Improving Physics Teaching Using POCoM (Practical On-site Cooperation Model)

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Abstract
Korean science teachers had implemented to practice only 38% of their knowledge and skills about educational theories and teaching strategies (Park, et al., unpublished). This study was motivated by the concern for how physics teachers can extract and activate their potential expertise or profession about educational knowledge and skills to improve physics teaching. We developed an alternative in-service approach, POCoM (Practical On-site Cooperation Model), based on the following basic principles: (1) the ‘bottom-up’ approach, where observed problems in actual physics classes are improved practically and instantly without using any pre-determined teaching plan and materials; (2) ‘cooperation’ between researcher and teacher to improve physics class; (3) ‘naturalistic setting’ by considering various real problems embedded in actual teaching and learning situations; and (4) ‘gradual improvement’ rather than revolutionary change. To observe and analyze the physics teaching in classroom and laboratory, we developed the KTOP (Korean Teaching Observation Protocol). Using the KTOP, we observed physics class directly, checked which parts of teaching needed to be improved, and just after the teaching, cooperated with teacher to invent the improvement ideas or methods for the physics teaching. And then, physics teacher applied the improvement ideas and methods to the next class immediately. Using this process of the POCoM, we obtained about 88% and 93% teaching improvement for the classroom teaching and laboratory teaching respectively. After analyzing the cooperation processes and actual classroom physics teachings, we identified 7 types of successful improvements and 5 types of unsatisfactory features, as well as their reasons and features, respectively. Finally, we introduced several other studies in detail, which would need to be performed in connection with this study.