*Full research paper*

# EXPLORING THE KEY PREDICTORS OF INSTRUCTIONAL QUALITY

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## ABSTRACT

Classroom instruction became a popular topic due to its crucial role in teaching and learning activities. The teacher plays an essential role in providing quality classroom instruction. This study tries to explore the key predictors of instructional quality. This study was conducted on 283 teachers taken randomly. We used an online questionnaire to reach the research participants in east java, Indonesia. Structural equation modelling (SEM) was utilized to examine the relationship between the variables. The findings revealed that the teacher competencies, including cognitive and motivational aspects, positively affected instructional quality. This study also revealed that teachers' cognitive aspect is not the only predictor of instructional quality. The motivational aspect also plays a crucial role in predicting instructional quality. This study provides several insights for related stakeholders (such as teachers, policymakers, and universities) in making efforts or policies to improve teacher instructional quality.

## KEYWORDS

**Instructional quality, teacher competence, senior high school**

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***Highlights***

- *Teacher competence consists of cognitive aspects (pedagogical content knowledge and constructivist beliefs) and motivational aspects (self-efficacy and enthusiasm).*
- *Teacher competence positively predicts instructional quality.*
- *This study revealed that instructional quality is not only determined by the teacher's cognitive aspects but also by the teacher's motivational aspects.*
- *To promote teacher instructional quality, the stakeholders must pay attention not only to teacher cognitive aspects but also to teacher motivational aspects.*

## INTRODUCTION

Millions of students received instruction daily and spent most of their school time in the classroom. The classroom activities were dominated by the instructional practices set up by teachers. Instructional quality describes as a specific teacher action related to the teaching strategies and practices during classroom learning activities (Baier et al., 2019). Furthermore, instructional quality refers to teachers' observable behavior and interactions between teachers and students during classroom activities (Blömeke et al., 2022, Rimm-Kaufman and Hamre, 2010, Fauth et al., 2019). The teacher plays a key role in setting up instructional practices (Baumert and Kunter, 2013a, Fauth et al., 2019) and essential sources during class activities (Fauth et al., 2019, Hattie, 2009). Therefore, teachers are responsible for providing a high-quality learning environment.

The study of instructional quality has become a popular topic in educational research due to its crucial role in learning activities (Nilsen and Gustafsson, 2016). However, most previous studies emphasize the effect on students learning outcomes (Kleickmann et al., 2016, Fauth et al., 2019, Praetorius et al., 2018, König et al., 2021). Empirically, instructional quality among teachers varies. Many researchers and policymakers are interested in increasing teachers' instructional quality (Baier et al., 2019). Therefore, finding the predictor of teachers' instructional quality became essential to improving low-performing instruction.

The current study provides two main contributions. First, most previous studies emphasized the relationship between instructional quality and students' learning outcomes. This study examines the antecedent variable of instructional quality to fill the gap. Hence, this study contributes to the body of knowledge regarding the key predictor of

teachers' instructional quality. Second, this study provides scientific understanding and directions to policymakers and practitioners in improving teachers' instructional quality.

## THEORETICAL FRAMEWORK AND HYPOTHESES

### Instructional quality

Instructional quality is conceptualized as teachers' observable behavior and teacher-student interaction during classroom activities (Blömeke et al., 2022, Rimm-Kaufman and Hamre, 2010, Fauth et al., 2019). Furthermore, instructional quality covers three dimensions of a specific teaching domain: cognitive activation, student support (supportive climate), and classroom management (Praetorius et al., 2018, Blömeke et al., 2022, Fauth et al., 2019).

Cognitive activation refers to challenging learning activities that stimulate students' high-order thinking skills through selected instructional strategies and tasks. Cognitive activation also covers the teacher's ways of exploring concepts, ideas, and students' prior knowledge (Praetorius et al., 2018, Fauth et al., 2019). For example, when trying to find out the solution to a specific problem, teachers can apply classroom discussions to enhance student engagement during learning activities rather than direct questions with "right" or "wrong" answers (Baumert and Kunter, 2013b). These practices could promote the students' ability to re-construct, elaborate, and integrate information, leading to a deeper understanding. Cognitive activation practices also enhance students' conceptual understanding through more engagement in classroom participation, such as communicating concepts and ideas during classroom discussions (Praetorius et al., 2018).

The second dimension of instructional quality is student support (also called supportive climate). The studies revealed that a challenging environment is not enough to promote students' engagement, but they need to be fully supported during learning activities (Baumert and Kunter, 2013b, Stefanou et al., 2004). Student support is conceptualized as quality interactions between teacher and student during learning activities (Praetorius et al., 2018). Another study refers to student support as positive and constructive feedback during teacher-student interactions (Lazarides, Gaspard and Dicke, 2019). It also covers how teachers treat their students positively (with respect, interest, and support) during learning activities. For example, the teacher positively approaches students who make mistakes or misconceptions. The teacher also allows students to express different ideas, choices, needs, and interests.

Classroom management refers to the teacher's ability to allocate classroom time efficiently and prevent the classroom from interpersonal conflicts and disruptions (König et al., 2021, Evertson and Weinstein, 2013). The other study conceptualized classroom management as a teacher's rules and procedures in the classroom to ensure smooth transitions during teaching activities (Fauth et al., 2019). Thus, classroom management covers the teachers' ability to allocate time efficiently through clear rules and procedures to minimize interpersonal conflicts and distractions during teaching activities.

### Professional competence of the teacher

In the last decades, the study of instructional quality predictors used qualifications and the number of courses taken by the teacher as proxy measures (Boyd et al., 2009, Darling-Hammond, 2000, König et al., 2021). However, the study about instructional quality predictors has recently shifted to teacher competence (König et al., 2021, König and Pflanzl, 2016, Lenske et al., 2016, Voss et al., 2014). Some scholars see competence as knowledge, skills, characteristics, motivation, and attitudes to act effectively and efficiently in specific situations and conditions (Zhu et al., 2013, Koster et al., 2005). Furthermore, teacher competence refers to the specific abilities to fulfill the need of their profession (Fauth et al., 2019), such as knowledge and motivation (Baumert and Kunter, 2013a). The concept of teacher competence distinguishes between cognitive aspects (knowledge and beliefs) and motivational aspects (self-efficacy and enthusiasm) (Fauth et al., 2019, Kunter et al., 2013, Blomeke and Kaiser, 2017, Blömeke et al., 2022, Fives and Buehl, 2012, Fives and Gill, 2015). A brief overview of each aspect and the link to the instructional quality will explain as follows.

**Cognitive aspect: Knowledge**. The domain-specific knowledge is divided into content knowledge and pedagogical content knowledge (Blömeke et al., 2022, Fauth et al., 2019). Content knowledge refers to the teachers' comprehensive understanding of subject matters (Shulman, 1986, Fauth et al., 2019). Meanwhile, pedagogical content knowledge refers to understanding how to teach the subject matter (Loewenberg Ball, Thames and Phelps, 2008, Shulman, 1986). Therefore, PCK plays a role to bridges the subject matters and the teaching practice.

The previous study revealed that PCK is closely related to instructional strategies, classroom management, and the relationships between teacher and student (König and Pflanzl, 2016). In more detail, the role of PCK on instructional quality through the following pathways. Teachers with good PCK will be able to create a challenging learning environment to activate a high cognitive level (Förtsch et al., 2016, Fauth et al., 2019, Kunter et al., 2013). This practice enhances students' cognitive engagement during learning activities, which in turn positively affects students learning outcomes (Fauth et al., 2019, Klieme, Pauli and Reusser 2009). The challenging learning activities foster students' engagement during learning activities, which helps the students to understand the topics easier (Fauth et al., 2019, Leuchter, Saalbach and Hardy, 2014).

Teachers with good PCK mostly provide better individual learning support for students (Baumert et al., 2010, Kunter et al., 2013). Positive teacher-student interaction will establish a supportive climate during learning activities, which is helpful for the student during knowledge construction and sense-making (Fauth et al., 2019, Fauth et

al., 2014). This practice provides a supportive environment for students to understand specific topics or courses easier. Last, teacher competence contributes to excellent teaching effectiveness (Liakopoulou, 2011) and classroom management (Voss et al., 2014). Teachers with higher PCK are better at allocating time efficiently and preventing the learning activities from being distracted. They know when to intervene in learning activities if needed (Praetorius et al., 2018). The teacher's ability to minimize classroom disruptions offers ideal environments for learning activities, making students more focused during learning activities. Therefore, teachers' PCK became crucial for teachers to run effective teaching.

**Cognitive aspect: Beliefs**. The concept of beliefs refers to the subjective assumptions that are held to be true (Kleickmann et al., 2016). Regarding teacher beliefs, scholars divide into two orientations, transmission and constructivist (Voss et al., 2013, Mansour, 2009). Transmission orientation sees that teaching as a direct transmission activity from the teacher to the student. Hence, students are considered knowledge recipients. Meanwhile, the constructivist orientation believes that students should actively construct new knowledge by themselves during learning activities. This orientation conceptualized students as active knowledge constructors (Dubberke et al., 2008, Fauth et al., 2019). Therefore, teacher beliefs refer to the teachers' ways of treating students in learning activities, whether as knowledge recipients or knowledge constructors.

Previous studies revealed that teachers with strong constructivist beliefs often give selected tasks to activate students' cognitive during teaching activities (Staub and Stern, 2002, Fauth et al., 2019, Voss et al., 2013, Kunter et al., 2013). In addition, the teacher has more concern regarding students' conceptual understanding by providing individual support (Dubberke et al., 2008, Kunter et al., 2013). Teachers with constructivist beliefs will provide individual support, keep an eye on the student learning process, and be aware of students' difficulties (Kunter et al., 2013, Cornelius-White, 2007).

**Motivational aspects: Self-efficacy.** The study of self-efficacy is popular, particularly in the psychology field. Self-efficacy is conceptualized as "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, Freeman and Lightsey, 1999). Similarly, the other studies also defined self-efficacy as a teacher's belief in their capacity to influence student performance (Berman, 1977, Tschannen-Moran, Hoy and Hoy, 1998, Zee and Koomen, 2016, Guo et al., 2014), although unmotivated student (Guskey and Passaro, 1994, Tschannen-Moran, Hoy and Hoy, 1998), and how to deal effectively with student misbehavior (Zee and Koomen, 2016, Chacón, 2005).

Some scholars have revealed the relationship between teacher self-efficacy and instructional quality. Teachers with high self-efficacy could better deal with the demand of classroom instruction, such as stimulating students' high-order thinking skills, providing a supportive environment, and minimizing interpersonal conflicts and classroom distractions (Zee and Koomen, 2016, Fauth et al., 2019). In addition, teacher instructional behavior is determined by self-efficacy (Tschannen-Moran and Johnson, 2011, Guo et al., 2012). The other studies also revealed that teachers with high self-efficacy consider implementing new instructional methods to avoid student boredom (Zee and Koomen, 2016). Teachers with high self-efficacy also reported better coping with student misbehavior (Lambert et al., 2009) and using positive strategies during teaching activities (Lambert et al., 2009, Emmer and Hickman, 1991).

**Motivational aspects: Enthusiasm.** Enthusiasm is a form of intrinsic motivation that encourages the active involvement of teachers in their work and play as a key to high-quality instruction (Kunter et al., 2008, Long and Hoy, 2006). Based on motivation theories such as interest theory (Krapp, 2002) and self-determination theory (Deci and Ryan, 2002), the teacher enthusiasm concept is described as teacher enjoyment and excitement during engagement in teaching activities (Kunter et al., 2008).

Previous studies show that enthusiastic teachers positively affect learning support and classroom management (Kunter et al., 2013). The higher the teacher's enthusiasm, the higher the instructional quality (Kunter et al., 2008, Kunter et al., 2013, Fauth et al., 2019). The teacher's enthusiasm created a warm and supportive atmosphere during learning activities (Fauth et al., 2019). Teachers can create a supportive atmosphere more easily if they teach with more fun (Roth et al., 2007). Furthermore, the enthusiastic teacher will focus on classroom mastery goal orientation (Lazarides, Buchholz and Rubach, 2018). Teachers must allocate instructional time efficiently through good classroom management to achieve the goal. Teacher enthusiasm also correlates with positive classroom behavior (Zhang, 2014).

In conclusion, based on the literature and previous findings, we hypothesized that teacher competence positively predicts instructional quality.

**Ha.** ***Teacher competence positively affects instructional quality.***

## Current study

The current study examines the relationship between teacher competencies and instructional quality. Based on the literature and previous findings, teacher competence as an antecedent consists of four dimensions (PCK, constructivist beliefs, self-efficacy, and enthusiasm). Furthermore, instructional quality as an outcome construct consists of three dimensions (cognitive activation, student support, and classroom management). Besides, we also performed the confirmatory factor analysis while examining the relationship between teacher competence and instructional quality.

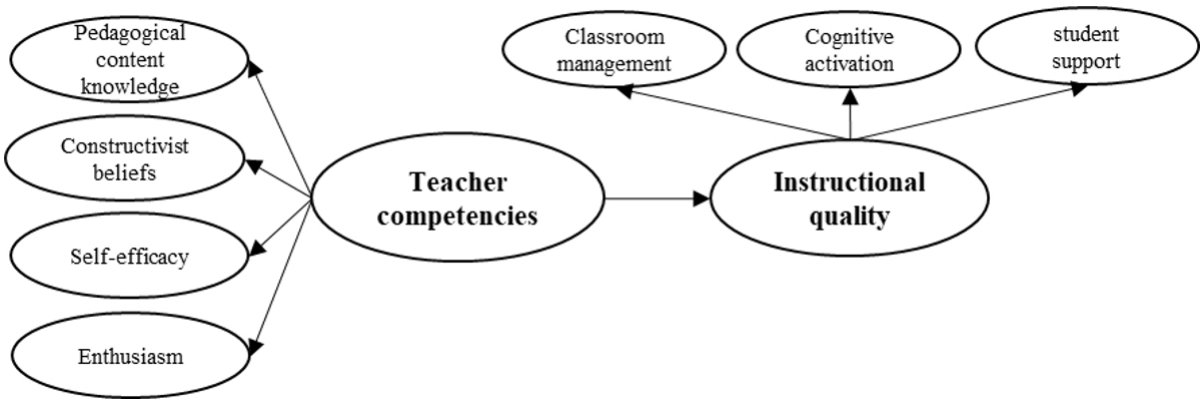


**Figure 1: Conceptual model**

## METHOD

### Participants

The current study use economics teacher from senior high school (public and private) in East Java, Indonesia. The teachers were invited to become research participants through professional teacher networks (high school economics teacher forum). The research participants were 283 teachers. On average, the teachers' age was 38.7 years old (*SD* = 11.2), and teaching experience was 12.6 years (*SD* = 10.8). Fifty-eight percent of teacher participants were female. All the research participants are voluntary.

### Instruments

**Pedagogical content knowledge (PCK).** Teachers' PCK was measured by a twenty-three item based on the PCK scale by Aksu, Metin and Konyalıoğlu (2014). The PCK scale is developed by combining the intersection between pedagogical knowledge and content knowledge. A sample item is: "I know the critical points of my lessons." The items were rated on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly disagree*).

**Constructivist beliefs (CB).** Teachers' constructivist beliefs were measured using the Teacher Belief Survey (TBS) developed by Woolley, Benjamin and Woolley (2004). We adopted a part of TBS, especially the constructivist section, which consists of eleven items. The scale captures teacher philosophies about the teaching profession covering seven main themes (classroom learning environment, behavior management, curriculum, assessment, teaching strategies, student roles, and working with parents). A sample item is "I believe that expanding on students' ideas is an effective way to build my curriculum." The items were rated on a 6-point Likert scale from 1 (*strongly disagree*) to 6 (*strongly disagree*).

**Self-efficacy (SE).** Teachers' self-efficacy was measured by ten items scale developed by Schwarzer and Schmitz (1999). The scale has been broadly validated (Schmitz and Schwarzer, 2000). The scale covers relevant aspects of teaching activities, such as interacting with students, parents, and colleagues. The scale captures teacher conviction in dealing with various situations, particularly in classroom instruction (sample item "I am convinced that I am able to successfully teach all relevant subject content"). The items were rated on a 4-point Likert scale from 1 (*strongly disagree*) to 4 (*strongly disagree*).

**Enthusiasm (Enth).** Teachers' enthusiasm was measured by four items developed by Kunter et al. (2008). The items focus on subject-related enthusiasm and teaching-related enthusiasm (a sample item is: "I am still enthusiastic about the subject"). The scale showed good predictive validity (Kunter et al., 2011, Lazarides, Gaspard and Dicke, 2019).

**Instructional quality.** Teachers' instructional quality was measured using the instrument developed by Schlesinger et al. (2018). The instrument consists of eighteen items covering three instructional quality dimensions (cognitive activation, student support, and classroom management). A sample item is: "The lesson starts and ends on time". The items were rated on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly disagree*).

### Data Analysis

We used partial least squares structural equation modeling (PLS-SEM) in SmartPLS 3.0 software to examine the research model. We adopted a multi-stage process that involves the model specification, outer model evaluation, and inner model evaluation (Hair et al., 2014). First, we draw the model specification according to the literature review (figure 1). Second, we evaluate the outer model through confirmatory factor analysis (CFA), including the validity and reliability of the measurement model. Third, we evaluate the inner model through the coefficient of determination ($R^2$), cross-validated redundancy ($Q^2$), path coefficients, and the effect size ($f2$).

## RESULTS

### First-order measurement model

After the model specification was established based on the literature and previous studies (figure 1), we evaluated the outer model through confirmatory factor analysis (CFA). We performed a first-order stage to examine the convergent validity (factor loadings and AVE), discriminant validity, and composite reliability of all constructs. During the analysis, we drop three items due to the factor loadings being less than 0.6 (PCK1, CA1, and CM5). The result (table 1) shows that the convergent validity of the measurement was established. It is evidenced by the factor loadings of the items for all constructs, which are higher than 0.6, and the AVE of each dimension is higher than 0.5 (Hair et al., 2017). The composite reliability of all constructs was higher than 0.7.

| Construct | Item | Factor Loading | AVE | Composite Reliability |
|---|---|---|---|---|
| Pedagogical content knowledge (PCK) | PCK2 | 0.888 | 0.733 | 0.984 |
| | PCK3 | 0.802 | | |
| | PCK4 | 0.87 | | |
| | PCK5 | 0.846 | | |
| | PCK6 | 0.851 | | |
| | PCK7 | 0.89 | | |
| | PCK8 | 0.876 | | |
| | PCK9 | 0.897 | | |
| | PCK10 | 0.864 | | |
| | PCK11 | 0.86 | | |
| | PCK12 | 0.745 | | |
| | PCK13 | 0.885 | | |
| | PCK14 | 0.82 | | |
| | PCK15 | 0.89 | | |
| | PCK16 | 0.812 | | |
| | PCK17 | 0.884 | | |
| | PCK18 | 0.878 | | |
| | PCK19 | 0.897 | | |
| | PCK20 | 0.854 | | |
| | PCK21 | 0.824 | | |
| | PCK22 | 0.812 | | |
| | PCK23 | 0.895 | | |
| | PCK24 | 0.833 | | |
| Constructivist beliefs (CB) | CB1 | 0.939 | 0.906 | 0.991 |
| | CB2 | 0.967 | | |
| | CB3 | 0.947 | | |
| | CB4 | 0.901 | | |
| | CB5 | 0.965 | | |
| | CB6 | 0.961 | | |
| | CB7 | 0.959 | | |
| | CB8 | 0.937 | | |
| | CB9 | 0.963 | | |
| | CB10 | 0.954 | | |
| | CB11 | 0.974 | | |
| Self-efficacy (SE) | SE1 | 0.832 | 0.786 | 0.973 |
| | SE2 | 0.855 | | |
| | SE3 | 0.856 | | |
| | SE4 | 0.897 | | |
| | SE5 | 0.845 | | |
| | SE6 | 0.876 | | |
| | SE7 | 0.938 | | |
| | SE8 | 0.931 | | |
| | SE9 | 0.928 | | |
| | SE10 | 0.901 | | |

| Construct | Item | Factor Loading | AVE | Composite Reliability |
|---|---|---|---|---|
| Enthusiasm (ENTH) | Enth1 | 0.867 | 0.78 | 0.934 |
| | Enth2 | 0.865 | | |
| | Enth3 | 0.915 | | |
| | Enth4 | 0.886 | | |
| Cognitive activation (CA) | CA2 | 0.666 | 0.741 | 0.918 |
| | CA3 | 0.915 | | |
| | CA4 | 0.923 | | |
| | CA5 | 0.911 | | |
| Student support (SS) | SS1 | 0.925 | 0.798 | 0.965 |
| | SS2 | 0.925 | | |
| | SS3 | 0.938 | | |
| | SS4 | 0.934 | | |
| | SS5 | 0.913 | | |
| | SS6 | 0.827 | | |
| | SS7 | 0.776 | | |
| Classroom management (CM) | CM1 | 0.943 | 0.876 | 0.973 |
| | CM2 | 0.936 | | |
| | CM3 | 0.949 | | |
| | CM4 | 0.926 | | |
| | CM6 | 0.926 | | |

**Table 1: First-order construct loadings, AVE, and composite reliability**

## Second-order measurement model

We performed the second-order stage due to the multidimensional construct of teacher competence as antecedent and instructional quality as the outcome variable. The teacher competence consists of four dimensions (pedagogical content knowledge/PCK, constructivist beliefs/CB, enthusiasm/ENTH, and self-efficacy/SE), while the instructional quality consists of three dimensions (cognitive activation/CA, student support/SS, and classroom management/CM). The result shows that factor loadings of all dimensions are acceptable (higher than 0.6) with $t$-values > 1.96 and $p$-values < 0.001. Furthermore, table 3 shows the AVE and composite reliability of all dimensions are higher than 0.5 and 0.8. Additionally, This study used Fornell and Larcker method (1981) to examine the discriminant validity. Table 4 shows that the discriminant validity of this study was established.

| Constructs | Dimensions | Factor Loadings | $t$-Values | AVE | Composite Reliability |
|---|---|---|---|---|---|
| Teacher competence | Pedagogical content knowledge (PCK) | 0.878 | 51.509** | 0.512 | 0.977 |
| | Constructivist beliefs (CB) | 0.761 | 28.364** | | |
| | Self-efficacy (SE) | 0.619 | 13.905** | | |
| | Enthusiasm (Enth) | 0.633 | 14.381** | | |
| Instructional quality | Cognitive activation (CA) | 0.984 | 548.373** | 0.794 | 0.984 |
| | Student support (SS) | 0.995 | 1111.639** | | |
| | Classroom management (CM) | 0.992 | 863.401** | | |

*Note. **significant at the level of 0.001*

**Table 2: Second-order construct loadings, $t$-values of dimensions**

| Dimensions | AVE | Composite Reliability |
|---|---|---|
| Pedagogical content knowledge (PCK) | 0.733 | 0.984 |
| Constructivist beliefs (CB) | 0.906 | 0.991 |
| Self-efficacy (SE) | 0.786 | 0.973 |
| Enthusiasm (Enth) | 0.78 | 0.934 |
| Cognitive activation (CA) | 0.741 | 0.918 |
| Student support (SS) | 0.798 | 0.965 |
| Classroom management (CM) | 0.876 | 0.973 |

**Table 3: AVE and composite reliability of the second order constructs**

| | PCK | CB | SE | ENTH | CA | SS | CM |
|---|---|---|---|---|---|---|---|
| PCK | 0.856 | | | | | | |
| CB | 0.457 | 0.952 | | | | | |
| SE | 0.343 | 0.376 | 0.887 | | | | |
| ENTH | 0.43 | 0.484 | 0.509 | 0.883 | | | |
| CA | 0.442 | 0.463 | 0.439 | 0.507 | 0.861 | | |
| SS | 0.432 | 0.466 | 0.417 | 0.52 | 0.773 | 0.893 | |
| CM | 0.447 | 0.447 | 0.418 | 0.509 | 0.766 | 0.862 | 0.936 |

*Note: PCK = Pedagogical content knowledge; CB = Constructivist beliefs; SE = Self-efficacy; Enth: Enthusiasm; CA = Cognitive activation; SS = Student support; CM = Classroom management.*

**Table 4: Discriminant validity**

Next, we evaluate the inner model through the coefficient of determination ($R^2$), cross-validated redundancy ($Q^2$), path coefficients, and the effect size ($f^2$). The result (table 5) shows 0.338 for $R^2$ and 0.266 for $Q^2$. That means the predictive accuracy of the research model is weak to moderate, while the predictive relevance is medium to large (Hair et al., 2017). Additionally, the path coefficient of teacher competence on instructional quality is 0.582 ($p$-value < 0.001), meaning teacher competence positively predicts instructional quality. Last, the effect size ($f^2$) shows 0.512, which means the teacher competence has a large effect on explaining the instructional quality (Cohen, 1988, Hair et al., 2014, Hair et al., 2017). In other words, the teacher's competence strongly contributes to explaining the instructional quality.

| Relationship | $\beta$-value | S.E. | $p$-value | $R^2$ | $Q^2$ | $f^2$ |
|---|---|---|---|---|---|---|
| Teacher competence → Instructional quality | 0.582 | 0.040 | < 0.001 | 0.338 | 0.266 | 0.512 |

**Table 5: Inner model evaluation**

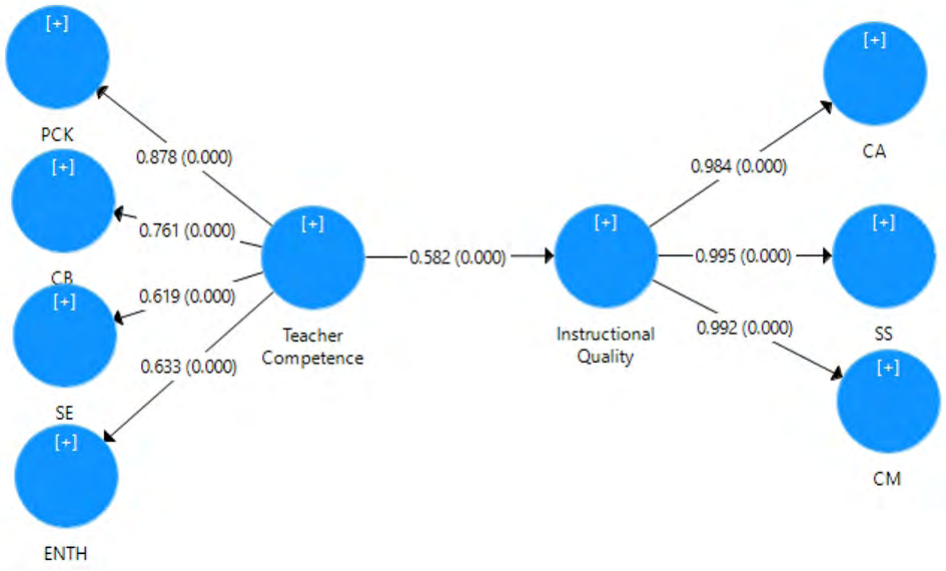


**Figure 2: Result of the structural model analysis**

## DISCUSSION

The result shows that teacher competence, including cognitive aspects (PCK and beliefs) and motivational aspects (self-efficacy and enthusiasm), positively affected instructional quality. This finding indicates the higher the teacher's competence, the higher the instructional quality. In other words, cognitive aspects (PCK and beliefs) and motivational aspects (self-efficacy and enthusiasm) are identified as relevant predictors of classroom instructional quality.

In more detail, this study revealed the underlying mechanism of the relationship between teacher competence and instructional quality, particularly on how each teacher competence dimension affects instructional quality. The first dimension of teacher competence is pedagogical content knowledge (PCK). This study denotes that teachers with good PCK will be able to provide better instructional quality. Teachers with good PCK understand how to organize, adapt, and deliver learning material to the diverse abilities of learners. In other words, the teacher with good PCK will be able to represent and formulate the subject matter and make it easy to understand for students. In short, PCK is a teacher's competence in teaching the subject matters and plays a role in bridging the subject matters and the teaching practice.

The previous studies revealed the role of PCK on instructional quality in the following ways. A good PCK will allow a teacher to provide a challenging learning environment to enable students' cognitive level (Förtsch et al., 2016, Fauth et al., 2019, Kunter et al., 2013). The challenging environment will promote students' cognitive engagement and help them comprehend the subject matter (Fauth et al., 2019, Leuchter, Saalbach and Hardy, 2014, Klieme, Pauli and Reusser, 2009). Furthermore, a teacher with good PCK will provide better individual learning support (Baumert et al., 2010, Kunter et al., 2013), which will establish a positive relationship between teacher and student. The supportive climate will promote knowledge construction and sense-making of the student (Fauth et al., 2019, Fauth et al., 2014). Last, good PCK also enables the teacher to create lesson plans and efficiently use time allocation. In addition, teachers also have the ability to minimize classroom distractions during learning activities. Teachers know when to intervene in the learning activities (Praetorius et al., 2018). These practices offer students an ideal learning environment and help them focus on the subject during learning activities. Therefore, the current finding strengthens the previous study that PCK is positively related to instructional quality dimensions, including cognitive activation, student support, and classroom management.

Second, constructivist beliefs. This study revealed that teachers with constructivist beliefs treat students to construct knowledge by themselves. In other words, the teacher believes that the student is a knowledge constructor instead knowledge recipient. Furthermore, teachers with constructivist beliefs will encourage students to construct knowledge by establishing a challenging learning environment through selected tasks and strategies, which could activate students' cognition. In addition, to encourage the student to self-construct knowledge, teachers with constructivist beliefs will keep an eye on the student learning process and be aware of students' difficulties by providing individual support. This finding is in line with the previous studies that proposed teacher with strong constructivist beliefs will more be successful in activating students' cognitive (Staub and Stern, 2002, Fauth et al., 2019, Voss et al., 2013, Kunter et al., 2013) and provide better student support (Dubberke et al., 2008, Kunter et al., 2013, Cornelius-White, 2007).

Third self-efficacy. As conceptualized, self-efficacy is the teacher's belief in their capabilities to organize and execute the required learning process to achieve the learning goal. Therefore, teachers with high self-efficacy have confidence in promoting student performance and dealing effectively with student misbehavior. This study revealed that teachers with high self-efficacy would be more confident in making decisions to deal with classroom demand during instruction, such as considering the new instructional methods to stimulate students' high-order thinking skills. Furthermore, high self-efficacy makes it easier for teachers to minimize classroom distractions, develop a supportive environment, and encourage students' motivation. The current findings are in line with the previous studies that reported that teachers with high self-efficacy had a better ability to utilize an appropriate learning strategy (Lambert et al., 2009, Emmer and Hickman, 1991) and cope with student misbehavior (Lambert et al., 2009, Zee and Koomen, 2016).

Last enthusiasm. This study revealed enthusiastic teachers could create a warm and positive relationship with students. In addition, the enthusiastic teacher shows a positive and constructive approach to students. These practices contribute to establishing a supportive environment during learning activities. This study also revealed that teacher enthusiasm is related to classroom management. Teachers with high enthusiasm show high motivation to achieve the learning goal through effective and efficient time allocation. The enthusiastic teacher also shows an excellent ability to minimize distraction and interpersonal conflicts during classroom instruction to achieve the learning goal. These findings are in line with the previous if enthusiastic teachers positively related to the ability to create a supportive atmosphere through a positive teacher-student relationship (Praetorius et al., 2018, Fauth et al., 2019, Lazarides, Buchholz, and Rubach, 2018, Roth et al., 2007) and good classroom management through efficient time allocation and minimizing classroom distraction (Zhang, 2014, Kunter et al., 2013). Therefore, the more enthusiastic the teacher is, the more student support and classroom management are provided.

## CONCLUSION AND IMPLICATION

In conclusion, this study discloses that teacher competence, including cognitive aspects (PCK, constructivist beliefs) and motivational aspects (self-efficacy and enthusiasm), positively affected instructional quality. This study revealed that instructional quality is not only determined by the teacher's cognitive aspects but also by the teacher's motivational aspects. Therefore, to enhance instructional quality, this study suggests paying attention to the teachers' motivational aspects as well as teachers' cognitive aspects.

This study provides insights for all stakeholders, including the practitioners (teachers), policymakers, and universities as the

responsible institutions for preparing teacher competencies. First, practitioners (teachers) should increase the four competencies (PCK, constructivist beliefs, self-efficacy, and enthusiasm) through continuing professional development programs to ensure quality instruction. Second, policymakers should support teacher development programs in cognitive and motivational aspects. For the cognitive aspects, the support can be in the form of free professional development opportunities and research grants. Furthermore, the support to increase the motivational aspects can be from career paths, salary increases, and direct rewards for outstanding teachers. Through the actual support, the increases in the four teacher competencies could be expected, which in turn enforce the instructional quality. Last, the universities should not only focus on preparing the cognitive aspects of prospective teachers but should also pay more attention to the motivational aspects to ensure instructional quality.

## LIMITATION

This study has several limitations. First, this research model ignores socio-demographics (age, gender) and teacher experience, although those variables, theoretically, affect the teacher's instructional quality. Second, the research was conducted on high school teachers as participants. This study can not be generalized to other levels of education, such as elementary and higher education. At those education levels (elementary and higher education), the instructional quality may predict by different variables due to the different students and environment characteristics. Therefore, more research is needed to confirm and generalize our findings.

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