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Research paper

A study of teachers' pedagogical content knowledge in Kuningan, West Java

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Abstract

The problem of this study is the lack of teachers' pedagogical content knowledge (PCK), in junior high schools in Kuningan, West Java. It's seen from several facts: first, most of social studies teaching process is conducted separately based on each field without any integration; second, teachers tend to use monotonous teaching method such as lecturing; third, the lack of ability and skill in using ICT and evaluation system which only focus on students' cognitive aspect. However, teachers' pedagogical content knowledge is a vital factor in accomplishing successful teaching and learning outcomes to handle existing educational problems. Therefore, it is crucial to investigate the pedagogical content knowledge of social studies teachers' in Kuningan. In the present study, 164 social studies teachers from 85 junior high schools in Kuningan were surveyed to find out factors influencing teachers' pedagogical content knowledge. The study revealed two important findings: first, teaching experience, training, learning facilities and motivation of teachers have a positive influence on Social Studies teachers' Pedagogical Content Knowledge (PCK) in Kuningan; second, self efficacy has no influence on Social Studies teachers' Pedagogical Content Knowledge (PCK) in Kuningan either directly or indirectly.

Keywords: *Learning facilities, pedagogical content knowledge (PCK), teaching experience, training, self efficacy and work motivation*

1. Introduction

Pedagogical Content Knowledge (PCK) is a science and an important element that absolutely must be controlled by teachers in order to improve the teachers' quality. In teaching and learning process, teacher is not enough just to understand the material or content (what to teach), but to know about pedagogical aspect (how to teach). A teacher who is strong in the knowledge of the content but weak in pedagogical knowledge will lead to difficulties for students to be able to understand the teaching material. Meanwhile, if a teacher is weak in content knowledge but strong in pedagogical knowledge there will be a mismatch between the materials presented by teachers with the academic demands of the structure of science. Shulman (1986), states that the content knowledge and pedagogical knowledge should be integrated into learning to create new knowledge, which is Pedagogical Content Knowledge (PCK).

In Indonesian context, especially in Kuningan, practice suggests that junior high school teachers still apply traditional learning system that is teacher-centered where the teacher brought the material and the students listen. Besides that, there are still teachers who have difficulty in utilization of ICT, particularly with regard to computer and internet media. In addition to the problems mentioned above, another constraint is found with respect to the assessment or evaluation. Assessment conducted by social studies teacher at junior high schools in Kuningan prone to cognitive aspects. The problems described above indicate that the PCK possessed by teachers of junior high schools in Kuningan are still low.

2. Literature Review

The concept of PCK (Pedagogical Content Knowledge) was first introduced by Shulman (1986), as:

"Special amalgam of content and pedagogy that is uniquely the province of teachers, their own special form of professional understanding. PCK represents the blending of content and pedagogy into an understanding of how particular topics, problems, or issues are organized, represented, and adapted to the diverse interests and abilities of learners, and presented for instruction".

PCK represents the knowledge of the teacher in the learning process, not only the knowledge or understanding the subject matter (content) but also on the ways or strategies that teachers can use to convey the material (Cochran, 1993; Ball, et al 1987). That is, in addition to a deep understanding of the subject to be taught, a teacher must also be able to foster understanding of the subject or the concept of a specific material to students so that students can easily accept and understand the material.

In line with that, Shulman (1987) states that "PCK is a base for teaching". It is certainly its further emphasizes that it is important for teachers to have high PCK, the higher the PCK had by teachers the more effective the learning developed by teachers. Further Shulman (1986) states that the PCK:

"Within the category of pedagogical content knowledge I include, for the most regularly taught topics in one's subject area, the most useful forms of representations of Reviews those ideas, the most powerful analogies, Illustrations, examples, explanations, and demonstrations-in a word, the ways of representing and formulating the subject that make it comprehensible to others ".
Teachers who are successful with good PCK are able to help students with a variety of ways for a subject or a particular material that can be received and understood. The core of PCK is the way in which the subject matter is changed in a manner to be taught to students. In this case the teacher interprets the subject matter, looking at different ways to represent and make the material be received and understood easily by learners.
Shulman (1986) proposed three components of the base knowledge of teachers including: (1) content knowledge, (2) pedagogical knowledge, and (3) curricular knowledge. Content knowledge deals with the knowledge of how much knowledge of teaching materials held by teachers. Pedagogical knowledge is defined as a way to represent a material and making it easily understood and absorbed learners is by using analogies, illustrations, examples, ideas and explanations of teachers. meanwhile, curricular knowledge, this knowledge with regard to knowledge, technique or treatment that is owned by a teacher. In the field of teaching, this knowledge is concerned with teachers' understanding of textbooks, technology and other media that support learning. Besides knowledge of content and pedagogy, teachers must also have a good knowledge of the learners, curriculum, instructional strategies and assessment so that it can carry out the transformation of science knowledge effectively. The concept presented by Shulman (1986), Abell, D. L. Hanuscin, M. H. Lee, M. J Gagnon, (2011), Abell et al (2008), as follows:
".knowing Science is a necessary but not sufficient condition for teaching. Science teacher Also must have knowledge about science learner, curriculum, instructional strategies, and assessment through the which they transform Reviews their knowledge in science to effective teaching and learning ".
Knowing somebody's pedagogical content knowledge becomes clear when teaching outside of their expertise. However the ability of teachers becomes strong when teaching in the field of specialist. Skills and abilities are doubtful if the teaching content is poorly understood. When teaching outside the area of expertise, although it has knowledge of highly advanced teaching procedures or charge very specialized knowledge, skills of teachers in combining the content and pedagogical knowledge in meaningful ways will be apparent.
In Indonesian context, studies on teachers' pedagogical content knowledge are scarcely found in the literature, it has been seen from teacher-centered teaching that is applied in most junior high schools in Kuningan. Therefore, there should be a change in the teaching and learning process paradigms from just transferring knowledge by the teacher to the learners finding needed information by themselves and it is also crucial to find out factors influencing teachers' pedagogical content knowledge to make more effective teaching and learning process.

3. Research Methods

In accordance with the objectives that have been formulated, the method used in this study was a survey method to conduct descriptive analysis and verification (Algifari, 2001).
The populations in this study were all social studies teachers in junior high schools in Kuningan, as many as 277 people from 85 junior high schools. In determining the number of samples, the study employed Proportionate Stratified Random Sampling technique and obtained a total sample of 164 people. The data in this study were collected by using questionnaire. The instrument used in this study was a type of questionnaire measuring the scale of attitudes, behavior and cognitive with five (5) alternative answers, with the highest score used was 5 (five) and the lowest score of 1 (one), were applied to statements both positive and negative. The research framework was in the following:

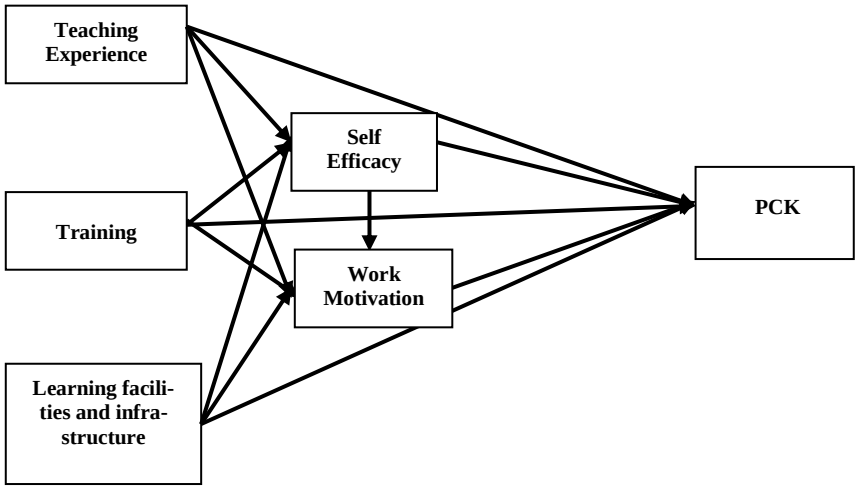

Fig 1: Research Framework

4. Findings and Discussions

In this study, the results of questionnaires were analyzed quantitatively by using Path Analysis and it revealed several findings:

- **The Direct Influence of Teaching Experience on PCK**

From the analysis results, obtained the value of t_{obs} for 3.059 with sig = 0.003 which is smaller than the probability value 0.05 (0.003 <0.05). This shows that Teaching Experience directly influences the Pedagogical Content Knowledge (PCK) of teachers. This means that the higher teaching experience, the higher the Pedagogical Content Knowledge (PCK) of teachers.

Furthermore, to determine the influence of teaching experience variable against known PCK ρyx1 path coefficient (beta) = 0.230 which shows a positive direct effect of 0.230 between the PCK teaching experience or equivalent to 5.29% (0,2302x100%) which means that, PCK is partially influenced by the teaching experience by 5.29%.

- **The Indirect Influence of Teaching Experience on PCK through Self Efficacy**

From the analysis results, the value of ρx4x1 (beta) = 0.216 and the value of ρyx4 (beta) = 0.009 in order to obtain the value of the indirect effect of teaching experience on the PCK through self efficacy of 0.002. This shows that Teaching Experience has indirect effect on Pedagogical Content Knowledge (PCK) of teachers through Self Efficacy. This means that the higher the teacher's teaching experience which is supported by a high self-efficacy, the higher the Pedagogical Content Knowledge (PCK) of teachers will be.

- **The Indirect Influence of Teaching Experience on PCK through Work Motivation**

From the analysis results, the value ρx5x1 (beta) = 0.230 and the value ρyx5 (beta) = 0.162 in order to obtain the value of the indirect effect of the PCK teachers teaching experience through work motivation of teachers at 0.037. This shows that Teaching Experience has an indirect effect on Pedagogical Content Knowledge (PCK) of teachers through Teacher Work Motivation. This means that the higher the teaching experience of teachers supported by high teacher's work motivation, the higher the Pedagogical Content Knowledge (PCK) of teachers will be.

- **The Direct Influence of Training on PCK**

From the analysis results, obtained the value of t_{obs} amounted to 2,551 with sig = 0.012 which is smaller than the probability value 0.05 (0.012 <0.05). It is addressing that Training directly influences the Pedagogical Content Knowledge (PCK) of teachers. Means that the more training undertaken by teachers, the higher the Pedagogical Content Knowledge (PCK) of teachers will be.

- **The Indirect Influence of Training on PCK through Self Efficacy**

From the analysis results, the value of ρx4x2 (beta) = 0.320 and the value of ρyx4 (beta) = 0.009 in order to obtain the value of the indirect effect of training to the Pedagogical Content Knowledge (PCK) of teachers through self efficacy of 0,003. It is addressing that Training indirectly affects Pedagogical Content Knowledge (PCK) of teachers through Self Efficacy. Meaning that the more training undertaken by teachers, supported by high self-efficacy, the higher the Pedagogical Content Knowledge (PCK) of teachers will be.

- **The Indirect Influence of Training on PCK through Work Motivation**

From the analysis results, the value of ρx5x2 (beta) = 0.267 and the value of ρyx5 (beta) = 0.162 in order to obtain the value of the indirect effect of training on Pedagogical Content Knowledge (PCK) of teachers through teacher work motivation at 0.043. This shows that Training indirectly influences Pedagogical Content Knowledge (PCK) of teachers through Teacher Work Motivation. In short, the more training undertaken by teachers who are supported by teacher high work motivation will increase the Pedagogical Content Knowledge (PCK) of teachers.

- **The Direct Influence of Learning Facilities on PCK**

From the analysis results, obtained the value of t_{obs} amounted to 2,437 with sig = 0.016 which is smaller than the probability value 0.05 (0.016 <0.05). This shows that Learning Facilities directly influence the Pedagogical Content Knowledge (PCK) of teachers. This means that the more supportive facilities and infrastructure of the learning, the higher Pedagogical Content Knowledge (PCK) of teachers will be.

Furthermore, to determine the influence of variable learning facilities known the value of PCK ρyx3 path coefficients (beta) = 0.247 which shows a positive direct effect of 0.247 between learning facilities and infrastructure of the PCK or by 6.1% (0,2472x100%) which means that PCK is partially influenced by the learning facilities of 6.1%.

- **The Indirect Influence of Learning Facilities on PCK through Self Efficacy**

From the analysis results, the value of ρx4x3 (beta) = 0.257 and the value of ρyx4 (beta) = 0.009 in order to obtain the value of the indirect effect of learning facilities and infrastructure of the Pedagogical Content Knowledge (PCK) of teachers through self efficacy of 0.002. It is addressing that learning facilities indirectly affects Pedagogical Content Knowledge (PCK) of teachers through Self Efficacy. This means that the supportive learning infrastructure backed by high self-efficacy will increase the Pedagogical Content Knowledge (PCK) of teachers.

- **The Indirect Influence of Learning Facilities on PCK through Work Motivation**

From the analysis results, the value of ρx5x3 (beta) = 0.246 and the value of ρyx5 (beta) = 0.162 in order to obtain the value of the indirect effect of learning facilities and infrastructure of the Pedagogical Content Knowledge (PCK) of teachers through teacher work motivation at 0,040. It is addressing that learning Infrastructures indirectly affect Pedagogical Content Knowledge (PCK) of teachers through Teacher Work Motivation. This means that the better learning infrastructure backed by high teacher work motivation, the higher the Pedagogical Content Knowledge (PCK) of teachers will be.

- **The Direct Influence of Self Efficacy on PCK**

From the analysis results, obtained the value of t_{obs} 0.119 with sig = 0.905 which means greater than the probability value 0.05 (0.905> 0.05). This shows that there is no effect Self Efficacy against Pedagogical Content Knowledge (PCK) of teachers. Meaning that the level of teachers' self-efficacy has no influence on Pedagogical Content Knowledge (PCK) of teachers.

- **The Indirect Influence of Self Efficacy on PCK through Work Motivation**

From the analysis results, the value of ρx5x4 (beta) = 0.164 and the value of ρyx5 (beta) = 0.162 in order to obtain the value of the indirect influence of self efficacy against Pedagogical Content Knowledge (PCK) of teachers through teacher work motivation at 0.027. It is addressing that Self Efficacy indirectly affects Pedagogical Content Knowledge (PCK) of teachers through Teacher Work Motivation. This means that the higher self-efficacy had by teachers who are supported by teacher work motivation which is also high, the higher the Pedagogical Content Knowledge (PCK) of teachers will be.

- **The Direct Influence of Work Motivation on PCK**

From the analysis results, obtained the value of t_{obs} amounted to 2,019 with sig = 0,039 which is smaller than the probability value 0.05 (0.039 <0.05). This shows that Work Motivation against Influential Teacher Pedagogical Content Knowledge (PCK) of teachers. This means that the higher work motivation of teachers, the higher Pedagogical Content Knowledge (PCK) of teachers will be.

5. Conclusion

Based on the analysis and discussion that has been stated previously, it can be concluded as follows:

1) Teaching experience, training and learning facilities have a positive influence on self-efficacy; meaning that the more teaching experienced and more trained teachers supported by adequate infrastructure as well will then increase the teachers' self-efficacy .

2) Teaching experience, training, learning facilities and self efficacy have a positive influence on work motivation, meaning work motivation of teachers will be increased if the teachers have high teaching experience, join a lot of training and supported by the adequate infrastructure of learning and have high self-efficacy.

3) Teaching experience, training, learning facilities and motivation of teachers have a positive influence on the teachers' Pedagogical Content Knowledge (PCK), which means that to increase the Pedagogical Content Knowledge (PCK), teachers can improve the experience of teaching, substantial training, supported by facilities and adequate learning infrastructure and increase the motivation to work as well.

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