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# Community-Oriented Pedagogy for In-Service CS Teacher Training

In this paper we present a community-oriented pedagogical approach for in-service teacher training. The premise within the work was that although CS teachers have many opportunities for professional interaction, they do not exhaust the potential of being part of a community of practice [2].

In Israel, where this study was conducted, teachers typically interact with their peers in school and those they meet in in-service teacher training courses, with people from the CS inspecting body at the Ministry of Education, and within the myriad possibilities for interaction at Machshava, the Israel National Center for Computer Science Teachers [1]. The teachers' burning pedagogical needs are rooted in improving their classroom performance. These needs are typically addressed by exchanging classroom materials (e.g., tests, exercises, and examples) shown to "work" in class.

We sought to enhance the interaction between the teachers, as well as to transform the interaction to include, in addition to the existing element of materials "consumption", an element of "production", namely, a responsible production and review of materials, influenced by thorough pedagogical discussions and a bird's eye view of the field.

To this end, a community-oriented pedagogy was developed. It is based on the following guidelines:

1. An explicit emphasis on the relationship between the contents of specific domains and the general principles of CS should be made in order to enable the teachers to establish a bird's eye view of the discipline.
2. The possible benefits of relying on learning theories to guide pedagogical decisions should be demonstrated. Specifically, the theories of learning and instruction that were used by the course mentors should be explicitly referred to in the context of their utilization for preparing school materials as well as for activities associated with the teachers' course.
3. The knowledge and opportunities for interaction should be provided within a context that is seen as beneficial by the course's participants. Otherwise, the participants will not prudently utilize their efforts in establishing a community of practice. We suggest that the best context is the teachers' in-class practice, such as preparing new materials and analyzing in-class situations.
4. The teachers should be provided with opportunities to actively use the knowledge gained in the course in order to establish a professional discourse and practice.
5. The course activities should encourage interaction between the course participants in order to establish a micro-community that supports its members. Teachers should also be

provided with opportunities for interaction outside the micro-community of the course. In addition, they should be encouraged to maintain an elevated level of interaction by appearing at conferences, writing articles in CSE newspapers, and actively participating in CSE forums on the Web.

We demonstrate how this approach was implemented in one teacher-training course. Specifically, we show that teachers who participated in the course changed their self-perception from being merely knowledge consumers to collaborative knowledge producers as well.

[1] Israel National Center for Computer Science Teachers. "Machshava": the Israeli National Center for high school computer science teachers. *ACM SIGCSE Bulletin, Proceedings of the 7th Annual Conference on Innovation and Technology in Computer Science Education*, 34, June 3, 2002.

[2] Barab, S. A., Barnett, M. and Squire, K. Developing an empirical account of community of practice: characterizing the essential tensions. *The Journal of the Learning Science*, 11, 4, 489-542, 2002.

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