Inclusive knowledge production at an elementary school through family-school-university partnerships: A formative intervention study

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ABSTRACT

Students from racially minoritized backgrounds have been disproportionately subject to exclusionary school discipline in the United States. Utilizing cultural-historical activity theory and the formative intervention methodology, we conducted a yearlong formative intervention, *Learning Lab*, in an elementary school with significant racial disproportionality in school discipline. Teachers, family members, administrators, support staff, and community members with diverse and often opposing histories and goals worked together to critically examine their existing behavioral support system and racial disparities in practices, assumptions, processes, and outcomes from multiple perspectives. We utilized the method of expansive learning actions to analyze qualitative data from ten subsequent sessions. Our findings showed that local stakeholders successfully formed and sustained a diverse working group that represented families, educators, researchers, and community members. Learning Lab members worked collaboratively to question their existing school practices and to examine the root causes of racial disproportionality through historical and empirical analyses. We discuss both possibilities and challenges regarding inclusive knowledge production and the systemic transformation process at local schools.

1. Introduction

If we were brave enough to show parents our ethnicity report, it makes it very concrete. 17% of our students are identified as Black and they account for 38% of our referrals...Parents would have something to say about that and can maybe give us some insight about what we need to do differently.

(Jessica, Social Worker)

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Cole Elementary School, located in a Midwestern suburban city in the United States (U.S.), experienced significant disproportionality in school discipline. African American students were subject to a disproportionate number of exclusionary disciplinary actions historically. As Jessica, a White female social worker, stated clearly, the school leaders realized that to examine and address this complex systemic crisis, they needed to go out of the hierarchical and siloed organizational structure of the school and work with the whole school community to address this problem. In 2012, a group of educators including Jessica initiated Learning Lab, a formative intervention at Cole Elementary to address the racialization of school discipline. The purpose of the present study is to examine a yearlong effort of the school community for collective examination of racial disproportionality. Below, we provide a critical review of the literature on the racialization of school discipline.

2. Literature review: disproportionality in exclusionary disciplinary actions

Each year, millions of K-12 students have been subject to exclusionary disciplinary actions (e.g., suspension, expulsion, detention, and referral to police) in the U.S. For example, 3.2 million public school students received out-of-school suspensions during the 2015–2016 school year (Musu-Gillette et al., 2017). According to the U.S. Department of Education Office for Civil Rights report (2018), about 2.7 million K-12 students received one or more out-of-school suspensions in a single year. Exclusionary discipline results in severe consequences in academic and social experiences of students and the whole school community. Excluding students from learning environments increase students' chances for poor academic performance in reading and math (Lassen et al., 2006), further suspensions (Arcia, 2007), referral to alternative schools (Afacan & Wilkerson, 2019), school dropout (Arcia, 2006), and incarceration (Losen & Gillespie, 2012).

Historically youth from racially minoritized backgrounds have been subject to the disproportionate use of exclusionary discipline, including suspensions and expulsions. Although African American male students represented only 8% of enrolled K-12 students nationally, they constituted 25% of students who received an out-of-school suspension. In contrast, White male students represented 25% of enrolled K-12 students, but they accounted for 24% of students who received an out-of-school suspension (Office for Civil Rights, 2018). Disproportionality is impacted by and impact spatiotemporal context (Bal, 2017). For example, African American students were seven times, Native American, and Latinx students were two times more likely to receive exclusionary discipline compared to their White counterparts in the state of Wisconsin (Bal, Betters-Bubon, et al., 2019). Punitive discipline practices were disproportionately used with African American students in Florida schools (Gagnon et al., 2017; event ratio was 1.004). African American students received out-of-school suspensions at more than twice the rate of White students in Maryland schools (Porowski et al., 2014).

The U.S. is a nation built on settler colonialism, slavery, and capitalism. Disproportionate representation of minoritized students in school discipline is a symptom of deeper social and structural injustices. In the U.S. education system, race and behavioral problems intersect in complex ways that require a re-framing of this problem to account for the interplay of individual, interpersonal, and institutional factors (Artiles, 2011a; Bal, 2017; Bal, Betters-Bubon, et al., 2019). Interventions that solely aim to change behaviors or beliefs of individuals cannot address the multilayered and cultural-historical nature of racial disproportionality. In this study, we conceptualized racial disparities in school discipline as a bundle of systemic contradictions that requires a process-oriented collaborative analysis with local stakeholders of multiple activity systems (e.g., home, school, community) to disrupt inequitable practices and outcomes (Bal, 2016).

In this article, we presented an analysis of a formative intervention with local stakeholders at Cole Elementary School that experienced significant racial disproportionality in school discipline outcomes in a Midwestern state in the U.S. In the following section, we introduced an overview of our theoretical framework.

2.1. Theoretical framework: cultural-historical activity theory

We utilized the Cultural-Historical Activity Theory (CHAT) as a theoretical framework in this study. Historically, CHAT has evolved into a succession of four generations (Engeström & Sannino, 2020). Each generation centered on its own unit of analysis. The first generation of CHAT was based on Lev Vygotsky (1978) and his collaborators' work that focused on culturally mediated actions as a unit of analysis. The second generation of CHAT furthered Vygotsky's work and developed the concept of activity in which a collective object gave an activity its identity and direction (Leont'ev, 1978). The third generation of CHAT focused on the interaction among two or more activity systems that have a partially shared object (Engeström, 2011). The emerging fourth generation of CHAT research underscores the importance of heterogonous coalitions that aimed at addressing pressing societal problems such as poverty, homelessness, and food sustainability (Engeström & Sannino, 2020).

The concept of expansive learning becomes a central idea in the third and fourth generations of CHAT. Expansive learning is defined as "the formation of a new, expanded object and pattern of activity oriented to the object" (Engeström et al., 2014, p. 122). Expansive learning takes historically accumulated systemic contradictions as the motives and the starting point of the analysis (Engeström & Pyörälä, 2020). It requires crossing boundaries and interactions across multiple activity systems. The construction of new solutions emerges through debate, negotiation, and shared experimentation in local organizations (Engeström & Sannino, 2020). For example, racial disproportionality (outcome) can be a result of contradictions in multiple activity systems such as school, family, school district, university, and the state department of education that worked toward a shared object (student).

Transforming knowledge-production processes in schools should not be seen as a linear process toward pre-determined endpoints. Rather, they are assumed as zones of proximal development. Zones of proximal development are places of possibilities between the present and the future where activities can be collectively transformed as a solution to the systemic contradictions (Engeström & Pyörälä, 2020). A shared object is often the individual student with "problem" behavior in school discipline. This particular object

holds together multiple interacting activity systems, including school, family, school district, and university. CHAT scholars emphasize that formative interventions are essential in generating ecologically valid and actionable information and finding possibilities and alternate futures to historically evolving contradictions in local activity systems (Lotz-Sisitka et al., 2017; Sannino, 2011; Virkkunen & Newnam, 2013).

2.1.1. Formative intervention

The formative intervention methodology was developed by Yrjö Engeström (2015). In formative interventions, the research design is driven by the historically accumulated systemic contradictions in the participants' activities (Engeström & Sannino, 2011). The goal is systemic transformation to address the contradictions through facilitating critical dialogue and transformative agency of local stakeholders (Engeström et al., 2014; Sannino, 2011). Thus, the process is open to participants' resistance or subversion. The participants reconceptualize and practically expand the object of their activity that leads to systemic contradictions. The object "has drawing power and refers to something at which human efforts are directed" (Sannino et al., 2016, p. 604). Formative interventions involved participants and researchers who could utilize a set of conceptual tools designed for collectively analyzing contradictions in their activities and for developing new solutions. These conceptual tools are designed based on two epistemological principles: (a) the principle of double stimulation and (b) the principle of ascending from the abstract to the concrete (Sannino, 2011).

The method of double stimulation was defined as "the subject is put in a structured situation where a problem exists…and the subject is provided with active guidance towards the construction of a new means to the end of a solution to the problem" (van der Veer & Valsiner, 1991, p. 169). The method of double stimulation has two key concepts: (a) first stimulus and (b) second stimulus. The first stimulus refers to the problematic situation that causes a paralyzing conflict. The second stimuli are any artifacts that help participants to gain control of and transform the problematic situation they confront (Sannino et al., 2016).

Vygotsky's method of double stimulation led to the concept of formative interventions that are different from linear interventions and design-based research in four different ways. They focus on (a) activity systems as a unit of analysis, (b) contradictions as a source of change and development, (c) agency as a layer of causality, and (d) transformation of practice as a form of expansive concept formation. Formative interventions can include deviations from the researchers' instructional intentions, and the researchers may not predict outcomes from the beginning (Sannino et al., 2016). In this aspect, formative interventions (a) are based on the design done by the learners in a local organization, (b) the collective design effort is seen as part of an expansive learning process, and (c) aim at generative solutions that are developed over lengthy periods of time. Formative interventions have the potential to create a new type of learning in which local stakeholders put their local resources together to generate novel solutions. The intervention process is open to negotiation, and the participants gain agency and take control of the intervention process.

Formative interventions utilize a cycle of change in which participants follow a series of expansive learning actions including: (a) questioning, (b) analyzing, (c) modeling, (d) examining, (e) implementing, and (f) reflecting on the process (Engeström et al., 2013). Local stakeholders and interventionists work together to define and address historically evolving contradictions in activity systems. For example, Engeström et al. (2013) conducted a Change Laboratory intervention in order to redefine the services a library offers to research groups and the ways of organizing work in a university library in Helsinki. Formative interventions have been gaining popularity in several countries such as Finland, South Africa, Chile, United States, Australia, Taiwan, and Brazil (Bal et al., 2018; Lotz-Sisitka et al., 2017; Sannino et al., 2016).

2.2. The present study and research questions

Following the prior studies on CHAT and formative interventions, we conducted a formative intervention, Learning Lab, at Cole Elementary School that reported significant racial disproportionality in school discipline. School staff, families, researchers, and community representatives, worked together to define contradictions in their school activity system. The purpose of this study was to examine the work of Learning Lab members that aimed at addressing racial disproportionality in school discipline outcomes. We answered the following research questions:

Research Question 1: What kinds of expansive learning actions emerged in Cole Learning Lab?
Research Question 2: How did Learning Lab members work together to form an inclusive working group, question existing practices, and analyze systemic contradictions?

3. Methods

3.1. The research project

This study was a part of a longitudinal, statewide research project in the state of Wisconsin, Culturally Responsive Positive Behavior Interventions and Supports (CRPBIS). The CRPBIS Project was funded in 2011 by the state's education department to examine and address the racialization of school discipline in Wisconsin schools. Schools in Wisconsin have historically experienced racial disparities in exclusionary discipline and the disproportionate representation of minoritized students in special education (Bal, Betters-Bubon, et al., 2019).

Learning Lab aimed to bring together local school communities with diverse and often opposing experiences, interests, and goals to transform existing practices and processes that marginalized minoritized students and to disrupt unjust educational practices in local schools. The research project team had worked collaboratively with the Wisconsin Department of Public Instruction, local schools,

civic organizations, and a local university to ensure the ecological validity and sustainability of Learning Lab as a multi-site formative intervention. Learning Lab has been implemented at six schools (two elementary, two middle, and two high schools) since 2011. Each implementation informed the others. Three schools are located in an urban school district. Two schools are from a suburban school district. And the one school is located in a rural town serving students from White settler communities and students from an American Indian tribal nation, the Anishinaabe Nation whose land spreads to Canada and the U.S.

The schools participated in this project based on two criteria: schools that (a) experience racial disproportionality in behavior outcome and (b) school administrators' willingness to design and implement a new schoolwide behavioral support system with racially minoritized families, students, and community members. Five schools were able to form and sustain Learning Labs, examine their schools' behavioral support systems, and design new, culturally responsive behavioral support system. Cole Elementary School was the first Learning Lab site. The school community was able to form Learning Lab including diverse groups of members and analyzed their system over an academic year. Cole Elementary School was the research team's first formative intervention site that informed the following formative interventions at the other five schools. In this study, we studied how Cole Elementary formed and led a formative intervention, critically examined disproportionality in their school, and engaged in empirical and historical root cause analyses to unearth the possibilities and challenges regarding facilitating an inclusive formative intervention study to addresses a complex, enduring societal problem, the racialization of behavioral problems, in schools.

3.2. Setting: a diverse urbanizing school

Cole Elementary School was one of seven elementary schools located in a vast, growing, and demographically changing suburban city in Wisconsin. The population was about 29,000, with the majority of the population being 85% White, 6% African American, 4% Latinx, 3% Asian, and 2% identified as two or more races. The school district restructured school boundaries, and diversity notably increased among the school population. In 2012–2013, only 69% of students were White, while 10% of students were African American, 7.7% were Latinx, 6% Asian, and 6.4% of students identified as two or more racial groups. Cole Elementary School had been experiencing racial disproportionality despite of several initiatives to change teachers' minds and acts regarding racial bias through professional development workshops and streamlining the discipline system. For example, African American students received 37% of out-of-school suspensions in 2012.

The school was unique, given its history to serve the majority of economically and racially minoritized students in the city's school district. In the same year, while the district's average of students eligible for free or reduced-price lunch (FRPL) was 28.6%, Cole Elementary School's percentage was 55.4%. Similarly, the school's percentage of racially minoritized students was higher than the school district's average. The school board had attempted to change the elementary school boundaries in the district to redistribute the percentage of students with FRPL eligibility across all elementary schools. Yet, given the concentration of low-income houses at the attendance zone of Cole Elementary, the school board's efforts fell short; the school continued to serve the majority of the district's

Table 1
Cole Elementary Learning Lab participant demographic information.

Participant	Gender	Role	Race
Alex N.	Male	Parent	African American
Axel R.	Male	Community schools manager	White
Brett L.	Male	Parent	African American
Carmelo B.	Male	Principal	White
Denise L.	Female	Music teacher	African American
Derrick F.	Male	Physical education teacher	White
Destiny J.	Female	Parent	African American
Donna R.	Female	ELS teacher	White
Elouise O.	Female	School professional	Hispanic
Gabriella G.	Female	Counselor	White
Janice E.	Female	Library media specialist	White
Jessica L.	Female	Social worker	White
Larissa F.	Female	Parent	African American
Lola A.	Female	Parent	White
Maddy R.	Female	Teacher	White
Malena B.	Female	School professional	White
Maria G.	Female	Student services program manager	White
Melody D.	Female	Parent	Asian
Monique D.	Female	School professional	White
Morgan L.	Female	School psychologist	White
Nancy R.	Female	Teacher	White
Rebecca R.	Female	Parent	African
Randy P.	Male	Parent	White
Samantha T.	Female	Playground instructor	White
Samara D.	Female	Teacher	White
Sandy R.	Female	Parent	White
Sarah F.	Female	Parent	Hispanic
Shawntay P.	Female	Special education teacher	White

economically and racially minoritized students. Racial disproportionality in school discipline and special education identification was a conundrum in the district. In the same year of the research, the district received a citation from the U.S. Office for Civil Rights for discriminating against African American students in special education placement. In the 2011–2012 academic year, African American students made up 30.3% of the special education program despite being only 10.5% of the district's total students.

3.3. Participants

Learning Lab included 33 participants, including five research team members, a lead researcher, a professor of special education, as well as four research assistants (see Table 1 for demographic information about the participants). Among all members, principal, student services program manager, social worker, and library media specialist participated in all sessions. Parents were included in Learning Labs started in session 5. They continued participating in Learning Lab until the end of the intervention.

Before Learning Lab sessions started, the research team held two meetings with the school principal to explain the process and obtain his commitment. A teacher who was responsible for the school's discipline system was selected as the Learning Lab liaison. The principal and the Learning Lab liaison worked together, identified other possible members, and selected the Building Leadership Committee as a starting point. The committee oversaw the school's academic and behavioral interventions. All committee members were invited to join Learning Lab.

To identify the parent participants, a *participatory social justice* perspective was utilized (Bal, 2012). First, the research team worked with the school leadership to determine parents from nondominant backgrounds and historically underrepresented in the school's decision-making activities. Three groups of parents were identified: African American and Latinx parents, immigrant/refugee families (Hmong and Gnahan), and families experiencing homelessness. Later, the Learning Lab members involved in the decision-making process: The researchers asked members to invite parents from the targeted nondominant groups who would also work with them during this study as equal partners. Members formed a list of potential participants. A total of 13 parents provided their consents and 10 participated in the study.

3.4. Data generation process

Learning Lab sessions were conducted from June 2012 to May 2013. Members met monthly for about 2-hour meetings. Members followed the cycle of expansive learning actions (Engeström et al., 2013). The participants first formed an inclusive working group. The first four meetings focused on identifying the focus of systemic transformation and select parent participants. The participants were first asked to identify daily pressing incidents of problems with disciplinary practices. Those incidents were used as the starting point. In these early meetings, members identified two pressing issues that they wanted to address in Learning Lab: *disproportionality* and *family-school collaboration*. Parent participants joined the Learning Lab process in the fifth meeting. The facilitators used artifacts such as the cycle of change diagram and interactive data maps that were designed to show statistics on discipline outcome data. Then, members *questioned* their daily pressing issues, including the overrepresentation of minoritized students in the exclusionary discipline and problems with family-school collaboration. The participants *analyzed* the root causes of contradictions regarding racial disproportionality. Table 2 presents the monthly chronology of Cole Learning Lab sessions with their objectives.

During the data collection process, we generated video recordings of 10 Learning Lab meetings (36.5 h), audio recordings of seven interviews (10.5 h), and audio recordings of three agenda meetings (4 h). A professional transcriber transcribed all audio and video data. Transcripts based on the video recordings of 10 sessions were analyzed for the purpose of this study.

3.5. Privacy and confidentiality

The Institutional Review Board (IRB) of the university where the research team worked approved this study in 2011. The research team collected consent forms from all study participants. All participant, school, and district names were changed to pseudonyms. Data were only accessible to research team members who had received research ethics and compliance training at the researchers' institution.

Table 2
Summary of Cole Learning Lab sessions.

Meeting	Date	Purpose of LL meetings	Rs	Te	Pa	Ad	Sp	T
LL#1	06/20/2012	Introduction the project and forming the group	4	2	0	2	4	12
LL#2	09/11/2012	Identify pressing issues in school	2	5	0	2	7	16
LL#3	10/09/2012	School and family collaboration	2	5	0	2	3	12
LL#4	11/13/2012	Finalize forming the group	2	6	0	2	3	13
LL#5	12/12/2012	Welcoming parents and pressing issues in the school	4	8	9	2	5	28
LL#6	01/08/2013	Disciplinary data and disproportionality discussion	2	6	7	2	3	20
LL#7	02/12/2013	Three aspects of culture	2	6	9	2	4	23
LL#8	03/12/2013	Presentation and discussion on equity	3	6	5	2	5	21
LL#9	04/09/2013	Disproportionality at the school level	2	5	6	2	4	19
LL#10	05/07/2013	Mapping out the behavior support system	3	5	5	2	4	19

Note. LL: Learning Lab, Rs: researcher, Te: teacher, Pa: parent, Ad: administrator, Sp: school personnel, T: total.

3.6. Data analysis

We employed the method of analysis of expansive learning actions (Engeström et al., 2013). We conducted the analysis by categorizing data according to three levels of data nodes: (1) expansive and nonexpansive learning actions, (2) subtypes of expansive learning actions, and (3) speaking turns. Speaking turns served as a tool to identify the frequency of each expansive action and define corresponding subtypes. We distinguished expansive and nonexpansive learning actions in transcripts of Learning Lab sessions. Expansive learning actions were defined as new types of learning that emerged as members worked toward systemic transformation. They were identified based on (1) discerning the conversational episodes based on their substantive contents, (2) analyzing the speaking turns within each episode in terms of actions and formulating a preliminary description of the actions, and (3) specifying the epistemic function of each action in the stream of learning actions (Engeström et al., 2013). We identified nonexpansive actions inductively and named them descriptively based on their content (e.g., informing, directing/redirecting, clarifying, and summarizing).

The original model of the cycle of change developed by Engeström (2015) started with the expansive action of questioning. Our analyses showed an additional expansive action, *forming an inclusive group*. We expanded the cycle of change and added *forming the group* as the first expansive action. This action included the school administrators' and Learning Lab members' actions regarding the composition of the Learning Lab structure. *Questioning* was about the participants' comments about criticizing or rejecting some aspects of the accepted practice and existing system. *Analyzing* involved mental, discursive, or practical transformation of the situation in order to find out causes or explanatory mechanisms (i.e., historical genetic and actual empirical; Engeström et al., 2013). Subtypes of expansive learning actions are unique to each study and need to be defined based on the data.

We independently coded each session. We first decided expansive and nonexpansive learning actions and collectively coded transcripts of all sessions after 100% reliability was established. As we coded expansive and nonexpansive learning actions, we generated ideas about the subtypes for the second level of analysis. The second level of analysis involved identifying subtypes within each expansive learning action. Finally, we analyzed speaking turns that were the moment when one participant finished speaking, and another participant began speaking.

4. Results

4.1. Types and frequencies of expansive learning actions

We analyzed the types and frequencies of expansive and nonexpansive learning actions. Table 3 presents three expansive learning actions that emerged during the intervention with their corresponding subtypes.

Data analyses showed that the expansive learning process occurred through three expansive learning actions: (1) forming the group, (2) questioning, and (3) analyzing the existing system in place. The frequency and evolution of expansive learning actions are presented in Fig. 1.

The visual analysis of expansive learning actions showed that they took place over multiple sessions. For example, the expansive learning action *forming the group* began in the first session and continued until Learning Lab session #10. *Questioning* was the most frequent expansive learning action with a total of 46 instances that peaked at 17 occurrences in Learning Lab #3. *Analyzing* had a total of 39 occurrences during the intervention. While analyzing occurred at a low frequency in the first meetings, its frequency notably increased in the last four sessions. Interventionists' role was minimal in taking expansive learning actions across all sessions. As Fig. 2 shows, teachers, administrators, parents and other school personnel actively engaged in forming the group, questioning, and analyzing.

Three expansive learning actions included a total of 13 subtypes. Table 3 shows all subtypes of all expansive learning actions. Questioning had the highest number of subtypes ($n = 7$). During the first five meetings, members spent most of the time on forming the group and questioning actions. Then, through analyzing, members began to conduct historical and empirical analyses of systemic

Table 3
Subtypes of expansive learning actions in Cole Elementary School Learning Lab.

Forming Learning Lab
F1: Who should be in Learning Lab
F2: Establishing rules and procedures of Learning Lab
F3: Procedures and accommodations to include multiple voices
Questioning
Q1: Questioning Learning Lab process, procedures, composition, and outcomes
Q2: Questioning school's existing practices for family engagement
Q3: Questioning disproportionality in behavior/academic outcomes
Q4: Questioning the school's existing academic/curricular practices
Q5: Questioning school climate
Q6: Questioning school/district resources
Q7: Questioning the school's existing disciplinary practices
Analyzing
A1: Analyzing actual-empirical
A2: Analyzing historical-genetic
A3: Mapping out the existing behavior support system

Note. F = forming Learning Lab; Q = questioning; A = analyzing.
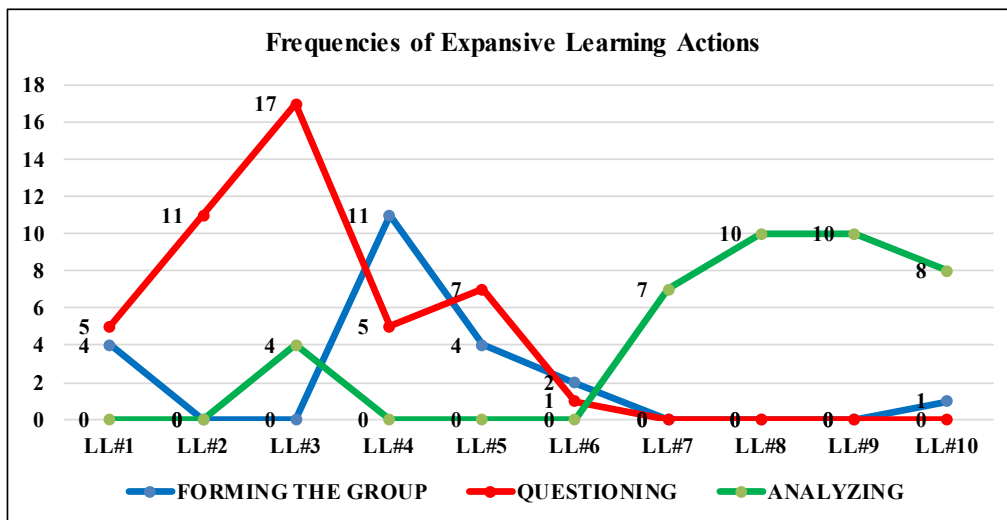
Fig. 1. Frequencies of expansive learning actions in Cole Elementary Learning Lab.

problems. The intervention was ended after Learning Lab session #10 because the planned intervention duration was completed, and the school year ended. Table 4 shows a detailed analysis of expansive and nonexpansive actions. Speaking turns were used to count for the number of expansive and nonexpansive learning actions in each session. For instance, a total of nine expansive learning actions (four forming the group and five questioning) occurred in session #1. A total of 10 expansive learning actions (10 analyzing) appeared in session #8. This result clearly showed that members became progressively more focused as they moved from group formation and questioning stages to provide a root cause analysis of systemic problems in the school activity system (e.g., disproportionality, family-school partnership).

Our analyses were in line with prior formative interventions (e.g., Bal, Afacan, et al., 2019; Bal et al., 2018; Engeström et al., 2013) that the expansive learning actions emerged along with nonexpansive learning actions. We identified five types of nonexpansive learning actions (see Table 4). Directing/redirecting was the most frequent nonexpansive action that occurred 85 times over ten sessions. This particular action meant that facilitators led members to focus on tasks avoiding off-topic conversations or repetitions, and move toward the next topic on the agenda. Informing and clarifying were the second most common nonexpansive learning action, occurring 22 times each. Informing involved presentation of a topic prepared for members. In clarifying, facilitators provided further information about a topic, activity, or agenda.

4.2. Progress in the expansive learning process

The inner contradiction (i.e., disproportionality in school discipline) was the primary motivation for members. We hypothesized
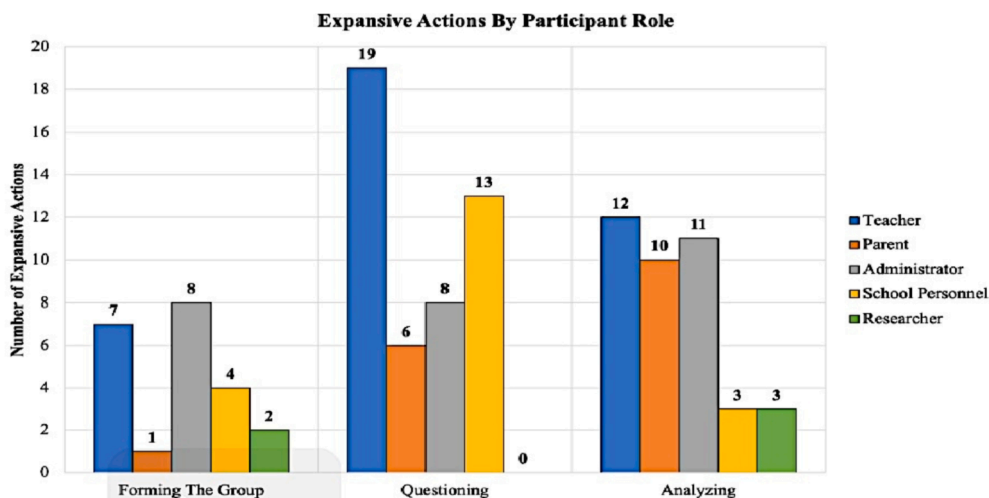

Fig. 2. Number of expansive learning actions by participant role.

Table 4

Types and frequencies of expansive and non-expansive learning actions in Learning Lab sessions.

	LL#1	LL#2	LL#3	LL#4	LL#5	LL#6	LL#7	LL#8	LL#9	LL#10	Total
Expansive learning actions											
Forming the group	4	0	0	11	4	2	0	0	0	1	22
Questioning	5	11	17	5	7	1	0	0	0	0	46
Analyzing	0	0	4	0	0	0	7	10	10	8	39
Total	9	11	21	16	11	3	7	10	10	9	107
Non-expansive learning actions											
Informing/introduction	3	3	2	2	2	3	3	1	2	1	22
Clarifying	3	1	0	5	0	1	4	1	6	1	22
Summarizing	1	2	1	1	2	0	1	1	1	2	12
Directing/redirecting	5	6	18	12	7	4	9	11	7	6	85
Planning for the future LL	0	2	1	3	1	1	1	1	1	1	12
Total	12	14	22	23	12	9	18	15	17	11	153
All learning actions											
Total	21	25	43	39	23	12	25	25	27	20	260

Note. LL: Learning Lab.

the entire discipline system was like a machine that reproduced disproportionality. Thus, members conceptualized the existing discipline system as the unit of analysis. The object of the existing discipline system was a single student with "problem" behavior. Exclusionary discipline actions were organized around this particular object. Through this formative intervention, the object was expanded from a discrete "problem" behavior of a single student to the entire school context. Below, we answered our second research question: *How did Learning Lab members work together to form an inclusive working group, question existing practices, and analyze systemic contradictions?*

4.2.1. Forming an inclusive working group

Forming the group was the first expansive learning action that emerged in the data analyses. This action included three subtypes: (a) who should be in Learning Lab, (b) establishing rules and procedures of Learning Lab, and (c) procedures and accommodations to include multiple voices in Learning Lab. Forming the group was an ongoing process. The topic of the fourth session was "who should be in this process?" Members discussed a need and rationale for inviting other stakeholders. The excerpt below illustrates the work of members on diversifying the group composition by inviting parents from diverse backgrounds such as parents of color, parents who experienced homelessness, and parents who lived in poverty:

> **Nesimi (facilitator):** What kind of criteria should follow in that?…Parents you have been working with closely?
> **Samara (teacher):** I think we definitely do need a pretty good representation of African American families if that is our overarching problems of overrepresentation of African American families in PBIS [school's behavioral support system].
> **Maria (student services program manager):** I think it's about confidential settings. If you had a parent that was like, " This parent who I had a really good conversation with," it'd be fine to say that parent's name in this setting like versus- like make our list now versus trying to wait…So if there's anyone that's like, "I like this person," or, "this person's great," feel free! Shout it out and we can keep a list.
> **Jessica (social worker):** I think we all know our family's lives, so let's make a big list. Because there's going to be lots of reasons they can't come, they can't commit like we can do December 12th? So let's make a big list and hope we get half of them.
> **Carmelo (principal):** The idea of representing our school population when we think about our demographics, I think parent participation will be representative of our whole school is an idea. I don't know if it's the way we go or not. So if we would look at what percent of our school is white and what percent is students of color and then we would have that representation.
> **Maria:** If we should have that grouping. Because I am just feeling like I think the purpose of the study is to listen to- hear the voices we don't usually hear, and those are the, for me, the voices that come from minority cultures.
> **Jessica:** If 35% of our referrals are from African American students, then maybe they shouldn't be seventeen percent, they should be 35%.
> **Carmelo:** I think our participation may account for some of that population already. We are white people represented in this. Yes, we are. White middle-class people. But when it comes to, maybe white parents who are living in poverty or homelessness, families in transition, those might be people to consider.

(Learning Lab #4)

It is essential for schools to increase diversity in their school-based teams. Racially minoritized and immigrant families and families with low income had negative experiences in schools. Members enacted a utopia for opening-up the knowledge production process to families, particularly those from minoritized groups, as can be seen in Maria, Jessica, and Carmelo's comments. In the following sessions, staff and researchers invited parents and worked together as equal partners to question the existing system and to analyze the existing problems. As a result of these discussions, a total of 10 parents participated in the following Learning Lab sessions. When members formed a group that included educators and parents, they were ready to question the systemic problems in the school activity system.

4.2.2. Questioning

We identified seven subtypes of questioning. It included (a) questioning the Learning Lab process and procedures, (b) questioning the school's existing practices for family engagement, (c) questioning disproportionality in the school's behavior/academic outcomes, (d) questioning the school's existing academic/curricular practices, (e) questioning school climate, (f) questioning school/district resources, and (g) questioning the school's existing disciplinary practices. The following excerpt is from session #5, where the school staff presented data on school discipline outcomes. Members discussed one of their most pressing issues: disproportionality in school discipline outcomes.

> **Carmelo (principal):** So our data says that yes, students of color are disproportionately getting more disciplinary referrals. Getting in trouble more often.
> **Jessica (social worker):** It's about 17 or 18% of our students are African American students, and they account for about 35 to 37% of our referrals.
> **Melissa (facilitator):** Twice as much as you would expect.
> **Randy (parent):** So where we are at.
> **Jessica:** It is an issue that we're trying to- and that's consistent across the district and the nation, we want to be the first to figure it out.
> **Carmelo:** We're trying to figure out.
> **Randy:** I'm not trying to be ignorant, but I didn't know.
> **Carmelo:** Absolutely. And we haven't had a chance to get specific about the data, to share that with you today, but that's true in our behavior data, we have achievement gaps in our academic results. And we want to solve that. We hear about it all the time, it's in the news in Downton. But we're not okay with that.
>
> (Learning Lab #5)

All members established a "here and now" situation after the review of school discipline data (Freire, 2000). The problem was restated based on the school's existing behavior outcome data in front of parents and researchers. This was the first time when the school staff shared school discipline data with parents and researchers. These initial data presentations and discussions served as the first stimulus in Cole Elementary Learning Lab. Members faced a problematic and contradictory situation that was embedded in their daily activities (Engeström, 2011). In Cole Elementary School, the problematic situation was the disproportionate representation of African American students in the school's discipline outcomes. Although the staff implemented a schoolwide behavioral support system for years, disproportionality had not been eliminated. The excerpt below illustrates that the members expressed their discomfort about the contradiction in the school's disciplinary practices:

> **Jessica (social worker):** I think the issue like Carmelo said, we know that we want to use their experiences. It seems like we put new things in place to make them bigger and better than before with PBIS or academic interventions, and yet this early on in the year, we're already disproportionate in our discipline referrals.
> **Nesimi (facilitator):** I see.
> **Jessica:** Like if our data.
> **Carmelo (principal):** A lot.
> **Jessica:** I see who's sitting in Carmelo's office every day, going over discipline referrals, it's like continuing, you know? And I don't think there's- the teachers are writing the referrals they need to the right.
> **Carmelo:** And playgrounds and everybody.
> **Jessica:** Right. But what can we do so that it doesn't get to the point of needing to write a referral? I mean we're there again, and yet we're coming up with cool ideas and doing really great so that we feel right but we're a lot of white people sitting around the table talking about it.
>
> (Learning Lab #3)

This exchange among the principal, social worker, and facilitator demonstrates an example of a double bind (Engeström & Sannino, 2011). Social worker Jessica not only criticized their existing discipline system but also indicated a feeling of urgency to take action. She was ready to go beyond words and to do something, as can be seen in "what can we do…". However, a single individual usually cannot resolve this type of situation alone (Engeström, 2008). Rather, it requires a transformative and collective effort in local organizations. Other issues, such as school climate and cultural mismatch, were also questioned. Mostly, parents were sharing their everyday experiences. The following excerpt illustrates three parents' concerns regarding how cultural mismatch and bullying in Cole Elementary School impacted their children's everyday educational experiences:

> Rebecca (**Immigrant Parent**): In Africa, where I come from, we have much particular lesson they want to give you. The math homework, right? What I'm studied here is the teacher is much interested in the procedure that you follow to an answer. Even if the answer is wrong, you might get some points. Where I come from it's not like that. So if it's one plus one, the text uses one plus one. Unless you get to college, you follow it different. But where I went to school, they just wanted to know that one plus one is two. But here at elementary school, they want you to know that you follow ABCs to get to- so we are building them from the beginning, before they even get to parents, by the time you already have them. I'm now learning to follow the procedure that you can get, for them to get for them to understand and get an answer. I said "Okay. No dad. Its 15, but what am I supposed to do?" And then I can't explain the formula, that was my whole issue of saying that it's a little different. And also that the transition. We're colonized in Ghana. We were colonized by British. You don't have an accent. I do. I know I have accent.

Because of the language you speak, and I know we speak English but we have accent. Now, when you are talking, we make sure that every letter of the word stands out. Comes out. In this place, its most of the times you try to swallow everything.

Lola (**White parent**): I want to talk about bullying. My daughter has been here 3 years, and walking home from school, or in the hallways, I've seen and talked to several students about bullying other kids…I've seen them fight, and just different things. So we'd like to figure out a way to get the parents involved as well. If they see something walking home, or just walking down the hallway, while you know obviously teachers can't be in the hallway all the time, so I think that's really important because I've seen it quite a bit.

Melody (**Asian parent**): that raises a question for me, too…So with my seventh grader. I know she's been bullied quite a while too. She had been bullied because of her shortness. She had been picked on, name-calling, even bad words. Calling her. Now that she's in middle school. It's a lot more peer pressure, but she has been harassed. And harassment paper has been sent out. I don't know how to go about it, although I would feel like I would want to go in and talk to the principal or the counselors or the teachers. Or meet up with the child that harassed my child. I know that she has been very uncomfortable. So I have been trying to get the teacher to at least switch them both in different either different classes or assign them different seats, but it turned out that teacher doesn't allow that, so they had to sit together again in the same class. Even though that child did harass my child, and it just got to a point where she just kind of had to not talk to anybody. And so that just kind of raises a question for me that, how do you go about it when things like that are happening to your child. That they don't call you immediately, they call you two three days later.

(Learning Lab #5)

These examples show parent's serious concerns regarding how cultural mismatch and school climate negatively impacted their children's daily experiences in Cole Elementary School and beyond. The behavior outcome data and the everyday experiences of parents and students served as the first stimulus that mediated a comprehensive understanding of problems at the school. This type of collective knowledge generation in the questioning stage also facilitated members' active participation and the establishment of a shared motive to redesign the existing system. Expansive learning action questioning was critical in increasing members' awareness toward the inner contradiction and ownership of the process. Next, members analyzed the school's activity system from multiple perspectives and histories.

4.2.3. Analyzing

Analyzing was the third expansive action that was found in our data. Notably, a majority of analyzing action occurred in the last four sessions. In analyzing, the members engaged in the root cause analysis of the disproportionality. They moved from forming the

Fig. 3. A moment from Learning Lab February meeting.

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group and questioning stages to analyzing the existing system. We identified three subtypes of analyzing: (a) empirical, (b) historical-genetic, and (c) mapping out the existing behavior support system. In session #7, the facilitators introduced the three layers of culture diagram that displays interacting institutional, individual, and intersectional cultural contexts (Artiles, 2011b). For example, Fig. 3 shows a moment from the February meeting when members examined the institutional culture (e.g., social climate, roles, rules). This diagram served as a mediating artifact (a second stimulus) in the meeting.

Then, facilitators grouped members for a *walkthrough* activity in which members walk along with a partner within the school to observe and take notes on daily school activities. Facilitators formed groups, including one parent with one school staff, and requested each staff-parent dyad to walk through the school and complete a walkthrough form. The form included questions related to school-family partnerships, resources, dialogue, physical space, and representation. Each dyad presented their findings as data in the following meeting. The following excerpt shows how members shared their observation notes:

> **Shawntay (Special education teacher):** We also had an interesting conversation just when it talks about representation of your staff. One of our members had an experience… when they got hired it seems like it was because of their race, and it made them feel used or singled out. So we got into some deep conversation about just hiring- how we're trying to make our schools more diverse and it's a challenge, but there's also just deeper issues about finding who is the right match for your school.
>
> **Nesimi (facilitator):** We know that often when staff and educators of color are hired into schools where it's primarily white teachers- that can feel really marginalizing for a lot of reasons, and even when we make a point to in some ways emphasize their race or their ethnicity, that can make them feel even more "othered", if you will.
>
> **Samara (teacher):** The only thing I was going to comment is I'm sure everybody noticed and- either you took a picture or you commented on- but the signs that "We all need friends" "We all learn…." you know, whatever. For anyone that hasn't been in the building for a while, those have been up for two-three years. And they stayed put in the same spot… I wondered out loud "I wonder if we switched them around? And if anyone would actually notice."
>
> (Learning Lab #8)

Walkthrough activity helped members to discover both visible and invisible sites of the school activity system. For example, while Shawntay noticed that race was a factor in the hiring of her colleague, on the other hand, Samara realized that signs and posters on walls were outdated and meaningless for some school members. Walkthrough activity was an example of empirical analyses that also served as the first stimulus for members. We found another example of empirical analysis in the next session. In the following excerpt, the student service program manager provided an actual-empirical analysis:

> **Maria:** PBIS tells us that 80% or more of your school should have 0 or 1 referral. So we are at 90%, like we're doing better than what PBIS would say with our implementation! So that's great! But there also are parts of it that are like not as great. That's why we're all here to try to figure that out because nobody has been able to solve that… the issues we're having at Cole Elementary are issues that are happening at schools all around the country. So that's why, we're like, "Okay, Nesimi (facilitator) come on in." And then you guys all said you'd come and that's awesome so thank you.
>
> (Learning Lab #9)

The excerpt above illustrates an important aspect of formative interventions. Maria did not only criticize the existing system but also appreciated the possibility of working with local stakeholders, including researchers from a local university and parents, to find solutions to the school's existing problems. Facilitators used nonexpansive learning action directing/redirecting to initiate conversations around the school discipline system.

Members also engaged in a historical-genetic analysis of the inner contradiction in Cole Elementary School. In session #9, members provided root cause analyses of the disproportionality in school discipline outcomes. As members highlighted, two potential causes emerged: lack of cultural responsiveness in school's behavioral support system, PBIS, and cultural mismatch between school and home for students of color:

> **Maria (student service program manager):** We said about seven or eight years ago, Cole Elementary adopted "Above the Line." and then worked with one of the first schools to start PBIS…So what we see is more and more kids are having fewer office disciplinary referrals…when you go to the 2012–2013 school year almost 90% of our students have 0–1 office disciplinary referrals…We do, though, have the kids who have 2–5 referrals, and 6 or more referrals. So what we see is as the years progress "Wow, things are really going well. PBIS overall at Cole Elementary is working." So yay that's a big celebration for us. When we dig a little bit deeper though, we see it's working for a lot of the same kind of kids and it's not working for some other kids.
>
> **Denise (music teacher):** At least I can say for African Americans it tended to be personal, came from a place of personal feeling…We also reflected on the fact that this is very cultural. There are some cultural things that need to change. We came to a place of reflection about it being historical, and in terms of acting, maybe getting our kids in tutoring, definitely getting the parents involved and on board, like the questions we're asking were, "How can we make what happens at school look like what happens at home?" And we know that parents have to be involved.
>
> **Monique (school professional):** I had a particular instant when an African American boy was causing a lot of trouble on the playground. I talked with his teacher one day and she told me that when he's in the classroom, she called him a "schoolboy." He's like a schoolboy; he wants to learn; she doesn't see any of these behaviors in the school. The minute that he got out on the playground, it was like he was a tough kid, and he wasn't gonna let an adult go into that world. And that really hit me, that's probably a lot of what happens. What they were saying, the parent involvement and a lot of times parents not being able to be

there, when these kids are home- and possibly they go home and they're outside, they're not supervised by adults, and they just kind of form this, well it's a barrier against adults. And I've seen that quite a bit.

Maria's comment above has implications for culturally responsive implementations of PBIS in schools. Historically, she observed that PBIS implementation mostly worked for the same students (i.e., White students) in Cole Elementary. However, as it was clear from the school's discipline data, students of color did not much benefit from PBIS implementation. Maria's comment was consistent with PBIS scholars who recommend *culturally responsive* implementations of PBIS (e.g., Bal et al., 2018; Sugai et al., 2012). Also, Denise and Monique highlighted the difference between school and home culture and how it often negatively impacted the daily experiences of students of color. They noticed that parent involvement was a missing element in the existing system. This situation often caused a misinterpretation of student behavior, in turn, receiving a disciplinary action.

The last session was planned for a mapping out activity. Facilitators proposed this activity, and the purpose was to develop a mediating artifact to make the object and the organizational structure of the discipline system visible; hence, transferable (Bowker & Star, 2000). The following excerpt illustrated a moment from Learning Lab session #10 when members worked together to map out the existing school discipline system:

> **Maria** (**student services program manager**): What is a referral written for? Is it because you're late? Are you late to class and get a referral? Or what is an office disciplinary referral?
> **Destiny** (**parent**): That's a great question.
> **Maria**: That's what I said. That'll be good for everybody.
> **Janice** (**librarian**): I can show there's a bunch of different things you can make a referral for.
> **Alex** (**parent**): I see. Definitions.
> **Sarah** (**parent**): These are the areas.
> **Maria**: So the largest one is PA, which is physical aggression, so like fighting or hands-on stuff. Disrespect is the next highest, inappropriate language, other is the next, harassment, forgery or theft, property damage, lying, and then fighting.
>
> (Learning Lab #10)

This exchange illustrates members' attempts to understand better the procedures followed in a discipline referral. This step-by-step of mapping out made the discipline system logical for all participants in Learning Lab. However, discussions remained in words. In other words, the existing school discipline system was not made physically visible during the Learning Lab intervention. After the 10th session, the school year and the planned intervention duration ended. Thus, members could not move to the modeling a culturally responsive discipline system.

5. Limitations and directions for future research

A major limitation of our work was that the intervention had to be ended without fully designing a new discipline system. Members only formed an inclusive group, questioned, and analyzed the problems in the existing school system. They could not move from the expansive actions related to forming the group and problem identification to problem-solving (modeling, examining, and implementation). We had to stop the intervention because the school year ended, and members left for a summer break. Thus, modeling, examining, and implementing a culturally responsive schoolwide system remained as an area for future research at Cole Elementary School. One of the main reasons that Cole Elementary Learning Lab we identified is members did not establish a shared comprehensive understanding of the whole school system. Without a shared understanding of the existing system, Learning Lab members lacked a common platform for the knowledge generated from questioning and analyzing actions (e.g., systemic breakdowns) and solutions and innovations members suggested in response. As a result, the ideas generated by members were still idiosyncratic and floating in the air without a container – a secondary artifact that could help members to form a collective agency and design the new, culturally responsive behavioral support system engage through modeling. In response, we developed an expansive action called, *mapping out* (Bal, 2016). However, we introduced the action too late in the process in the session #10. In the following Learning Labs, mapping out were added into the Learning Lab process between analyzing and modeling in order to help Learning Labs in moving from problem identification to problem-solving (Bal, Afacan, et al., 2019; Bal et al., 2018; Bal et al., 2021).

Another challenge was that Learning Lab included a total of 33 participants from various ethnic, professional, and economic backgrounds. It was highly important to have multiple voices from all possible backgrounds in the process. However, facilitating sessions with a high number of participants was a big, complex, conflict-laden, and incomplete endeavor for facilitators. Reaching a consensus on several issues such as group composition and the most pressing issues took time and ongoing discussions among members. Based on Cole Learning Lab experiences, we facilitated sessions with smaller numbers of participants in other intervention sites. For example, a high school formed a diverse group of Learning Lab with 14 participants (Bal et al., 2018), and a middle school formed a similar group with 19 participants (Bal, Afacan, et al., 2019). While expansive learning actions were highly instrumental in facilitating and analyzing school's organizational structure, formative interventions can be directly started with the most pressing issue an organization faced (Engeström et al., 2013). This can help to save members' time and energy for a targeted discussion about the most pressing issue, such as disproportionality in discipline outcomes.

At Cole Elementary and other intervention schools, Learning Labs served as zones of proximal development for local school communities as well as the research team. Members from diverse backgrounds expressed their own cultural practices, histories, and goals in Learning Labs. In turn, this kind of knotworking developed the organizational capacity for the sustained coalition among members (Engeström, 2008). Learning Lab at Cole Elementary School was instrumental in developing a collective organizational

memory. It is essential to investigate the generalization of Learning Labs to other schools that experience similar problems. We conducted a follow-up interview with the principal. Cole Elementary School did not continue Learning Lab given the district changes its focus from cultural responsiveness to STEM education. The principal moved up to a leadership position in the district. He stated that he utilized Learning Lab and initiated a similar process at the district schools to facilitate family involvement in school activities.

We continue to build and sustain partnerships with the state's department of education, local schools, and community organizations to implement Learning Labs in schools in Wisconsin and other states. Each intervention site presents unique possibilities, challenges, and learning experiences for educators, families, community members, and researchers. Learning Labs may be instrumental in forming and sustaining a democratic, inclusive, and knowledge production process that will foster expansive learning in addressing educational problems in local schools.

6. Discussion

This study builds on the prior theoretical and empirical work of formative interventions (Engeström et al., 2013; Gutiérrez et al., 2016) and contributes to the development of the fourth-generation activity theory (Engeström & Sannino, 2020). Learning Lab presented both possibilities and challenges regarding inclusive knowledge production and the systemic transformation process at an elementary school in an urbanizing city. Our work revealed that it was possible to form and maintain a productive, inclusive knowledge production process. The formation of an inclusive group was an ongoing endeavor that continued until the last session. The participation of stakeholders who represented multiple activity systems (e.g., families, educators, administrators, and university-based researchers) made the process more democratic and equal for the school community. Thus, multivocality or heteroglossia (Bakhtin, 2004) fostered the reality of how the school activity system at Cole Elementary worked with its existing acts, tools, division of labor, and outcomes. Our findings suggest formative interventions advance possibilities for local schools to diversify knowledge production activities and run decision-making teams inclusively.

Our findings show that the members effectively *questioned* and *analyzed* their existing school practices as situated in their specific social-historical-spatial context. Parent voices are not usually heard in school-based decision-making teams. However, school staff purposefully opened up the decision-making process to parents of color, parents who experienced homelessness and poverty because their children disproportionately received exclusionary discipline and had negative social and academic educational experiences at Cole Elementary School. Allowing parents to express their thoughts on their children's educational experiences contributed to the transformative agency. They took ownership of the process, openly questioned the existing system, and conducted actual-empirical and historical-genetic analyses during the intervention process. Staff's partnership with this diverse group of individuals presented the possibility of creating democratic schools with local stakeholders. This type of democratic school-based decision-making teams has the potential to increase ecological validity, impact, and sustainability of the interventions in education research that reproduce and maintain the outcome disparities such as the racialization of discipline and educational opportunity gaps.

Even though members formed an inclusive working group, questioned the problems, and analyzed the existing school system, they could not complete the cycle of change over a school year. They could not design and implement a culturally responsive discipline system in their school. We noted that Cole Elementary School Learning Lab was our first formative intervention site. Thus, our experiences at Cole Learning Lab informed our following formative interventions at the other schools, where we have implemented Learning Labs between 2012 and 2021 in Wisconsin, Florida, and Rio, Brazil. In all of the following Learning Labs, members were able to design new systems (Bal et al., 2018; Bal et al., 2021). For example, Rogoff Middle School and Martin Luther King (MLK) High School initiated Learning Labs between 2012 and 2014 (Bal, Afacan, et al, 2019; Bal et al., 2018). Rogoff and MLK Learning Labs included 19 and 14 members who could attend most of the sessions during the intervention duration respectively. Also, subcommittee meetings that were consisted of volunteered participants were held to complete unfinished work (e.g., mapping the school's discipline system) from a previous Learning Lab session. These meetings helped to prepare the next session's artifacts that would direct the group to make progress in the expansive learning process. Both schools were also prompt to form a diverse working group including educators, parents, students, and researchers and to identify their most pressing issues. This helped them to spend more time on analyzing, modeling, examining, planning for implementation, and reflection on the process. Both schools' local stakeholders successfully engaged in problem-identification, problem-solving, and designed culturally responsive discipline systems in response to diverse needs, resources, and goals of their local school communities (Bal, Afacan, et al., 2019; Bal et al., 2018). These schools strategically planned on implementing their culturally responsive discipline systems in the following academic years. Learning Lab may be instrumental in creating and sustaining democratic and inclusive knowledge-production activities, collective agency, and transformation at local education systems.

Schools are complex organizations that include multiple daily activities. They are under the impact of top-down policies as well as interventions from researchers. Even within a single school activity system, educators and administrators conduct their own interventions every day. Thus, as Engeström (2011) indicated that researchers should not expect to see clean linear results from their interventions in schools. O'Neill (2016) aptly stated, "[w]e must develop our capacity to produce truly informative reports of failed designs and misadventures as well as a new connoisseurship of these reports" (p. 500). Our work illustrated both Engeström and O'Neill's points because our formative intervention was ended without developing a culturally responsive school discipline system. Members could not complete the cycle of change. They could not move from abstract to concrete (Sannino, 2011). In other interventions (e.g., Bal, Afacan, et al., 2019; Bal et al., 2018; Engeström et al., 2013), researchers developed or adopted secondary stimuli where members used charts, graphs, or visuals that represented their activity systems. External cultural artifacts can become a powerful mediating sign in moving members from analyzing to modeling a new system (Engeström, 2011). The use of secondary stimuli was missing at Cole Elementary School Learning Lab, and it resulted in an incomplete formative intervention that was not

planned and expected by facilitators.

To ensure ecological validity and sustainability of Learning Lab and other multi-site formative interventions require a continuous, strategic, and expanding coalition that should involve the district leadership more actively in the school-based implementation of Learning Labs. For example, an urban school district implemented Learning Lab in the 2020–2021 school year. They selected five middle schools as pilot schools for Learning Lab. The district coordinated each Learning Lab through the participation of members of the leadership team in Learning Labs. Five Learning Labs designed their culturally responsive behavioral systems and are currently implementing the new system. The district will start forming five more schools to implement Learning Lab based on their experiences and the infrastructure that they built through the pilot Learning Lab schools.

7. Conclusion

The disproportionality in exclusionary discipline outcomes is an enduring multifaceted problem of social justice that requires a robust interdisciplinary framing that examines human behaviors within in specific social-historical-spatial contexts. Complex, systemic, and cultural-historical problems such as the racialization of school discipline require solutions that are responsive to the needs and interests of multiple stakeholders of a local school system. Critically examining exclusionary school systems with local stakeholders, including educators, families, and researchers, requires authentic and equity-oriented collaborations over time. Formative interventions such as Learning Lab led and owned by local stakeholders can provide opportunities for local schools to form and sustain democratic and inclusive decision-making teams. Overall, Learning Lab accomplished three things: (a) they formed an inclusive group, (b) they questioned their most pressing issues, and (c) they provided actual-empirical and historical-genetic analyses of the inner contradiction. Our study shows that an inclusive knowledge production teams can be formed to question marginalizing practices and to examine historically developing systemic contradictions in a school's activity system.

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