

The Mentor Learns the Most: The Effects of Curiosity-Driven Discourse on Physics Mentors

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Abstract. This study explores the transformative impact of curiosity-driven (CD) discourse on teacher-mentors' professional development. Eight physics and mathematics in-service teachers participated in CD discourse workshops, alternating roles as mentors and mentees across four rounds. Leveraging Mason's model, we assess changes in mentors' awareness levels through content analysis by categorizing their responses to open questions. Findings reveal significant shifts in mentors' awareness post-discussion, highlighting heightened generalization abilities. Importantly, CD discourse fosters mutual learning, challenging traditional mentor-centric perceptions and enhancing mentors' teaching practices. Our study underscores the transformative potential of CD discourse, offering insights into its role in shaping teacher professional development.

Introduction

Video-based evidence plays a central role in a teacher's professional development (PD) when engaged in collaborative discourse (e.g., [1]). However, research on such discourse, when one participant serves as a mentor, mainly focuses on the mentees' PD as a teacher and often misses the mentors'. Although the development of the mentor **as a mentor** has already been previously studied (e.g., [2]), their development **as a teacher** remains unexplored thus far. Here, we report on the impact of a specially designed curiosity-driven (CD) discourse on physics and mathematics teachers who played the role of mentors (for details on the CD discourse, see [3]). In CD discourse, two peer teachers discuss a short excerpt of a self-video of the lesson from the mentee's lesson. The mentors prepare their mentoring based on instances that raise their curiosity about the evidence at hand. Unlike an evaluative discourse, which judges the mentee's actions in class as right or wrong, in a CD discourse, the mentors ask questions that intrigue them and for which they have no clear answer. In contrast to the perception of discourse as an event in which one party (the mentor) transfers knowledge to the other (the mentee), in the CD discourse approach, both parties treat the process as a collaborative inquiry process. In this kind of discourse, the mentor is also a partner in the same learning process as the mentee and, therefore, may gain professional growth due to the conversation. As a measure of this growth, we used the model of changes in teachers' level of awareness [3] that was adapted from Mason's [4]. According to this model, Awareness In Action (AIA) is the awareness of teaching actions in planning and executing the lesson. Awareness In Disciplines (AID) is the ability of the teacher to connect the anecdotal occurrence in class to two disciplines: the one she teaches (e.g., physics) and the discipline of teaching the subject matter (e.g., physics teaching).

This study offers a way to identify and quantify the PD of teachers who participate in CD discourse. It also offers a way to test the model of levels of awareness.

Research question.

What is the evidence of the mentor's PD **as a teacher** after participating in a CD Discourse?

Method

Participants consisted of eight physics and mathematics in-service teachers who participated in a voluntary workshop aimed at training them for a CD discourse and implementing it with each other. During the workshop, the teachers participated in four rounds of CD discourse. Each round focused on the mentee's selected 5-minute-long excerpt from a self-recorded video of a lesson they taught. The teachers then watched their own video excerpt in detail and reflected on it while identifying issues of interest and recording these in writing. Next, participants were assigned to pairs where one member would act as a mentee and the other as a peer mentor. The assigned peer mentor then watched the mentee's selected video excerpt and generated questions and topics for discussion with the mentee. Finally, dyads met to conduct a CD discourse in which they watched and discussed the assigned mentee's video excerpt while following the principles of such discourse [3]. All the teachers acted as both mentors and mentees, alternating roles in successive rounds. After each round, the participants filled out an open questionnaire about the CD discourse and its contribution to them. We used content analysis to sort the teachers' statements into the aforementioned categories - Indications of AIA and AID.

Findings

Following the conversation, we found a change in the mentor's and the mentee's levels of awareness. An example of such a change can be found in Reena's case. When Reena first watched the video from Ben's class, she wrote: "As an answer to the question 'When does the normal force increase?' a student answered, 'When I go up,' and Ben focused him – 'We have displacement, velocity, and acceleration; use these terms.' Why is it so important to Ben that students will use these terms?". After conversing with Ben, the mentee, she wrote: "I have learned from Ben how to teach students to justify their answers properly- to use kinematic terms. When you focus them on a few terms – displacement, velocity, acceleration, time – it is easier for them to translate their intuition to physical terms." An analysis of all the reflections shows an increase in the generalization ability of both the mentor and the mentee. That is, the mentor is contributed from the conversation no less than the mentee.

Conclusion

We observed that CD discourse contributed to mentors' ability to generalize anecdotal instances into pedagogical content knowledge. After their discussion with a colleague, their observations exhibited a higher level of awareness. Therefore, CD discourse may contribute to the mentor no less than the mentee. The knowledge teachers report acquired while they were acting as mentors seems to have the potential to contribute to their teaching.

References

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