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Augmenting bilingual preservice teachers’ articulation of teaching in a Change Lab: an art-mediated instrumental approach

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Abstract

The funds of knowledge of bilingual preservice teachers (BPSTs) are undervalued in the U.S. predominantly White teacher education space. Therefore, this study aimed to investigate and integrate the overlooked knowledge and epistemologies of BPSTs into teacher preparation. To do so, we conducted a secondary analysis of Play-Doh pictures and narrative generated by the BPSTs from a multi-year change laboratory (CL) intervention, which took place in one graduate-level practicum seminar, enabling the participants to tell their stories and express their voices in multimodal ways. By applying Rabardel’s notion of instrumentality to preservice teachers’ imaginative work with Play-Doh, the study describes how the art-mediated instrumental approach supported BPSTs to co-reflect on their articulation of teaching. Implications of using cultural-historical research to study teacher education are discussed.

Keywords: Change Laboratory; instrumentality; cultural historical activity theory; bilingual teacher education; art mediation.

Introduction

Bilingual preservice teachers (BPSTs) continue to face marginalization in U.S. teacher education, which is primarily dominated by White professionals (Flores et al., 2022). In this study, BPSTs refers to those who are heritage or second language learners working towards bilingual childhood certifications, serving immigrant students and/or students from immigrant families. Previous research in teacher education left open the investigation of how to motivate BPSTs to theorize and express their own articulation of teaching so that their voices become a part of the ongoing classroom practice (Clark et al., 2011; Flores et al., 2022; Martínez-Roldán, 2021; Torres-Guzmán & Tran, 2011). In order to solve this problem, teacher education programs should create equitable avenues for BPSTs to engage in decision-making and foster a sense of belonging in the profession (Cochran-Smith & Reagan, 2022; Jez, 2020). Building upon prior efforts to promote equity in teacher education programs using a cultural-historical activity theory (CHAT) approach, we conducted a secondary analysis (Beck, 2019) of pictures of Play-Doh creations and narratives (i.e., descriptions of the Play-Doh creations and teaching philosophy statements) generated by the BPSTs while participating in a multi-year Change Laboratory (CL; Virkkunen & Newnham, 2013), a formative intervention led by the first author (Chang, 2024), which took place in one graduate-level practicum seminar. The CL sessions using Play-Doh were devised to support the participants to express their voices in multimodal ways. Verillon and Rabardel's (1995) instrumental approach is the driving force of carrying out formative intervention work, because it centers on the relationships among agency, artifact, and mediation (Engeström & Sannino, 2021). In this study, an art-mediated instrumental approach to facilitating CL is defined as incorporating interactive artwork to provoke social imagination (Greene, 2000).

The initial development of Funds of knowledge (FOK) from language-minoritized communities aimed to address children's learning and socialization within their communities. Nevertheless, we incorporated FOK into our CL research proposal to reshape teacher education practice (Chang, 2021). The underused FOK of BPSTs have become the focus of recent teacher education research. For instance, Martínez-Álvarez et al. (2017) examined the graphic organizers of five BPSTs in a cross-cultural teacher education course assignment. They discovered that the participants showcased their teacher-student relationship within language-minoritized communities by incorporating their transnational Spanish and Chinese speech communities in their digital cultural concept maps. This work showed that BPSTs reflected FOK in ways that are different from their dominant White counterparts. Such work guided us to recognize that provision of an equitable practice of eliciting BPSTs' FOK requires teacher-educators to adopt multimodal tools to mediate the BPSTs' learning.

Drawing on Vygotskian theory, we propose that the process of constructing intersubjectivity, defined as "the awareness of self and other's intentions and feelings in the dynamic of shared understanding" (Kokkinaki et al., 2023, p. 1), fosters a balanced collaboration between BPSTs and higher education institutions, making BPSTs' FOK available and "visible" to the dominant communities so that BPSTs can equitably participate in dialogues to tell their own stories. That is, intersubjectivity focuses on negotiation of knowledge and values concerning all participants. Establishing intersubjectivity requires that participants of an activity are honest and voluntary who trust one another (Göncü, 1993). Participants also make the proleptic assumption that all of

them share a minimum amount of knowledge about the subject in question, and that they are willing to achieve a shared goal based on the expansion and negotiation of what they bring to their interaction (Clifford & Göncü, 2019). This process of establishing shared meanings demands equal distribution of power and the recognition of everybody's FOK. In support of this, Flores et al. (2022) argued that critical bilingual-bicultural pedagogues should focus on becoming conscious of their practice and express it in ways that would be heard in mainstream contexts of teacher education research. Additionally, Clark et al. (2011) described a bilingual teacher's recursive trajectory of becoming conscious of the school's multicultural environment, leading to acceptance, empowerment, revitalization, and self-realization. Finally, Torres-Guzmán and Tran (2011) described the development of bilingual teachers in ways that are consistent with their linguistic and cultural heritage by recourse to the notion of *crisálida* (a Spanish word for chrysalis), highlighting the articulation of teaching in their own language.

By applying Rabardel's (2001) notion of instrumentality to BPSTs' imaginative work with Play-Doh, the study described how the art-mediated instrumental approach enabled them to co-reflect on their articulation of bilingual teaching. The paper is organized in four sections. First, we describe the CL methodological framework which is informed by CHAT. Second, we discuss the theoretical underpinnings of an art-mediated instrumental approach to a CL intervention. Third, we explore the role of social imagination in conducting formative interventions. Lastly, we present an illustration of (social) imagination, transformation, and empowerment of selected BPSTs in a CL intervention. The present study sought to answer the following research question: how can BPSTs' articulation of teaching be augmented through an art-mediated instrumental approach in CL interventions?

CHAT and CL Methodological Framework

The CL methodological framework is a series of formative intervention sessions derived from CHAT-informed concepts and the principles of expansive learning theory (Engeström, 2015). CL has been employed across different disciplines to facilitate expansive learning of participants to drive transformational change. A CL formative intervention usually cycles through seven major expansive learning actions: (1) questioning, (2) analysis, (3) modeling the new solution, (4) examining and testing the new model, (5) implementing the new model, (6) reflecting on the process, and (7) consolidating and generalizing the new way of working (Virkkunen & Newnham, 2013, p. 50). Rather than investigating the expansive learning actions sequentially throughout the entire duration of the CL project (Engeström, 2015), we sought to understand how one CL session with Play-Doh assisted BPSTs' articulation of teaching (i.e., "modeling the new solution").

The six interacting components in one activity system are: subject, object, tools, rules, community, division of labor (for a discussion of activity system analysis, see Engeström, 2015). For the present study, the activity system under examination is preservice teacher education. Once the new solutions are modeled as an artifact-mediated collaboration between CL researcher-interventionist and the participants, the CL sessions then continue with interactive collaborations with various mediating artifacts used or generated by the researcher-interventionist and/or participants.

CHAT scholars using the formative intervention research paradigm are concerned “with developing theory and knowledge related to both classroom learning and implementation through systematic inquiry” (Fishman et al., 2013, p. 136). To that end, the CL methodological framework enables teacher educators and educational researchers to work towards establishing equity when working with vulnerable populations to resolve identified contradictions (Penuel et al., 2017). For instance, Bal et al. (2018) initiated an Indigenous Learning Lab project that focused on an ecological valid systemic transformation regarding Indigenous students’ racial justice in school discipline in Northern Wisconsin. Allen and Penuel (2015) investigated in-service teachers’ judgements from two schools in the U.S. after attending a professional development session to see how these participating teachers navigated the Next Generation Science Standards. Moreover, in helping educators to avoid essentializing cultures, Gutiérrez et al. (2017) employed the metaphor of “learning to see” (p. 30), urging educators who worked with non-dominant youth to imagine new forms of learning and to understand cultures as repertoires of community practices rather than individual personal traits.

Based on previous work, our study brings art mediation to the center of the instrumental approach of CL, which affords teacher educators to work collaboratively with BPSTs to co-reflect on the artifact they use and the mediation it offers. Further, Ritella and Hakkarainen (2012) have employed the instrumental approach to study the role of technology in mediation and learning. The authors assert that the instrumental approach takes place “when artifacts are turned into instruments by the subjects” (p. 246). This suggests that the subjects can use the developmental changes to create knowledge. For instance, artificial intelligence was developed by human beings for machine learning first, and now is widely applied as a digital instrument for humans to write automated content. In addition to digital instruments, an art instrument such as Play-Doh, can also mediate teaching and learning (Lace-Costigan, 2017; Mathews et al., 2023).

In this study, Play-Doh, a commonly used classroom resource that fosters play and imagination, is considered to be a symbolic artifact, which has hands-on and low-tech material properties that can be (1) used for different functions and (2) transformed into new semiotic representations assigned by participants. For the transformation to be symbolic, it must be materialized outward as a symbol that is subjected to one’s own critical self-negation dialectically (Greene, 2000). The symbol needs to be reflected upon as one’s (re)negotiation of reality, so that the person can articulate it in the ideation stage of one’s teaching philosophy.

An Art-Mediated Instrumental Approach

The key characteristics of Rabardel’s (2001) instrumental approach in CL implementations are immersed in a bi-directional understanding of the interactions of artifact (tools) and mediation (Daniels, 2015). The first directional understanding is that if the artifact has effectuated an instrumented action for the subject to enact on their object, the authors characterize such an instrumented action as *instrumentalization* (i.e., from ideation to action). For example, the BPSTs (subject) create Play-Doh (artifact) sculpture to articulate their teaching (object) in visual forms that guides their future action, thereby generating pragmatic (practical) mediation (i.e., connections to their practice). The second directional understanding is that if the artifact has a reversal course of instrumented action for the object to effectuate the subject, the authors characterize the reversal course of

instrumented action as *instrumentation* (i.e., from action to ideation). For example, the visual forms of Play-Doh sculpture (artifact) used to articulate their teaching (object) in turn support BPSTs' (subject) development of teaching philosophy, thereby generating epistemic (philosophical) mediation (i.e., connections to their development of teaching philosophy statement).

This present study is grounded in Rabardel's (2001) notion of instrumentality in CL that recognizes that a subject's instrumented action toward an object (goal, motive) is mediated by the artifact used (Cole, 1996). Play-Doh was used as the mediating artifact for the CL sessions to facilitate the expansive learning action of "modeling new solutions", because Play-Doh (art instrument) meets the goals of serving both as artifact and mediation for BPSTs in a pedagogical sense. This is to say that Play-Doh, as opposed to other digital technology or tools, is more conducive to facilitating BPSTs' imagination, expression, and growth for its materiality and embodiment. In this art-mediated instrumental approach, the course of instrumented actions is bi-directional: from either subject to object or object to subject (Rabardel, 2001; Ritella & Hakkarainen, 2012; Verillon & Rabardel, 1995). Artifacts can then construct both pragmatic and epistemic mediation (Cole, 1996).

In this regard, the first step, pragmatic (practical) mediation, means that subjects are learning how to use the artifacts to facilitate *instrumentalization*. Play-Doh can transfer and nourish the instrumentality of art-mediation in such a way that opens teachers' critical reflections, as teachers assemble a two-dimensional or three-dimensional representation of their professional aspirations. The Play-Doh started off as a mediating artifact that the subjects could directly maneuver with their hands. It allowed participants to sculpt any shape, offering opportunities to discuss their ideal spaces, thus creating new societal meanings as they (dis)assembled each piece of artwork. Second, epistemic (philosophical) mediation means the object makes the subject think about new concepts that can be generated via *instrumentation*. Preservice teachers can co-reflect on their processes of creating their Play-Doh representations and further explain their associated cultural expressions in visual and material forms. Art-mediation, therefore, has the potential to also facilitate preservice teachers' learning in a direct embodiment of Play-Doh creation. In order to achieve this, after working with the Play-Doh, the CL participants were provided with white board markers to draw, illustrate, or write their explanations using sticky notes within or next to their creations.

These future-oriented, art-mediated instrumental approaches can help preservice teachers to focus on their reflection on the dialectical nature of teaching and learning. Using art mediation to objectify the non-material aspects of cultures helps preservice teachers to understand the non-static, evolving role of teaching. When deploying art-mediation in a co-reflection space, Play-Doh "sculptures" are to be understood in action, in motion. An art-mediated instrumental approach to CL formative interventions helps BPSTs to connect their articulation of teaching and future-oriented action in generative manners. CL participants instruct themselves to move from imagination to ignition (Chant et al., 2004), re-orienting themselves to be the critical bilingual-bicultural pedagogues that focus on becoming conscious of one's practices (Flores et al., 2022).

Moreover, an art-mediated instrumental approach to CL formative interventions provides BPSTs with a space to create deviations for change. Cole (1996) contended that:

[The] mind cannot be unconditionally bounded by the head or even by the body, [and] must be seen as distributed in the artifacts which are woven together and which weave

together individual human actions in concert with and as a part of the permeable changing events of life (pp. 136-137).

The creation of artifacts and the actions of teachers are intertwined and play a role in the articulation of teaching, becoming part of the teachers' mental processes. That is, teachers can react to the art-mediated artifacts and collectively elaborate on them in a new way. Because of this collective re-elaboration of turning artifacts into instruments, Cole (1996) maintained that the role of imagination is not passive. CL participants could then retool the art-mediated instrument (i.e., Play-Doh creation) to activate their articulation of teaching and use it as a window into theorizing their own teaching philosophy.

The Role of Social Imagination in Change Laboratory

Greene (2000) defines social imagination as “a way of decentering ourselves, of breaking out of the confinements of privatism and self-regard into a space where we can come face-to-face with others and call, here we are” (p. 31). She proposed social imagination as a portal that we use to derive meaning from our past—that which we know and have experienced, which permits us to embody and perform meanings, hybrid or new, in the present. The elasticity of meaning itself becomes a potential portal into the new, unimagined future possibility. She goes beyond the traditional cognitively-based definitions to speak to the kind of imagination that emerges in, about, and as a public space – that which contains an alternative or, as Engeström (2015) proposes, points towards an emerging model of collective action. Greene's (2000) notion of social imagination is essential for teachers' expression and growth. As situated in art education and materialism, social imagination is mediated by critical consciousness that is provoked by the cultural-historical environment wherein a person is immersed.

Greene (2000) maintained that teachers must use their social imagination to make a breakthrough when encountering resistance. Greene (2000) further argued that creativity is key to mediating teachers' articulation of teaching, to be able to use their capacity to imagine socially. To help teachers not just to survive but also to thrive, teacher educators can use art-mediated artifacts to facilitate teachers' social imagination by eliciting their cultural expressions in visual forms. Greene's (2000) conceptualization of imagination is social, intersubjective, growth-producing, and expressive. Social imagination aids teachers in imagining the curriculum in the manner they would like to teach. While focusing on art-mediation as our unit of analysis in this study, we acknowledge that social imagination manifests itself as mirrors, windows, and prisms of a person's cultural-historical thoughts in narratives; it connects language, culture, and identity.

When BPSTs explain their FOK in visual forms to make sense of their own articulation of teaching, they are co-reflecting on their capacity to use creativity and social imagination to think concretely. By negotiating their existing knowledge and understandings in a playful manner, they reach intersubjective and shared future understandings (cf., Göncü & Perone, 2005; Greene, 2000; Holzman, 2017). In the words of Greene (2000), “the role of [social] imagination is not to resolve, not to point the way, not to improve. It is to awaken, to disclose the ordinarily unseen, unheard, and unexpected” (p. 28). As such, social imagination allows us to “particularize, to see and hear things in their concreteness” (Greene, 2000, p. 29), as the CL participants demonstrated by using Play-Doh creations to bring their articulation of teaching to life.

Social imagination also “make[s] new connections among parts of our experience” (Greene, 2000, p. 30), as shown when the CL participants co-reflected their Play-Doh creations and extended their cultural expressions.

We return to social imagination at various parts of the CL process: when we question, when we experience a phenomenon, when we make connections, when we look through our own Play-Doh creations in visual forms, and when we find our own language to voice. It is the role of social imagination in the process of active teaching and learning and “the provocation of thoughtfulness and critical consciousness [...] in which teachers and students find themselves in a collaborative search, each from his or her lived circumstance” (Greene, 2000, p. 23) that we borrowed from Greene to enrich art-mediated instrumental approach to CL formative intervention research to motivate BPSTs to articulate their teaching philosophy development

An Illustration of Augmenting BPSTs’ Articulation of Teaching in a CL Intervention

This study drew data from a multi-year professional learning course lab project that sought to illustrate the role of art-mediated instrumental approach in formative interventions. We used data from one CL session of the Play-Doh activity that was employed across three cohorts. During this session, participants were asked to use Play-Doh to create their sculptures that represent their ideal bilingual teaching and learning scenarios. After which, they were asked to take pictures of the sculpture they created and then upload their photo to a discussion board. In addition to the Play-Doh photo, we also collected two types of narrative datasets: (1) descriptions of the Play-Doh creations posted on the discussion boards, (2) their teaching philosophy statements.

We employed narrative analysis (Josselson & Hammock, 2021) as situated in the interpretative research paradigm (Merriam & Tisdell, 2016) to analyze the data. Narrative analysis allows CHAT researchers to scrutinize CL participants’ self-constructed accounts to better understand their interpretations, allowing a broader understanding of complex settings and multiple perspectives (Göncü & Main, 2023; Kajamaa et al., 2011). In addition, Kajamaa et al. (2011) maintain that personality, emotions, and social events are intertwined in narratives. Narratives, therefore, function as a map that provides an overview of change, a discursive tool to evaluate and mediate change and learning in formative interventions.

Using purposeful sampling (Patton, 2015), we selected five participants who worked in pairs (Patty and Gina¹), small groups (Shelly’s group, Mimi’s group), and independently (Irene) to include a wide range of Play-Doh creations and descriptions in relation to their articulation of teaching. Theoretically, the five participants were selected based on a contrasting experience (Patton, 2015). These five participants are Chinese/Spanish heritage/second language learners working towards bilingual childhood certifications. We cross-examined both participants’ descriptions of the Play-Doh creation and their teaching philosophy statements to look for vignettes where the art-mediated expressions had materialized in the narratives. Using CHAT concepts coding (Saldaña, 2021), we analyzed participants’ art-mediated instrumented action manifested in the visual forms, and pragmatic/epistemic mediation rendered in the descriptions and statements.

¹ All names in this study are pseudonyms.

That is, we further explored how participants theorized their teaching philosophy statements as impacted by the art mediation. In what follows, we present an illustration of the art-mediated instrumental approach to augmenting BPSTs' articulation of teaching.

Bilingual Teachers as Multicultural Advocates

Due to CL participants' own language learning background and sociocultural experiences, they have unique perceptions of the language power in their art-mediated visuals created using Play-Doh. For instance, Irene, a first-generation Chinese immigrant CL participant, used the Play-Doh to create a combination of Chinese knots (see Figure 1), with two contrasting colors yellow (English) and red (Mandarin) that represent the two named languages in her Mandarin dual language program. Irene took the Play-Doh out of two cans and rolled them into different lines. Irene curved the lines, sculpting them into "petals," as she envisioned her ideal translanguaging space in the bilingual classroom. Irene emphasized her knowledge of Chinese knots and the significance of red by integrating them into her Play-Doh sculpture. She noticed that, in her bilingual classroom, there tends to be more translanguaging (cf., Chang, 2022; Li & García, 2022) from Mandarin to English rather than from English to Mandarin. She stated that she would like to promote more blended use of translanguaging and make it more "contagious" in her bilingual school. Unlike her mainstream teacher colleagues who promote the use of English-only or encourage students to switch from Mandarin to English, Irene's articulation of translanguaging pedagogy was revolutionary in reversing the language-minoritized students' subtractive bilingualism.

Figure 1. Translanguaging as making Chinese knots - blend and contagious.



In the case of Irene, she used her solo Play-Doh creation to construct her art-mediated expression (a Chinese knot that braids two languages in two colors). Irene materialized this art-mediated expression in her teaching philosophy,

As a former ESL student and now a bilingual teacher, I understand the challenges of acquiring two different languages. I firmly believe that enabling the functional use of two languages allows deeper understanding of the world around them. I will foster an enjoyable and relaxed environment for my students to communicate. Thought and idea sharing in both minority and majority languages will fill up my classroom. I will create a classroom with easily accessible language visuals and tools to support communication practice. Students will be encouraged to explore their literacy skill sets in both languages. I will celebrate translanguaging rather than condemn it (Week 6 Discussion Board, Oct 15th, 2018).

Rather than rejecting the use of translanguaging, Irene avowed to maintain a more equal language status approach in her English-dominant school setting. As a multicultural advocate, Irene drew upon her personal experience “as a former ESL student” to make bilingual learning more equitable for language-minoritized students from her perspective. In short, Irene benefited from art mediation both pragmatically (as related to their translanguaging practices) and epistemically (as related to their development of philosophy drawing on their FOK using the Chinese knots). Play-Doh was used to help them visualize and reflect on their teaching philosophy.

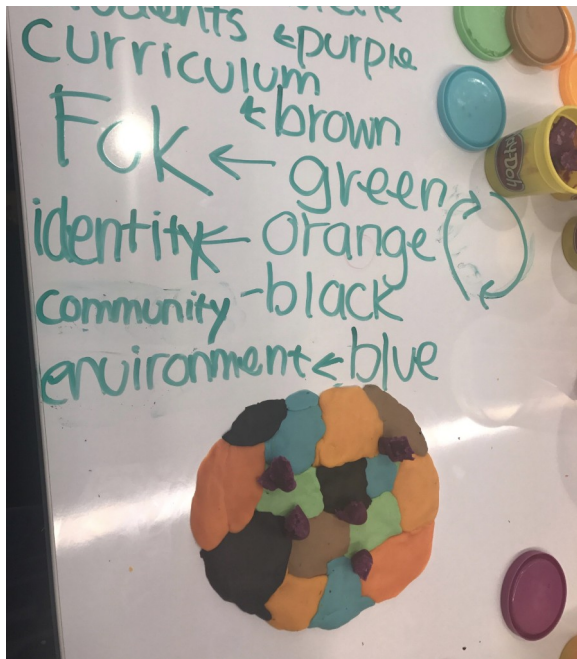
Bilingual Teachers as Community Collaborators

Due to the differentiated teaching requirements in legal documents (i.e., individual educational plans, IEPs) that must be implemented to accommodate bilingual students’ learning in classrooms, CL participants collectively regarded themselves as community collaborators to form a learning environment with students by eliciting their FOK. As shown in Figure 2, Patty (a second-generation Latinx heritage speaker) and Gina (a Chinese international student) worked together on a Play-Doh community puzzle map. Gina first took the Play-Doh out from the cans and rolled them into numerous smaller puzzle pieces. Patty then assembled the various puzzle pieces into a community map on the table. As they worked as a pair to envision their ideal bilingual classroom, Gina “sprinkled” five purple tiny ball-like figures on top of the community map to represent students. They wrote:

We imagine the ideal bilingual classroom as a puzzle, where every piece is different but is integral to forming the “whole picture” ([i.e.,] the classroom environment). These pieces can include students’ FOK, community (teachers, students, paras², faculty), identity, environment (how the class is set up), the curriculum. We decided a circle was an ideal shape because the parts of the classroom or puzzle are continuous, and they support and relate to each other (Week 6 Discussion Board, Oct 16th, 2017).

² Paras are short for paraprofessional educators, or paraeducators. They are adult volunteers assigned in special education classrooms to support students with learning disabilities.

Figure 2. A puzzle map of bilingual students, curriculum, FOK, identity, community, environment.



They used whiteboard markers to draw circular arrows near the words (green, orange) right next to the actual Play-Doh plastic cans to show that the puzzle is a circular motion, and always in the making. They intentionally made this map a round shape to demonstrate the notion of continuity and interconnectivity. Patty and Gina valued their identity as critical bilingual-bicultural teachers who prioritize themselves as a community collaborator to design a culturally responsive curriculum with their students.

Building on the cultural expression of a learning community, CL participants embraced Greene's (2000) principle of teaching for opening by engaging in more classroom-based community collaboration with their emergent bilinguals. Another 2nd generation Latinx participant, Mimi, stated her articulation of teaching as a BPST that:

Teaching for opening can only happen in safe spaces where students can understand that the languages they speak, the cultures that they come from, and knowledge and experiences that they bring with them into the classroom are as valid as any other person's. Practically speaking, this means setting clear expectations for students in regards to showing respect to each other and being consistent with those expectations (Mimi, Bilingual Teaching Philosophy Statement, lines 71-75).

Although Mimi's group Play-Doh creation (a more regular classroom layout with four lines indicating the walls) did not initially represent the community jigsaw puzzle as the one Patty and Gina constructed above, Mimi aligned herself to Patty and Gina's Play-Doh creation to re-elaborate her articulation of teaching. Diverging from her group's Play-Doh creation of a classroom layout, Mimi's ideas resonated with Patty and Gina's jigsaw puzzle metaphor and indicated that "another facet of our students and made us better educators for them as we could tailor our lessons to their needs and interests and support them in continued development as emergent bilinguals" (Lines 43-44). Collectively, CL

participants integrated more culturally responsive elements into their pedagogy to make bilingual teaching open enough for everyone to participate safely.

Bilingual Teachers as Innovative Facilitators

Co-reflective thinking can be socially transmitted from creating with Play-Doh to drawing to writing. This allows for more epistemic mediation, where the object makes the subject think about new concepts presented in the visual form. Lastly, we share another Play-Doh creation co-constructed by a group of participants presented by Shelly (a 2nd generation Latinx Spanish heritage speaker) that shows her group's direct embodiment of being an innovative facilitator. Shelly first made a piece of land serving as the base for her group mates to build upward. Her group mates then assembled a tree, a butterfly, and several flowers. As they worked as a group of three, they envisioned their ideal bilingual classroom to be a garden. Shelly's group explained their sculpture (Figure 3):

Our classroom is a garden. The soil represents the families, where the FOK originate. The continual support and connection with families is crucial to the success of our bilingual students. The flowers, butterfly, and orange bush represent the culturally and linguistically diverse students, who all come into the classroom with different skills, interests, and needs. The water hose represents the support of the whole school. The bee is the teacher who facilitates learning by pollinating the flowers. Our classroom represents an ecosystem, where all the parts work together (Week 6 Discussion Board, Oct 16th, 2017).

Figure 3. An ecological bilingual learning environment (bilingual teacher as the bee)



While gardening is a popular idiomatic expression in education (Mintz, 2018), this group did not regard themselves as gardeners but as “bees,” who facilitate learning by pollinating the flower. The former (gardeners) is a more traditional understanding of teaching as in teachers are “watering” students (i.e., teachers as givers; students as receivers); whereas the latter (bees) is viewing teaching as facilitation. They recognized the mediational aspects of learning and demonstrated their own articulation of teaching using cultural expressions in visual forms. The ecological perspective of Shelly’s teaching philosophy was evident in her account. She noted:

Sometimes, I need to provide extra support for some plants, such as water or fertilize them more times or tie them to wood sticks as scaffolding; however, I can’t “pull up seedlings to help them grow.” I have to let them grow in their own ways and at their own pace. This points out the significance of student-centered learning in teaching (Shelly, Bilingual Philosophy Teaching Statement, lines 74-78).

Going beyond transmission of culture is at the core of CL participants’ articulation of teaching as they enacted on their professional agency to tell their own curriculum ideas, classroom (re)configurations, and teaching philosophy. It is through the shaping and reshaping of who the bilingual teachers are themselves that they plant the seeds of transformation.

Conclusion

Articulation of teaching as mediated by artwork, such as Play-Doh, assisted the BPSTs in discovering where to go next. Art-instrumented action helped the participants to think collaboratively about where to land and the consequent opportunities that developed. Art-instrumented action is a generative way to provoke BPSTs’ social imagination, as seen in the Play-Doh examples. As participants illustrated their imaginary bilingual teaching environment and professional aspirations, they also brainstormed potential solutions for how they could make a positive impact on the learning of their future bilingual students, and assessed how they can continue to learn from bilingual students. Using Play-Doh is unique in this regard because it serves as an artifact and, in turn, the source of mediation.

The Play-Doh activity invited participants to imagine their ideal bilingual learning environment and construct their teaching philosophy. In this sense of epistemic mediation, art-mediated expressions can also be transformed by the subjects to signal future-oriented actions to solve the negotiations of reality. That is, BPSTs can use their social imagination to refract the articulation of teaching philosophy through their projected future-oriented actions to advocate, collaborate, innovate, and facilitate. BPSTs’ art-mediated co-reflections allowed those from language-minoritized groups to make their own underused personal FOK more visible in predominantly White teacher education space. Additionally, a Play-Doh activity similar to the one in this study, as an art mediation, can provide teacher educators a more reflective orientation to teacher education research. This study shows how art-mediated expressions can be instrumental in facilitating co-reflective thinking that gives teaching philosophy an articulatory means, first in narrative and visual forms, and then in future-oriented action. In conclusion, cultural expressions can be

mediated by art to shape and reshape BPSTs' articulation of teaching and inform teaching philosophy.

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