

The utilization of the partial credit model to create social competency assessment tools for pre-service educators

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Abstract

Social competence encompasses a dynamic interplay of cognitive, emotional, and interpersonal abilities that enable individuals to engage effectively in social interactions. For educators, particularly pre-service teachers, social competence is essential for navigating diverse classroom environments and fostering meaningful relationships. This study aimed to construct, validate, and evaluate the psychometric properties of a social competence scale and to assess the overall tendencies of pre-service teachers in this domain. The scale was developed based on four dimensions: attitudes, communication, adaptation, and professional orientation. Factor analysis confirmed a unidimensional model, indicating a coherent construct underlying the instrument. Item characteristics were examined

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using the Polytomous Item Response Theory with the Partial Credit Model. The results showed that the scale possessed strong item discrimination and appropriate item difficulty levels, ranging from -1.64 to 0.22. The social competence levels of pre-service teachers ranged from -0.87 to 0.69, suggesting moderate variability in their social adaptability and readiness. These findings support the instrument's utility for assessing and enhancing social competence in teacher education programs.

Keywords: Item response theory; pre-service teachers; psychometrics; social adaptation; social competence

1. INTRODUCTION

Technological developments and advances greatly affect the character formed in students. This character will affect the mindset, way of learning, and how to respond to act from a student (Broda et al., 2018; Gandhi et al., 2020). This character will also be a provision that can be used in future life and produce self-capacity and quality for students (Bayraktar et al., 2018; Ryan & Deci, 2019). This can support a good future for students and is adjusted to their abilities. In showing an increase in the capacity and quality of students, teachers need to have role models and be role models (Horsburgh & Ippolito, 2018; van Leeuwen & Janssen, 2019). This figure is in the form of responsibility, authority, independence, and discipline in carrying out their duties and functions (Putri et al., 2019; Shaturaev, 2021). This is reflected in the four competencies possessed by teachers, specifically, social competence, personality competence, pedagogic competence, and professional competence.

One of the competencies that can be used as capital or the main provision of teachers in strengthening the realization of student character is the teacher's social competence and personality competence. Improve social competence through speaking style, habituation in the workplace, attitudes through experiences and mistakes, ways of explaining, human relations with the environment, ways of thinking, behavior, lifestyle according to norms, and wise decision-making (Karačić, 2022; Lötter & Lötter, 2021; Maiese et al., 2019). Based on this improvement in social competence, teachers are expected to become role models that their students will imitate. In the learning process, students are required to have a sense of responsibility to develop attitudes, improve knowledge and skills, and have a high willingness to complete the assigned mandate (Apriana et al., 2019; Dryburgh et al., 2020; Irawatie et al., 2019; Junge et al., 2020). Furthermore, students are directed to become educated and have a good civilization through social competence (Martinsone et al., 2022).

Character education constitutes a deliberate and structured effort to nurture and enhance the potential of students, thereby facilitating the development of individuals who are beneficial to both themselves and their surroundings (Fiala, 2024; Arda Tuncdemir et al., 2022; de Lara et al., 2024). Lickona (1992) asserts that character education is a purposeful initiative aimed at enabling individuals to comprehend, value, and adhere to fundamental ethical principles. This process involves a direct approach with students to instill moral values and impart moral knowledge, thereby preventing undesirable behavior (Santrock, 2011). In Indonesia, character education represents an educational framework designed to instill specific character values in students, encompassing components of knowledge, awareness, and the commitment to implement these values. Character education is intrinsically linked to moral education, to shape and continuously develop individual capacities for self-improvement and progression toward a more fulfilling life. Additionally, character education serves to: 1) cultivate fundamental human potential, fostering individuals who think critically, possess virtuous dispositions, and exhibit exemplary behavior; 2) strengthen the conduct of a multicultural society; and 3) enhance the nation's civilization, fostering competitiveness on the global stage.

Character education can be delivered through socialization or a teacher-centric approach. Socialization may involve inviting guest speakers to conduct training sessions for teachers, with the expectation that such initiatives will positively influence students (Bakar, 2018; Albareda-Tiana et al., 2018). The impact on students can manifest through mentorship in various activities, with real-world applications integrated into daily life and the immediate environment, presenting opportunities for recognition by students (Junge et al., 2020; Santoso et al., 2020). This underscores the crucial role teachers play in shaping students' character (Baharun & Ummah, 2018; Dewaele et al., 2019). Despite the government's character education program, its

implementation remains incomplete, with certain teachers still lacking the requisite skills to effectively integrate character values into their instruction.

Teachers' social competence, as reflected in classroom dynamics, continues to fall short of fully demonstrating the extent to which teachers serve as role models for students (Francis et al., 2018). To address this, the Indonesian government has proposed the development of a teacher competency assessment, encompassing four areas of competence, one of which is social competence. The results of these assessments indicate that teachers' social competence remains comparatively low. This deficiency highlights the necessity of nurturing teachers' social competence, as it reflects their overall quality (Varela et al., 2020). Teacher performance, particularly in instructional settings, often fails to meet the demands of professional competence, emphasizing the need for further maturation and development of social competence in prospective teachers. Therefore, interventions, such as the implementation of social competency assessments for prospective teachers, are essential (Yemini et al., 2019).

Prospective teachers must possess elevated social competence and exhibit exceptional skills when confronted with challenges and scenarios within the school environment (Burnes, 2017). The rationale for conducting social competency assessments stems from the need for prospective teachers to demonstrate their authentic and comprehensive identities, to inspire others through exemplary conduct, and to cultivate harmonious, dynamic, persuasive, innovative, and creative interpersonal relationships (Devine & Apperly, 2022; Hukkelberg & Ogden, 2020). Such attributes are critical to assessing the effectiveness of interventions and services provided to students during the learning process. Social competence enables prospective teachers to engage productively with colleagues and students, facilitating adaptation and interaction in the educational setting.

An assessment strategy that aligns with the desired outcomes is essential in any evaluation process. A comprehensive assessment of prospective teachers' social competence should be conducted to ensure the accuracy of measurement (Carstensen and Klusmann, 2021). Evaluating social competence involves multiple perspectives on social cognition (Hukkelberg and Ogden, 2020), with this understanding demonstrated through the application of appropriate strategies and behaviors by established norms. Teachers must employ diverse cognitive approaches when responding to environmental factors, necessitating habituation practices that ultimately influence their performance in providing instructional support (Taborsky, 2021). Consequently, exploring, developing, and assessing social competence in prospective teachers is imperative.

1.1. Purpose of study

Based on the description above, there is a need for a review of the assessment of social competence in prospective teachers that have existed so far, by identifying the constructs of social competence in the assessment. This study aims to 1) develop a construct of social competence, 2) develop an instrument by conducting tests according to the dimensions formed, 3) determine the suitability of the scoring model and item characteristics, and 4) assess the social competence of prospective teachers.

Based on the awareness of the importance of social competence possessed by prospective teachers, this study specifically aims to explore the construct of social competence, develop instruments, determine model fit, estimate item characteristics, and assess social competence of prospective teachers. Thus, this research is directed to answer the following research questions.

- a. What is the construct of the social competence of prospective teachers?
- b. What is the quality of the social competence instruments based on the constructs that have been prepared?
- c. How is the suitability of the scoring model generated from the construct on the social competence of teacher candidates?
- d. What is the social competence profile of prospective teachers?

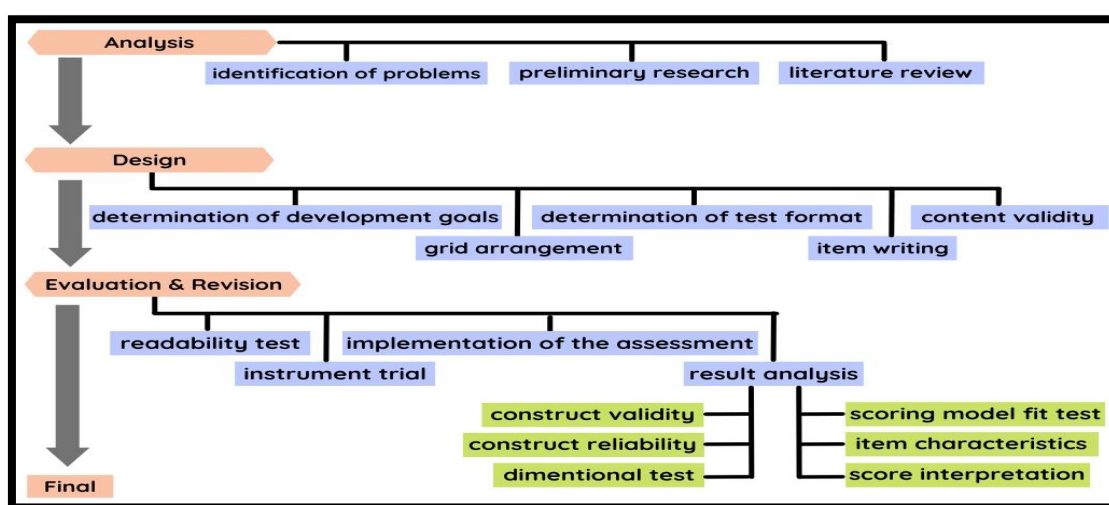
2. METHODS AND MATERIALS

2.1. Research design

The development model used in this study is a modification of the Plomp Model, which is integrated with the test development stage of Lane et al. (2015). The four stages of development (Plomp, 2013) in this study include analysis, design, evaluation, and revision. The stages of instrument development, as outlined by Lane et al. (2015), include the following integrated steps: 1) Overall plan; 2) Content definition/domain definition and claims statements; 3) Test/content specifications; 4) Item development; 5) Test design and assembly; 6) Test production; 7) Test administration; 8) Scoring of test responses; 9) Passing/cut scores; 10) Test score reports; 11) Item banking/security of the test; and 12) Test technical report/test documentation. Figure 1 illustrates the procedure for developing a social competency assessment model.

Figure 1

The procedure for developing a social competency assessment model



2.2. Participants

The population of this study was students of the undergraduate education study program for prospective teachers at the secondary school level (SMP and SMA), a many as 621 students. These students consist of third-level students at five universities that organize teacher education study programs. The universities consist of Yogyakarta State University (UNY), Indonesian Education University (UPI), Surabaya State University (UNESA), Ganesha Education University (UNDIKSHA), and Gorontalo State University (UNG). The selection of campuses that will be used as research locations is a campus with the authority to organize educational programs for prospective teachers in Indonesia, monitored and evaluated by the Ministry of Research and Higher Education. At the same time, the field of study for students is obtained based on the curriculum that applies to secondary schools in Indonesia. Four compulsory subjects are tested nationally, including Mathematics, Science, Social Sciences, and the Indonesian Language. Therefore, the respondents of this study focused on undergraduate students in these four fields of study. This study uses the formulation of the sample size of Krejcie & Morgan (1970). This is based on sampling, with all members having the same opportunity to be sampled. The formulation can be detailed with the proportion of the population being 0.5, the confidence level being 95, so it is 3.84, and the confidence level margin of error is 0.05. This results in a total sample of 347 students. Not only that, but the number of pieces used also considers the proprietary Confirmatory Factor Analysis rule (Wang & Wang, 2020), where the number of samples is at least ten times the number of items on the instrument. By the ethical guidelines for educational research (BERA, 2011), researchers ensure the confidentiality of participant demographic information. Table 1 shows the sample.

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$$n = \frac{\chi^2 NP(1 - P)}{e^2(N - 1) + \chi^2 P(1 - P)} = 237,57 \approx 238$$

Table 1

Research sample

Undergraduate Study Program	Number of respondents		
	Readability test	Instrument Trial	Implementation of Assessment
Mathematics education	9	48	151
Science Education	6	22	61
Social Studies Education	6	18	53
Indonesian Language Education	6	28	82
Total	27	116	347

2.3. Data collection instrument

There are three social competence instruments used, namely 1) study sheets, 2) instrument readability sheet, and 3) instrument review sheet. The study instrument was given to seven lecturers in a Focus Group Discussion (FGD), which examined the scope of competence, competency suitability, and language. The instrument readability sheet reveals the ease with which the items can be understood and the clarity of the instrument. Then the instrument review sheet revealed the suitability of the material, construction, and language. The development of the social competence instrument uses twelve steps for the development of effective tests with a structured and systematic process to create an effective testing program for all types (Lane et al., 2015). Table 2 shows the Criteria for formulating social competence and writing items

Table 2

Criteria for formulating social competence and writing items

Aspect		Criteria
Scope of competence	-	Contains aspects of social competence
		There is no overlap between aspects of competence
		Social competence contains various things related to social aspects that are mastered by the teacher.
Competency match	-	Social competence is the need to fulfill the duties and responsibilities of teachers.
		Social competence by the needs of teacher professional development
Theory	-	Items according to indicators
		Fill in the material according to the purpose of the measurement
Construction	-	The subject matter is formulated briefly, clearly, and firmly
		The formulation of the main questions and the answer choices is required statement
		The subject matter does not give clues to the answer key
		The subject matter is not a double negative statement
Language	-	Item questions do not depend on the previous question
		Using language that is by Indonesian rules
		Use clear and easy-to-understand language
		Sentences do not cause multiple interpretations

Social competence is measured using a Likert scale to measure the attitudes or opinions of prospective teachers towards the phenomenon or stimulus given. Respondents indicated their level of agreement with a series of statements related to social competence. There are 5 levels of agreement, ranging from strongly agree to strongly disagree, which are expressed by statements according to the phenomenon or stimulus, which are arranged randomly. Respondents choose one of the 5 choices of statements that best suit their social competence. The social competence instrument covers 4 aspects (attitude, communication, adaptation, and profession) and consists of 30 statement items. Table 3 is an example of a statement on the social competence scale of each aspect.

Table 3

Sample questions on the social competency scale

Aspect	Sample Questions on the Social Competency Scale
Attitude	<p>One of your students asked for time for a consultation. At the same time, you have promised to accompany your partner to solve personal problems, then the attitude you will take is</p> <ul style="list-style-type: none"> A. Tell your partner to make another schedule B. Tell your partner to wait until the consultation activity is finished C. Ask the student to wait until you go home with your partner D. Ask the student to schedule a consultation on another day E. suggested that the student find another teacher
Communication	<p>At a school meeting, you submit a proposal about the school's progress plan, but the proposal is rejected by your colleagues. Then the attitude you will take is ...,</p> <ul style="list-style-type: none"> A. expressing gratitude, paying attention to the reasons for refusal, and trying to find a better alternative for the benefit of the school B. Say thank you, listen to the reasons for rejection while waiting for the opinions of other friends C. Keep thinking positively, and return the decision to the forum to determine the best decision D. ignoring the opinion of colleagues and submitting to the chairman of the meeting E. ignoring the opinion of colleagues and defending the opinion you have conveyed
Adaptation	<p>Your school will carry out a program for developing school facilities and infrastructure in the form of building a hall for meetings with parents. The available funds are not sufficient for this development. Meanwhile, the socio-economic conditions of the community around the school and most of the students' parents are underprivileged. Then the most appropriate and realistic action is</p> <ul style="list-style-type: none"> A. Involve the community and parents of students to be able to contribute according to their abilities B. Provide opportunities for parents and the community as volunteers to seek donors and collect community funds C. Provide opportunities for parents and the community to donate their energy D. involve parents and the community as paid workers E. not involving the surrounding community or parents of students, because it will burden them
Profession	<p>You are attending a seminar on teacher learning innovation organized by the Provincial Education Office. When the material was running, the instructor gave an example of learning innovation. However, from the examples given, you feel that it is less appropriate than the learning innovations that you have made. Then what will you do is</p> <ul style="list-style-type: none"> A. Appreciate the example that has been given by the instructor B. took the initiative to give examples of what I have done regarding learning innovation C. choose silence and listen to the material from the instructor D. Blame the example that has been given by the instructor E. Tell a close friend that I have made learning innovations

2.4. Data analysis

The data analysis of the FGD results was carried out qualitatively by analyzing the input of the participants, identifying the most dominant findings, and formulating conclusions according to the objectives of the FGD implementation. The data from the results of the readability test were analyzed descriptively and quantitatively by being presented in the table of the results of the tabulation of the responses of the respondents. Content validity data were analyzed using the Aiken formula. Analysis of the test results of the instrument was used to determine the construct validity of the instrument, the reliability of the instrument, the dimensionality test, the suitability of the scoring model, and the characteristics of the items. The

instrument construct was validated by Confirmatory Factor Analysis using LISREL software. Instrument reliability using Alpha Cronbach and omega reliability to determine the reliability of the construct. The dimensionality test, the fit of the scoring model, and the item characteristics were analyzed with the help of R software. The results of the assessment were analyzed using descriptive statistics to interpret the scores.

3. RESULTS

In an assessment, it is necessary to set a standard measure to make an appropriate assessment. A standard measure is an action that has been performed following a consistent set of directions for a large (usually) sample of individuals from the target population (Finch & French, 2018). This is to ensure that the test conditions are the same for all individuals being assessed. To be able to do a good assessment, the instrument is the main key. Therefore, the construct of social competence becomes important as the basis for developing social competence instruments. An assessment will be influenced by the accuracy in doing the scoring. Without proper scoring, misjudgment will occur (Mardapi, 2017). Assessment using valid and reliable instruments, as well as the right scoring model, will result in an accurate estimate of social competence.

3.1. The social competency construct

Social competence is related to the ability of teachers as part of the community to communicate and interact effectively with students, between teachers, education staff, parents/guardians of students, and the surrounding community. From several opinions about aspects of social competence, it can be concluded that aspects of social competence consist of social skills consisting including interpersonal behavior, behavior towards self, and behavior towards tasks. The next aspect is adaptive behavior, which consists of independence, physical development, language, and academic development. The last aspect is peer acceptance, namely the extent to which individuals are accepted by their friends (Zhao et al., 2024).

Social competence has four aspects, namely attitude, communication, adaptation, and professionalism. The four aspects are translated into 9 indicators, then the indicators are translated into 30 items. The social competence assessment items were developed according to the criteria for formulating social competence and writing items, then content validation was carried out by the validator. Validity refers to the extent to which evidence and theory support the interpretation of scores (Aera, 1999). Content validity refers to the extent to which the items in the instrument represent the components in the overall content to be measured and the extent to which the items reflect the behavioral characteristics to be measured. The next test is the validity test using the formula from Aiken (1985). The decision for item validity is made by comparing the calculation of the Aiken index for each item with the reference value of the Aiken Table (Table 4).

Table 4

Social competency assessment grids and content validation results

Aspect	Indicator	Items	Aiken Index
Attitude	AT1: The teacher is inclusive and objective towards students, peers, and the surrounding environment in carrying out learning	I1, I2	0,86 – 0,96
	AT2: Teachers do not discriminate against students, peers, parents, and the school environment because of differences in religion, ethnicity, gender, family background, and socioeconomic status.	I3, I4, I5	0,82 – 0,96
Communication	C1: The teacher communicates with peers and other scientific communities in a polite, empathetic, and effective manner	I6, I7, I8	0,89 – 0,93
	C2: The teacher communicates with parents and the community in a polite, empathetic, and effective manner about the learning program and student progress	I9, I10	0,86 – 0,96

Adaptation	C3: Teachers involve parents and the community in learning programs and in overcoming students' learning difficulties	I11, I12, I13, I14	0,82 – 0,96
	AD1: Teachers adapt to the work environment to increase effectiveness as educators	I15, I16, I17, I18	0,89 – 0,96
	AD2: Teachers carry out various programs in the work environment to develop and improve the quality of education in the area concerned	I19, I20, I21, I22	0,86 – 0,96
Profession	P1: The teacher communicates with peers, scientific professionals, and other scientific communities through various media to improve the quality of education	I23, I24, I25, I26	0,82 – 0,964
	P2: The teacher communicates the results of learning innovations to the professional community themselves orally and in writing or other forms	I27, I28, I29, I30	0,85 – 0,93

The validation results show that the assessment instrument includes a representative content domain of social competence. This is shown from the Aiken index generated from 7 raters with 5 score criteria, and the significance used is 0.05, so the minimum Aiken reference value is 0.75. Based on the calculation, the Aiken index is found to be in the interval 0.821 – 0.964, so it is concluded as a valid item or fulfills content validation. The dimensionality test was conducted to analyze many different latent variables in determining the score of each item. Dimensionality testing aims to prove the unidimensionality/multidimensional nature of the developed test, but not to determine many dimensions. If the dimensional test results show that there is one dimension involved, then the estimated test parameters will be analyzed using the IRT approach. This can be seen from the eigenvalues and scree plots (Table 5, Figure 2).

Table 5

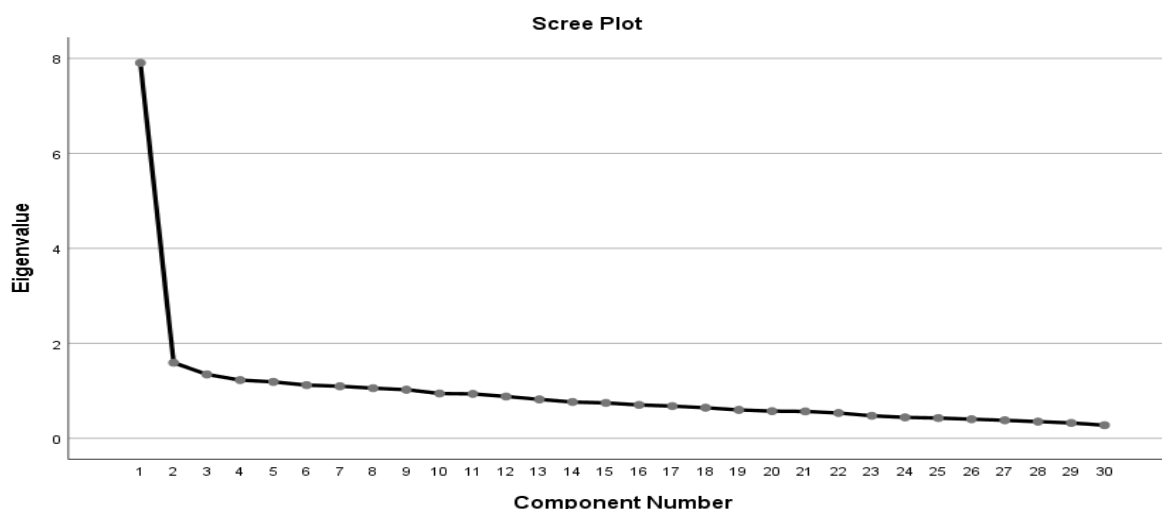
Determination of instrument dimensionality based on total variance explained

Component	Total	Initial Eigenvalues % of Variance	Cumulative %
1	7.906	26.353	26.353
2	1.592	5.306	31.659
3	1.344	4.481	36.140
4	1.226	4.085	40.225
5	1.188	3.959	44.185
6	1.120	3.733	47.918
7	1.096	3.654	51.572
8	1.056	3.520	55.091
9	1.023	3.410	58.501
10	.943	3.144	61.645
30	.276	.919	100.000

Extraction Method: Principal Component Analysis.

Figure 2

Scree plot to determine instrument dimensionality



The percentage of the first eigenvalue to the total of 26.353% ($> 20\%$) indicates a unidimensional scale. This is also supported by the scree plot, which shows 1 steep. The construct validity of the social competence instrument is shown by the LISREL software output. The social competence instrument, consisting of 4 aspects, 9 indicators, and 30 items, has a good construct, so it can be used to estimate the social competence of prospective teachers correctly. Figure 3 shows the relationship between variables - aspects - indicators of social competence, having a valid construct model, which is indicated by $p\text{-value} = 0.41774 (\geq 0.05)$ and $RMSEA = 0.015 (\leq 0.08)$. In more detail, the relationship of aspects, indicators, and items of social competence has a valid model construct. It is shown in Figure 4 has $p\text{-value} = 0.28726 (\geq 0.05)$ and $RMSEA = 0.041 (\leq 0.08)$ for the attitude aspect, and Figure 5 has $p\text{-value} = 0.14125 (\geq 0.05)$ and $RMSEA = 0.048 (\leq 0.08)$ for the communication aspect.

Figure 3

The construct of the instrument in terms of the relationship between variables, aspects, and indicators

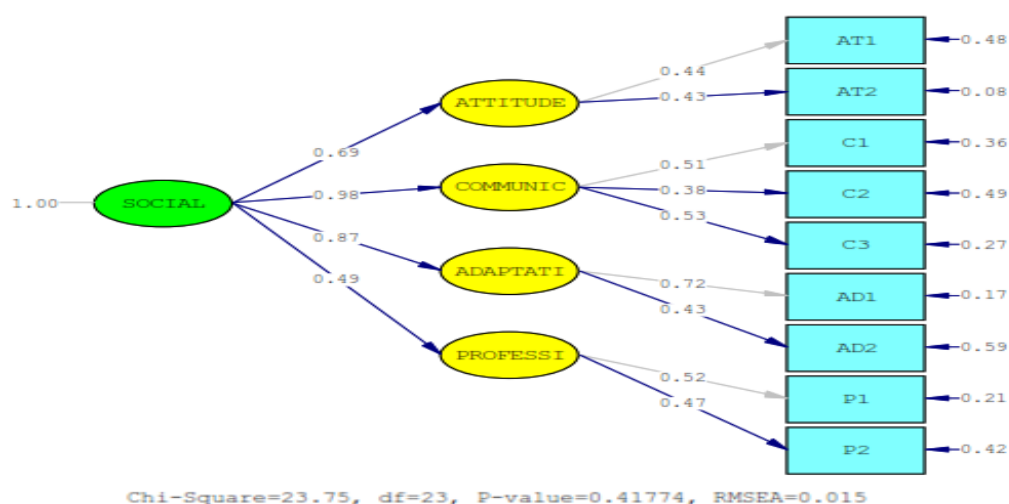


Figure 4

The instrument construct is viewed from the aspect - indicator - item relationship on the attitude aspect

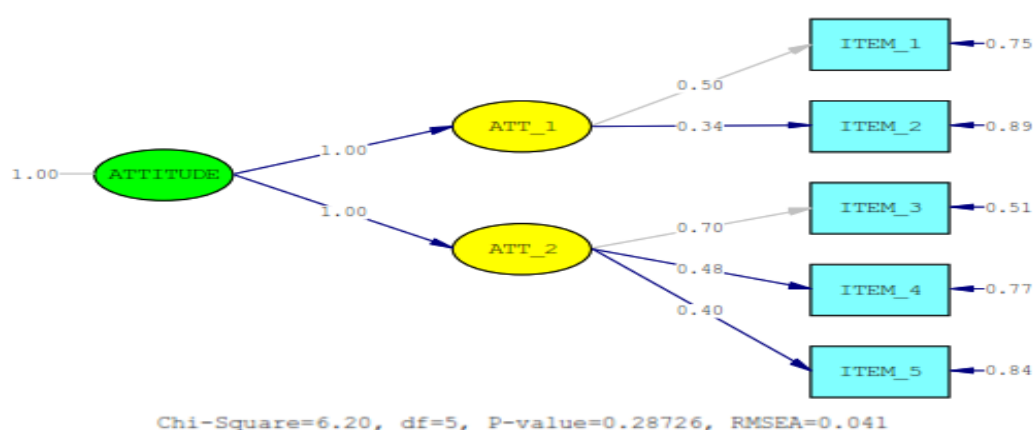
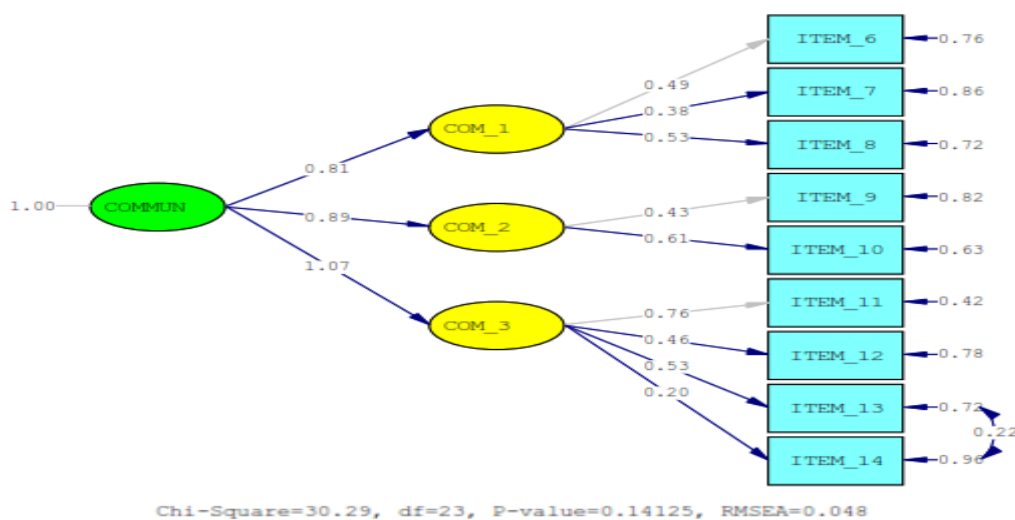


Figure 5

The instrument construct is viewed from the aspect - indicator - item relationship in the aspect of communication



The social competence instrument was proven to be reliable, as indicated by the correlation of the observed score with the actual score. Cronbach's alpha coefficient resulting from testing the social competence instrument is 0.878, indicating that the higher the reliability coefficient, the more accurate the results. Construct reliability can be estimated based on the factor load of each instrument component indicator (λ) and the unique error index of each indicator (δ). The omega reliability coefficient resulting from testing the social competence instrument is 0.744, indicating that the instrument construct is reliable. This means increasing the chances of making the right decisions in this study.

3.2. Suitability of social competency scoring model

The results of the dimensionality test show that the social competence instrument measures 1 dimension, so that the analysis of the estimated social competence of pre-service teachers uses IRT. The polytomous IRT model can be classified as a nominal item response model and an ordinal item response model depending on the assumption of data characteristics (DeVellis & Thorpe, 2021). This social competence scale has assumptions following the ordinal scale, namely, categories can be sorted from the lowest to the highest order, but there is no distance or interval between the positions of one category and another category. Several scoring approaches/models allow for the analysis of social competence, namely the Graded Ratings Scale Model, Graded Response Model, Partial Credit Model, and Generalized Partial Credit Model. The four scoring models have different assumptions regarding the many logistical parameters and the order of difficulty

between categories. Based on the scoring model fit test, it is proven that PCM is the most appropriate scoring model (Table 6).

Table 6

The results of the suitability of the scoring model with the PCM approach

Item	S_X2	df.S_X2	RMSEA.S_X2	p.S_X2	Item	S_X2	df.S_X2	RMSEA.S_X2	p.S_X2
I_1	24.5	17	0.057	0.106	I_16	16.067	12	0.05	0.188
I_2	25.684	27	0	0.536	I_17	35.554	30	0.037	0.223
I_3	14.428	8	0.077	0.071	I_18	35.031	39	0	0.652
I_4	15.863	13	0.04	0.257	I_19	19.067	11	0.074	0.06
I_5	15.91	13	0.041	0.254	I_20	32.055	35	0	0.611
I_6	41.178	38	0.025	0.333	I_21	45.654	38	0.039	0.184
I_7	38.928	30	0.047	0.127	I_22	36.701	25	0.059	0.062
I_8	35.653	25	0.056	0.077	I_23	41.793	31	0.051	0.093
I_9	26.21	22	0.038	0.243	I_24	34.496	21	0.069	0.032*
I_10	26.185	26	0.007	0.453	I_25	31.96	28	0.032	0.276
I_11	18.665	4	0.165	0.001*	I_26	40.451	33	0.041	0.174
I_12	44.988	40	0.03	0.271	I_27	45.863	40	0.033	0.242
I_13	36.404	20	0.078	0.014*	I_28	24.484	16	0.063	0.079
I_14	87.412	43	0.087	0*	I_29	42.79	31	0.053	0.077
I_15	44.477	38	0.036	0.218	I_30	37.34	34	0.027	0.318

3.3. Item characteristics

Estimation of item characteristics resulting from item analysis using PCM gives a discriminating power coefficient $a=1$ and the level of difficulty indicated by a threshold, namely the meeting point of two category probability lines in one item (b_1 , b_2 , b_3 , and b_4). Then, gen_dif is the average level of difficulty of each item (Table 7).

Table 7

Item difficulty level (threshold)

Item	b1	b2	b3	b4	gen_dif	Item	b1	b2	b3	b4	gen_dif
I_1	-0.10	-3.59	0.79	-1.73	-1.16	I_16	-0.78	-0.97	-2.29	1.46	-0.64
I_2	-2.73	-0.81	0.34	-1.19	-1.10	I_17	-0.65	-0.75	-1.27	-0.22	-0.72
I_3	-0.78	-1.92	-2.23	NA	-1.64	I_18	2.05	-1.71	-0.99	-0.10	-0.19
I_4	-0.77	-1.02	-1.83	2.13	-0.37	I_19	-0.62	-0.25	-0.33	-2.66	-0.97
I_5	0.60	-2.00	-2.65	1.22	-0.71	I_20	0.58	0.84	-1.83	-0.72	-0.28
I_6	-2.32	-1.10	0.75	-0.24	-0.73	I_21	-0.06	0.21	0.35	0.40	0.22
I_7	-0.72	2.09	-3.06	-0.44	-0.53	I_22	-1.29	0.48	0.97	-2.56	-0.60
I_8	-1.73	-1.50	0.41	NA	-0.94	I_23	1.29	-3.19	-0.63	-0.44	-0.74
I_9	-4.29	1.53	-1.18	NA	-1.32	I_24	-1.71	0.45	-1.82	-0.82	-0.97
I_10	-0.36	-2.48	-0.30	1.11	-0.51	I_25	-0.75	-1.25	1.92	-1.43	-0.38
I_11	-1.50	-0.08	0.24	-3.73	-1.27	I_26	-1.12	1.56	-1.02	0.35	-0.06

Item	b1	b2	b3	b4	gen_dif	Item	b1	b2	b3	b4	gen_dif
I_12	-2.81	0.39	0.04	0.22	-0.54	I_27	2.12	-2.32	0.61	-0.42	0.00
I_13	-0.90	1.04	-2.98	-0.06	-0.73	I_28	1.98	-1.45	-1.98	-1.22	-0.67
I_14	-1.49	-0.06	-0.15	0.03	-0.42	I_29	-2.05	0.00	0.93	-1.74	-0.72
I_15	-1.05	0.78	1.16	-1.20	-0.08	I_30	0.61	-3.58	-0.42	0.08	-0.83

Figure 6

ICC plot from item 3 (Attitude Aspect)

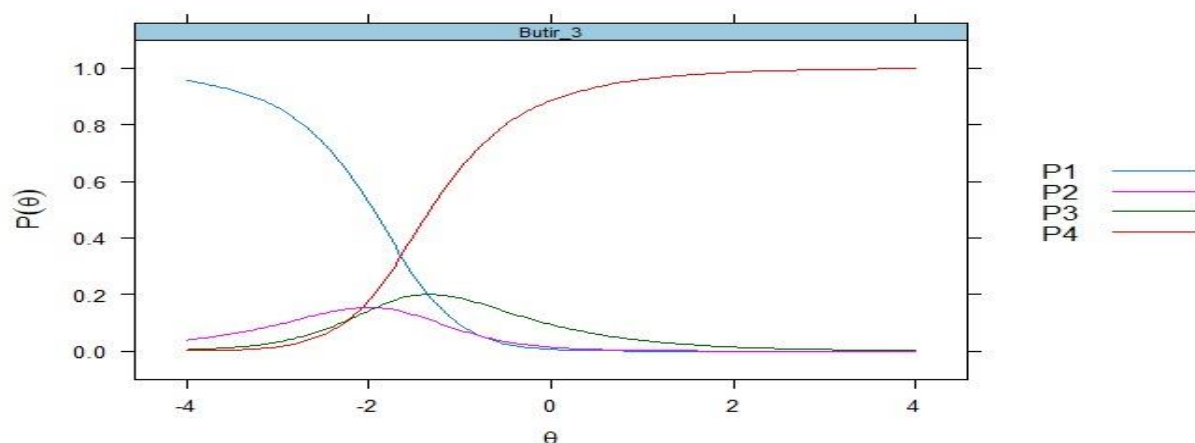


Figure 7

ICC plot from item 14 (Communication Aspect)

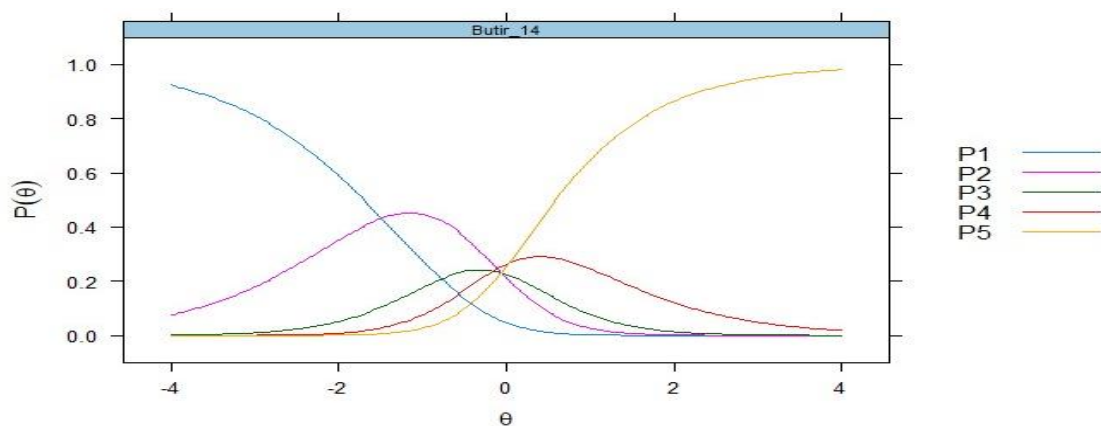


Figure 8

ICC plot from item 30 (Profession Aspect)

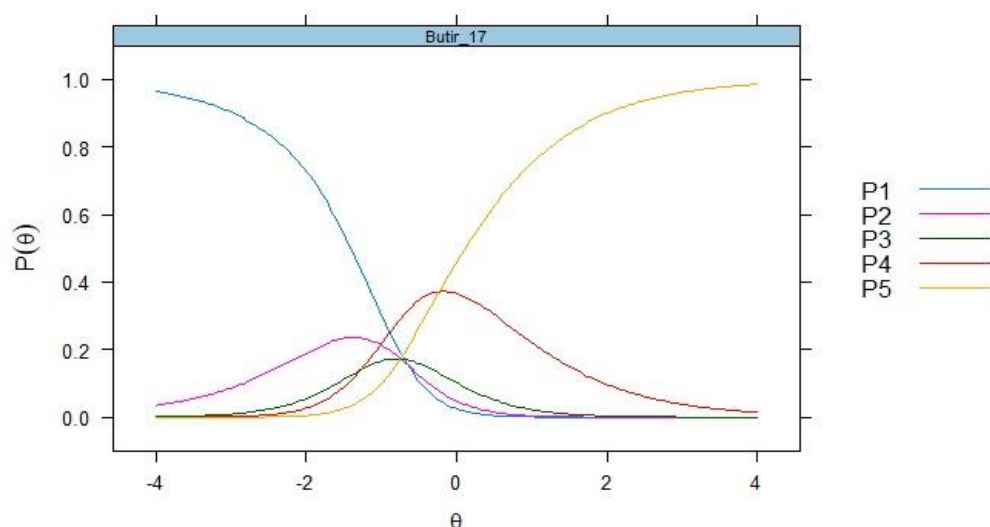
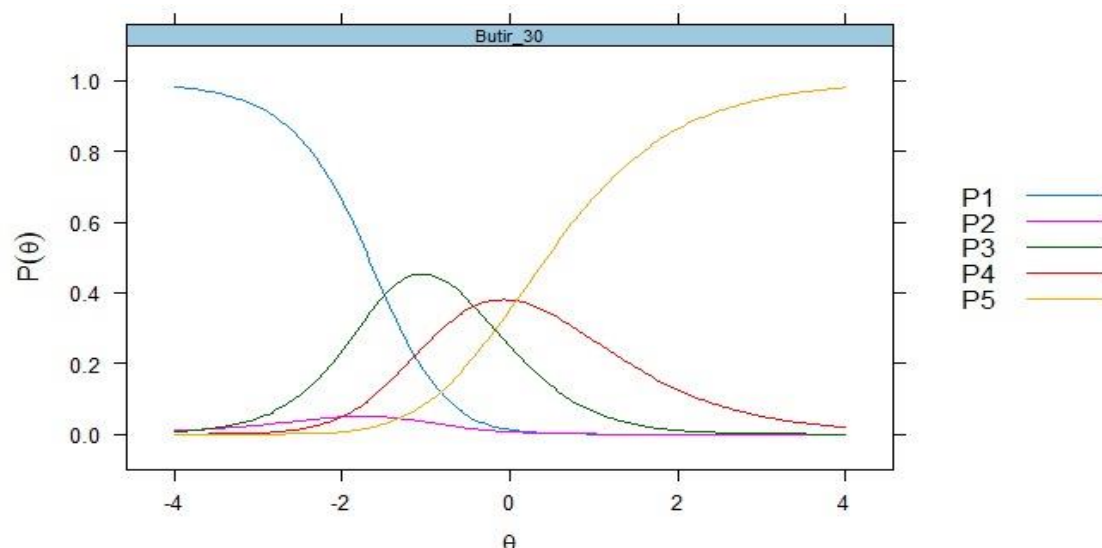


Figure 9
ICC plot from item 30 (Profession Aspect)



Each response category for polytomous items can be described by the Item characteristic curve (Nguyen et al., 2014). Figures 6, 7, 8, and 9 show the categorical response curves for polytomous items with four threshold parameters. This curve depicts the probability of selecting one of five possible response categories based on a given trait level. The item characteristic curves for each response category show that lower trait estimates correspond to a higher probability of selecting a lower response category (for instance, category 1 and category 2), whereas higher trait estimates correspond to a higher selection of response categories (for instance, category 3 and category 4). As defined in the model, the categorical trace lines have the same slope and unique threshold parameters.

3.4. Social competency assessment results

The results of the estimated social competence of pre-service teachers were analyzed using three approaches, namely Maximum Likelihood Estimation (MLE), Maximum A Posterior (MAP), and Expected A Posterior (EAP) (Embretson & Reise, 20013). The results of the social competence analysis using MLE illustrate that the tendency of pre-service teacher social competence is on a normal curve at the interval $-0.87 < \theta < 0.69$ (logit scale), presented in Figure 10. Then, the distribution of social competence based on aspects of social competence is presented in Figure 11.

Figure 10

Distribution of teacher social competencies as a whole

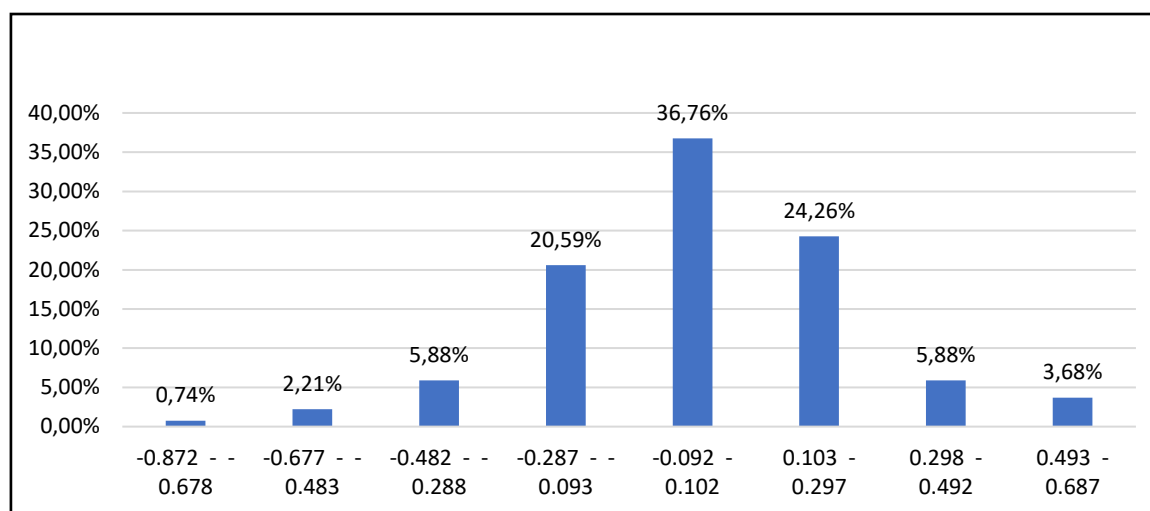
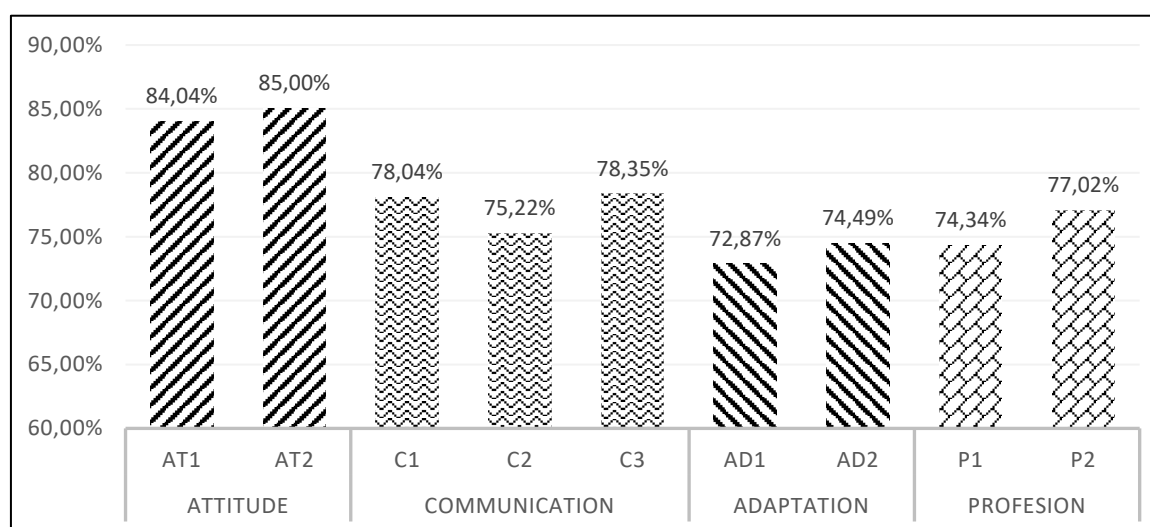


Figure 11

Distribution of teacher candidates' social competencies based on aspects of social competence



4. DISCUSSION

Teachers represent a dominant factor in achieving student success consistently. When teachers exemplify positive behaviors and provide engaging and motivating learning experiences, students are more likely to achieve higher performance in the learning process (Ahmad et al., 2019; Puspitarini & Hanif, 2019; Rafiola et al., 2020). In this context, the actions of teachers in delivering services to students must be supported by the specific competencies they possess, including those held by teacher candidates. Teacher competence encompasses a range of knowledge, skills, perspectives, and attitudes essential for performing the primary duties and functions of teaching (Haerani & Masunah, 2019; Sholihah et al., 2020; Zhumash et al., 2021). The specific competencies of teachers are categorized into four domains: professional competence, pedagogical competence, personality competence, and social competence.

The importance of social competence in prospective teachers is integral to their ability to perform effectively within society, demonstrated through communication and social interaction (Bottema-Beutel et al., 2018; Kostianinen et al., 2018; Rusilowati & Wahyudi, 2020). These competencies must be demonstrated

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both verbally and in writing, as well as through the mastery of knowledge and practical application in the field (Bottema-Beutel et al., 2018). This enables prospective teachers to consistently model exemplary behavior for their students. The items and aspects measured within social competence provide a strong foundation for assessing the competencies of teacher candidates. The significance of assessing social competence in teacher candidates lies in its potential to reveal the strengths of future educators in contributing to the improvement of education in Indonesia (Basilotta-Gómez-Pablos et al., 2022; Siri et al., 2020; Suryani, 2021).

The development of a social competence test for teacher candidates involves several aspects, which are subsequently developed into non-test items. The preparation of such a test requires an evaluation of content validity, which begins during the instrument development phase and continues through its administration to individuals within the target population. Content validation focuses on ensuring that the selected items provide comprehensive coverage of the trait being assessed (French et al., 2019). This serves as evidence to support conclusions regarding the target domain or domain description. The goal of content validity assessments is not to provide statistical justification, such as correlation coefficients, but to offer evidence of a theoretical relationship between item content and constructs. Construct validity refers to the extent to which test scores correlate with the theoretical characteristics of the attribute being measured. Evidence of validity is interdependent and collectively used to argue the degree to which valid conclusions can be drawn from the scores derived from these instruments (French et al., 2019).

The findings of this study suggest that teachers' social competence is rooted in an inclusive and objective attitude, free from discrimination toward students, peers, parents, and the broader community. Teachers are obligated to communicate with colleagues, other academic communities, parents, and the public in a respectful, empathetic, and effective manner. Furthermore, teachers must demonstrate adaptability within the work environment to enhance their effectiveness as educators and implement programs that contribute to the development and improvement of educational quality. Social competence is pivotal in fostering positive social interactions, thereby facilitating acceptance among individuals and within social groups (Romera et al., 2017).

The social competence of teachers, particularly prospective teachers, can significantly impact various aspects of the learning process with students (Ahmad et al., 2019). Low teacher competence can influence student learning motivation, social awareness, self-management, and academic achievement. Additionally, teacher performance, which reflects self-efficacy, is affected by these competencies (Kron et al., 2021). Poor teacher performance, such as tardiness, absenteeism, or disengagement, negatively impacts teaching quality, learning outcomes, and social development (Ahmad et al., 2019). Socially competent teachers can fulfill and guide the goals and rights of others, students, parents, and peers, especially in challenging situations with diverse social demands (Gundersen, 2014; Holmstedt et al., 2018). Social competence is influenced by various internal and external factors, including cognitive abilities, emotional regulation, gender, communication skills, family and school dynamics (parental stress, family support, teacher-student relationships, peer acceptance), cultural values, and beliefs about social competence (Bächler & Salas, 2021; Whalon, 2014; Bjorklund Jr. et al., 2021; Holmstedt et al., 2018; Michalsky, 2021).

Thus, to improve the competence of prospective teachers, it is crucial to provide training, guidance, and workshops that focus on both the knowledge and practical application of teacher competencies. Such initiatives should begin early, with educational institutions preparing teacher candidates who are qualified and experienced (Chen et al., 2020; Zaruba et al., 2021). Ultimately, the enhancement of teacher quality contributes to the improvement of education in Indonesia, fostering a workforce with highly qualified capacities.

5. CONCLUSION

Social competence represents a unidimensional construct encompassing four components: attitude, communication, adaptation, and professionalism. The social competence scoring model utilizes the Partial Credit Model, which includes five categories, with each step's difficulty level not necessarily ordered. The

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social competence instrument demonstrates favorable item characteristics, exhibiting a discriminatory power of 1 on the logit scale and a difficulty level between -1.64 and 0.22 on the logit scale. Results from measuring the social competence of pre-service teachers indicate that students possess good social competence, with a normal distribution within the interval -0.87 to 0.69 on the logit scale. Regarding the aspects of social competence, pre-service teachers exhibit the highest tendency in the attitude aspect and the lowest in the adaptation aspect, although all four aspects remain within the high category.

This study faces limitations due to the sample being restricted to a limited number of state universities offering educational study programs. A broader sample, including both public and private educational universities, would provide a more comprehensive perspective. It is hoped that the findings can be applied more widely. The limitation arises from the fact that the analysis conducted to determine the profile of prospective teachers in terms of social competence is confined to descriptive results. As a direction for future research, it is recommended to prepare an analysis of causal relationships concerning social competence, incorporating various assessments from both the school environment and the home community environment.

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