Profiles of Participation Outcomes in Faculty Learning Communities

Introduction

Significant evidence suggests that undergraduate education in science, technology, engineering, and mathematics (STEM) disciplines needs to be improved [1–4]. Research on effective teaching has recognized interactive teaching and active learning as effective tools in advancing STEM education: they promote both student achievement [5] and conceptual understanding of the material [6]. However, despite the growing body of research that supports this type of teaching, traditional lecturing still prevails in college classrooms [7].

The factors that prevent faculty from innovating their teaching include (1) the lack of faculty training in teaching and pedagogy [8,9]; (2) the lack of skills, resources, and time [10,11]; and (3) the fear that students would not perceive innovations positively [12]. Moreover, research shows that just reminding faculty that they ought to care about teaching and devote time to it would not change their behavior [13]. Teaching innovations are risky in nature; therefore, faculty may take this risk only if they feel actively encouraged and supported [13].

In order to encourage innovative teaching, a support system needs to be developed. Such a system is necessary not only for resistant or hesitant faculty, but also for those who are willing to innovate their teaching or who are already doing it. A study by Henderson, Dancy, and Niewiadomska-Bugaj found that faculty often stop using innovative strategies after trying several times [14]. They suggested that it happens partially because of the lack of support and feedback during implementation. One of the ways to support faculty in their teaching innovations is through faculty learning communities (FLCs). In this study, we explored the outcomes of instructors' participation in FLCs with a goal of developing profiles of FLC participation

outcomes. The goal of the profiles is to understand how different faculty might benefit from participating in an FLC. Understanding the different participation outcomes that might be possible during a yearlong FLC chould help other leaders of FLC groups consider the types of activities that could be included. For instance, some participants might be seeking more strategies beyond what they already are trying. Some others might be interested in creating connections with other people in their departments around teaching initiatives. The first goal might require considering external resources that would be useful to the group and the second might require more opportunities for collaborative work among faculty members or creating common goals.

Literature Review

By FLCs, also referred to as communities of practice in the faculty development literature, researchers typically mean a community of instructors meeting regularly to discuss and to improve their teaching [15–27]. FLCs can be implemented in a face-to-face [15–24] or virtual [25–27] delivery format. FLCs tend to include a small number of instructors, typically 5-10. Participating instructors can vary in rank and employment type. Communities may have either a very specific focus (e.g., on service learning [18] or technology [21]) or a rather broad focus on having teaching conversations, learning about teaching, and/or teaching improvement [15,17,20]. The studies on FLCs are usually exploratory, but there are some quantitative evaluation studies [18,20,26]. Those studies described FLCs and evaluated their effectiveness, identifying participation benefits and challenges. The challenges are typically instructors' time constraints [15,28] and scheduling issues [16,19], as well as the lack of university value for teaching [17] and priorities different from teaching [22]. A few of the participation benefits included learning gains [16,18], appreciation of having teaching conversations with their peers [15,17], re-forming their attitudes

toward innovative teaching [22], and making changes to their teaching [20,23,25,26]. While significant efforts were directed at describing the outcomes of faculty participation in FLCs, to date, no attempts to systematize those outcomes have been undertaken. To address this gap, we conducted this study, guided by the following research question: What are profiles of participation outcomes in a FLC focused on teaching?

Context

Since the term "faculty learning community" could include other goals (e.g., research), we refer to the groups as Teaching Development Groups. Four groups were organized in four STEM departments at a suburban public university on the east coast of the US. Conceptually, the organization of the Teaching Development Groups was framed using six SIMPLE Design principles represented in Figure 1. According to the SIMPLE principles, members of the FLCs have a common goal of innovating their teaching by making incremental changes to it (the Incremental Change principle). Further, members focus on changing the learning environment to become more interactive and considering active learning strategies (the Learning Environment principle). The FLCs are developed around the members' needs, such as problems they have encountered in their classrooms or strategies they think might be useful (the People-driven principle). In addition, to maximize the effectiveness of the FLCs, they need to be sustainable over time, continually providing their members with a safe place for interaction and learning while expecting a reasonable time commitment (the Sustainable principle). Lastly, members are encouraged to create artifacts, in which they document the new teaching strategies they are trying or learning about (the Design principle). These artifacts, called design memos, are used to share this knowledge inside and outside of the FLC [29].

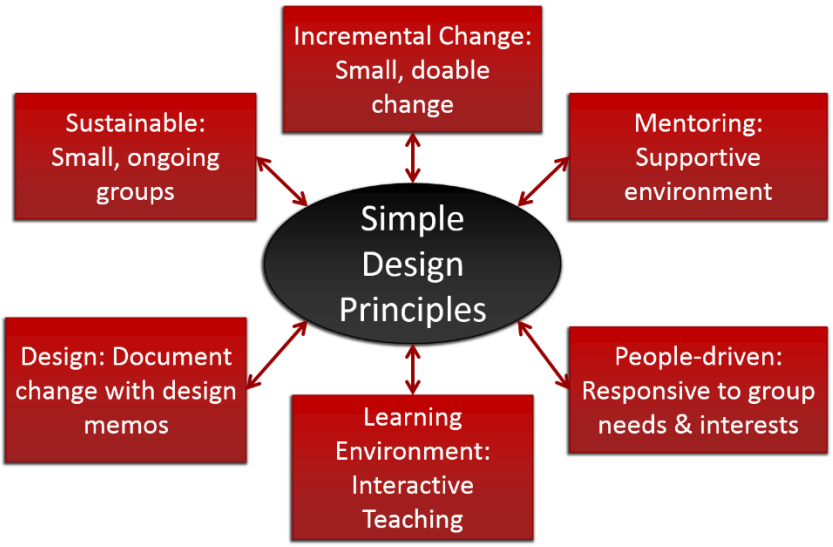


Figure 1. The SIMPLE Design principles

Each group had a leader – a faculty member within the department who received a semester-long training from the project research team on pedagogy and FLC leadership. The research team identified people within their departments who had an interest in interactive teaching and were known to be trying new teaching methods. The leaders then recruited colleagues from their departments who they knew were interested in teaching generally and interactive teaching. The leaders were responsible for participant recruitment, organization of meetings, and facilitating discussions during them. The leaders received a small stipend for their role as facilitators. Participation in the groups was voluntary. In this study, we explored the first year of the TDGs functioning. The four groups consisted of 4-9 members including the leaders. The number of meetings varied for the groups, but the goal was to have regular meetings according to the needs of the group. Some groups incorporated discussing educational articles and books. One group had an additional focus on educational research.

Participants

A total of 25 instructors participated in the project: 5 leaders (one group had two co-leaders) and 20 members. Group members varied in gender and employment type. The

proportions of male and female participants were almost the same (12 male participants and 13 female). About half of the participants were term faculty whose primary focus is on teaching (12 instructors); tenured or tenure-track faculty members, who are research-oriented, were less represented in the groups (5 and 4 faculty members respectively). Two TDGs also included graduate students (a total of 4). In addition, project participants also varied in classes they taught. The classes they taught ranged in size (from small classes of less than 30 students to large classes of more than 300 students), type (classes taught included lectures, seminars, and laboratories), delivery format (face-to-face, online, and hybrid), level (undergraduate and graduate), and kind (required classes and electives). We are unable to provide the distributions of the discussed data across groups as it may lead to participant identification.

Data Sources

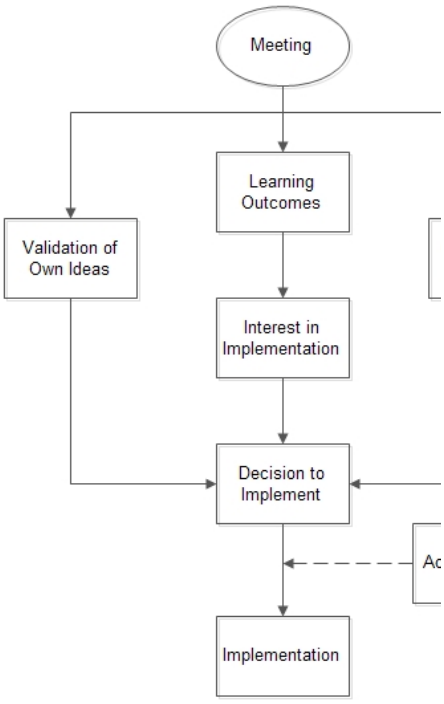
The data for this study were collected mainly through interviews with project participants. In total, 21 participants (including all group leaders) were interviewed using a semi-structured interview format [30]. During the interviews, participants were asked about their teaching and experience with TDGs. All interviews were audio recorded and transcribed. For this paper, we are excluding interviews with the two participants who were in administrative positions because they had different purposes for attending meetings and one participant who did not attend meetings regularly so was not really engaged in the process. So, 18 interviews are included in this analysis.

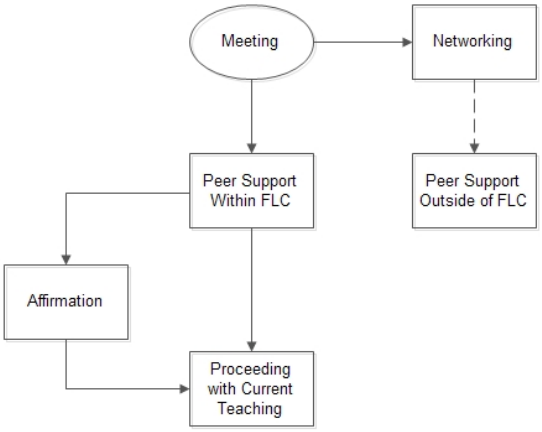
Data Analysis

For each participant, we wanted to describe their participation outcomes in the TDG and begin to synthesize common profiles of participation outcomes. The transcribed interview data were coded in two cycles: initial coding and pattern coding [31]. During the first cycle of coding

(the initial coding) we employed descriptive coding to assign labels to the segments of data, resulting in over 500 codes. During the second cycle of coding (pattern coding – that was partially conducted simultaneously with initial), we grouped initial codes into categories, resulting in the development of 29 final categories with sub-categories. For further analysis, with respect to our research question, we selected categories and sub-categories that represented participants' outcomes from TDG meetings and the project overall, which later became the profiles elements.

As a next step in our analysis, we conducted within-case and cross-case causal network analysis [31]. A qualitative causal network analysis is used to describe the relationship between components of a system and can be used to describe a process or series of connected events[32]. It can rely on within-case analysis and cross-case analysis to analyze patterns across participants. In the within-case analysis, we organized and connected the codes in a network for each participant to describe the outcomes of their participation in the group. As a result, we developed a participation outcomes network for each participant. For the cross-case network analysis, we compared the networks across participants to create a common profile[31]. At first, we attempted to create one, overarching network to describe possible paths. However, this profile quickly became too cumbersome, which led us to the decision to split it in two more parsimonious profiles. The two final profiles of participation outcomes were the following: the implementation profile (Figure 2) and the peer support profile (Figure 3). After we designed these profiles, we looked back in the data and mapped coded interview excerpts to the profiles to ensure the absence of mismatch between the data and the profiles. Specifically, we ensured that no elements were left out or misrepresented and that the order in which we placed the elements matched the order identified by participants. We will discuss the developed profiles in the next section.





Results

In this section, we will describe the two profiles of TDG participation outcomes – the Implementation Profile and the Peer Support Profile. TDG participation primarily includes instructors' participation in their groups' meetings. Thus, TDG participation outcomes typically mean the outcomes from the meetings. Different participants indicated outcomes from either one of the profiles, or both, or none (see Table 1). The two profiles include multiple outcomes (profile phases), some of which formed a chain of phases. It is important to note that participants did not necessarily go through all phases of the profiles or have all the outcomes. Rather, different participants had different participation outcomes and thus might have been at different profile phases. For the two participants that did not fit either model, one had previously been in groups that were more successful so the new experience was less successful and one had other objectives for participation related to education research and student mentoring.

Table 1. *Number of participants per profile*

Implementation Profile only	9
Peer Support Profile only	1
Both Profiles	6
No profile	2

Implementation Profile

The Implementation Profile describes participation outcomes related to learning about teaching strategies and potentially trying them in their classrooms. They especially emphasized the benefit of learning from their peers. One member who learned a teaching strategy from another member reflected, "That's something I don't think I would have ever been exposed to if I hadn't met in a group like this." Learning from their peers was also valuable because it provided opportunities to learn from first-hand experience (i.e., strategies that were already tried by others in the group). In addition to peer learning, participants were also learning from the books and articles they read as part of their group participation.

While some of the learned ideas were not useful to participants (e.g., not applicable to their classes), other ideas interested them as something they could try in the future in their classes. An interest in those ideas led some participants to the decision to implement them and several members had a chance to do so during the first year of TDG functioning. However, some members deferred the implementation of new ideas to the future for various reasons (e.g., the current class was already planned or the idea was not suitable for the current class). Reasons for delaying implementation included the implementation difficulty of particular strategies or the lack of leeway in the course structure.

The decision to implement and the actual implementation of new ideas, however, were found to appear not only as a consequence of learning outcomes. For some participants, those

phases appeared as a consequence of other participation outcomes, such as generation or validation of participants' own ideas. For example, in several groups, members decided to develop a new strategy to implement during the semester and report back to the group after trying it. One member remembered, "I came up with this idea of implementing that for the purpose of this [project]. So, I wouldn't have done that otherwise. I feel it was successful, and it's something that I want to implement more in the future class." Other members used the group as a space to fine-tune their ideas before implementing them. Another member shared, "Before I even started this group, I knew where I was going with my own teaching technique but talking about it with other people helped me to validate my decision to do what I was doing."

Regardless of what led members to the decision to implement their ideas, some of them emphasized the accountability aspect of group participation as a factor that pushed their process from making a decision to actual implementation. One participant remembered, "I feel like having the group kind of forced me into doing it, so that I had something… [In the] middle of the semester, I knew we were all going to meet, and I have to talk about it. I didn't want to say, oh, I haven't done it yet. So, [it] keeps you accountable. I knew they were going to keep me accountable for."

Peer Support Profile

The Peer Support Profile focused on outcomes about the perceived support that participants received from other members in the group (see Figure 3). These types of support refer to more general support for teaching rather than providing specific advice or suggesting specific strategies to try. Some participants reported that they enjoyed the camaraderie among the group members and the feeling of community they perceived while discussing teaching. For one participant, one of the most important aspects of the group was "the idea that you have

connections between people who are trying to do some more of things, people who are frustrated with what's happening, or people who have ideas and know how you can overcome [these] little frustrations. It's just really good to have kind of a sounding board group." Some members also emphasized the supportive and encouraging atmosphere that prevented them from feeling isolated in their teaching and reinforced their desire for teaching improvement. Moreover, several participants also mentioned an affirmation for being "on a right track for that stuff" as an outcome of the groups' support structure. Thus, those members in the Peer Support profile were returning to their classes after the meetings feeling supported and/or with more confidence in the direction of their teaching. Lastly, another participation outcome within the Peer Support Profile was networking. Some participants noted that the group provided them an opportunity to connect with and get to know their colleagues in the department better. Knowing colleagues and specifically their teaching may be beneficial for participants going forward, as it allows them to seek peer support from them outside of the TDG.

Discussion

In this paper, we presented the development of the two profiles of FLC participation outcomes. The Implementation Profile describes participants' participation outcomes that lead to implementation of new teaching strategies in their classes. The Peer Support Profile is concerned with the feelings of support that participants perceived while participating in the FLCs. A note needs to be made that the two profiles are not mutually exclusive in that participants could benefit from participation within both profiles. For example, some participants were interested in implementing newly learned ideas and felt supported in their teaching at the same time. The identification of two profiles also suggests that different faculty have different needs and preferences for teaching development.

The two profiles were developed through an exploratory study conducted on the first year of the groups. The data from the second year will be used to conduct a confirmatory study, which will verify the profiles and/or potentially identify new ones. We also aim to explore other efforts of group members that are not about their own teaching improvement. For example, some groups' work in our project included directions in educational research or department-level teaching improvement, which may result in additional profiles. We are also interested in how different group composition functions might impact the types and outcomes of participation that occur (e.g., including graduate students, the role of administrators, the roles of term faculty). Finally, we will investigate profiles of participants who were involved in the project for multiple years. We are interested in whether their profiles and interests change over time.

The development of the profiles of FLC participation outcomes contributes to the body of knowledge on faculty professional development through FLCs, as they systematize participation outcomes that can occur in a FLC. It also provides insight into how FLCs can influence implementation of and support for interactive teaching. This knowledge may also help future FLC organizers in designing their communities. In particular, the profiles can be useful for setting goals and expectations for participants. For instance, if members are coming to a group simply looking for information that can imply a different group structure than if members have teaching strategies they need support to try in their classrooms.

The future research can go beyond systematizing participation outcomes themselves and estimate the timelines of these outcomes. This research may also be useful for future FLC designers, as they may need to consider the average time (and its range) needed for participants to move between profiles' phases. For example, we are interested in understanding what the timeline might be for faculty to shift from learning about a strategy to trying it in their

classrooms to continuing to refine and expand their use of interactive teaching. For research and evaluation of faculty development efforts, it is important to understand what a reasonable timeline is for expecting teaching improvement and to understand what reasonable levels and characteristics of this improvement might be realistically achieved through faculty learning communities.

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