

## Exploring Professional Development Needs of Mathematics Teachers through Their Reflective Practitioner Experiences

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**Abstract :** According to existing educational research studies, students learn better with high teacher quality. Therefore, professional development has become a crucial way of increasing the quality of novices and veteran in-service teachers by providing support regarding content and pedagogy. To answer what makes PD effective, researchers have studied different PD models and revealed some critical elements that need to be considered, such as duration of a PD and the manner of delivery (e.g., lecture vs. engaging). Also, it has been pointed out that if PDs are prepared as one-size-fits-all, they most likely be ineffective in addressing teachers' needs toward improving instructional quality. Instead, teachers' voices need to be heard, and the foci of PDs should be determined based on their specific needs. Thus, this study was conducted to identify professional development needs of middle school mathematics teachers based on their self-evaluation of their performances in light of teaching standards. This study also aimed to explore whether the PD needs with respect to years of teaching experience (novice vs. veteran). These teachers had participated in a federally-funded research grant, which aimed to improve the competencies of 6-9 grade-level mathematics teachers in pedagogy and content areas. In the research project, the participants had consistently videoed their lessons throughout a school year and reflected on their performances, using Teacher Advanced Program (TAPTM) rubric, which was based on the best practices of teaching. Particularly, they scored their performances in the following areas and provided evidence as the justifications of their scores: Standards and Objectives, Presenting Instructional Content, Lesson Structure and Pacing, Activities and Materials, Academic Feedback, Grouping Students, and Questioning. The rating scale of the rubric is 1 through 5 (i.e., 1=Unsatisfactory [performance], 3=Proficient, and 5=Exemplary). For each area mentioned above, the numerical scores of 77 written reports (for 77 videoed lessons) of 24 teachers (nnovices=12 and nveteran=12) were averaged. Overall, the average score of each area was below 3 (ranging between 2.43 and 2.86); in other words, teachers judged their performances incompetent across the seven areas. In the second step of the data analysis, the lowest three areas in which novice and veteran teachers performed poorly were selected for further qualitative analysis. According to the preliminary results, the lowest three areas for the novice teachers were: Questioning, Grouping Students, and Academic Feedback. Grouping Students was also one of the lowest areas of the veteran teachers, but the other two areas for this group were: Lesson Structure & Pacing, and Standards & Objectives. Identifying in-service teachers' needs based on their reflective practitioner experiences provides educators very crucial information that can be used to create more effective PD that improves teacher quality.

**Keywords :** mathematics teacher, professional development, self-reflection, video data

**Conference Title :** ICTE 2017 : International Conference on Teacher Education

**Conference Location :** Toronto, Canada

**Conference Dates :** June 15-16, 2017