

Promoting Sustainable Teacher Learning: Nurturing a School-Based Technology-Enhanced Teacher Community of Practice

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Abstract

The goal of this research is to design and study a socio-technological infrastructure that can support sustainable teacher learning. We hypothesize that leveraging on existing teachers' social infrastructure in their real-world settings, can lead to such sustainable learning. Informed by situated learning theory, we designed an intervention to foster the development of a high school teacher department as a technology-enhanced community of practice (CoP), by engaging teachers in authentic activities as members of their local community. This longitudinal study examined the long standing effects of the intervention over a period of two years. Qualitative analysis was performed based on data from observations and semi-structured interviews. Evidence for sustainable learning was found, where members of the CoP have shown an improved collective ability to learn from one another, supported by a socio-technological infrastructure. Recommendations for professional development design that may promote sustainable teacher learning are included.

Keywords: situated learning, teacher professional development, collaborative learning, technology-enhanced communities of practice, sustainable learning.

Introduction

In the past two decades there has been increasing recognition of the importance of teacher learning to educational improvement (Desimone, 2009; Fishman, Davis, & Chan, 2014). Yet, unfortunately, many teachers nowadays do not have sufficient opportunities for deep and sustainable learning that prepares them for the complexity of new forms of teaching and learning in the digital age of 21st century (Feiman-Nemser, 2001). In their workspace, teachers are usually isolated, deprived of fruitful interactions from which they can learn and develop professionally. Professional development (PD) is often short term, sporadic, disconnected from teachers' practice and of weak influence (Borko, Jacobs, & Koellner, 2010; Salomon, 2000).

To address the growing need for effective PD, reviews of the literature have recommended the following common core features of PD, that are aligned with contemporary learning theories (Borko et al., 2010; Desimone, 2009): 1) the PD content should be situated in practice, address problems of practice, and focus on students' learning; 2) the PD should model desired instructional strategies; 3) teachers should participate collaboratively in professional communities; 4) the PD should be school-based when possible; and 5) the PD should be ongoing. Yet, empirical research, attesting to the effectiveness of the current PD literature is rather limited, and even though some studies have shown a positive impact on teacher learning and practice, not many have been found to be sufficiently sustainable or scalable (Schlager & Fusco, 2003).

The goal of this study is to contribute to the understanding of how sustainable teacher learning might be achieved. We hypothesize that leveraging on existing teachers' social infrastructure in their real-world settings, with the support of technology, can lead to sustainable teacher learning. Therefore, in this case study we fostered the development of a civil-studies high school (HS)

teacher department (TD) as a technology-enhanced community of practice (CoP), and examined whether and how this development contributed to sustainable teacher learning.

Theoretical Background

Situated learning theorists (e.g., Brown, Collins, & Duguid, 1989) view knowledge as a product of activity and context (physical, social and cultural), and is therefore tentative and continuously evolving (Salomon 2000). Learning is viewed as a process of enculturation into a community and its culture, and occurs as a ‘side-effect’ of engaging in shared *authentic activities*; those ordinary, yet meaningful and purposeful practices of a culture, performed by its members (Reimann, 2008). Lave and Wenger (1991) have further developed this idea of enculturation, and have coined the term *legitimate peripheral participation*, viewing learning as a process in which a newcomer becomes a fully participating member of a CoP, through growing involvement within practice.

CoPs are defined by three interrelated characteristics: a joint enterprise, mutual engagement, and a shared repertoire (Wenger, 1998a;b). *Joint enterprise*, is what members, sharing a domain of interest, are pursuing together. In pursuit of the joint enterprise, members of the community *mutually engage* in joint activities, discussions, and information sharing. A *shared repertoire* is a set of communal resources that have developed over time through sustained mutual engagement, and includes tools, routines, norms and discourse. Development of CoPs is achieved by learning along these three dimensions (Wenger, 2009). Learning within ambient (naturally occurring) CoPs, informed the design of learning environments, conceptualized as classroom learning communities (LCs) (Bielaczyc & Collins, 1999). Such LCs have a dual goal of 1) continually advancing the collective knowledge, while supporting the growth of individual knowledge, and 2) learning how to learn.

Empirical research on PD of the past two decades can be categorized to scholarship focusing on situating teacher learning within their instructional practice, and scholarship focusing on engaging teachers in social learning (Fishman et al., 2014). These categories can be seen as adopting two different aspects of situated learning theory to inform the design of teacher learning: 1) authentic activities, and 2) social learning (Putnam & Borko, 2000). This study is informed by a combination of both these aspects; rather than trying to build a new social-cultural context in the form of CoPs to foster social teacher learning, we use an existing authentic physical-social-cultural context, to provide the setting for social learning (a school-based TD); rather than focusing primarily on teachers' instructional practice and activities, we take a broader view on teachers' authentic activities as members of their local socio-cultural community.

Research Questions

How has the development of the teacher department as a CoP supported sustainable learning?

Method

Participants and Context

A civil-studies TD in a large HS in northern Israel participated in the designed intervention. Seven teachers participated in the study.

Methodology

This longitudinal study examines the long standing effects of the intervention (a school-based workshop) over a period of two years, and was comprised of the following stages: exploration, workshop design, enactment and analysis.

Exploration

Through exposure meetings and questionnaires, the researcher analyzed the stakeholders' needs, and teachers' technological skills and explained the intervention's rationale to the participants.

Design

Our study is on the continuum between ambient and designed technology-enhanced environments (Kali et al., 2015). In designing for nurturing a CoP, a delicate balance between design and emergence was kept, refraining from disrupting the CoPs' self-organizing drive (Reimann, 2008). This tension was addressed by 1) *flexible and adaptive design*; and 2) minimalist design - a socio-technological infrastructure was provided, yet room was left for members to assume ownership and create their own space within.

The choice of a HS discipline-based TD is an important aspect of the design. First, choosing an existing, functioning social and organizational unit that will continue to exist beyond the intervention's lifespan, provides good grounds for making sustainable changes. Second, teachers belonging to a discipline-based department have much in common with regards to their shared practice, potentially inviting frequent interactions (Penuel, Riel, Krause, & Frank, 2009).

The workshop's goal was learning how to learn from each other with the support of technological tools inspired by the classroom LC goal—learning how to learn. In line with the above design principles, two technological tools were chosen: a collaborative editing community website (Google Sites) a social network platform (Google+). We therefore consider the CoP in this study as a technology-enhanced CoP, in which mutual engagement between its members is enhanced by technological tools (however, we address it shortly as a CoP).

Enactment

The workshop included three face to face sessions during May-June of 2014. The first session was devoted to negotiation of joint objectives. These were derived from the workshop goal, and from teachers' 'here and now' needs of practice. Findings from the needs analysis questionnaire were used as a basis for this negotiation. The team agreed upon two objectives: 1) create a template for the civil-studies project on the community's website. This objective was pursued only during the time of the workshop; 2) sharing and discussing current events, and enabling ongoing communication through a closed Facebook group (FG). The teachers suggested to use Facebook, since most of them were using it in their personal lives. The facilitator (first author) was attentive to this request even though she had planned to use a different social network platform (Google+) for the workshop. With the opening of the FG, it became active, and it is still so, at the time of writing this article.

Data sources and analysis

Data were obtained from 1) observations of Facebook group activity over a period of two years; and 2) semi-structured interviews of teachers: one-week post intervention ('post') (June 2014), five-months post intervention ('5 months'; November 2014), and two years after the intervention ('2 years'; June-July 2016). A qualitative thematic analysis was conducted on transcripts of interviews, and was triangulated with fellow researchers (Shkedi, 2003; Schoenfeld, 2007). Qualitative content analysis was conducted on the FG's online activity.

In this context, sustainable learning refers to long lasting autonomous collective ability of CoP members to learn from one another. Based on the literature review, this will be operationally defined as a CoP's shared repertoire (routines, norms, discourse and tools) supporting learning within the CoP.

Findings

To respond to the research question, we analyzed the development of the CoP along the three dimensions of joint enterprise, mutual engagement and shared repertoire (Wenger, 1998a;b). An elaborate analysis follows.

Development in shared enterprise

The development of the CoP was triggered by the joint negotiation of objectives, which resulted in expanding the joint enterprise with an additional objective (sharing current events reports through a FG).

This is a learning objective: teachers advancing their knowledge and instructional practice of integrating current events in the teaching of civics. Roie reflected on this process.

The message in a [traditional] professional development is: here is something for enrichment, then go and think what you do with it, how and whether you implement it or not. [The researcher's] starting point was [different]: I have an agenda, but I intend to connect it to the here and now. The connection to the here and now prevents opposition to the professional development. This gives an immediate gain, and secondly, it expands the team's toolbox for dealing with our daily tasks. (Roie, post, 16.6.2014, 10)

The workshop content, derived from the defined objectives, was determined together, as in a partnership, reflecting both the workshop goals and the teachers' here and now needs. The combination of an objective that answered and acknowledged a strong existing need with the process of a joint negotiation, gave rise to teachers' mutual engagement and commitment to pursuing the objective.

Development in mutual engagement

We describe the development of mutual engagement within the CoP according to the following aspects: 1) communication (channel and content); 2) shared activities (team meetings); and 3) relationships.

Ongoing communication, and daily sharing of professional content via an open virtual channel

In pursuit of the expanded joint enterprise, the teachers began to mutually engage through the newly formed communication channel (the FG). The FG modeled a new way of interaction, being open and transparent to all team members, non-hierarchical, and not depending on a certain time and place.

At first, teachers shared mainly contents related to current events, building upon an existing norm of sharing. Fueled by the strong ongoing need of incorporating current events into teaching, this mutual engagement was sustained, and with its continued use, teachers shared also discipline related content and general pedagogical content. This further expanded the joint enterprise. There was very little sharing of processed, readymade contents such as lesson plans. Sharing on the Facebook group also enabled sharing contents in various media forms (such as videos and pictures). Through sharing on the Facebook group, teachers learned from one another, thus expanding their professional knowledge, at times translating this knowledge to improvement in their instructional practice.

Democratic team meetings focused on teachers' learning

The introduction of a new virtual channel, where messages and professional content could be shared efficiently, and continuously between meetings, challenged the existing role of team meetings as a communication channel. Based on teachers' needs identified by the department head, team meetings started to revolve around enrichment and professional development; their number significantly being reduced. Some of the enrichment sessions were conducted by team members, sharing their unique expertise.

Additionally, the discussions in team meetings reached greater depth, due to cross-channel communication between the Facebook group and face to face encounters. Posts on the Facebook group served as a starting point from which face to face discussions could build upon, rising above the informative level. In short, "flipped team meetings" emerged.

Generally speaking, it enables us to be exposed to a lot of content in a short time, and everyone does it when it's convenient for them. People usually choose what to read and what to respond to. By the way, mostly reading. We don't usually develop the discussions there, but take it from [the Facebook group] to [the team meetings]. In a way this is similar to the "flipped classroom" model. The teacher reads the content and thinks about it before coming [to the team meeting]. (Roie, 2 years, 9.6.2016, 11-13)

Tighter relationships of collaboration and trust

To begin with, there were relations of openness, mutual trust, and support in the team (that enabled sharing on the Facebook group in the first place). As in a spiral, the continuous mutual engagement via an open, democratic channel, contributed to tightening the relations of trust and advancing team collaboration.

I think [the usage of the Facebook group] also helps in the sense, if we speak about teamwork, it strengthens the collaborative climate. That is, once we have such an open format, where people continuously share, I think it strengthens a climate that has its roots here [trust and supportive relations], but it undoubtedly strengthens a climate of collaboration. Yes, it makes a kind of modelling of how to work together to some extent. (Roie, 5 months, 27.11.2014, 16)

Changes in shared repertoire

As a community, the members' collective ability to learn from one another has increased throughout the two-year period. Pursuing the joint enterprise, which was expanded to include a learning objective, mutual engagement was sustained over a prolonged period of time, resulting in a change in the CoP's shared repertoire. This change was evident in 1) routines: team meetings designated for reciprocal enrichment and discussions ("flipped team meetings"); 2) technological tool (Facebook); 3) established norm of sharing; and 4) discourse revolving around professional issues and other issues of interest to them as persons. As Erez describes.

This group created a certain discourse. A discourse of sharing; principled, academic and professional sharing. It was not dependent on meetings nor on a specific school agenda. It's not just profession related (whether it makes you a better teacher), but more broadly to the content that interests you as a person. (Erez, 2 years, 11.7.2016, 30)

Discussion

The goal of this research was to design and study a socio-technological infrastructure that can allow for sustainable teacher learning, and contribute to the understanding of how this might be achieved. This longitudinal study, spanning a two-year period, found evidence of sustainable teacher learning supported by the development of the teacher CoP. Members' collective ability to learn from one another enhanced by technological tools has increased, and was not dependent on external ongoing PD support.

Based on the findings, we suggest an initial framework describing development within the CoP that might lead to sustainable learning (Figure 1). As the figure depicts, the CoP's development was triggered by the joint negotiation of objectives for the workshop, which led to the expansion of the CoP's joint enterprise (see first circle in Figure 1). In pursuit of an agreed upon learning objective, the teachers began to mutually engage through the newly formed communication channel (the Facebook group), sharing relevant current events reports. Fueled by a genuine ongoing need of incorporating current events into teaching, this mutual engagement was sustained for a prolonged period of time, its imprints becoming part of the shared repertoire. Learning inherently became part of the local CoP's culture along all three dimensions (Wenger, 1998a;b), and is therefore sustainable.

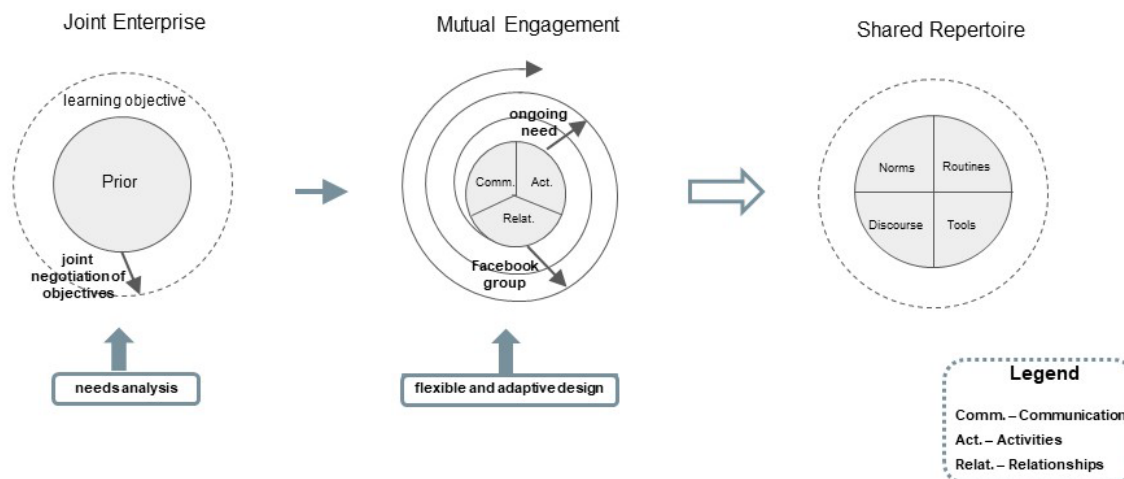


Figure 1. Suggested framework for sustainable learning in a CoP

As we hypothesized, leveraging on the existing social infrastructure of the TD's CoP, contributed to sustainable learning, as seen through all its dimensions: 1) joint enterprise – was expanded to address existing needs; 2) mutual engagement—relations of trust within the CoP gave rise to the norm of sharing; when sharing was intensified via an open channel (the Facebook group), the relationships were strengthened even further. This is reflected in the spiral depicted in Figure 1; and 3) shared repertoire—the habit of using a technological tool (the Facebook platform) was expanded, and the existing norm of sharing was strengthened. This leverage was made possible due to the adaptive and flexible design.

Conclusions and Implications

Limitations

Limitations to this study include the idiosyncratic nature of a small scale study, and the lack of observation data of team meetings. Additionally, the TD under study was a non-normative group of teachers, being of high profile and having relations of trust. Future research is opted for in additional settings that exhibit less favorable conditions.

Implications

Based on these results, a refinement of the suggested features of effective PD (Borko et. al, 2010; Desimone, 2009) that might promote sustainable teacher learning, can be considered:

1. Foster existing CoPs within schools, in which members already have a widely shared practice, rather than building new CoPs for the mere purpose and lifespan of the PD.
2. Leverage on the CoP's existing shared repertoire elements (e.g., norms and tools) and strengthen them, rather than trying to introduce new ones. The moderator is required to become familiar with the existing repertoire, and tailor the design such that it is taken into account.
3. Objectives and derived contents for the PD should be determined as in a partnership, through negotiation, reflecting both the facilitator's goals and teachers' here and now needs. Needs addressed should preferably be strong, ongoing, and common to all teachers, and analyzed systematically.
4. Ongoing PD support is not necessarily needed, if PD succeeds in triggering sustainable autonomous learning.

We envision that nurturing school-based teacher CoPs, as described in this study, can ultimately support educational improvement. Our vision being: teachers collaboratively working within

communities, where they support each other and learn from one another. We hope that in the long run, teacher participation in CoPs, will form the basis for instructional change towards teachers' facilitation of classroom learning communities.

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