

# Micro-Skills Triads for Training STEM Teaching Assistants to Support Active Learning

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## ABSTRACT

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Doctoral teaching assistants are frequently present when students are most active, such as in labs and exercise sessions (Fagen & Wells 2004), yet typically get little pedagogical training (Cox et al. 2011) and what training is offered may be generic rather than specifically adapted to the subject epistemologies of science and engineering (Luft et al. 2004, 213). Yet if teaching assistants are to effectively support students in active learning environments, their tendency to see undergraduate students principally as “receptacles of information” (Gardner & Jones, 2011) is problematic as it reveals the belief of many that their role is to provide “good” information rather than to assist students figuring things out themselves (Luft et al. 2004).

This **hands-on session** will allow participants to experience a 60 minute triadic role play activity which addresses specific teaching methods associated with STEM disciplines. The design is informed by key findings of our review of evidence on teacher training in science and engineering, namely the challenge of *enactment in practice* or *transfer of learning* from the training workshop into the classroom (Darling-Hammond, 2006). The three STEM specific micro-skills practiced in the role play are:

- a. Teaching by questioning (rather than by explaining).
- b. Providing feedback that aids student self-regulation.
- c. Teaching a scientific/mathematical problem-solving method.

The 175 doctoral teaching assistants who provided feedback through evaluation questionnaires in the 14 sessions organized since 2014 have expressed broad agreement that the micro-skills triads were useful for developing these skills. Further, 75% of participants strongly agreed that they were quite likely to try the skills in practice. This shows that participants not only saw the skills as useful but that they also felt that they had been taught in a way that facilitated their transfer into practice.

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