

Applying Design Principles for Responsive Professional Development

Abstract: Drawing on the work of Simon, Schön, and Dall’Alba, I describe a theoretically-grounded model for responsive professional development, including core design principles and an application of those principles through a professional model of teachers as designers. Implementation of a design research study based on this model took an unexpected turn as the COVID-19 pandemic forced schools to close and rapidly move to online instruction. However, because the PD model was centered on the complex particular, I was able to adapt it to meet the shifting needs of teachers. Findings have implications for responsive professional development and educational design research.

Introduction

The purpose of this paper is to explore how a design-based professional development program resulted in positive outcomes despite disruption from the COVID-19 pandemic. In particular, it explores the design principles and professional model the program was built upon and whether these principles supported adaptation in complexity. It is hypothesized that part of the success of the program was because of the foundational model and principles the PD program was founded on. In this analysis, we explore whether the adaptations remained consistent with the model and principles and how this affected the outcomes. The findings have implications for professional development and design research.

Theoretical foundation

In this paper, we discuss an educational design research study on teachers as designers. We begin with the theoretical foundations of each.

Teachers as designers

I base my work on the theoretical writings of Herbert Simon (1969), Donald Schön (1983, 1987, 1992), and Gloria Dall’Alba (2009a, 2009b). First, Simon differentiated between the sciences, studying the natural world, and design, centered on the artificial. He described design as the core of professional training—professionals “design courses of action aimed at changing existing situations into preferred ones” (p. 111). Schön built on Simon’s work, describing professionals as those whose work involves “the artful practice of the unique case” (1983, p. 19). Professionals find practical solutions in complexity, requiring skill beyond applying pre-determined solutions. Thus, professional work is grounded in unique cases that need to be dealt with “by a kind of improvisation” through inventing and testing strategies applicable to the specific situation (Schön, 1987, p. 5). Finally, my work is influenced by Dall’Alba’s writing on the importance of identity work in professional training. The way we view ourselves and our work opens possibilities for action, and thus “learning professional ways of being occurs through integration of knowing, acting and being the professionals in question” (2009b, p. 8).

Following the example of others (M. W. Brown, 2011; Goodyear, 2015; Kali et al., 2015; Laurillard, 2012), I view teachers as designers of learning opportunities amidst complexity (Clark & Yinger, 1987). This complexity includes an increasingly heterogeneous student population (Day, 2012), political and professional strife (Day, 2012), an influx of technological advances (Holmberg, 2014), and the need to prepare students for an ever-changing future (Burdick & Willis, 2011), not to mention the complexity of teaching during a global pandemic! As designers and professionals, teachers devise practical solutions in complexity, going beyond applying prescribed techniques to bounded problems.

Educational design research

I come to this work from an educational design research paradigm. In educational design research, the researcher attends to both designing an artifact or innovation and developing theoretical insight. The dialectic process of both designing in a context and developing empirical and advance scientific understanding is hoped to increase both practical and scientific relevance. Notably, McKenney and Reeves (2018) posited that educational design research’s “goals and methods are rooted in, and not cleansed of, the complex variation of the real world” (p. 6).

The research study I describe in this paper began by hypothesizing on principles of responsive professional development and teachers’ designerly identities. An intervention was designed to both support teachers in developing a designerly identity as well as to develop theoretical insight on what it means for teachers to be designers. However, the closing of schools due to the COVID-19 pandemic forced a redesign of the

intervention, testing its ability to withstand the “complex variation of the real world” to the extreme. In this paper, I use a case study method to explore how the PD program adapted to contextual changes.

Research method

In this analysis, I explore the impact of the COVID-19 pandemic on research of a professional development (PD) program through a case study. The case study analysis addresses three research questions:

1. In what ways did the design of the PD program change in response to COVID-19 conditions?
2. How did the redesigned PD program reflect and fail to reflect the professional model and design principles?
3. What is the relationship among the design principles, professional model, and positive outcomes experienced by participants?

Case Study Method

Case study research focuses on a “technically distinctive situation in which there will be many more variables of interest than data points” (Yin, 2017, p. 15). Other hallmarks of case study research include the use of multiple forms of data, analysis guided by theoretical propositions, and analytic generalization. The case is not a sample of phenomenon, rather it offers “the opportunity to shed empirical light on some theoretical concepts or principles” (Yin, 2017, p. 38).

This analysis applies an explanatory case study method to gain understanding of a revelatory case (Yin, 2017). Specifically, the unexpected interruption in the PD program illuminated the role of the design principles on which the original study (as designed pre-COVID19) was based. The closing of schools forced a change to the format of the intervention, requiring the researchers to reflect on the core pieces of the intervention and revise accordingly. The case is bound by time (from the initial development of the model in spring 2019 to conclusion of the formal workshops in July 2020), and includes an analysis of the PD program as implemented as well as responses of the researcher and participating teachers.

Data

Although a large amount of data, including recordings and transcripts of all PD workshops, was collected, this analysis specifically focuses on the design and implementation of the research study and professional development program. Thus, the data used for this analysis included:

- Reflections/researcher memos concerning the workshop design and reflections on plans, directions, and adjustments
- Workshop plans and slides
- Emails describing plans, goals, and adjustments
- Post-interview transcripts that include how participants described what happened in the workshops, what they remember the most, what was useful, and what they learned

Researcher memos were kept throughout the project. Topics of memos included theoretical reflections, literature connections, research design, workshop plans, and workshop reflections. Memos on research design and workshop plans were included in this analysis.

Post-interviews lasted 90–120 minutes and included three parts: follow-up questions on a creativity-based identity activity teachers completed before the interview, questions about teachers’ understandings of relatedness (a concept explored in the workshops), and questions about teachers’ experiences in the PD workshops. This analysis focused on the third interview part, including answers to the following questions:

- Pretend that another teacher asked you what you did in the design workshops. What would you tell them?
- What do you remember most out of all the things we’ve done? Why?
- What has been most useful to you?
- What is the most important thing you learned during the design workshops?
- Have the design workshops changed how you view yourself or your teaching practice? If so, how?

Email messages also provided a way to trace the changes in the workshop design. I analyzed email messages that addressed program goals and changes to plans or formats.

Documents, such as research proposals, ethical reviews, grant applications, and research presentation slides provided information about the program design and adaptations

Analysis

The analysis included creating theoretical propositions out of early research and workshop plans followed by pattern matching to understand how the principles did and did not support the PD program as implemented. I began the analysis by reviewing all the data. After an initial review, I identified elements of the planned intervention (PD program), professional model (teachers as designers), and core design principles established in spring and summer 2019. I summarized principles and elements (see Figure 1), then used them as an analytical frame for understanding the adaptations of the PD program, similar to Yin's (CITE) description of theoretical propositions that can guide case study research. I reviewed the data in light of Figure 1, identifying changes to the framework, including examples and non-examples of elements and principles, writing analytical memos on each. I then used the memos to develop and analyze a case description.

Case Description

The case description below traces the development and implementation of the program from spring 2019 to July 2020. I present it in a narrative form. Following the case description, I will explicitly address each research question.

Spring 2019: Professional model and application

The design of the PD program began in the spring of 2019 as I was completing multiple projects related to teachers and designers in preparation for entering doctoral candidacy. I had completed a literature analysis of teachers and designers and conducted a small study of how teachers viewed and talked about their work. This work led to the framing of not just teachers participating in design activities but teaching as a design profession. My writing on this topic included three implications for viewing teaching as a design profession. Specifically, we should support teachers (1) construct professional products and knowledge through design, (2) view and interact with design spaces from different perspectives, and (3) center practice on acting and reflecting-on-action.

As part of my comprehensive examination, my doctoral committee asked that I prepare an “annotated syllabus” that put my initial theoretical propositions into a pedagogical application—a PD program to support teachers in viewing themselves and working as designers. The result was a plan for an eight-session PD program centered on exploring and reflecting on teacher-selected problems of practice from multiple epistemological perspectives. In the PD program, teachers would (1) select a problem of practice, (2) explore the problem of practice from various epistemological perspectives, and (3) collect and reflect on representations of the problem/solutions space.

The use of representations drew from the idea of sketching in design. When designers sketch, they try out and evaluate an idea or approach. Sketching is typically associated with designing physical things, particularly in architecture. However, I extend sketching to include any attempt to try and evaluate an idea. This means that in teaching, sketching not only would include physical drawings, but also writing about the design space, discussing potential scenarios, and implementing new ideas in small ways to learn more about them. For example, a teacher might try out a mini lesson based on a new idea or change the classroom layout to explore how it affects student engagement. The application emphasized teachers sketching by trying out ideas in their classrooms. I hoped such an approach would help teachers be more active and intentional in their practice. Ultimately, the sketches would lead to a designed professional product such as a curricular unit, classroom procedures, or a new approach to classroom management.

Summer 2019: Four design principles

In summer 2019, I wrote a paper with a colleague who was also conducting a professional development program. Although her approach was based on culturally responsive pedagogy and STEM, we observed similar underpinnings in our approaches. We identified four design principles common to both of our approaches:

1. *Begin with the particular.* As described by Schön (1983, 1987), practitioners learn and work through the particular. To develop professional knowledge, practitioners reflect on their experiences, forming a personal understanding as “knowing-in-practice . . . become[s] increasingly tacit, spontaneous, and automatic” (Schön, 1983, p. 61).
2. *Respect complexity.* Anchoring learning to the particular can preserve the complexity of practice.
3. *Expand agency.* Agency, as I use it here, is based on Bandura's (2006) description of human agency. He provided four main properties: intentionality, forethought, self-reactiveness, and self-reflectiveness. Agents “intentionally influence one's functioning and life circumstances” (p. 164) through perceiving desired outcomes, self-regulating actions, and reflection.
4. *Support identity development.* Identity “stands at the core of the teaching profession. It provides a framework for teachers to construct their own ideas of ‘how to be’, ‘how to act’ and ‘how to understand’ their work and their place in society” (Sachs, 2005, p. 15). Teachers develop identity through navigating

and making sense of experience. As highlighted by Dall’Alba (2009a, 2009b), professional learning should open up new possibilities for teachers to know, act, and become. Further, it should address the personal dimensions of being a teacher.

September-October 2019: Designing an educational design research study

The design principles identified in collaboration with my colleague are illustrated as the foundation of the triangle of Figure 1. They formed the base of both of our approaches. The middle tier of Figure 1 is specific to my professional model: viewing teaching as a design profession, where both professional knowledge and professional action are developed through action and reflection in a particular context (Authors, under review). The main principles of the PD program I outlined in spring 2019 (represented in the top tier of Figure 1) offered a way to explore these theoretical propositions in depth. This PD program served as the designed intervention of an educational design research study that explored the elements of the professional model. Specifically, the intervention aimed to determine whether the professional model—viewing teaching as a design profession—could, as described in the research plan, “help [teachers] develop self-efficacy, build a designerly identity, and lead to feelings of empowerment, ultimately increasing the quality of their teaching practice and improving student outcomes.”

November-January 2020: Forming a partnership

In November 2019, I formed a partnership with a small, rural junior-senior high school located approximately 90 minutes from the university campus in the southwestern United States. The school was situated in a mining town. Fifty-four percent of students qualified for free or reduced-price lunch. In 2019, the student population was 53% Hispanic, 41% white, and 14% Native American. The junior high and high school combined included 440 students.

The school had collaborated with the university on previous projects and the principal was supportive of future collaborations. However, he was insistent that the teachers make the decisions on the nature of our collaboration. I began building relationships with the teachers by attending professional development workdays. The teachers were warm and inviting, they formed a tight-knit family that held frequent potluck breakfasts and knew each other’s children and grandchildren. They supported me in my efforts, allowing me to experiment with some initial ideas in brief workshop settings.

At the end of January, the principal offered funding for four teachers to engage more extensively in my professional development research. The first four teachers to volunteer were to join me in eight two-hour after-school workshops centered around creative design approaches to address their selected problem-of-practice. The teachers included a language arts teacher with 20 years teaching experience, an international math teacher with 10 years experience teaching in India and two years in the local community, a math teacher in his 2nd year teaching, and a beginning science teacher hired as a long-term substitute while completing her teaching certification at the university.

February 2020: Initial workshops

The teachers and I worked together during three two-hour workshops in February 2020. In these in-person workshops, we used creative techniques to explore their problems of practice. The teachers were concerned with student behavior and selected to focus on the lack of respect students in the school showed towards adults. We explored definitions of learning and engagement and discussed personal experiences of engagement in school. Between the second and third session, the teachers asked their students to write letters to teachers describing what they did and did not like about school. We began analyzing these letters in the third workshop.

Spring 2020

In March 2020, schools were unexpectedly closed due to the COVID-19 pandemic. Although many schools were able to continue instruction online, this school was extremely limited because less than half of their students had access to devices and consistent internet at home. The school decided to continue instruction by sending students packets of work each week. After students completed the packets, the packets were quarantined for 14 days before teachers were able to view student responses.

In the early weeks of the school closure, I journaled about the core elements of my design and attempted to identify how I could continue to explore those elements while supporting the teachers in a difficult time. I re-evaluated my research questions and the principles behind them, attempting to determine how I could adapt them to the shifting context. Embedded in this was the PD program itself and how our original plans would need to change. In particular, a large piece of my approach was having teachers try out ideas in practice and then reflect on the results. However, their ability to try things out with students was almost non-existent given the packet-

based approach to instruction the school was implementing. Despite the limitations, I chose to continue the program in hopes that I could find a productive direction moving forward.

The four teachers and I began meeting weekly online in early April 2020. We attempted to pick up our discussions by exploring student learning engagement from various perspectives. I built a collection of research literature teachers could explore, and one of the teachers came across the idea of relatedness as a tool for learning engagement. The teachers found this idea particularly powerful given the isolation of both students and teachers during this time. We expanded upon the idea of relatedness to include connecting the curriculum with students' experiences in the world. The teachers found a packet that would support students in exploring their experiences with COVID-19 and asked the students to complete it. Although the use of the COVID-19 packet seemed productive, I was disappointed at the lack of opportunities teachers had had to try ideas and reflect on results, and I did not think we had succeeded at designing professional products.

Summer 2020

The upheaval of the spring had significantly impacted my research. At the same time, the school was grappling with how to provide better educational experiences to their students. The principal was applying for grants to build the technological infrastructure to hold school online in the fall if needed. He was particularly concerned about the emotional and mental health of the students and teachers. The teachers and I decided to continue our work on building relatedness between teachers, students, and curriculum, specifically focusing on relatedness in online learning. The initial goal was to design some type of program or approach that could be shared with other teachers at the school in the fall.

One of the teachers was unable to continue during the summer. The remaining three teachers and I met for one hour one to two times a week, with 13 sessions in June and July. We explored relatedness through different epistemological perspectives. For example, we read research literature on relatedness, social-emotional learning, and engagement. The 2nd year math teacher wrote a poem about a marching band rehearsal where he felt relatedness. We created metaphors and drew mind maps. Throughout these conversations, teachers shared stories of experiences with students and I brought in related learning theory such as zone of proximal development and Deci's (2002) self-determination theory. The teachers also called several students to ask them about their experiences during the stay-at-home order.

Although I felt that the teachers were engaging in productive discussions and benefiting from our meetings, we struggled to put ideas into action and design professional products. The students were not in school, and it was difficult to prototype ideas without students. At the end of June, we took the many notes, pictures, and drawings we had produced and put them on an online bulletin board. We reviewed the ideas we had discussed and then combined them in various ways. I challenged the teachers to create an activity that we, as a group, could participate in that incorporated a mixture of elements on the board. Over the final five workshop sessions, teachers prototyped activities for relatedness and reflected on the results. Ultimately, teachers made plans for implementing some of the ideas once school began again.

Post-Interviews

Throughout the sessions, and particularly in the summer, I asked teachers if what we were doing was useful. They reassured me it was; however, I struggled to understand why. In the final interview, I asked each teacher to describe what we were doing in the workshops together what was and was not useful. I was surprised to find that each of the teachers explained the workshops differently. For example, the experienced language arts teacher emphasized that we were exploring an idea from different angles, "expanding the self-awareness and the knowledge." She also appreciated the opportunities to try out various technological tools that she might be able to use in her classroom. The international math teacher described our work as learning how to engage students, and found the discussion of student-teacher relationships helpful. She said she learned to think about the students' needs first. The 2nd year math teacher described our work as "excavating relatedness." Early on in the workshops, he latched onto the idea of "failure-proof sketching," where designers take action to learn from something. They can learn from their sketch whether or not it was successful. Finally, the beginning teacher said we talked about how to take students' needs into consideration and that I was helping the teachers to "interpret the ideas in [their] own minds" and "involve [their] self" in the work. She is using a similar reflective approach with her students this school year. Table 1 illustrates the differences in responses across participants.

Analysis and findings

Even though each participating teacher described the PD program differently, all found it useful in some way. From this perspective, the program could be considered "successful" in that it offered something teachers perceived as useful. However, the implementation itself was significantly different from originally planned. In

this section, I explore what changes were made, the relationship between the changes and the elements of Figure 1, and the successes and challenges of this type of research work.

RQ1: In what ways did the design of the PD program change in response to COVID-19 conditions?

The first research question considers the changes in the PD program. The primary elements of the program application are outlined in the top tier of Figure 1.

The PD program went through three core stages: pre-COVID, spring 2020, and summer 2020. The surface features clearly changed, from every-other-week two-hour workshops in person in February, to one hour a week online in spring, and finally twice a week online in summer. But what is perhaps of more interest here is how the core elements of the program shifted to accommodate the changing context, including the types of representations to be explored and reflected upon.

Reviewing specific writings of the purpose of the workshops reveals a contrast from the initial research proposal to researcher memos written during the summer. In the initial plan, the lofty goals of the PD program was stated as to “help [teachers] develop self-efficacy, build a designerly identity, and lead to feelings of empowerment, ultimately increasing the quality of their teaching practices and improving student outcomes.” During the spring sessions I became significantly more focused on the products of the design sessions. Although I was sensitive to the challenges teachers were having and attempted to provide a space where they could get support, I also pushed them to design a professional product to support their students. The design would be the representation that would support reflection. In the process, I seemed to lose sight of the overall goals of the workshops—to empower teachers and expand their agency. In June 2020, I reconsidered my goals. I focused less on a product, and more on exploring the idea of relatedness. I began thinking more about professional knowledge. I wrote in memos, “I’m trying to help them build professional knowledge around this concept [relatedness]. Knowledge that will be useful now, in their current context.” Later I wrote, “at the heart [of this program] is still a way of working, being, and thinking.” Representation and reflection centered on images, words, and drawings rather than designed products and classroom implementation. However, the foundational idea of constructing through representation and reflection remained intact.

RQ2: How did the redesigned workshops reflect and fail to reflect the professional model and design principles?

Comparing the enacted workshops to the designed application illustrated moderate fit. The first and third elements of the professional mode (“teachers as designers”)—that both professional products and knowledge are constructed through design, and that teaching practice would be centered on acting and reflecting on action—were not implemented as planned. Design work and was meant to anchor the PD program; I hoped the program would support teachers in designing solutions or approaches to a problem of practice and support direct application to practice. However, although teachers designed short activities near end of the program, our work did not result in significant professional products that could be immediately implemented in the teachers’ classrooms.

Before beginning this project, I might have considered the inability to fully explore these two elements to be what Brown and Campione (1996) called a “lethal mutation” to the approach. The design process was to be anchored by what the teachers needed help with and working on a problem of practice would both suggest a purpose to our work and anchor our explorations. Additionally, the direct application to practice would support integrated acting and knowing. However, the constantly changing context made it extremely difficult to know *what* teachers practice consisted of, let alone what to design for that practice. Teachers who were used to interacting with students all day were now at home, trying to figure out how to continue their practice without direct interaction. During the summer, the teachers were trying to learn new technology programs and add their curriculum to the learning management system, something not previously a part of their practice. Teachers did not know whether school would be online, in-person, or hybrid in the fall; they did not know whether they would teach multiple classes a day or spend most of their day with one group of students. Again, this hindered our ability to design and implement new professional products. However, despite this limitation, teachers’ professional knowledge still seemed to be constructed through our work together. I will explore this in more depth in the next section.

The second element of the professional model—that teachers view and interact with a design space from different perspectives—was evident in the workshops. This was made particularly clear by the online collaboration board where we collected the variety of insights we had throughout the workshops. In July, we sorted the ideas by *how* we came to discuss the insight based on four mindsets or epistemologies: empathetic,

creative (divergent), analytic (convergent), and aesthetic. In the post-interviews, each teacher referenced the idea of viewing an idea or concept from different perspective, as will be described more below.

The design principles showed close fit with the redesigned workshops. Our work together began with the particular and respected complexity—the directions we chose were based on the particular context teachers were working in, and it shifted as the complexities of the situation changed. For example, the initial in-person workshops focused on a problem of practice identified by the teachers: they were struggling with student behavior and engagement. When the school moved online in March, engagement continued to be a concern. However, engagement had to be approached differently because of the physical separation between teacher and students as well as the mental and emotional toll of the pandemic. Our work shifted to focus on relatedness as an element that could support engagement, something that was selected in response to particular problems that were happening in the school.

The post-interviews provided evidence of meeting the design principles of “expand agency” and “support identity development.” I will provide evidence of this in the next section.

RQ3: What is the relationship among the design principles, professional model, and positive outcomes experienced by participants?

The post-interviews show that participating teachers viewed the PD program as a positive experience. Each participant described the program in a different way and provided different descriptions of positive outcomes (see Table 1). It is not known whether these outcomes will have a significant influence on practice; however, of interest here is *how* the program supported the reported positive outcomes in light of the professional model and design principles. The analysis suggests the *intent* to design a professional product anchored our work in the shifting complex particular and supported viewing that particular from different perspectives. Furthermore, exploring an idea from different perspectives supported agency and knowledge construction. Finally, the creative approaches allowed teachers to be fully involved in the work, opening space for identity work. I take each piece in turn.

First, *the intent to construct professional products anchored our work to the particularities of the context, even as the particularities shifted in complexity.* Not only did our work *start* with the particular, but it was also anchored in the particular, even when that particular shifted in response to a global pandemic. We started our work with a pressing and emotionally challenging problem of these particular teachers: student behavior. When instruction moved online and teachers were worried about work completion, we focused more intensely on engagement with learning. Finally, teachers and students were isolated, and the school principal expressed concern about the mental and emotional consequences of the isolation. We shifted our focus to relatedness in online learning to support both learning engagement and social-emotional health. The teacher-selected problem anchored our work and respecting the complexity of the changing environment allowed us to respond in a productive way.

Second, *this anchor supported trying out diverse epistemological perspectives, an element of the professional model that was particularly powerful for the teachers and that expanded agency.* The professional development model emphasized supporting teachers in seeing and interacting from different epistemological perspectives. The particular anchor that adapted to complexity enabled us to do so. We were able to incorporate multiple ways of knowing to explore our ideas, something the teachers found particularly useful. One teacher compared our work to an MRI, where we were “making cross sections and . . . trying to put together the MRI that would reveal what relatedness is.” Another discussed learning to look at and think about things in different ways. The ability to look at things in new ways supported agency; it provided new ways of thinking and acting. The language arts teacher mentioned that “to be able to have a thought process about” looking at something in different ways “expanded [her] thought process” and provided a more specific way to think about her work, adding “more tools in [her] teacher toolbox.” The tools were developed in response to the complex particular.

Third, *viewing the anchor from different perspectives led to the construction of new professional knowledge.* The international math teacher provided a solid example of this. In our post-interview discussion, she spoke about considering students backgrounds and experiences, trying to “understand their level,” and considering that there may be “different situations they come across every day” including emotional problems. The teacher mentioned that asking students to write letters about school and interviewing students about their experiences at home helped her think more about these issues. However, her knowledge construction did not stop there. In our third workshop, she expressed concern about the lack of financial literacy skills in students and expressed a desire to help students learn to save money. One of the teachers discussed the idea of a poverty mindset and why saving money might be especially difficult for many of their students. In July, the international teacher came back to these ideas as she was considering how to address social-emotional challenges of students. She researched the poverty mindset and identified gratitude as a potential antidote. To center her gratitude

explorations on relatedness, she focused specifically on expressing gratitude for people. She designed a gratitude journaling activity that could help her begin to explore these ideas with students.

The combination of empathetic and research-based exploration helped the international teacher integrate new understandings of her students and their sociocultural environment into her professional knowledge. She chose to focus her work on her own passions and what she was coming to understand through reading literature and talking with students. The other teachers and I supported her explorations and brought the ideas into our discussions of relatedness, helping all of us build a deeper understanding of engagement, relatedness, financial literacy, social-emotional health, and gratitude.

Finally, *the emphasis on particularity and creative approaches supported teachers in bringing their identity into our work*. As discussed above, the international teacher was able to bring her own values and passions into our work; the flexible structure allowed her to adapt the program to her needs and desires. Beyond the flexible structure, the creative approaches and activities we engaged in also supported teachers in bringing their professional identities into our work. The beginning teacher described this as “involve[ing] yourself” in our explorations. She said that open-ended, creative tasks, such as finding pictures to represent understandings, drawing images, using metaphors, and having multiple ways to approach a task “pulls you in more.” Evidence of the impact of our work on professional identity is seen throughout the post-interview transcripts. For example, the 2nd year math teacher described “I have a different approach to authority as a student . . . the shift has happened a bunch of different ways, in my mind . . . I see myself as a learning leader.” The language arts teacher described our work together “expanding the self-awareness and the knowledge,” and helping her “become a better teacher as a result of what we talked about and maybe even a better person.” The international teacher described “I never thought this as a teacher . . . I am like a boss giving orders . . . that shouldn’t happen,” instead, she should “think in the students’ perspective.”

Implications and conclusion

The purpose of this paper is to explore whether the design principles and professional model supported positive outcomes in a PD program despite the disruptions cause by COVID-19. The case study illustrated that the contextual elements interrupted attempts to apply new ideas in practice and design professional products. However, despite these changes, participating teachers still described positive experiences. These findings suggest that the design principles—anchoring in the particular, respecting complexity, expanding agency, and supporting identity development—did indeed support effective and responsive professional development.

Future research will investigate how the ability to embody professional knowledge in a designed product and apply explorations directly to practice might affect responsive professional development. Further research will also explore how COVID-19 not only affected the PD program itself, but the educational design research study which it was a part of. Ultimately, it must be recognized that research and practice happen in complexity, and approaches such as design research provide ways to use that complexity in productive ways, or, as described by McKenney and Reeves (2018), design research “goals and methods are rooted in, and not cleansed of, the complex variation of the real world” (p. 6).

Figures and tables

Figure 1

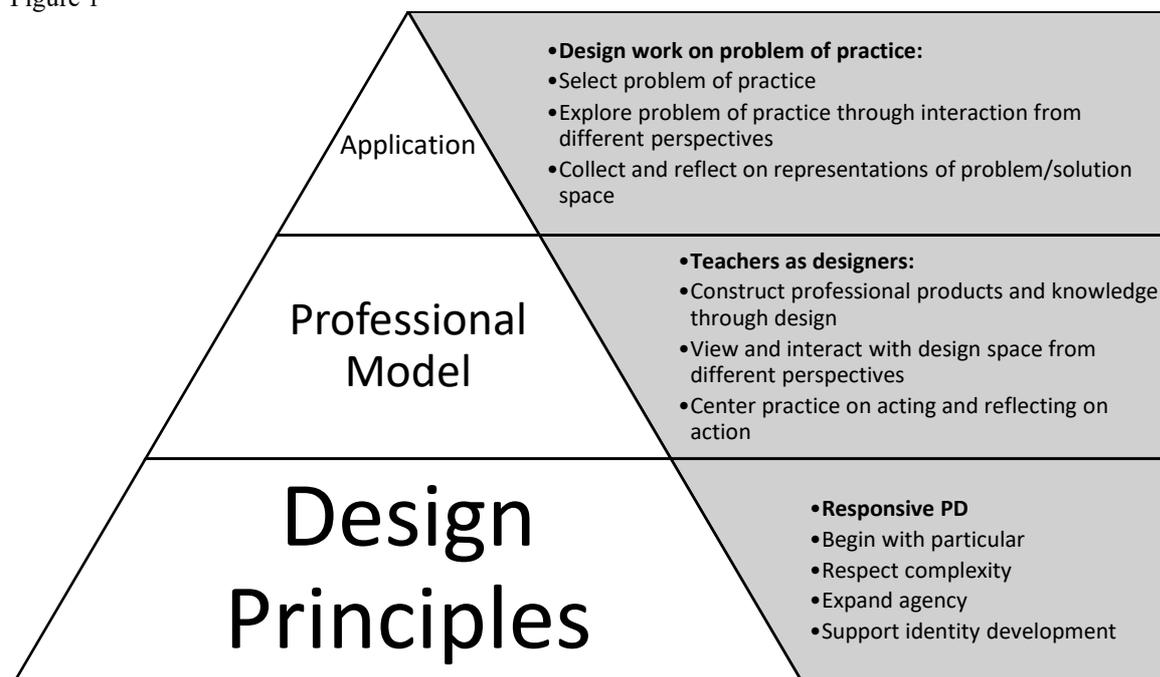


Table 1

Interview Question	Language arts, 20 years of experience	Mathematics, 12 years of experience (2 years in USA)	Mathematics, 2 years of experience	Science, long-term substitute (1 st year teaching) ¹
What were we doing in the workshops?	expanding thought process through different categories; staying in touch	learning to control emotion and behavior of kids	excavating relatedness	"collaborating and talking about how we can help our kids"
What was useful in what we did together?	approaching from different angles, "expanding the self-awareness and the knowledge"	building student-teacher relationships, empathy	sketching, mindsets, seeing "relationships as the active ingredient"	deep questioning, taking kids' feelings into consideration, "bringing self into work"
Did our work change your view of yourself as a teacher?	I need to be multi-dimensional with teaching and teach the whole child	"My practice is the same, but the strategies changed," I consider the social/emotional dimensions of what I do, I need to learn about the students first	"I have a different approach to authority as the teacher," I see teachers as learning leaders	I have "different ideas of how to approach my kids, and how to get them more into a critical thinking process, instead of just . . . spitting out answers"

¹This teacher did not participate in the summer workshops.

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