

Pedagogic Competence Development Model: Pedagogic Knowledge and Reflective Ability

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Abstract—The effectiveness of the pattern of relationships between teachers and students is possible to develop in the context of teachers' understanding of the characteristics and potential of students. This ability becomes urgent and fundamental for teachers to have and needs to be prepared from the start and become a skill in managing learning interactions or what is called pedagogical competence. This has become the focus of attention for solving the crucial situation of the low pedagogical competence of elementary school teachers in DKI Jakarta Province (30.43%) and the occurrence of situations and conditions of violence in schools that place educational institutions in Indonesia in the highest position of violence against children. The focus of fundamental research is directed at the development of a pedagogical competency model that includes the need for a pedagogical knowledge paradigm and reflective abilities for teachers, especially primary school teachers. Analyses were carried out for the construct of the model formation. The quantitative research approach with the Structural Equation Modeling (SEM) technique is intended to be able to analyze the dominant indicators that constitute the model. Data collection with 26 statements in a questionnaire of 264 elementary school teacher respondents. The results of the study: (1) twenty-six valid indicators as indicators to measure the construct, (2) there is a suitability of the model with the data so that the pedagogical competency model can be developed with the construct of pedagogic knowledge and reflective ability. Research is expected to be a trigger for advanced competency development research models.

Keywords: *pedagogic competency, pedagogic knowledge, reflective ability*

I. INTRODUCTION

The ability of the relationship patterns between teachers and students is possible to develop in the context of teachers understanding the characteristics and potential of students [1]. This ability becomes urgent and fundamental for teachers to have and needs to be prepared from the start and become a skill in managing learning interactions or what is called pedagogical competence [2]. Pedagogic competence is one of the four basic

competencies that teachers need to have. Previous related research shows that the low pedagogical competence is shown by the teacher's ability to manage to learn causes the low formation of values and character of children so that it becomes part of the emergence of fundamental problems to the success profile of students [3]. Data shows that pedagogical competence contributes to the achievement of children's learning outcomes (94.50%) and the work of the teacher himself amounting to 46.7%. [4] While other conditions that become an urgency for research are policies launched with Permenagpan RB No. 16 of 2009 against the reality of 2.92 million teachers (51%) lacking pedagogical competence [5] Other data shows that the teacher's pedagogical competency skills are still in the moderate category of the stage of understanding the characteristics of students [6] and have an impact on the poor quality of the management of the learning process [6] and impact on the low quality of the management of the learning process [7]. This affects the quality of teacher teaching [8]. The ability of teachers to hone themselves in educative interaction with students is also not honed due to the lack of training and development programs provided and does not compensate for the speed of development of science and technology that affects patterns of interaction and learning.[9] [10] While it is inevitable that schools in Indonesia are included in the school map with high levels of violence (84%), and there is a ratio of 7:10 children getting violent (International Survey Center for Research on Women / ICRW) [11], and this is done by teachers and school employees [12-13].

Then the teacher professional paradigm should focus on a model of pedagogical competency development. The pedagogical development model should be based first on extracting internal resources from within the teacher. Teachers should start themselves with pedagogical knowledge. Pedagogic knowledge becomes fundamental because it facilitates the teacher's understanding of the patterns and concepts of a dialogic and interactive relationship between the teacher and students. Pedagogic knowledge allows teachers to recognize the characteristics of children in-depth so that it can

become an educational interaction pattern that involves an emotional atmosphere and relationships that overcome the problems of values, characters, learning outcomes, and competent teacher profiles. It is highly demanded by the teacher's ability to have pedagogical competence to create conducive and effective management of classroom learning. [14]. Tacher understanding based on pedagogical knowledge will be effective if the teacher makes reflective efforts [15-16]. Through reflective efforts, the teacher can make improvements to the process and patterns of interaction in the learning of students [17]. The development of a pedagogical competency model based on pedagogic knowledge and reflective capabilities becomes a focus of studies that need to be carried out towards developing a pedagogical competency model.

II. MATERIALS AND METHODS

A. Materials

1) Pedagogic Knowledge

Humans can think and think, can understand something. Something that humans know through thought is called knowledge [18]. In the teaching profession, basic and necessary knowledge is knowledge of the conditions and characteristics of students and how to approach education that needs to be done [19]. This knowledge is called pedagogic knowledge. This is formulated as 1 of 4 teacher competencies and includes an understanding of educational philosophy, stages of child development, and the concepts of learning and learning. This fundamental knowledge plays an important role in optimizing the development of children's potential. Pedagogic knowledge must be mastered by the teacher for the role of guiding and managing learning interactions in the classroom. [20]. The Law of Teachers and Lecturers Number 14 of 2005 formulating pedagogical knowledge includes understanding the concepts (a) educational philosophy, (b) psychology of child development, (c) learning theory

2) Reflective Ability.

Reflective ability is a part of thinking ability. Thinking is related to intellectual conditions as an activity that focuses on learning everything through experience, through ways of thinking about what has been done and what can be followed up to achieve even better results and is needed in social relationships in interactions with students [21]. Reflective ability is a form of ability that can enhance reasoning and problem-solving activities [22]. Reflective ability can be facilitated by listening seriously to be able to interpret a learning experience [23].

3) Pedagogic Competency

Pedagogic competence is a major requirement for carrying out the teaching profession. [24] Pedagogical competence is an ability that is related to understanding students 'characteristics, mastering theories and learning principles, curriculum development, learning activities, developing students' potential, communication skills with students, and assessment and evaluation skills. The embodiment of pedagogical competence is the profile of actions identifying students' learning characteristics, ensuring the opportunity for students to participate actively, arranging classes for different

characteristics, knowing the causes of deviations in learning behavior, developing potentials and deficiencies, and humanist actions [25-26].

B. Methods

1) Research design

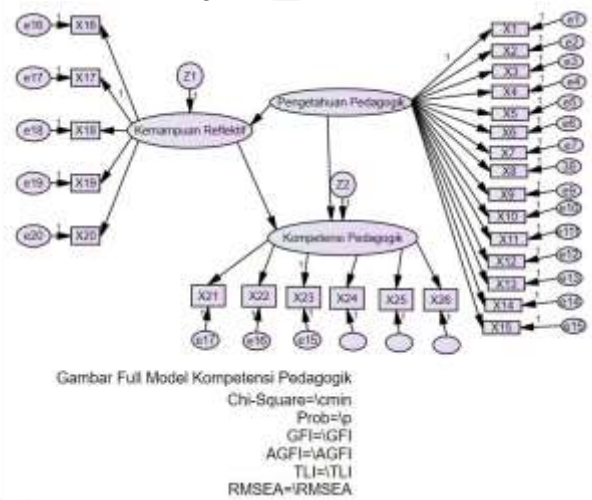


Fig. 1. Research Design

Information:

- PPD = Pedagogic Knowledge (Pengetahuan Pedagogic)
- KRF = Reflective Ability (Kemampuan Reflektif)
- KPD = Pedagogic Competency (Kompetensi Pedagogik)

2) Data collection technique

Data collection techniques using a Likert scale questionnaire.

3) Data analysis technique

Data analysis of dominant factors in pedagogical competency profiles is done by identifying the model, assessing the Goodness-of-Fit criteria, the stages of modeling and analysis of structural equations, the analysis of First and second-order CFA and SEM measurement models

III. RESULTS AND DISCUSSION

A. Construct validity

The construct validity test shows that the size of the indicator reflects the latent theoretical construct through Confirmatory Factor Analysis (CFA) with the following table.

TABLE I. CONSTRUCT VALIDITY

	Estimate
PPD1 ← Knowledge Pedagogic	.693
PPD2 ← Knowledge Pedagogic	.729
PPD3 ← Knowledge Pedagogic	.767
PPD4 ← Knowledge Pedagogic	.743
PPD5 ← Knowledge Pedagogic	.739
PPD6 ← Knowledge Pedagogic	.802
PPD7 ← Knowledge Pedagogic	.707
PPD8 ← Knowledge Pedagogic	.702
PPD9 ← Knowledge Pedagogic	.797
PPD10 ← Knowledge Pedagogic	.785
PPD11 ← Knowledge Pedagogic	.759
PPD12 ← Knowledge Pedagogic	.716
PPD13 ← Knowledge Pedagogic	.761
PPD14 ← Knowledge Pedagogic	.758
PPD15 ← Knowledge Pedagogic	.724
KRF16 ← Reflective Ability	.804
KRF17 ← Reflective Ability	.774
KRF18 ← Reflective Ability	.729
KRF19 ← Reflective Ability	.755
KRF20 ← Reflective Ability	.777
KPD21 ← Pedagogic Competence	.834
KPD22 ← Pedagogic Competence	.765
KPD23 ← Pedagogic Competence	.687
KPD24 ← Pedagogic Competence	.764
KPD25 ← Pedagogic Competence	.717
KPD26 ← Pedagogic Competence	.740

B. Constructive Reliability

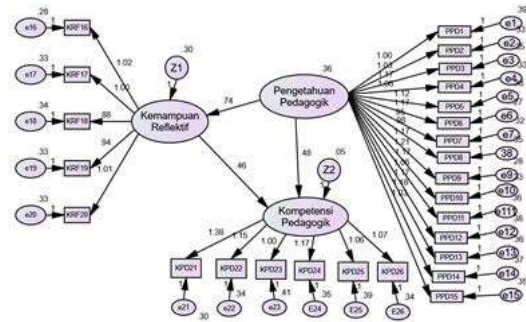
The construct reliability test is shown in the following table.

TABLE II. CONSTRUCTIVE RELIABILITY

Reliability Statistics	
	Cronbach's Alpha
Pedagogic_Knowledge	.746
Reflective_Ability	.865
Pedagogic_Compentency	.886

The calculation results show that all instruments have very high-reliability figures (Cronbach's Alpha), because according to Nunnaly (1967) and Hinkle (2004) or the index commonly used in social research if Cronbach's Alpha (α) numbers above 0.60 indicate that the construct or variable is reliable.

C. Model Similarity Test



Gambar Full Model Kompetensi Pedagogik
 Chi-Square=462.716
 Prob>.000
 GFI=.908
 AGFI=.865
 TLI=.959
 RMSEA=.040

Fig. 2. The Goodness of Fit (GOF) Model

The diagram above provides summary information of GOF (Goodness of Fit) test results on the research model, presented in the picture above

TABLE III. THE GOODNESS-OF-FIT MODELS

Goodness-of-Fit (GOF)	Analysis Results	Cut off Value	Model Evaluation
Chi-square	χ^2 1130.83 P = 0.000	Probabilitas ≥ 0.05	Not good
TLI	0.66	TLI > 0.90	Good
GFI	0.58	GFI > 0.90	Not good
AGFI	0.57	AGFI > 0.90	Not good
CFI	0.66	CFI > 0.90	Good
RMSEA	0.042	RMSEA ≤ 0.08	Good

The table above provides summary information of GOF (Goodness of Fit) test results on the research model as follows: (1) chi-square criteria 1130.83 > 0.05 shows less good because the smaller, the better. The table above provides summary information of GOF (Goodness of Fit) test results on the research model as follows: (1) chi-square criteria 1130.83 > 0.05 shows less good because the smaller, the better, (2) Model fit test with TLI 0.944 > 0.90 shows good results, (3) GFI 0.833 < 0.90 almost reaches 0.90 shows poor results but can still be accepted as a good relative model, (4) AGFI 0.814 shows results that almost reach 0.90 so the model can still be accepted as a relatively good model, (5) CFI 0.945 > 0.90 shows good results, (6) RMSEA analysis as an index to compensate for chi-square statistics shows 0.042 \leq 0.08 so that there is a suitability of the model with the data so that the model can be accepted, based on the existing GOF criteria, the GOF is fulfilled, it is concluded that the model is fitted with the data.

D. Model Similarity Test

The diagram above provides summary information of GOF (Goodness of Fit) test results on the research model, presented in the picture above

E. Hypothesis testing

Hypothesis testing is done with the criteria of Critical Ratio (CR) > 1.96 or the value of Probability (P) < 0.05 then the basis for decision making:

If the probability value (sig value) > 0.05 or - t table < t count < t table then H0 is not rejected

If the probability value (sig value) < 0.05 or t arithmetic < - t table or t arithmetic > t table, then H0 is rejected.

TABLE IV. THE GOODNESS-OF-FIT MODEL

Regression Weights: (Group number 1 - Default model)

		Estimate	S.E.	C.R.	P	Label
Reflective Ability	← Pedagogic Knowledge	.805	.090	8.980	***	
Pedagogic Competency	← Reflective Ability	.412	.069	5.968	***	
Pedagogic Competency	← Pedagogic Knowledge	.399	.060	6.690	***	

F. Decision:

- the p-value of Pedagogical Knowledge variable = *** < 0.05 so that H0 is rejected, and H1 is accepted, which means the Pedagogical Knowledge variable has a positive and significant effect on the Reflective Ability variable.
- 2. The p-value of the reflective ability variable = *** < 0.05, so H0 is rejected, and H1 is accepted, which means the reflective ability variable has a positive and significant effect on the pedagogical competency variable.
- 3. The p-value of pedagogic knowledge variable = *** < 0.05 so that H0 is rejected, and H1 is accepted, which means pedagogic knowledge variable has a positive and significant effect on pedagogical competency variables.

Thus the structural equation is:

- Reflective Ability = 0.805 * Pedagogic Knowledge + e
- 2. Pedagogical Competence = 0.412 * Reflective Ability + e
- 3. Pedagogic Competence = 0,399 * Pedagogic Knowledge + e
- 4. Pedagogic Competency = 0.399 * Pedagogic Knowledge + 0.412 * Reflective ability + e

Then the model can be used in developing pedagogical competence.

IV. CONCLUSIONS

The pedagogical competency development model can be carried out by developing pedagogic knowledge variables and reflective abilities. Indicators that can be constructs for developing pedagogical competency models include pedagogical knowledge of the extent to which understanding

the concepts of educational philosophy, child development psychology and learning theory and construct indicators of reflective abilities that include mental activities that demonstrate the ability to reason and solve problems, [19] can be facilitated by listening seriously to be able to interpret a learning experience. The higher the level of pedagogic knowledge and reflective abilities, the higher the pedagogical competence will be. Then pedagogical competence can be done by developing the level of pedagogic knowledge and reflective ability either partially or together.

ACKNOWLEDGMENT

This study was funded by a Research Grant of KEMENRISTEKDIKTI (Ministry of Research and Technology and Higher Education, Indonesia)

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