Research Article https://doi.org/10.12973/eujem.6.2.69

EUJEM

European Journal of Educational Management

Volume 6, Issue 2, 69 - 82.

ISSN: 2642-2344
https://www.eujem.com/

Helping Teacher Leadership Teams: Enhancing Teaming by Focusing Knowledge Integration

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Received: February 23, 2022 ▪ Revised: May 18, 2023 ▪ Accepted: June 7, 2023

Abstract: Teacher Leadership Teams (TLTs) are cross-functional teams, and thus knowledge integration is central to their teaming. Importantly, the existing literature maintains that cross-functional teams apply the traverse or transcend approach differently to integrate divergent knowledge, but few studies have directly focused on it within the context of TLTs. Studies on leadership teams in schools have highlighted political and/or cultural perspectives and mainly stressed team/organizational conditions that might influence the TLT process of using two knowledge integration approaches. Therefore, our research analyzed how one TLT employed two knowledge integration approaches in consideration of team/organizational conditions. More specifically, we conducted qualitative research using the Cultural-Historical Activity Theory as an analytic lens. We identified that the TLT used traverse, transcend, and mixed approaches, and that its context influenced the team's hybrid use by determining when the team utilized each approach. We believe that our findings contribute to revealing TLTs' actual knowledge integration process by empirically examining one TLT's use of knowledge integration approaches. Our findings also contribute to developing a more comprehensive framework to understand TLT knowledge integration by addressing existing research from political and cultural perspectives and suggesting further areas of focus (i.e., functional conditions) for future research.

Keywords: *CHAT, cross-functional teaming, knowledge integration, teacher leadership teams.*

To cite this article: Choi, H., & Drago-Severson, E. (2023). Helping teacher leadership teams: Enhancing teaming by focusing knowledge integration. *European Journal of Educational Management*, *6*(2), 69-82. https://doi.org/10.12973/eujem.6.2.69

Introduction

Scholars and practitioners have shed light on the importance of teacher leadership to build organizational capacity for school improvement, and a teacher leadership team (TLT) is one common operationalization of teacher leadership (Doraiswamy et al., 2022; Vernon-Dotson, 2008). Importantly, the existing literature (e.g., Crow & Pounder, 2000; Havnes, 2009; Truijen et al., 2013) suggests that TLTs work as cross-functional teams. In other words, in TLTs, members coming from different functional backgrounds work together to accomplish the organizational-level work of developing school-wide instruction and professional development (PD). For instance, some researchers have described how principals often create TLTs by engaging multiple subject teachers with interdisciplinary expertise in collaborative inquiry and action research to develop school-wide strategies (e.g., school initiatives, staff PDs) based on school goals and mission (Lesaux et al., 2016; Scribner et al., 2007; Stosich, 2021; Trinter & Hughes, 2021). TLTs can also play a role in democratizing the schooling process structure by inviting a broad range of teacher leaders who represent various teacher groups/teams in the school to make decisions that impact their daily lives at school (Hughes et al., 2016; Muijs & Harris, 2007; Smylie et al., 2002; Wenner & Campbell, 2017). As such, TLTs function as cross-functional teams, and this implies that TLTs face different knowledge derived from the diverse content areas, grade levels, positions, and teams/groups that each member represents; ultimately, they are required to integrate these differences in knowledge into the successful development and implementation of effective strategies throughout the school. In other words, knowledge integration is central and essential to TLTs and their teaming.

Nevertheless, the existing literature has also emphasized that knowledge integration is hard work for TLTs (Zimmerman et al., 2019). For example, extensive discourse is required for cross-functional teams, including TLTs, to understand and connect members' different knowledge derived from diverse functional backgrounds, but many TLTs face time restrictions on their teamwork (Holloway et al., 2018; Wenner & Campbell, 2017). More specifically, knowledge is not information that can be easily stored, retrieved, and transferred from one person to another person (Kotlarsky et al.,

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2015). Knowledge is "a fluid mix of framed experience, values, contextual information, expert insight, and grounded intuition" (Gamble & Blackwell, 2001, p. 3) and "is localized and embedded in particular contexts" (Edmondson & Harvey, 2018, p. 348). For instance, TLT members have interdisciplinary knowledge derived from decades of research and a long practical tradition in their subject area (Crow & Pounder, 2000; Havnes, 2009; Kodkanon et al., 2018). According to the dominant research stream on knowledge integration, this kind of knowledge has more nuances grounded in the context where the knowledge is generated than what is shared explicitly (Carlile, 2002). Hence, to translate one's different knowledge "into knowledge understandable to others and recombinable into new cogenerated solutions" (Majchrzak et al., 2012, p. 953), team members are required to engage in extensive deep-knowledge sharing to accomplish their work (Bechky, 2003; Boland & Tenkasi, 1995; Carlile, 2002; Tsoukas, 2009). In other words, team members need to externalize their tacit (deep) knowledge through extensive deep-knowledge sharing discourse (e.g., questioning each other's assumptions/rationales, probing). By doing so, they reveal the finer and more complex differences of their knowledge and gain more in-depth understanding of what discrepancies need to be traversed to co-create shared solutions (Edmondson & Harvey, 2018; Hargadon & Bechky, 2006). Notably, this knowledge integration approach requires considerable resource and time (Majchrzak et al., 2012), but existing studies have reported that one of the greatest challenges often facing TLTs is time constraints (Holloway et al., 2018; Wenner & Campbell, 2017). Thus, there is value in learning more about how TLTs actually integrate their different knowledge with extensive, time-consuming discourses of deep-knowledge sharing while addressing time constraints. Our research explored this issue with one TLT.

Majchrzak et al. (2012) have discussed how two different knowledge integration approaches (i.e., traverse and transcend) might be helpful to this purpose. Specifically, according to Majchrzak et al., more recent research has questioned the dominant approach of deep-knowledge sharing—which they called the traverse approach—and suggested that cross-functional teams facing a lack of resources and time employ the transcend approach, wherein members co-construct knowledge without engaging in extensive deep-knowledge sharing. In their study, Majchrzak et al. discovered that three cross-functional teams in the business sector "shared a broad range of observational fragments at the surface level without discussing, critiquing, or querying each other for more details" to co-develop intermediate scaffolds quickly (p. 959). In fact, other studies (e.g., Edmondson & Harvey, 2018; Faraj & Xiao, 2006; Kerrissey et al., 2020) supported Majchrzak et al.'s (2012) findings by discovering that some teams, such as temporal work teams, simply elaborated the pre-established protocols without deep-knowledge sharing to process members' diverse knowledge and address team problems timely. Importantly, Majchrzak and colleagues emphasized that a certain knowledge integration approach might be prevalent, depending on conditions wherein teaming occurs, and that, for some teams, hybrids of two approaches might be most appropriate. TLTs seem to require both (a) time-consuming dialogues of deep-knowledge sharing to process members' interdisciplinary knowledge, and (b) rapid co-creation of shared knowledge to address time restrictions. Therefore, empirically exploring how TLTs employ two different knowledge integration approaches might be beneficial to understand the TLT knowledge integration process in greater depth, as demonstrated by our present study.

Yet, the existing literature on TLTs is largely defined from political and cultural perspectives, which have taken dominancy in the research stream on teams in schools (Hargreaves, 2019; Wallace & Huckman, 1999). This literature offers some useful insights into the TLT knowledge integration process but does not directly focus on it. Research from the political perspective (e.g., Ball, 1987; Holloway et al., 2018; Stosich, 2021; Weiner, 2016) has mainly stressed principal/district influence on TLT decision-making processes, while studies from the cultural perspective (Bush, 2011; Hargreaves, 2019; Lieberman & Miller, 2016) have explained that school teams often develop and sustain a shared set of beliefs and values, which enables them to identify shared team problems/solutions and act more coherently. These studies from political and/or cultural perspectives have shed light on either (a) the influence of formal authority (e.g., principal, district) on the TLT process, or (b) shared beliefs, values, and norms (e.g., team norms) that promote cultural coherence during TLT teaming. However, these are team/organizational conditions that might influence the TLT knowledge integration process (Choi et al., 2021).

In other words, there remains a lack of clarity and explanation around actual team knowledge-integration processes, in which TLT members coming from different academic disciplines, functional positions, and teacher groups/teams might employ two different knowledge-integration approaches (i.e., traverse and transcend) in order to translate different knowledge understandable to each other and connect different knowledge to construct joint resolutions for team tasks/issues/problems. Therefore, to complement the existing literature on TLTs, we analyzed one TLT's knowledge-integration process for this research in the connection with team/organizational conditions, as highlighted by existing research from political and cultural perspectives. To achieve this goal, we employed Cultural-Historical Activity Theory (CHAT) as an analytic lens because it offers a useful framework to analyze the micro-level process in the consideration of its social, cultural, and historical contexts (Sannino & Engeström, 2018). Based on CHAT, the research questions for our study were as follows:

1. In what ways did the TLT members (n = 9) employ the traverse and/or transcend approach to integrate their divergent knowledge?
2. What systemic factors influenced the team knowledge integration process?

Literature Review

We employed CHAT, specifically the second generation of activity theory, for this research to investigate one TLT's team knowledge interaction process in connection to its context (Engeström, 2012; Sannino & Engeström, 2018). CHAT leads to the assumption that human activity can only be understood within its social, cultural, and historical contexts (Levine, 2010). Based on this assumption, as indicated in Figure 1, it is possible through CHAT to explain that the subject deals with the object through instruments (e.g., language) to achieve collective outcomes; moreover, this interplay of subject, instruments, and object is influenced by less visible systemic factors (Sannino & Engeström, 2018). The systemic factors consist of (a) community—individuals or groups who pursue the same goal; (b) division of labor—the social relationship between actors that includes both horizontal and vertical relationships; and (c) rules that govern the behaviors and interactions of actors (subject and object) as well as members of community (Engeström, 2012; Youn & Park, 2012).

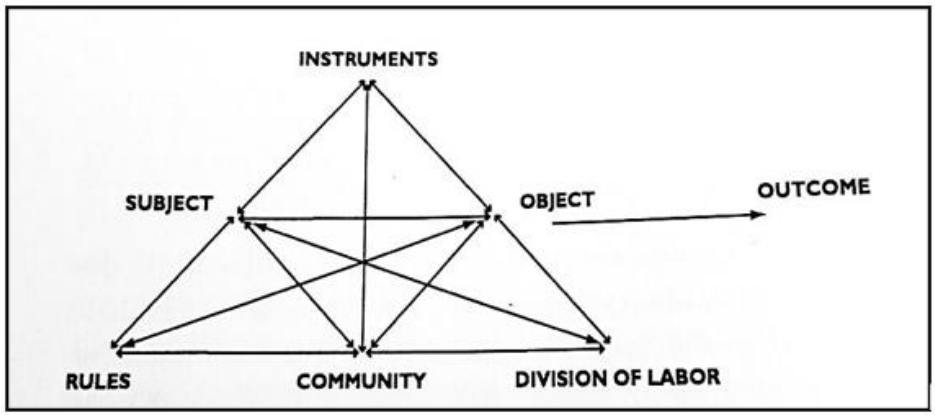

Figure 1. The Meditational Structure of An Activity System From Teams to Knots: Activity-Theoretical Studies of Collaboration and Learning at Work (Engeström, 2012, p. 630).

As suggested by Figure 1, CHAT is a useful framework to explore the interrelationships between micro-level processes (subject-instruments-objects) and the macro-structures that are manifested in the systemic factors (i.e., community, division of labor, and rules) (Engeström, 2012; Jarzabkowski, 2003; Youn & Park, 2012). By investigating how each systemic factor influenced the micro-level process, we systemically examined how the social, cultural, and historical contexts of the TLT came to shape the nature of the TLT process, wherein the members (n = 9) employed traverse and/or transcend approaches to integrate diverse knowledge derived from their different functional backgrounds (Levine, 2010).

Methodology

Research Design

We employed qualitative research. More specifically, we employed pattern, concept, and axial coding to explore one TLT's knowledge integration process from observations, interviews, and artifact collection.

Sampling

We collected data from one TLT in a comprehensive urban middle school in New York City. One important criterion for selecting the school and the team was that we wanted to learn from a team at an intermediate level of collaboration, heeding McLaughlin and Talbert's (2001) discussion claiming that teachers "begin to examine data collectively, develop a shared language and goals for their work, and build leadership skills" (p. 18) after reaching the intermediate level (Lieberman & Miller, 2016).

Selection of Site

We selected one comprehensive urban middle school in New York City because the principal agreed to give us access and was interested in this research. The principal explicitly emphasized and prioritized building effective teams and teaming throughout the school. Additionally, the school showed reports of an excellent level of collaboration per district (New York City Department of Education [NYCDOE], 2019a) and an overall good rating for student achievement, measured by state test results (NYCDOE, 2019a). We used these criteria because existing discussions (e.g., Intxausti et al., 2016) have maintained that school-level outcomes are indicative of effective school leadership teaming, and team effectiveness is related to the quality of team knowledge collaboration (Edmondson & Harvey, 2018).

Important demographic characteristics of our research site were as follows. School enrollment was about 1,500 students, with a racial composition of about 60% Asian, less than 5% African American, 30% Hispanic or Latinx, and 10% Caucasian. About 15% of students were English Language Learners, and about 10% were students with special needs.

The school employed 90 to100 teachers (Public School Review, 2018), 85% of whom had 3 or more years of teaching experience (NYCDOE, 2019a).

Selection of the Team

Without us asking, the principal recommended one TLT, namely a Professional Development (PD) team, because it (a) could participate in the study voluntarily, (b) used interdisciplinary knowledge derived from members' diverse backgrounds to accomplish team tasks, and (c) was identified by the principal as using high-quality collaboration. The PD team facilitated schoolwide PDs that consisted of three cycles of learning for the entire academic year. Each cycle consisted of several sessions held every other Monday for the entire school faculty (approximately 100). When we conducted the study, the cycle that the PD team was working on involved supporting teachers to adopt advanced literacy education (provided by NYCDOE as a statewide initiative) in their daily instruction. As shown in Table 1, the PD team consisted of nine experienced teachers from different functional backgrounds although they shared similar demographic backgrounds. All nine members were invited to participate in this research.

Table 1. Participant Characteristics

Participant	Race/Ethnicity	Gender	Subject	Grade	Years of Teaching
Abby	White	Female	ELA	6	between 5 and 10
Bell	White	Female	ELA	Special Ed	between 15 and 20
Indigo	Hispanic	Female	ELA	7	between 5 and 10
Danny	Hispanic	Female	Social Studies	8	between 15 and 20
Eva	White	Female	ELA	8	between 5 and 10
Cal	White	Female	STEM	8	between 10 and 15
Joe	White	Female	STEM	8	between 10 and 15
Harmony	Asian	Female	Math	6	-†
Gabby	White	Female	Math	7	-‡

Data Collection

We collected three types of data over 2 months. First, we conducted eight semi-structured interviews (approximately 4 hours total) with participants after the team meetings. Eight of the nine members were interviewed for 30 minutes. The interview questions were informed by CHAT (Engeström, 2012). We also asked the teachers follow-up questions that helped us identify connections between systemic factors and the members' discourse in the meetings. Seven interviews were audio-recorded and transcribed verbatim. For the one teacher who did not agree with-audio-recording, we took notes during the interview.

Second, we observed three team meetings (2.5 hours total). Each of the first two meetings lasted 45 minutes, and the final meeting took approximately 1 hour. During the meetings, we wrote open-ended field notes on physical settings, behaviors, events, and observer's impressions. All meetings were audio-recorded and transcribed verbatim.

Lastly, we collected eight documents/artifacts, including (a) team norms; (b) team agendas; (c) members' notetaking co-created in Google Docs; (d) PowerPoint presentations that the team co-created for PD sessions; and (e) members' notetaking in the Google Docs of the leader's tool, 7.1 Professional Learning Inventory, which NYCDOE provided as a part of a statewide initiative. Members' notetaking and PowerPoint presentations were produced during three observed meetings, but all other documents were artifacts constructed prior to our observation of the team.

Analyzing of Data

Our analysis consisted of two stages. Stage 1 began with pattern coding—using the concept of adjacency pairs to explore the team knowledge integration process. In other words, the pairings were part of our analysis. More specifically, we analyzed team dialogues (transcripts) that occurred during the team meetings, with focus on adjacency pairs (Sacks et al., 2015). For example, we coded suggesting an idea—accept the idea for adjacency pairs—whereby one member suggested an idea as part of the first pair, and upon producing the first part, other members agreed with it as part of the second pair. These were pattern codes that had one or both of the two core codes in the specified pattern (Saldaña, 2016). Second, we analyzed the organization of adjacency pairs by using concept coding. We coded a certain chunk of adjacency pairs based on definitions of traverse and transcend approach (Saldaña, 2016).

In Stage 2, we used concept and axial coding to identify a connection between (a) the PD team's use of knowledge integration approaches, and (b) their systematic factors (Saldaña, 2016). First, by employing concept coding with interview transcripts and the eight documents, we identified the systematic factors connected to the knowledge

† Participant did not allow us to record the interview or share their years of teaching.
‡ At the last moment, we were told that participant's schedule was so full no interview was possible.

integration approaches. Second, by using axial coding, we developed contextual categories that organized around how systematic factors influenced the core phenomena of the TLT knowledge integration process (Corbin & Strauss, 2015; Creswell & Poth, 2018).

Validity

To address descriptive and interpretive validity, we wrote analytic memos to keep track of our learning from interviews and meetings as well as our assumptions of what we thought we were learning. We also created within-case and cross-case data displays by using NVivo. Transcripts from meetings and participant interviews were transcribed verbatim to address descriptive validity (Maxwell, 2013). In addition, we searched data from meetings and interviews to both confirm and disconfirm evidence of emerging findings and preliminary grounded theory to address theoretical validity (Maxwell, 2013).

Findings

In this section, we discuss our findings regarding TLT's ways of employing two knowledge integration approaches. Next, we explain in what ways systemic factors (i.e., community, division of labor, rules) influenced this knowledge integration process.

Hybrid Use of Knowledge Integration Approaches

We found that the TLT, a PD team, employed both traverse and transcend approaches during their teaming, often using either a traverse or a transcend approach to address a certain team task/issue/problem. Interestingly, we also found use of a mixed approach, wherein the members engaged in the traverse approach after they used the transcend approach to address a certain team task/issue/problem.

Transcend Approach

We identified that the PD team utilized the transcend approach seven times to engage in the co-creation of shared knowledge (e.g., action plan) to address a certain task/issue/problem. In this transcend approach of team interaction we observed, most members continuously supported the creation of one idea/view by accepting, clarifying, specifying, elaborating on, justifying, or extending other members' ideas, or offering decisive responses.

For instance, in one discourse we observed, when one team member from ELA and special education, Bell, suggested the idea of using a benchmark for Hallmark 3 (i.e., extended writing) for all grades in ELA, other members supported this idea by (a) simply agreeing with Bell, (b) extending the idea through the process of exploring the feasibility of implementing the idea in other departments as well, and (c) offering affirmative statements and action plans for the idea. In this exchange, Bell said, "The benchmark, would it be useful to look at the trend that we're seeing across the ELA where they're lacking in writing? Because everybody in the ELA did a benchmark, right?" Cal simply agreed with Bell by saying, "Absolutely." Then, Eva further extended this idea of using benchmarks for extended writing in ELA to every department by pointing out, "Is that something every department has to do?" Following Eva's question, other members shared how their departments implemented the benchmarks related to the extended writing. This helped the members explore the possibility of creating PD sessions for all department teachers in terms of using benchmarks for Hallmark 3. Indeed, after these dialogue exchanges, Abby said, "We could definitely use plans to look at our benchmarks. That's something that keeps being brought up, but we don't have any time to look at it," and even Cal from science agreed with Abby by saying, "Maybe we should make some sort of benchmark schedule." In response to Abby's and Cal's affirmative statements, other members started to develop the idea further by suggesting action plans (e.g., making mini sessions for it) to adopt the idea to plan their PD sessions.

As indicated in this example, in the transcend approach, the members continuously participated in the production of one idea/view by accepting or elaborating on the idea, offering affirmative statements or suggestions of action plans for the idea, and/or coordinating various departments with different contexts to implement the idea. This approach helped the members to co-construct shared knowledge rapidly (i.e., create a possible PD session plan that used benchmarks for Hallmark 3).

Traverse Approach

We observed PD team's use of the traverse approach twice, in which more than two members continuously challenged each other's idea/view and provided more rationales for disagreement or offered their own idea/view in response to the other's challenge.

For example, in one dialogue we observed, Joe and other members continuously sought, questioned, and challenged each other's opinions/rationales/assumptions around the issue of whether they should intervene with the teachers' team reflection. Specifically, Cal brought a team tool for teachers to reflect on their curriculum, plans, and materials for hallmarks. Then, Joe addressed a possible limitation of the team reflection with the tool for her department and presented the idea that it was necessary for the PD team members to intervene with the teachers' team reflection. Yet, Danny, Cal,

and Gabby simply expressed disagreement, such as "I don't think we can." (Danny). In response to this disagreement, Joe explained an additional rationale: "'Cause, then the data is meaningless. You know what I mean?" and further explained her department's problem by saying, "And like I just know, like from sitting with one of the science people, the science grades that don't have one of us, they really think they are doing some of these things, and it's not...". Abby, Bell, Indigo, Danny, Eva, Cal, and Gabby also kept critiquing Joe's idea and offering explanations and rationales for their idea. They (a) provided additional rationales, such as "There's only so much micro-managing that you can do. And [the tool is] a self-reflection" (Gabby) and "I don't think that's us" (Indigo); (b) suggested an alternative way to resolve the problem that occurred in Joe's department by saying "I mean, if you're worried about that being introduced, just do the larger group, and you do the check in, at each, so you can actually look at the lesson" (Danny); and (c) providing an alternative view to interpret science teachers' behaviors, shifting blind spots (problematic behaviors) to the "learning curve" (natural learning behaviors) (Bell).

In this dialogue, the members continuously challenged each other's idea/view by (a) disagreeing with the alternate idea/view; (b) rephrasing/elaborating their own idea/view upon the other's challenge; (c) offering additional rationales for disagreement; or (d) suggesting different ideas/views to understand, interpret, and resolve the problem. This transverse approach led the members to engage in the opportunity to reveal their own deep knowledge around needs and situations that each subject/grade teacher team faced as well as underlying assumptions that each member held around their TLT role and adult education.

Mixed Approach

The PD team demonstrated the mixed approach, wherein the members initially engaged in the traverse approach but changed to the transcend approach to address a certain team issue/task/problem. In this mixed approach, after more than two members engaged in several turns of using the traverse approach, most of the members stepped back from their own ideas/views and participated in the co-construction of one idea. We observed this approach four times.

For instance, when the team planned out what they would do for the rest of their PD cycles by using *hallmarks*, initially, the members challenged each other around whether they were focusing on a certain hallmark or identifying which hallmark was their focus. These conflictive turns around multiple issues generated various alternatives as a result, but the team narrowed them down to two conflictive ideas and engaged initially in the transverse approach by challenging each other's idea/views. In the following excerpt, these two ideas were (a) focusing on Hallmark 3 (i.e., Cal's idea) and (b) incorporating all hallmarks simultaneously into their daily lessons (i.e., Abby's idea):

> Abby: Right, but as far as the wording of each cycle, we could word it as "Today we're working on building in discussions to strengthen our writing. This Monday, we're working on vocabulary to strengthen our writing," and we can have some sort of reflection of which—maybe it's like we added some things into lesson one, three, and five, or whatever.
>
> Cal: Honestly, what I feel I like doing, it's just me, I'm going [to] lesson plan, the lessons [will] be like, "Add another text here, add some writing here," and that's me with the understanding of this and the investment in, but I feel you gave me that time, I'm probably not going to—
>
> Abby: I don't know, I sort of disagree, because if we're going back into our unit maps with this lens, this is a lens we've never really gone back and tinkered with.
>
> Bell: Sorry, guys.
>
> Abby: I just feel with that goal in mind, we even added a hallmarks column to one of our unit maps.
>
> Bell: But I think if we look at each department differently, for ELA it seems so valuable because our whole life revolves around text. You know what I'm saying? Our whole life revolves around text. Giving somebody time, of course, we could always talk about texts and vocab because that's our own world, but maybe for some other departments, I don't know, for maybe math and science,

The conflicts between the two ideas shifted after Abby and Bell stepped back from their idea in respond to Cal's affirmative statement: "I think we have to spend time on Hallmark 3 because that's the focus of our school. That's our school's initiative." Abby then stepped back and started supporting Cal's idea by asking, "Okay, so how? What should we think of? In the unit maps? Or more teaching them about Hallmark 3?" This marked the transition to the transcend approach. After this Abby's step-back, other members also started elaborating on Cal's idea of focusing on Hallmark 3 by "creat[ing] activities that center around Hallmark 3" (Danny).

In the mixed mode, after more than one member conflicted around various issues at the surface level by generating multiple alternatives, they narrowed the several alternatives down to two conflictive ideas and challenged around them. After these multiple conflictive turns of sharing deep knowledge, we found that at a certain point, some members stepped back from their idea/view and engaged in the transcend approach to co-create one idea.

Systemic Factors That Influenced Team Knowledge Integration Process

We found that each of the three systemic factors (i.e., community, division of labor, rules) in the CHAT model (Sannino & Engeström, 2018) led the PD team to engage further in a certain knowledge integration approach. In other words, systemic factors contributed to determining when the TLT employed a certain knowledge integration approach and when the TLT changed one to another approach.

Community

The communities that were connected to the PD team included (a) NYCDOE and (b) their school. First, the district provided (a) the grounded work (i.e., team goals/tasks around advanced literacy education) that was the focus of the TLT; and (b) the shared framework (i.e., concepts, strategies around advanced literacy education such as hallmarks) that the TLT members used to accomplish this grounded work. Specifically, NYCDOE (2019b) set a new district initiative that asked schools to implement advanced literacy education by creating interdisciplinary leadership teams to model for and support teachers' uptake. As Indigo and Danny representatively stated, all seven members whom we interviewed perceived that their main task was to facilitate use of the district's hallmarks in teachers' daily instruction:

> Our focus is on instruction and about the hallmarks, how we have to include these hallmarks. (Indigo)
>
> Sometimes the book definition of something [advanced literacy] doesn't translate in action. So, it's our job then to take that book idea and make it work in this building. (Danny)

Second, their school as another community offered the team broad directions (e.g., school goals) that guided their teamwork. Four members described how the principal and their administrative team played in an important role in the work of their TLT since "[the team] need[ed] principal approval for everything that [they were] going to show the staff" (Abby). However, this did not mean that the principal intervened in PD team decision making for every single detail. According to Cal, the principal and the administrator team "interject[ed] if [the PD team was] going in a direction that [might] not seem fit [for] what they were doing, but it's very rare unless [the PD team] ask[ed] them for an opinion."

Importantly, the community factors of district and school led the PD team not only to engage further in the transcend approach, but also to shift from traverse mode to transcend mode. Specifically, as stated above, based in the views of seven members, the shared framework from the NYCDOE required them to align; thus, they said they spent more time building ideas around it rather than rebutting each other's perspectives. In other words, the shared framework coming from the district was a factor that encouraged the TLT toward a transcend approach, with members agreeing to co-construct shared knowledge.

Furthermore, we found that the school vision set by the principal/administrator team led the members to shift a traversing discourse to transcending dialogues that were aligned with the vision. For instance, as shown in the team dialogue of the mixed mode, Abby and Bell ended the conflictive dialogue by stepping back from their own ideas and began co-constructing Cal's idea when Cal emphasized that Hallmark 3 was their school goal. Notably, Hallmark 3 was the school goal identified by the administration to measure improvement for this academic year, based on students' achievement and the district initiative and recorded in the school's Comprehensive Education Plan (CEP). According to Joe, "as a team, [they] look[ed] at the school's goals and tr[ied] to align [their] professional development to those goals."

Role: Division of Labor

As indicated in the following passage from Bell, all seven members whom we interviewed suggested a horizontal relationship that emerged from diverse functional backgrounds as one distinctive characteristic of division of labor, the second of three factors in the CHAT model:

> Absolutely, I think everyone's a leader, but I also think that our work is supposed to make every teacher a leader because we all bring [it] back, and that's why I think our team works because we all have a voice for everybody in this school. Like the sixth grade ELA department has a voice for the sixth grade, you know, the Math department has a voice, the Social Studies has a voice. You know, [be]cause if we were all just ELA teachers, we would be providing PD just with what we know about ELA and what comes up in our classrooms. (Bell)

We found that the horizonal relationship emerging from their differences in knowledge meant members faced the necessity of traversing these differences; however, this equal relationship sometimes promoted a mixed approach that led the members to stop persisting their idea/view and engaging further in conflictive discourse in the area that was not their expertise.

As shown in the following interview excerpt, not only Danny, a social studies teacher, but also four members explained that different subject teachers challenged the ideas of adopting strategies coming from ELA if the planned strategies did not work in their subject area.

> We're working on a lot, a bunch of different things right now, but the main focus is putting the advanced literacy into...all of our individual curriculums and then somehow finding a connection between the two of them or three

> subjects or even across the board. I feel like my role in the team is really to advocate from the perspective of the teacher as well.... Showing what works in a classroom and maybe what we feel would not work in this school...I'm not shy. If you can tell already, I don't have a problem saying if something did not work for me. I'll try out anything and if, if I feel like it was not worthwhile, I will say this was a problem or I encountered this as an issue in doing this. (Danny)

As such, different department contexts were a source of conflict, wherein the team was required to employ the traverse approach to address differences in knowledge. However, at the same time, three members described that division of labor also led the team to engage in the mixed approach by allowing members to step back from their own knowledge in the area which was not their expertise. In other words, as shown in Cal's and Joe's interviews below, after engaging in team dialogues of traversing differences in knowledge, the team often co-created shared knowledge (e.g., PD session plan) in the way that allowed "room to maneuver" (Edmondson & Harvey, 2017, p. 103) if a member still insisted that the knowledge was not applicable to their subject:

> We may feel that the strategy is more effective in one subject area than not.... And as a result, we may talk about the reasons why it may work in one place and not another.... And we don't leave the meeting in a disagreement. We have to find a way to make it.... So, for example, we were talking about using this strategy called RACE…. It's an acronym for restate, answer, cite evidence, and then explain. And the ELA teachers really like it. The science teachers, we have problems with it because the students restate the questions and because mostly they're "how" questions. They don't ever answer the question. So, it's a strategy that we don't want to use in our classroom. So, we had to try to find a way in which we could support the students with the strategies that they've been given. So, instead of saying this is a schoolwide strategy that everyone has to use, we came to an agreement of making a school-wide strategy toolkit where we listed each strategy, what it would be good to answer, and examples of when you use it. (Cal)

> There have also been times where the disagreement is based on what your group of teachers that you're facilitating the PD for need. And if one of us voices that our group needs something that might be different than another group, we've allowed them to go off and provide that. (Joe)

Rules

The team had both explicit and implicit rules that were connected to their hybrid application of the three knowledge integration approaches (i.e., traverse, transcend, and mixed approach). These rules, which comprise the third factor in the CHAT model, include (a) *hearing out*, and (b) *doing what is best for the staff and the students*. The rule of *hearing out* influenced the TLT's approach to conflict, as shown in the following interview excerpts:

> I think our team, when we face certain challenges or struggles or disagreements, we kind of give each other the time to *hear out* why we think what we think. And I think that's a good thing. (Eva)

> I think that we all listen to each other and that we all validate each other. We...even though my idea isn't there, everyone always explains why. (Bell)

> We've had situations where we've had that [conflict], and I think a lot of the things is the way that we...I like saying, "I understand why you think like this, but-statements like that help us to redirect it or, you know, "Help me to understand." Like those instead of saying like "I don't support this" or "I think you're wrong," we try to nicely redirect the conversation away. (Cal)

Six members described that the team had the shared rule of seeking each other's rationales for disagreement and actively listening to others' different ideas/views, which "help[ed] [them] to understand why something is being said" (Cal). This implies that "hearing out" for disagreements/conflicts promoted use of the traverse approach by the team.

Moreover, the team also had the rule of *doing what is best for the staff and the students* as part of the leadership, as Bell representatively put it:

> I also think that as professionals, when you sign up to be on a team like a leadership team, you have to put all egos aside and think about "My idea wasn't that great today but maybe next week, you know, my idea might be there."… Of course, sometimes you're like, "I just put all my hard work into it and now I have to scrap it," but I think that we all do what is best for...the staff and the students and what works best for us. (Bell)

In the above excerpt, Bell pointed to an important feature that echoed what the other six members expressed: As a part of a leadership team, the members tried to devote themselves to the organizational goals of student achievement and instructional improvement, moving beyond their personal goals or ego. Furthermore, from Bell and three other members' views, this allowed the members to adopt a mixed approach, shifting from the traverse mode to the transcend mode by willingly putting aside their own ideas/views and revising them to do what was most beneficial for their students and teachers when they faced conflicts and disagreements.

Discussion

Our study examined how the TLT applied knowledge integration approaches (i.e., traverse and transcend) to address their team tasks/issues/problems and how the team's context (i.e., systemic factors) influenced this knowledge integration process. As our finding for the first research question suggested, the PD team members engaged in both knowledge integration approaches, but the PD team utilized the transcend approach more often (seven times) than the traverse approach (two times). Furthermore, the PD team demonstrated a mixed approach—wherein the members initially started with the traverse approach, then moved to the transcend approach at a certain point (four times). This unequal use of the traverse and transcend approach and the mixed approach might have enabled the PD team to share members' deep knowledge to a certain extent while still securing time to co-construct their shared production (e.g., PD session plans) to address team tasks/issues/problems. We believe that this finding can offer some insights into how teams within the context of teacher leadership might engage in extensive dialogues to understand members' different knowledge to integrate them while still addressing time restrictions that often occur during their teaming.

Importantly, our findings for the second research question suggested that each systemic factor (i.e., community, division of labor, rules) contributed to determining when a certain knowledge integration approach was prevalent in the TLT and when the TLT shifted from one to another approach. First, the district and school, especially principal/administration team, as formal authority provided the PD team with not only the source for a transcend approach, but also the rationale for a turning point, when the team transited the traverse mode to the transcend mode, as shown in Figure 2. This finding implies that when the members perceived their decision-making was connected to matters of coherence toward the organizational goal, the team engaged in the transcend mode or, if initially in traverse mode, it shifted to the transcend mode so that its work was aligned with organizational direction. In fact, several studies (e.g., Hallinger & Lee, 2012; Ho et al., 2020; Leithwood et al., 2007; Nguyen et al., 2017) exploring the dualistic structure of school leadership supported these findings. According to these studies, administrators often took leadership to set schoolwide vision, mission, and goals, but teacher leaders and/or teachers took leadership to operationalize the broad direction. For instance, Ho et al.'s study revealed that teachers in their study "wanted to involve in making decisions on the inquiry approach and focus at [the] Professional Learning Teams level" (p. 7)—which were related to how professional learning opportunities were implemented—but they also wanted the school principal to provide the general (strategic) direction for PLC.

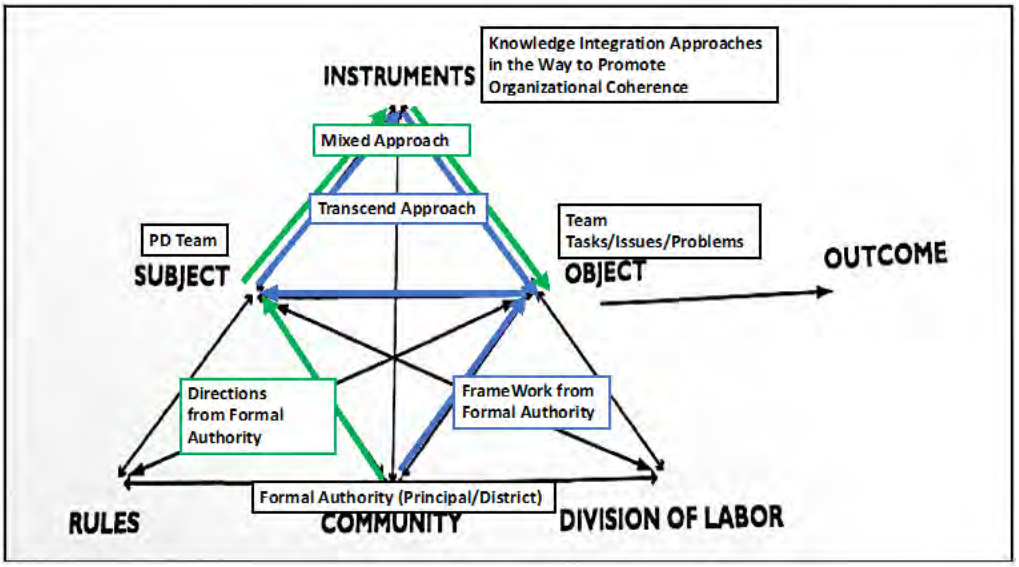

Figure 2. PD Team Community

Second, we discovered that the members' horizonal relationship stemming from different content areas, grade levels, and teacher teams/groups provided the PD team with not only the source for the traverse approach, but also the driving force of transitioning the traverse mode to transcend mode, as indicated in Figure 3. This finding indicated that when the members viewed it was necessary to diversify their PD plans to address the different needs of diverse subject/grade levels, the team engaged in either the traverse mode or shifted to the transcend mode such that their work offered local variations to implement across subject and grade areas. In fact, Edmondson and Harvey (2017) supported this finding by suggesting that team leaders in the five effective cross-functional teams gave each member "room, both physical and intellectual, in which to explore the alternative solutions" and "freedom to act within their domain" (p. 103).

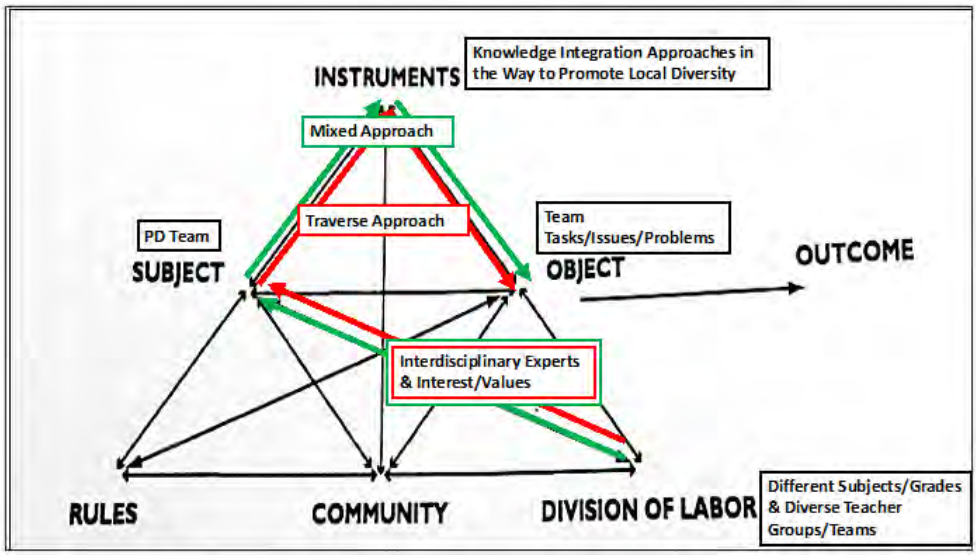

Figure. 3. PD Team Division of Labor

Third, we identified two team norms (*rules*) that contributed to creating the team environment, that at times encouraged the members to engage in the traverse approach and at others called for a shift from the traverse mode to the transcend mode for the benefit of a bigger entity (their school), as shown in Figure 4. Specifically, the team norm of *hearing out* enabled the members to bring up and reveal their different ideas and views by leading the members to listen actively to others and provide more rationales/explanations for their knowledge and their disagreement. In fact, existing studies on team psychological safety have stressed that active listening contributes to creating a psychologically safe team environment, wherein members speak up or propose different ideas/views and engage in difficult conversations and conflicts by addressing their self-censorship as coming from fear from power and/or group thinking (Castro et al., 2018; Edmondson & Harvey, 2017; Itzchakov et al., 2022). Moreover, the team norm of *doing what is best for the staff and the students* helped the TLT members to step back from their own idea/view and start to engage in co-construction of others' ideas/views, as Boucouvalas (2009) discussed. According to Boucouvalas, people have not only an autonomous aspect of selfhood that promotes self-direction as an individual (*self*), but also an homonomous aspect of self (*Self*), which stems from "being part of meaningful wholes and in harmony with super-individual units" (p. 4) (e.g., organizations). The team's norm of *doing what is best for the staff and the students* mirrors *homonomy* and enables the team to "move their dialogue from an exclusive focus on the *me* of self-direction to inclusion of the *we* of self-direction" (p. 7).

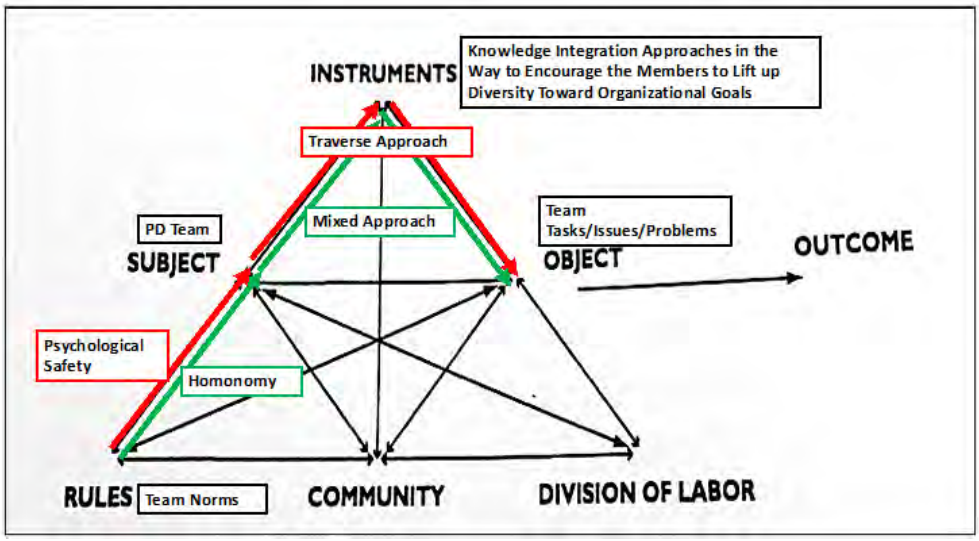

Figure. 4. PD Team Rules

We believe that our study contributes to enriching the existing literature in two ways. First, our study expands the existing research on knowledge integration by empirically revealing the hybrid use of knowledge integration approaches within the context of one cross-functional team. Furthermore, as Majchrzak et al. (2012) suggested for future research, our research examined this hybrid use of knowledge integration approaches in the consideration of the

team/organizational factors that were "relevant to understanding the conditions under which the different [approaches] apply" (p. 965).

Second, we believe that our research contributes toward developing a more integrative framework to understand TLT teaming, and knowledge integration in particular, by utilizing multiple perspectives (e.g., political, cultural) on school leadership teams. Specifically, in our findings, the formal authority described by the political perspective led the PD team to engage in transcend and hybrid knowledge integration approaches to promote organizational coherence toward the goals set by formal authority (e.g., district initiative, school goals). Meanwhile, the members' functional backgrounds coming from different subjects, grades, and teacher teams/groups in the school led the PD team to use the traverse and hybrid approaches to knowledge integration to bring up their different voices while offering different groups of people in the school room to maneuver during implementation. Moreover, the PD team's shared norms as emphasized by the cultural perspective created the climate the team needed to share and negotiate different knowledge to co-construct beneficial outcomes for their students and staff. As such, our research explained how one TLT's knowledge integration process was influenced by the team/organizational conditions highlighted by political and cultural perspectives, using the CHAT model (Sannino & Engeström, 2018) to offer a promising new integrated framework. More importantly, we found that functional backgrounds, including the academic disciplinary and teams/groups from which the members came, were also a critical condition that influenced the TLT knowledge integration process.

Conclusion

TLT teaming, and especially their knowledge integration, clearly do matter but are not yet sufficiently understood. We hope that our research contributes to making much further progress in this important work. We also hope that our findings can be a small step toward helping TLTs to engage genuinely in shared leadership practice by learning how to listen more deeply to others and uplift diverse others' voices—as well as their own—while collaborating across lines of different kinds of diversity with greater equity and authenticity.

Recommendations

Our findings suggest two lessons. First, it might be necessary to help TLTs employ *all* knowledge integration approaches. For instance, if there is only a *transcend* approach, members may not have enough chance to engage in deep knowledge sharing by revealing each other's perspectives more deeply. Conversely, if there is only a *traverse* type, as Zimmerman et al. (2019) showed, TLTs may not be able to co-construct shared team solutions in a timely manner. Teaching TLTs about the different knowledge integration approaches can help them assess both individually and collectively if, indeed, they engage in all three approaches—and if not, perhaps they can engage in conversation *as a team* about how to build in the discourses that are absent in order to integrate divergent knowledge in the team.

Second, it is important to consider systemic factors that increase a certain approach, and sometimes intentionally make efforts to change factors when a team dominantly engages in a certain approach. For instance, if a TLT engages in only the traverse approach and has difficulty developing joint solutions, it may be helpful for their principal and leadership team to communicate with TLTs regarding organizational directions. On the other hand, if a TLT engages in only the transcend approach to develop its outcomes, it may be helpful to look at whether the team has diverse composition such that the members can represent a wide range of people in the school. It would also be effective to remind TLT members about the importance of developing norms—and of re-evaluating how, if at all, both explicit and implicit team norms encourage effective knowledge integration.

Limitations

We want to highlight two limitations of our study and hope that these will be useful for future research. First, our study pointed to emergent and interesting categories, but without the amount of data that would make it possible to explore fully either the nuances within the categories or their potential import for TLT knowledge integration. Therefore, we recommend that future research use more interviews, ongoing tracking of how TLT members change their communication and interactions with each other, and additional artifacts or observations to gain more robust and evidence-based assertions about the team knowledge integration process within the context of teacher leadership teams. Second, we also encourage future researchers to collect data over a longer period of time so that they can examine more closely the influence of systematic factors on team knowledge integration processes. Since many systemic factors are tacit, undistinguishable, and unnoticeable, it is difficult to identify systemic factors clearly during more condensed periods.

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