

Elevating Physics Teachers' Instruction Using Video Based Didactics - A Model of Growth in Professional Awareness

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Abstract. Following the report from the last Girep [1] on our ongoing research, we have studied new evidence from different levels of physics teachers and teachers' trainers' video-based-didactics (VBD) discourse. We also further elaborated the framework of awareness levels [2] and constructed a model of awareness growth of teachers and teachers' trainers in the context of video-based-didactics. Our findings suggest that both teachers and teachers' trainers exhibit special incidents ("Hmmm- moments" and "Aha! moments") that may indicate on their awareness growth. We characterize these moments and study the conditions for their emergence.

1. Introduction

Teachers' professional progression involves climbing from lower to higher levels of awareness with regard to teaching. Mason [2] described three such levels: awareness with regard to one's own acts of teaching (awareness in-action - AIA), awareness regarding the discipline (physics teaching) context of the AIA (awareness in-discipline - AID) and awareness to the needs of others in building their own AIA and AID (awareness in-counsel - AIC). We adapted Mason's framework for teachers (T^1) and teachers' trainers (T^2) professional progression (Figure 1). In our interpretation climbing up the awareness ladder is correlated with a progress in the proficiency of instruction.

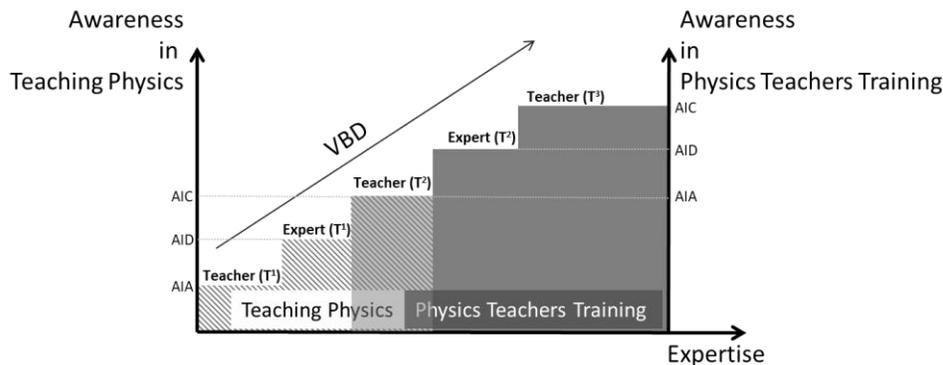


Fig. 1: A model of growth in professional awareness of teachers (T^1) and teachers' trainers (T^2) by employing the VBD discourse

2. The research

1. Methodology, findings and initial inferences

In our study, we analyzed new data of verbatim transcription from Video Based Didactic (VBD) discourses [1] of 39 T¹ and 10 T² physics teachers and semi open interviews with 4 of the T² teachers. In order to test the role of the VBD discourse in elevating the T¹ and T² teachers, we identified statements of two types that indicate on insights of the trainee that were correlated with modes of conversation led by the trainer: (1) Statements that represents instances in which the trainee have a reflective or thought provoking moments in the discourse (“Hmmm moments”) and (2) Statements that represent instances in which new ideas or insights emerge in the discourse (“Aha! moments”). Here is an example from an interview held with T² teacher, Rebecca (pseudonym):

Rebecca: ...using VBD made me much more aware of teaching. I listen to my students more carefully to understand what they're thinking....Regarding [instructing] other teachers, I consider teachers mistakes [in teaching physics] more mercifully... If two years ago I thought in such occasion 'how could she do such a mistake?!' now I seek to understand how the teacher thinks....I think to myself, how to help her carve from herself the understanding of that mistake, and help her to be aware of that.

This example (out of many) shows Rebecca's upward shift in the level of awareness, from T² with only AIA, to an expert T² that experienced the emergent of new insight of AID as a physics teachers trainer. We will present further analysis of these awareness growth moments and conditions that induce them as well as evidence for teachers shift in awareness as they climb up the model stairs.

3. Conclusion

Our tool for analyzing the VBD discourse by looking for special growth in awareness instances seems to be promising. The research findings indicate that the VBD discourse assists both T¹ teachers and T² teachers in climbing the awareness ladder and at the same time fosters their professional progression. These findings may suggest the potential of employing the awareness growth model in planning teachers' and teachers' trainers PD programs and the efficiency of using the VBD tool as part of such programs.

References

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