COLLABORATIVE LEARNING WITHIN AN INFORMAL COMMUNITY: HOW ONLINE SPACES CAN CATALYZE CHANGE

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Online learning communities are an increasingly prevalent informal learning site for teachers. These sites offer an emotionally and philosophically supportive space for teachers who advocate for change. In this study, our analysis of the interactions transpiring within one mathematics education Facebook group illuminates a critical conversation taking place, instruction based on students' perceived abilities. Teachers discuss systems level tracking and classroom level ability grouping to catalyze change and subvert the structures that produce tracking in schools. This collaborative environment both informed and empowered teachers to make educative decisions about inclusive strategies that built heterogeneous groups of learners.

Keywords: affect, emotion, beliefs, and attitudes; equity and diversity; informal education; technology

The negative effects of tracking are clearly articulated within the National Council of Teachers of Mathematics' publications *Principles to Action* (2014) and *Catalyst for Change* (2018), yet this practice continues to dominate K-12 classrooms. Choices made based on ill-informed assumptions about students' academic ability (Ladson-Billings, 1997) have led school systems to track students into mathematics classrooms that often do not prepare students for futures in STEM fields (Oakes, 1990). Course sequencing and perceived ability grouping continue to have negative effects on students such as: the continuation of social reproduction (Reichelt, Collischon, & Eberl, 2019), lack of student motivation (Lessard, Larose, & Duchesne, 2018), and lower beliefs about one's mathematical ability (Mijs, 2016).

Teachers are becoming more aware of the effects of tracking and some are attempting to change the oppressive system from within their schools and classrooms. The purpose of this study is to highlight the voice of teachers engaged in a social media network seeking support on how to make a change in their schools. In what follows, we begin by situating our work within social learning perspectives and previous research on the negative effects of tracking. We then outline our findings and discuss how a social media space can emotionally and philosophically support teachers as they advocate for change.

Framing

Teacher Learning

Grounding our work within the context of social learning, "communities of practice" offer a lens to examine the dynamic interactions that occur within an informal learning environment. Wenger (2006) defines communities of practice as "groups of people who share a concern or passion for something they do and learn how to do it better as they interact regularly" (p. 1). Communities of practice foster a sense of belonging where members share a common goal. Teachers' participation and interaction within these spaces allow them to develop shared knowledge, learn together, and support one another in their practice (Wenger, 1998).

Teachers' beliefs about teaching and learning play a significant role in shaping their instructional practice (Schoen & LaVenia, 2019). Kyndt and colleagues (2016) utilized the results of their meta-analysis on informal teacher learning to identity three key learning outcomes that resulted from participation in these learning communities: (1) improved content knowledge, (2) stronger

In: Sacristán, A.I., Cortés-Zavala, J.C. & Ruiz-Arias, P.M. (Eds.). (2020). *Mathematics Education Across Cultures: Proceedings of the 42nd Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*, Mexico. Cinvestav / AMIUTEM / PME-NA. https:/doi.org/10.51272/pmena.42.2020

pedagogical knowledge and skills, and (3) a change in attitudes and identities. Macia and Garcia (2016) further explored the nuances of informal learning spaces and found that teachers often entered into these spaces to support the context-specific needs of their classroom. For example, one contextual demand teachers frequently sought advice on was how to best group students for mathematics instruction. These findings suggest that an informal learning community can serve as a source of instructional support for mathematics teachers.

Ability Grouping

In mathematics instruction, ability grouping is a teaching practice implemented by many teachers (Anthony & Hunter, 2017). Ability grouping refers to students that have been grouped based on their perceived academic ability, which is often determined by their performance on an assessment. While teachers identify the use of ability grouping as a way to cater to their students' diverse learning needs and raise student performance (Hunter, Hunter, & Anthony, 2019), these practices continue to fuel the inequities in our education system. In the era of No Child Left Behind, categorizing students based on their performance with particular labels has contributed to the specific language that teachers use when talking about students (Datnow et al., 2018). For instance, using words such as "high" or "low" communicates the belief that students have fixed mathematical abilities. In order to help teachers shift their beliefs about students' abilities and vision of equitable mathematics instruction, opportunities for professional learning and growth within a supportive environment are needed.

These opportunities expand beyond traditional face-to-face learning environments as the demands placed on teachers continue to grow. For this reason, informal learning communities have become particularly appealing. These communities offer a flexible space for teachers to collaborate, advocate, learn from one another, share ideas or resources, seek information or support, and reflect on one's own knowledge or practice with other teachers from around the world (Macia & Garcia, 2016). In this study, we examine one Facebook group where teachers network together to build a learning community focused on mathematics education.

Methodology

In this qualitative study, a grounded theory approach (Charmaz, 1983) was employed to conceptualize the nature of the interactions taking place in a mathematics education Facebook group. The group was created by a university-based mathematics education research group and had 14,943 members at the time of data collection. In this space, members can pose questions, celebrate successes, share struggles, elicit support, and share resources. On average, the group generates seven original posts per day, and 95 comments on existing posts. In this study, data gathered from this Facebook group includes 2,600 original posts with comments.

The constant comparative elements of grounded theory (Charmaz, 1983) warrant the use of an inductive content analysis (Roller & Lavrakas, 2015) to identify themes and patterns within the data. The coding process took place across three phases. In phase one, the research team open-coded a subset of the data to form emergent themes (Creswell & Poth, 2018) and generated an initial codebook. The research team met to discuss the 49 initial codes and collapsed them into 15 overarching themes. In phase two, the research team drew on these 15 themes to analyze a different subset of data. Additional codes emerged and two themes were added, yielding a total of 17 overarching themes. To establish intercoder agreement (Creswell & Poth, 2018), the research team analyzed a final subset of data and achieved an 84% agreement score. In phase three, the entire data set was hand-coded using the 17 themes.

For the purposes of identifying conversations around tracking, only posts coded for the following three themes were included: (1) beliefs about teaching and learning mathematics, (2) challenges

experienced by teachers and students when teaching and learning mathematics, and (3) any mention of students' experiences learning mathematics. A total of 147 posts were included and analyzed.

Results

In what follows, we report on one prevailing topic, tracking, that emerged as teachers discussed their experiences in this informal learning community. Our analysis suggests that members often come to this community to share their frustration and solicit help to become change agents - teachers actively trying to address inequitable practices within their schools. Teachers appear to recognize the negative impact tracking can have on students at a classroom and systems level; however, there is a disconnect between what they believe and the pressure they receive from colleagues, administration, parents, and district leaders to enact ineffective grouping practices. We draw upon two illustrative posts that represent our findings around how this online learning community discusses systems level tracking and classroom level ability grouping to catalyze change and undo, or subvert, the structures that produce tracking within today's schools.

System Level

In one interaction, a teacher described the negative impact tracking has had on her high school students. She wrote, "I have been teaching the 'lower' track now for 4 years and most of my students tell me they feel stupid for being in my track. Kids make fun of them and feel like they are better than them because of what track they got placed in." At a staff meeting, this teacher advocated against the use of tracking in mathematics but was met with opposition. "I guess, I was surprised of [sic] the resistance."

In her post, she continued by asking, "Was wondering if anyone has had any success in convincing change at their schools?" The post generated 54 replies, which led to a critical conversation around this type of practice. Many of these replies created a feeling of connectedness among the group members that engaged in the conversation. That is, they seemed to share similar beliefs about tracking. Some replies built a bond through words of encouragement, such as, "You have planted the seed! You are right - all kids DO deserve better." Other members of the group shared similar experiences where they too were met with resistance and unsuccessful in their own attempts to lead change. In another reply, a teacher wrote, "I have had absolutely no luck at all. My school is very set...and I can't see anything changing not even in the medium-term future."

This post demonstrates a desire to make a change at a systemic level. These teachers seem to think beyond their own instruction and consider the changes needed to transform education on a larger scale. While teachers may recognize the need for a systemic change in education, they also seem aware of the impeding barriers and obstacles. To mitigate the impact of system level choices, many group members that replied to the post suggested that the original poster take on the issues within her own classroom and mitigate the negative effects through practices she could control immediately.

Classroom Level

One reply encouraged the original poster to address systemic issues of tracking within her own classroom, "You should just go all 'Stand and Deliver' on them and teach the 'lower' track so well that they surpass the other track!" Similarly, another teacher wrote, "Keep your mouth shut and prove them wrong! Do solid teaching with your 'low' kids and let them prove that your methods work on the lowest kids. I love proving people wrong with data." Both of these replies called for the teacher to subvert the systemic level practice of tracking by using good teaching practices, which are less likely used in lower tracks (Mijs, 2016), to create noticeable change through student performance.

Members of the Facebook group discussed their experiences and struggles with ability grouping within their individual classrooms and the impact this has had on their students. One teacher shared how his colleague is "stuck on grouping." As this teacher described his colleague's students, he used

language such as, “fast kids” and “slower kids,” though he indicated he did not care for those terms. This teacher described the tension between promoting heterogeneous grouping practices and the pressure of time constraints and curriculum expectations. To help his colleague shift away from these harmful teaching practices, he posed the following question to the group, “How can I help her [colleague] with this transition without homogenous grouping and/or what recommendations do you have to help get her students to being able to work together and help each other?” Interestingly, this post did not evoke the same level of engagement. While the previous post generated rich dialogue among members, replies to this post were limited. These replies guided the original poster, and the readers of the interaction, towards inclusive strategies that built heterogeneous groups of learners.

Discussion

Educators have leveraged the use of social media, such as Facebook, as a platform for informal learning. Given its flexibility and appeal, teachers gravitate towards these spaces to improve their knowledge and practice (Anderson, 2019). In our analysis of one Facebook group, we found teachers engaged in critical conversations to catalyze change and undo the structures that produce tracking within today’s schools. Research has consistently found that ability grouping fails to benefit the student and further exacerbates the inequities in our school systems; however, conversations within this online community suggest that these practices continue to prevail. Our findings suggest that membership in this type of learning community provides individuals affective resources (Brodie, 2020) through emotional support, which is often overlooked in these spaces. This group also provides emotional support through confirming other members' feelings of frustration, while encouraging them to continue to fight for change at their schools.

While some teachers in this Facebook group recognize the impact of ability grouping and hope to dismantle these practices on a systems level, others navigate these waters within their own classroom. As members from the group share their subversive practices and call for others to “prove them wrong”, they are advocating for Creative Insubordination practices such as, “using the master’s tools” and “flying under the radar” (Gutiérrez, 2016, p. 54). These practices encourage teachers to work within the system and use required tools, such as student assessment and imposed ability groups, to produce outcomes contrary to those often expected. Using Creative Insubordination practices allow teachers to be instigators of change while still working within the confines of a deeply flawed system that continues to impose tracking.

Online learning communities, such as this Facebook group, provide technologically-enhanced ways for teachers to build their understanding of how mathematics is taught and learned. Further research within social media facilitated learning communities should investigate how these spaces are changing the field’s perception of collaborative learning within a community of practice. These online spaces are critically important to some educators and will continue to serve as a professional learning site for teachers.

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