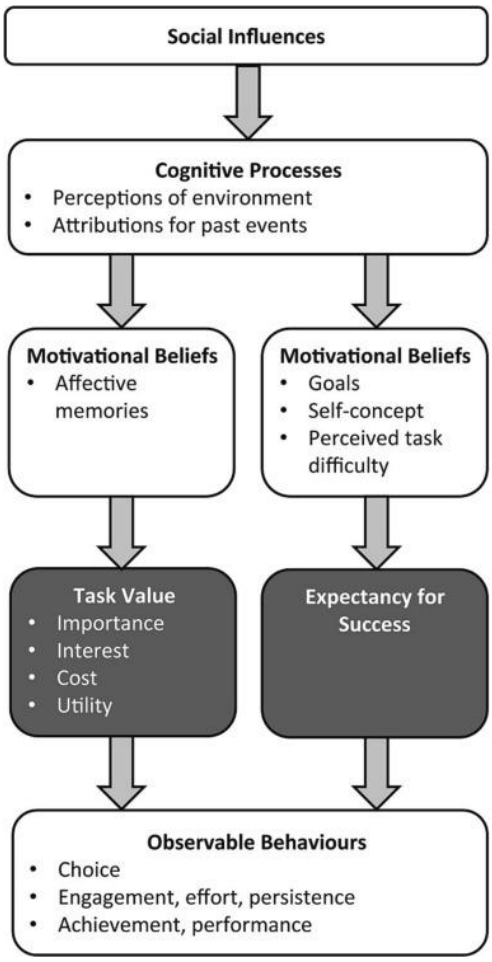

Figure 5. Expectancy-Value Theory Framework (Bandhu et al., 2024)

CONCLUSION

This study aims to analyze the relationship between talent, interest, and competence in prospective mathematics teachers using SEM-PLS analysis. In contrast to theoretical expectations, results of this study indicate that the relationship between talent, interest, and competence of prospective mathematics teachers is not statistically significant. The relationship between talent and interest, and between talent and competence show a positive direction, although not significant. Unexpectedly, the relationship between interest and competence in this study shows a negative direction and is not significant. In addition, the model proposed in this study shows a low predictive power (R^2=5.9%), indicating that the talent, interest, and teaching competence merely explains a small portion of relationship.

The insignificance of these relationships provides a theoretical contribution regarding the complexity of comprehensive teaching competencies development, which may be influenced by many variables, such as social supports, learning environments, or individuals' psychological constructs. This finding suggests that teaching competencies develop through experience and social interaction in the educational environment, not as a direct result of talent or interest. Talent and interest do contribute to individual readiness to become teachers, but those factors are not adequate to describe comprehensive teaching competence during early professional training. Competency development requires more than talent or interest; it is also influenced by environment support, instructional experience, or educational culture.

RECOMMENDATION

For practical implications, teacher education institutions need to provide space for exploration of talents, interests and career support to improve the competence of qualified mathematics teacher candidates. The teacher education program should support the development of teaching competencies of prospective teachers, for example through continuous teaching practice and mentorship. Furthermore, the institution should provide career supports, workshops, or opportunities for prospective teachers to enhance their teaching identities.

This study is limited to only one department and one university. Thus, to improve the generalizability, future studies may involve broader sample diversity. Moreover, further research is needed to examine the relationship between talents, interests and competence of prospective teachers in a wider scope by using moderators or mediators. Further research could examine various possible factors that indirectly mediate between teacher talent and competence through interests such as self-efficacy, motivation, or external factors such as learning environments. Adding these factors could provide a more comprehensive and in-depth picture of how prospective mathematics teachers' talents and interests relate to teaching competence through the mediation of internal and external factors of prospective teachers.

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Author Contributions Statement

Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
Herani Tri Lestiana	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
S. L. Diah Pramesti		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	

Conflict of Interest Statement

Authors state no conflict of interest.

Informed Consent

We have obtained informed consent from all individuals included in this study.

Data Availability

The data that support the findings of this study are available on request from the corresponding author. The data, which contain information that could compromise the privacy of research participants, are not publicly available due to certain restrictions.

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