Supporting Teachers in Designing for Intersectionality

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As educational researchers and instructional designers, we often attempt to create standardized solutions designed to work in all learning contexts. However, sometimes this approach ignores the intersectionality of students' identities, or how their culture, language, abilities, economic background, gender, and other sociocultural factors interact to foster privilege, oppression, and inequalities (Crenshaw, 1989) and affect their learning experiences in and out of school. Philip et al. (2019) asserted that teaching must be "relational and situated. It is not only a technical endeavor but also an intellectual and creative one" (p. 259). An over reliance on the technical or "best" practices "has a long history of ultimately harming historically marginalized communities" (p. 257). In this chapter, we draw upon the concepts of figural complexity, particularity, and design to argue for the need to frame and educate teachers as designers. Through design-centered practice, teachers can create learning opportunities centered around the particular and complex intersectional identities of the learners in their classroom. We focus primarily on K-12 teachers, but similar arguments could be made for teachers in other contexts.

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B. Hokanson et al. (eds.), *Toward Inclusive Learning Design*, Educational Communications and Technology: Issues and Innovations,
https://doi.org/10.1007/978-3-031-37697-9_14

Intersectionality, Figural Complexity, and the Particular

Our argument centers on the idea of teachers as designers—that framing teachers as designers places an emphasis on creating learning opportunities centered on students and context. This is because design is deeply embedded in context: While a scientific approach attempts to create knowing that applies across contexts, design focuses on knowing and creating that is adapted to a specific (particular) context amidst complexity (see Nelson & Stolterman, 2012; Perkins, 1986). From this design perspective, teachers design opportunities for learning. Like all designers, they can develop ways of working and knowing that are embedded in the specific context of their classroom and students–the particular (Warr & Mishra, 2021; see also Nelson & Stolterman, 2012). The classroom context is fluid and complex. Intersecting aspects of each student's and teacher's sociocultural identities, curriculum, societal expectations, and political context are in constant flux (Harris & Leonardo, 2018). The complexity is akin to Donald Schön's (1990) construct of *figural complexity*, a term describing the interdependent relationships of parts of a whole. Schön described design as a way to work with figural complexity, which we will explore in more depth below. First, however, we address what we mean by intersectionality and its relationship to educational equity.

Intersectionality

Intersectionality examines how groups are multiply marginalized when issues of inequity and oppression are considered from only a single sociocultural factor, such as race or gender, rather than the intersection of these and other factors (Crenshaw, 1991). According to Hill Collins and Bilge (2016), "Intersectionality is a way of understanding and analyzing the complexity in the world, in people, and in human experiences" (p. 2). In education, an intersectional lens focuses on the multiple, interacting sociocultural factors and social structures that shape students' educational experiences (Tefera et al., 2018). These intersecting factors can facilitate or hinder students' learning opportunities in a variety of ways, depending on what is privileged within a specific educational context or system (Boveda & Weinberg, 2020).

A common misconception in education is that effective teaching practices and materials transcend culture and are the same for all students in all settings and circumstances (Gay, 2018). In the United States, middle-class European American cultural values and norms are so deeply embedded in education that they have become largely invisible and unchallenged as the "best" way to teach students (Souto-Manning & Rabadi-Raol, 2018). Yet groups of marginalized and multiply marginalized students (e.g., students of color with disabilities) continue to experience barriers and inequities within this educational system (Artiles, 2013).

In general, centralizing the intersectional identities of students in order to increase educational equity includes recognizing "troubling restrictive notions of

what counts as legitimate knowledge in schools and schooling and unveiling multiple interconnected injustices in and through pedagogies" (Souto-Manning & Rabadi-Raol, 2018, p. 214). Teachers are situated within specific educational contexts, work directly with students, and, ideally, build relationships with these students. Thus, teachers are uniquely positioned to design equitable learning opportunities if they have the support and knowledge to do so.

Figural Complexity

Intersectionality is a way of understanding how multiple sociocultural categories shape students' identities and their experiences in school (Hill Collins & Bilge, 2016; Tefera et al., 2018). These categories are not simply independent or additive, they are interdependent and multiplicative, especially in relation to dynamics of power and inequality. As Crenshaw explained, "We tend to talk about race inequality as separate from inequality based on gender, class, sexuality, or immigrant status. What's often missing is how some people are subject to all of these, and the experience is not just the sum of its parts" (as cited in Steinmetz, 2020, para. 2) For example, the experiences of a student of color with a disability cannot simply be considered as the sum of the experiences of students of color and students with a disability (Artiles, 2013). The intersection of these aspects of the student's identity shapes a different experience altogether. Donald Schön's figural complexity presents a similar construct (Schön, 1990).

Figural complexity describes the interdependent relationship of multiple parts of a whole. Schön (1990) gives the examples of how changing a single note in a melody changes the whole melody, or how changing a color in a painting will affect the rest of the painting. In this case, we might consider two levels of figural complexity: the individual student and the students in a group (such as a class). First, a focus on intersectionality emphasizes the interactive and interdependent relationship of various identities of an individual which is unique and cannot be duplicated. Student groups can also form an interdependent whole. Each student affects the other students in the class. The teacher and their intersectionality also interact in the context.

Importantly, figural complexity assumes that the elements of a whole will change; it goes beyond "the stable state" (Schön, 1971) to represent a dynamic situation. Similarly, intersectional identities are not fixed, and the privilege and inequities related to these identities shift and change frequently in response to social, economic, and political conditions (Harris & Leonardo, 2018). Thus, not only do the students and teachers in a classroom change, external events also constantly shift. An obvious example is the changes resulting from the COVID-19 pandemic; however, even smaller shifts, such as technological, cultural, and political trends, upset the stability of the classroom.

The Ultimate Particular

A circumstance that demonstrates figural complexity—be it an intersectional identity, class, lesson, or other entity—is unique. The complexity means that even the same student, class, or lesson will be different each moment in time. The result is particularity—or what Nelson and Stolterman (2012) called the "ultimate particular" (p. 12).

Nelson and Stolterman (2012) contrasted the "true and ideal" with the "ultimate particular and real" (p. 31). They described the true as facts and the ideal as desiderata (what is desired). The true and ideal might be compared to scientific knowledge, where one creates a theory that is true across contexts. A similar mindset underlies standardized curricular and pedagogical approaches. On the other hand, the ultimate particular and real describes something (e.g., an object, process) that exists in a unique form in a concrete way. Design is "a process of moving from the universal, general, and particular to the ultimate particular—the specific design" (2012, p. 31). In a classroom, the ultimate particular might be the interaction of factors such as the intersectional identities of students and teachers, sociocultural context, and curriculum at a moment in time.

The ultimate particular is congruent with Schön's definition of figural complexity; it is a dynamic situation that cannot be predicted. Our exploration of intersectionality has highlighted a similar type of complexity and particularity. How, then, might a teacher support learning in such a context? How can teachers manage the complex particular, centering students' intersectional identities, instead of generalizing and standardizing, perpetuating dominant approaches that privilege some over others? Schön, Nelson, and Stolterman offered a way of acting, knowing, and being that capitalizes on complexity and uniqueness: design (Nelson & Stolterman, 2012; Schön, 1983). This is because design thrives in complex and particular situations (Redström, 2017). In the next section, we dig deeper into what design means for centering student intersectionality in the figurally complex, ultimate particular and how framing teachers as designers might support more equitable classrooms.

Teachers as Designers

If, as we assert, framing teachers as designers can better center student intersectionality in the classroom, what do we mean by design? Design is a widely used term with many definitions, but we agree with Redström (2017) that "the presence of many *different* definitions of design is not a conceptual shortcoming of our thinking but in fact an effective strategy for coping with certain kinds of complexity" (p. 6; see also Lawson & Dorst, 2009). In respect for this complexity, we do not offer a singular definition of design here. Rather, we describe how teachers can be framed as designers from four perspectives (design as planning, acting, learning, and knowing) and the relationship of each perspective to intersectionality, figural complexity, and particularity.

Design as Planning

"Planning" is a phrase often used to describe what teachers do before class time. Although many would not consider planning as an act of design, teachers who center the intersectionality of their students' identities must combine, modify, and adapt resources to meet students' particular needs, and such an act requires more than simply scheduling when to read a textbook chapter or selecting a homework page from a textbook. In this section, we discuss two dimensions of design as planning: *what* is designed and how teachers use curricular materials and technologies in their designs.

First, *what* do teachers design before class time? Although teachers might design activities, projects, assessments, and other tangible artifacts, ultimately, they create and combine several aspects of the classroom, including tasks, physical architecture, and the social architecture that will support learning (Goodyear & Dimitriadis, 2013). Scholars have labeled this "design for learning" (see Conole, 2013; Goodyear, 2015; Goodyear & Dimitriadis, 2013). The "for" suggests that while teachers can create environments and structures that support learning, they cannot directly design the learning; ultimately students must choose to engage in learning opportunities and construct their own understandings (Goodyear & Dimitriadis, 2013). What teachers design are the combination of tasks, social structures, and the physical environment that they believe will support students' learning. They are designing opportunities for learning.

Second, how do teachers use materials and technologies when they design opportunities for learning? We can describe teachers' use of curricular materials and technologies on a scale of teacher agency (Brown, 2011). Teachers can select to "offload" agency to the materials (following them closely), work more flexibly with the materials to adapt them to their students' needs, or engage in free improvisation. Teachers make changes to align with their own knowledge and goals, their students' needs and strengths, beliefs about the subject matter, and beliefs about technology (Davis et al., 2011; Matuk et al., 2015). Importantly, teachers work with materials and technologies; they change materials to fit their context and the affordances of the tools affect how teachers teach (Brown, 2011). This means that others, such as instructional designers, who create tools and curricular materials impact teachers' abilities to meet the needs of their classes and provide equitable learning opportunities.

When planning, teachers design for intersectionality by reflecting on the students in their classroom. They center intersectionality as they select and adapt the materials as well as physical and social environment for learning. Ultimately, however, it is impossible for a teacher to anticipate what will occur in their particular figurally complex classroom at any given time, and any design planned before class time will require adjustment. This leads to our second view of design: design centers action in the ultimate particular.

Design as Acting

Design can be considered as acting in two ways. First, a design process requires action that helps the designer create in and understand a situation. Second, some describe improvisational acts, such as a teacher responding to the immediate needs of students during a learning episode, as an act of design (Brown, 2011). Both perspectives describe a way of handling figural complexity and the resulting particularity. Both can help teachers center the intersectionality of their students, creating more equitable learning spaces. Here we explore both angles through Schön's (1983, 1987, 1992) concept of reflection-in-action.

Because a design situation is unique and often volatile (particular and figurally complex), designers cannot fully comprehend—or plan for—a situation. Instead, they work in a way that does not require complete understanding: They interact with the situation to simultaneously come to understand and create. Schön (1983) described this way of acting as "reflection-in-action," where "the unique and uncertain situation comes to be understood through the attempt to change it, and changed through the attempt to understand it" (p. 132).

Schön (1992) compared reflection-in-action to having a "conversation with the situation" (p. 134). In a productive conversation, conversers do not ask questions because they know what the other will say. Rather, they speak to learn from and develop knowing with their interlocutors. Similarly, in a conversation with the situation, the designer does not act because they know what will happen; rather, they act to find out what will happen—how the situation will respond. This way of working is effective even amidst complexity and rapidly changing situations—the designer continues to respond to the situation as it exists in the particular moment; they change with the situation. Although they draw upon past understandings to inform their actions, they respond to what is, not what was in the past.

Although reflection-in-action is often used to describe improvisatory acts, including teachers' ongoing adjustments in the classroom, Schön (1983) applied the term to design on multiple scales. Engaging in reflection-in-action means interacting with a situation "in the 'action-present,' the zone of time in which action can still make a difference to the situation. The action present may stretch over minutes, hours, days, or even weeks or months" (p. 62). Thus, reflection-in-action can be applied to both the immediate changes teachers make in situ as well as how they act and learn across longer periods of time, such as a school year. This way of acting is at the heart of design.

A designerly way of working, where the designer can continually learn and adapt to the complexities of the particular, offers a framework for how teachers can meet the needs of their students—individually and as a group. This approach does not require teachers to do the impossible task of fully understanding the intersectionality of each student (though some basic knowledge about the students can be extremely helpful). Rather, teachers constantly learn through acting in the particular.

Design as Learning

Design as acting supports the next perspective on design: design as learning. Adaptation supports teachers in learning; Each adaptation offers an opportunity for learning more about the student and context. Even if teachers cannot articulate new understandings, they still can move what they learn forward into new designs.

Design is a type of learning in that it consists of seeing a situation in multiple ways, evaluating the situation from various perspectives, and using what is discovered to adapt (Lawson & Dorst, 2009; Schön, 1983). The result is "learning cycles" that allow you to "explore different possibilities and learn your way towards a design solution" (Lawson & Dorst, 2009, p. 34).

Schön (1990) described that the learning that occurs through design supports an "appreciation of figural complexity" (p. 125). As teachers engage in design—both before and during class time—the ongoing reflection helps them learn about their students, class, and practice. This is not to say that teachers necessarily can articulate the details of what is learned. Rather, what is learned becomes part of their "*representation* of a design situation" (Schön, 1990, p. 123)—the design situation being the learning or development of students in their classroom.

By viewing teaching as design, we open the space for teachers to learn while responding to the intersectional identities of their students. Rather than offering a standardized curriculum that supposedly meets the needs of all, it recognizes that teachers are in the best position to learn about and address the needs of *their* students in *their* classroom. Design practice results in a type of knowing that is developed *through* the complex particularities of the teacher's classroom, which we explore next.

Design as Knowing

The learning that occurs through design leads to a type of fluid and complex knowing that reflects the teacher's contexts and experiences. We will draw on two scholars to describe what designing for intersectionality means for teacher knowing. First, we explore David Perkin's description of a design as a "structure adapted to a purpose" (1986, p. 2). Second, we compare this to Glanville's (2006) descriptions of the difference between "knowledge of" and "knowledge for."

Perkins (1986) defined the noun form of design as a "structure adapted to a purpose." He proposed knowledge itself could be thought of as a design. Like any designed entity, knowledge is "devised to serve [a] purpose," (p. 2) whether that knowledge is a formal theory or informal understanding of the world. As a type of design, knowledge is formed through cycles of seeing as, evaluating the results, and adjusting understanding accordingly. This results in teachers developing knowledge that is "adapted to [the] purpose" (p. 2) of teaching their particular students in their particular classroom context.

The idea of knowing built to meet a purpose aligns with what Glanville (2006) described as "knowledge for." He contrasted "knowledge of," where teachers might know something of or about their students, with "knowledge for," or knowing in a way that is needed to support students' learning. "Knowledge for" does not assume teachers have a complete understanding of their students or context. Rather, they develop the knowing they need to act in the context and support their students. Because that knowing is designed, it is fluid and adaptable, constantly responding to changes. It is knowledge for the figurally complex, ultimate particular of their students in their classroom.

Implications

In this chapter, we have argued for the importance of centering intersectionality in teaching, the figural complexity and particularity of both intersectional identities and today's classrooms, and how a design approach has the potential to support teachers in meeting student needs amidst this complexity. This perspective has broad implications for educational systems, teacher education, teacher practice, and instructional design. Here we focus on two implications specific to the creation of learning materials: teachers and the origin of instructional materials, and the need for instructional designers to create flexible materials.

Teachers: Origins of Instructional Materials

We have argued that teachers should design opportunities for learning for the particular students in their classroom. We mentioned opportunities for learning might consist of tasks, physical architecture, and the social architecture of the classroom (Goodyear & Dimitriadis, 2013). Curricular materials often come with embedded assumptions about these dimensions that privilege certain students' ways of learning and knowing and using these materials without adaptation can contribute to inequitable learning environments (Souto-Manning & Rabadi-Raol, 2018). How teachers use—or create—instructional materials as they design for learning becomes critical to equity in education.

Consider two extremes of the relationship between teachers and instructional materials. First, teachers might only use existing materials that were designed for learners in a different context, unaware of the biases present in the materials. Second, teachers might develop all of their own materials from scratch to specifically meet the needs of their students. However, doing so might be unreasonably time intensive and fail to draw upon the shared knowledge researchers have built around instruction. We propose teachers find a balance between these two extremes, critically analyzing prepared instructional materials before use as well as creating instruction specific to their students. This is not a small task; it requires new

approaches to teacher education as well as changes to the educational system. For example, teachers must critically analyze curriculum and adapt it to their students, designing new materials where necessary. This requires not only unique skills and ample preparation time, but also the agency to make appropriate changes.

Note, this approach does not mean teachers should ignore scientific understandings of how people learn, such as well-established learning theories. Rather, teachers can develop their own knowing through interactions in their context as well as critically evaluate scientific knowing as it specifically addresses the needs and intersectionality of students in their classroom. In other words, teachers can utilize scientific knowing to *support* their design work rather than attempting to adapt scientific knowledge to their designs.

Through the process of critically evaluating, mixing, and/or redesigning instructional materials, teachers develop knowing that is centered on their own teaching practice in their particular context. Teachers who engage in curricular design tasks take ownership of the curriculum; connect knowledge, skills, learning, and practice; and develop new pedagogical approaches and beliefs (Agyei & Voogt, 2012; Voogt et al., 2015). We argue that this approach also has the potential to help teachers center intersectionality, learning about and better meeting the needs of their students by considering the multiple ways in which students may be experiencing opportunities or barriers based on what is being privileged in the classroom.

Instructional Designers: Creating Multiple Pathways

This perspective on teachers, design, and intersectionality also has implications for those who design instructional materials for teachers or other learning contexts. Although we believe it is impossible to remove all bias from instructional materials, instructional designers can strive to be aware of how certain norms and values are embodied in the materials they create and how the designs impact the users.

When teachers choose to use prepared materials for their classroom, they are off loading some of their design agency to those materials (Brown, 2011). The materials might be designed in a way that supports adaptation and customization. Brown suggested curricular materials and tools include multiple points of access, focus on resources rather than steps or procedures, and support customization. For example, rather than creating one set of materials that could later be "adapted" to various students, instructional materials might include several pathways that would draw on the strengths of various students. Other material might describe multiple pedagogical approaches to address the same topic. Importantly, no single example or approach should be positioned as the primary or default method; instructional materials should include affordances that encourage teachers to make choices based on their students.

Conclusion

A focus on standardizing content and approaches within education has resulted in attempts to create materials or interventions that should be implemented with "fidelity" so that the outcomes meet the standardized expectations. This approach unavoidably values certain ways of learning and knowing above others, resulting in unequal learning opportunities for many students.

By framing and educating teachers as designers, teachers can be empowered to create learning opportunities that recognize the complex and particular intersectionalities of their students. Instructional designers can support this work by creating materials that encourage teachers to make choices based on the unique intersectional identities and needs of their students. We believe this lens offers a useful way to consider and begin to address the implicit bias and inequities in curricular materials.

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