

# **Analyzing the development of Pedagogical Content Knowledge and Teaching Efficacy of Chemistry Prospective Teachers: A Case of Chemical Bonding Topic**

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## **ABSTRACT**

The education of prospective chemistry teachers must be carried out as effectively as possible to prepare them who are competent in teaching. Pedagogical content knowledge (PCK), that is a beneficial new theoretical framework for defining teachers' knowledge and practice, has not been fully developed in the education of prospective chemistry teachers. PCK of prospective chemistry teacher can be developed through various courses that integrate pedagogical competence and content mastery. The exploration of PCK development of prospective chemistry teachers, from microteaching courses to their practical teaching experiences in schools is very important. It is because considering that during microteaching, prospective teachers teach in the situation of 'peer teaching,' while in school, they teach real students in a real environment. The teaching-reflection skills during microteaching learning are expected to become provisions for developing transformative PCK of prospective chemistry teachers. This transformative PCK can be observed during the teaching practice program, which is followed by prospective chemistry teachers with mentoring from lecturers and teachers. Accordingly, prospective chemistry teachers will develop their teaching efficacy. Chemical bonding contains a lot of abstract chemistry concepts so challenges prospective teachers to develop suitable PCK to teach chemical bonding topics in high school. That means not only to encourage mastery of concepts, but also making learning relevant to students' lives. This will be explored from the pedagogical components chosen by prospective chemistry teachers. This research aims to analyzing the PCK development, exploring the factors that influence the PCK development, and describing the interrelation between prospective chemistry teachers' teaching efficacy and their PCK abilities. This research will adopt a case study method. The participants are chosen by purposive sampling that having 3 different level group of understanding of chemical bonding concept that is examined by their developed concept map. The participants will attend microteaching course then follow the teaching practice program in the high school. During this process, interview, observation, documentation and reflection will be carried out. Content analysis will be conducted to data analysis of PCK development in teaching chemical bonding topic. The result showed that the PCK of prospective chemistry teachers is develop well. They are aware and have better efficacy to teach chemical bonding. The most factors that influence their PCK are the basic knowledge, practice and experiences

Kata Kunci: *chemical bonding, prospective chemistry teacher, pedagogical content knowledge, teaching efficacy, microteaching*