

# Mapping Preservice Teachers' Metaphors of Teaching and Learning

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**Abstract.** This study explores preservice teachers' metaphors of teaching and learning. Specifically, it uses social cartography and critical discourse analysis to map the beliefs of 20 preservice teachers at a large urban university. The results suggest a split between those who share positivist metaphors, which depict teaching and learning as a unidirectional process, and those who share constructivist metaphors, which depict teaching and learning as a more dynamic social process. Considering the increasingly diverse population of students in the United States, learner-centered metaphors are framed as the most pedagogically appropriate, and the implications of replacing positivist ways of thinking with more constructivist views are discussed.

**Keywords:** teacher education; metaphor; social cartography; critical discourse analysis; constructivist pedagogy

## Introduction

Metaphor is generally understood as a comparative figure of speech. When Shakespeare's Ophelia compared Hamlet to a rose, for example, she was not only emphasizing his gentleness, she was also alluding to his capacity for violence. For Lakoff and Johnson (1980), however, metaphor is more than just a poetic device. They contend that "metaphor is pervasive in everyday life, not just in language but in thought and action" (p. 3). Because metaphor structures our most basic understanding of experience, allowing us to use what we know to make assumptions about what we do not, it follows that our actions are then mediated by how metaphor allows us to see phenomena from a particular point of view, by how our subconscious assimilates and makes sense of our environment.

## Metaphor in Teacher Education Discourse

One of the ways that researchers examine preservice teachers' beliefs is by studying the cognitive devices they use to situate themselves in the profession (Akinoglu, Tatik, & Baykin, 2015; Cameron, 2010; Ersozlu, 2013; Gatti & Catalano, 2015; Olthouse, 2014; Ozdemir & Akkaya, 2013). According to Tobin (1990), who

was among the first to study the link between preservice teachers' metaphors and their beliefs, "teaching can be defined in terms of roles undertaken by teachers. And just as metaphors are at the basis of all (or most) concepts, the metaphors used to make sense of the main teaching roles can be the focus for reflection and change" (p. 125). Similarly, Martínez, Sauleda, and Huber (2001) assert that "metaphors exert powerful influences on processes of analyzing and planning in education" (p. 966). In particular, they find that metaphors can have a profound effect on teachers' thinking, and further suggest that they can be used as a catalyst for a deeper understanding of the profession as a whole.

For Fry and Fleeners (1997), "metaphor offers new perceptions of reality, ultimately the means to communicate beyond the literalness of experience" (p. 27). As a tool for examining the ways in which knowledge is constructed, metaphor can help researchers unpack preservice teachers' latent assumptions and help them reflect on their identities in relation to their students. After all, "a large part of self-understanding is the search for appropriate personal metaphors that make sense of our lives. Self-understanding requires unending negotiation and renegotiation of the meaning of your experiences to yourself," and, in education, this process involves the conscious recognition of and reflection on the metaphors we teach by (Lakoff & Johnson, 1980, p. 233).

Sfard (1998) suggests that because "metaphors bring with them certain well-defined expectations as to the possible features of target concepts, the choice of a metaphor is a highly consequential decision. Different metaphors may lead to different ways of thinking and to different activities" (p. 5). From this perspective, the metaphors that guide preservice teachers' thinking can provide a glimpse of how they intend to situate themselves in the profession, including the approaches they will take to content and the kinds of student-teacher relationships they will attempt to create (Bullough & Gitlin, 1995; Tortop, 2013). More recent research includes Gök and Erdoğan's (2010) metaphor analysis of preservice teachers' perceptions about technology, as well as Pinnegar, Mangelson, Reed, and Groves' (2011) exploration of metaphor plotlines to determine how preservice teachers position themselves in relation not only to their responsibilities in the classroom, but also to the expectations they have for their students.

In general, researchers agree that metaphors are powerful tools for helping preservice teachers reflect on their beliefs, and the consensus is that this lead can to a more nuanced understanding of any conflicts that may exist in their understanding of what it means to teach (Bullough, 1991; Bullough, Knowles, & Crow, 1991; Capan, 2010; Yalcin & Erginer, 2012). For Tobin (1990), "using metaphors of teaching and learning provides a focus from which to begin looking at teacher change processes. By conceptualizing teachers' beliefs and roles through the metaphors they use, and then introducing...more appropriate metaphors, teacher change can be implemented" (p. 127). For example: replacing positivist metaphors that view teaching as the passive transmission of knowledge from teachers to students with constructivist metaphors that view teaching as a more dynamic social process might better prepare preservice teachers to work with diverse populations of students.

## Constructivist Pedagogy

Constructivist pedagogy supports the kind of activity-based teaching and learning that encourages students to develop their own frames of thought. Based on the work of Dewey (1938), constructivism encourages reflection and empowers students to become responsible for their own learning. According to O'Loughlin (1992), "emancipatory constructivism is best viewed as a reaction against the positivist doctrine that objective truth exists and that by using certain rational methods of thinking we can arrive at authoritative knowledge that can be imparted to others" (p. 336). By supporting the construction rather than the transmission of knowledge, this approach is open to the multiple perspectives and alternate worldviews that teachers are encountering in our public schools.

In the present study, which aligns with Pinnegar, et al.'s (2011) contention that we can learn more about how teacher candidates might situate themselves in the profession by examining their beliefs, metaphor is used to provide preservice teachers with an opportunity to reflect on any discrepancies that may exist within their understanding of what it means to teach. Instead of simply identifying the metaphors that the participants brought with them into a teacher education program, however, this study also employs social cartography to map these metaphors in an intertextual field (Weidman, Jacob, & Casebeer, 2014). According to Paulston (1997), social mapping "seeks to open up meanings, to uncover limits within cultural fields, and to highlight reactionary attempts to seal borders and prohibit translations" (p. 454). Rather than offering a static portrait of preservice teachers' metaphors, in other words, the map functions as a heuristic device, encouraging the participants to reflect on their beliefs.

## Methods of Inquiry

This study maps the teaching metaphors of 20 preservice teachers in a one-semester course on the social foundations of education. All of the participants were enrolled at various levels in the Bachelor of Applied Psychology degree program at a large urban university; however, excluding classroom observations and informal daycare work, none of them reported any previous teaching experience. Eighteen of the participants identified as female, two identified as male. With the exception of one Black participant and one Hispanic participant, all of the preservice teachers identified as White.

### *Data Collection*

After reading Lakoff and Johnson's (1980) work, specifically their thoughts on the experientialist alternative for giving new meaning to old myths, and discussing how metaphor might help teachers construct meaning and reflect on their experiences, the participants responded to a three-part questionnaire. Part 1 solicited demographic information (see Table 1), while Part 2 asked the participants to provide their own metaphors for teaching and learning in the form of "Teaching is like..." and "Learning is like..." Finally, in Part 3, the participants justified their responses to Part 2 by writing brief personal narratives.

**Table 1: Participant Demographics**

Gender	N	%
Female	18	90
Male	2	10
Ethnicity	N	%
Black	1	5
Hispanic	1	5
White	18	90

### *Critical Discourse Analysis*

Critical discourse analysis, which views language as a form of social practice, was used to construct knowledge communities from the preservice teachers' metaphors and personal narratives (Fairclough & Wodak, 1997; Foucault, 1986). Then, using social cartography, these communities were mapped in an intertextual field whereby the participants were encouraged to reflect on the results (Paulston & Liebman, 1994). In order to construct the knowledge communities, the participants' metaphors were examined in the context of cultural transmission. According to Sfard (1998), "one glance at the current discourse on learning should be enough to realize that nowadays educational research is caught between two metaphors...the *acquisition metaphor* and the *participation metaphor*" (p. 5). The acquisition metaphor, on the one hand, suggests that knowledge is acquired through individual experience and gradually refined into more complex cognitive structures. Participant responses that were categorized as acquisition metaphors include: "Teaching is like tuning a violin" and "Learning is like building a bridge." The participation metaphor, on the other hand, suggests that knowledge is the consequence of participating in authentic learning communities. Participant responses that were categorized as participation metaphors include: "Teaching is like being a guide" and "Learning is like being on a team."

Next, the participants' personal narratives were examined in the context of positivist and constructivist epistemologies. For Guba (1990), "the constructivist chooses to take a *subjectivist* position. Subjectivity is not only forced on us by the human condition...but because it is the only means of unlocking the constructions held by individuals" (p. 26). Excerpts from participant narratives that were categorized as constructivist include: "It is important for teachers to construct democratic learning environments" and "Teachers should be open to diverse perspectives." Alternately, "the positivist is constrained to practice an *objectivist* position...that permits the inquirer to wrest nature's secrets without altering them in any way" (p. 19). Excerpts from participant narratives that were categorized as positivist include: "It is the teacher's responsibility to make sure that their students are prepared to take standardized tests" and "Students learn by soaking up information from their teachers."

### *Social Cartography*

Social cartography was introduced to comparative researchers as a method for enhancing the presentation of their findings (Paulston & Liebman, 1994). The argument, initially proposed by Paulston (1993) in response to Rust's (1991) call for the application of postmodern theories to emerging representations of reality, was that the construction of a visual discourse in education would provide a better understanding of the diverse and often marginalized players in the social milieu. Mapping, in other words, was packaged as an effective method for counter hegemonic boundary work.

According to Paulston (2000), "in the process of mapping meaning, the subject is seen to be mobile and constituted in the shifting space where multiple and competing discourses intersect...Social mapping, in this view, makes possible a way of understanding how sliding identities are created" (p. xxi). Rather than being pinned to a fixed position, as in the case of the Cartesian subject, the perspectivist subject is articulated around a core self, which is differentiated across local and historical contexts. Recent examples of how social cartography has been used in education research include O'Dowd's (2001) mapping of texts from the Malmö Longitudinal Study and Nicholson-Goodman's (2012) mapping of the doctoral journey via autobiographical consciousness.

While mapmaking is a personal practice, akin to writing poetry or painting a picture, there are certain steps that all social cartographers must take: border-making, populating, and interpreting. Border-making involves drawing the map's boundaries, usually along invisible axes that represent conceptual dualisms; in the present study, the map's borders are drawn along the vertical axis of Acquisition/Participation and the horizontal axis of Positivist/Constructivist. Populating requires determining the locations of knowledge communities on the map, not only in relation to the axes but also in relation to each other. Finally, interpreting encourages a return to critical discourse analysis to justify all of the decisions that went into border-making and populating, thus producing a phenomenological rather than an arbitrary construct (Nicholson-Goodman, 2009).

### **Results**

Critical discourse analysis revealed the five knowledge communities that appear on the map (see Table 2). They are labeled according to size, from largest to smallest, and represent the overarching metaphors that emerged from the participants' responses to Parts 2 and 3 of the questionnaire. The largest knowledge community includes metaphors pertaining to growth, such as "Teaching is like tending a garden" and "Learning is like mapping new worlds." These metaphors position teachers as partners in learning who encourage their students to improve by building on their own experiences. The second largest knowledge community includes metaphors pertaining to production, such as "Teaching is like working in a factory" and "Learning is like fitting into place." These metaphors view teachers as content experts who are solely responsible for the transmission of information.

**Table 2: Participants' Dominant Metaphors of Teaching and Learning**

Knowledge Community	Dominant Metaphor	N	%
Growth		6	30
	Teaching is like gardening.	2	10
	Teaching is like mentoring.	1	5
	Teaching is like beekeeping.	1	5
	Learning is like painting.	1	5
	Learning is like pollenating.	1	5
Production		5	25
	Teaching is like building.	2	10
	Teaching is like carving.	2	10
	Leaning is like absorbing.	1	5
Travel		4	20
	Teaching is like traveling.	2	10
	Learning is like traveling.	2	10
Maintenance		3	15
	Teaching is like watchmaking.	2	10
	Learning is like working out.	1	5
Guidance		2	10
	Teaching is like guiding.	1	5
	Learning is like hiking.	1	5

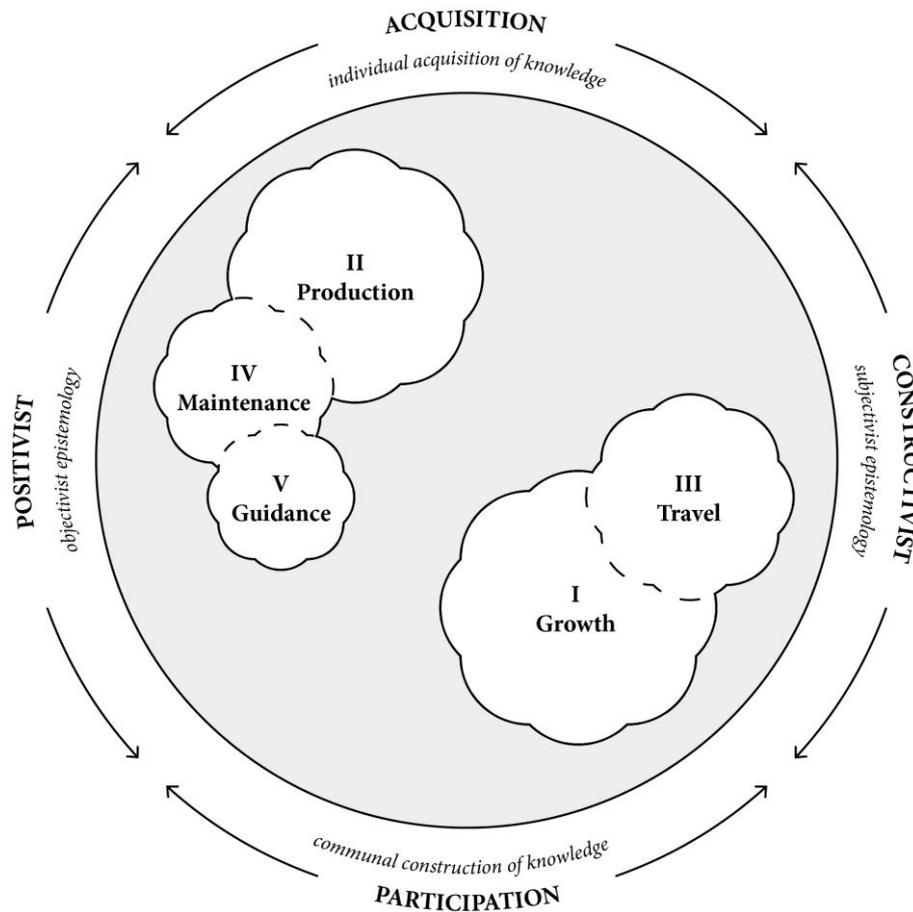
The third largest knowledge community includes metaphors pertaining to travel, such as "Teaching is like going on a journey" and "Learning is like collecting postcards." In much the same way as the growth metaphors in the largest knowledge community are closely aligned with constructivist epistemologies, the metaphors in this group also envision teachers in partnership with their students, working together instead of in opposition. The fourth largest knowledge community includes metaphors pertaining to maintenance, such as "Teaching is like pruning a hedge" and "Learning is like working out." These metaphors lean more toward positivist epistemologies, offering a more objective view of knowledge acquisition. Finally, the fifth largest knowledge community, albeit the smallest, includes metaphors pertaining to guidance, such as "Teaching is like being a tour guide" and "Learning is like going on a hike." These metaphors, while still essentially positivist, begin to move toward an acceptance of more constructivist worldviews.

## Discussion

The map suggests that the preservice teachers involved with the present study were almost evenly split between positivist and constructivist epistemologies, between objectivist and constructivist worldviews (see Figure 1). While this does not imply that the beliefs of all preservice teachers can be so neatly categorized, it does provide a starting point for discussing how teachers' unconscious beliefs about teaching and learning can manifest in their practices. If the atmosphere in a particular classroom, as Martínez, Sauleda, and Huber (2001) suggest, can be traced to the teacher's preferred educational metaphor, then it can be assumed that the atmosphere in the participants' future classrooms would be significantly different. A preservice teacher who favors the growth metaphor, for example, might be more open to collaborative teaching strategies, encouraging students to make sense of learning in the context of their own experiences, whereas a preservice teacher who favors the production metaphor would be more likely to exercise control in the classroom, preferring didactic rather than dialogic methods of instruction.

The map also suggests that the preservice teachers who favored an objectivist approach to teaching were more likely to accept the acquisition metaphor of student learning. Similarly, the preservice teachers who favored a subjectivist approach were more likely to accept the participation metaphor. There was very little overlap, although some of the preservice teachers, especially those who viewed teaching as guiding, seemed to be accepting, or at least aware of, alternate perspectives prior to viewing the map. According to Sfard (1998), the acquisition metaphor's emphasis on viewing knowledge as intellectual property, as something that can be accumulated, has the capacity to promote rivalry rather than collaboration. The participation metaphor, however, can bring people together through its shifting conceptualization of permanence, through the promise of a more democratic process of teaching and learning.

In addition to exploring the knowledge communities, the overlaps and disconnects, the participants also considered the *negative space*, the gray area in which none of their metaphors were mapped. The most obvious gaps, or *silences*, occurred at the intersection of participation metaphors and positivist epistemologies, and at the intersection of acquisition metaphors and constructivist epistemologies. While this is not surprising, given the position of the knowledge communities at the opposite poles, it does provide an opportunity to think about the metaphors that preservice teachers possess in a different way. According to Star (1991), "finding the silent blueprint to a life means looking in areas of darkness" (p. 266). Extended to teacher education, this suggests that we can learn just as much from the metaphors that preservice teachers do not possess as we can from those that they do. After the participants spent some time with the map, questioning its borders and challenging the placement of their own ideological positions, they began to think about which metaphors might help them in our current climate. This added a reflexive element to the study that encouraged the preservice teachers to think about making their own maps, which may or may not have resembled the researcher's.



**Figure 1: Heuristic map of the participants' metaphors of teaching and learning.**

According to the United States Department of Education (2014), non-White minority students collectively outnumbered their White counterparts for the first time last year in America's public schools. Even though White students will remain the largest social group for some time, currently accounting for over 49% of the total enrollment, their numbers are expected to decline. Teacher demographics, however, are shifting at a much slower pace, with White teachers accounting for over 85% of the teaching force (Hill-Jackson & Lewis, 2010). For Dee (2004), this disparity is problematic because racial interactions between teachers and students can affect student performance. For example: "pupils may trust and respect someone with whom they share a salient characteristic, making learning come more easily. Likewise, a teacher of the same race may serve as a more effective role model, boosting students' confidence and enthusiasm for learning" (pp. 53-54).

Even though it might be easier for teachers to work with students from similar cultural or economic backgrounds, it is possible for all teachers to engage all of their students if they are willing acknowledge that people are capable of constructing knowledge in different ways. According to McAllister and Irvine

(2000), teachers who accept and display multifocal worldviews are more likely to create productive learning environments that motivate their students, and, one of the ways that preservice teachers can work toward an acceptance of multiple perspectives is by examining and reflecting on their beliefs. By replacing acquisition metaphors of teaching and learning, which view students as containers to be filled, with participation metaphors, which view students as active participants in their own education, preservice teachers can start to address their own latent assumptions about teaching and learning before ever stepping foot in a classroom.

### **Limitations and Recommendations for Future Research**

Even though the use of metaphor in teacher education discourse can help preservice teachers uncover some of their latent beliefs about teaching and learning, it is not without its drawbacks. Thompson and Campbell (2003), for example, identify three problems with metaphor analysis: the narrow focus on self, the potential for superficial responses, and the inherent limitation of using metaphor to express complex ideas. The narrow focus on self is problematic because it diminishes the importance of context, suggesting that a single metaphor is somehow capable of expressing all of a preservice teacher's beliefs. The potential for superficial responses is also of concern because preservice teachers who do not take metaphor analysis seriously might compromise the complexity of the study. Finally, the inherent limitation of using metaphor to express complex ideas is potentially troublesome because, once again, it supports the compression of large ideas into smaller ones.

Social cartography, as a method for helping preservice teachers acknowledge and visualize difference, also has its share of limitations. For critics, the absence of objectivity and generalizability make social maps too context dependent (Torres, 1996). Another complaint is that a lack of "hard data" reduces social cartography to little more than an exercise in "intellectual gymnastics" (Watson, 1998, p. 108). For social cartographers, however, it is this very lack of objectivity and generalizability that make social maps so important: "A map...is a construct, a unique object. Initially, each map, as is true of any written discourse, is the property of its creator—it contains some part of that person's knowledge and understanding of the social system" (Paulston & Liebman, 1994, p. 223). Regardless of how social maps are perceived, as metaphorical curiosities or literal representations, they nevertheless provide researchers with an opportunity to open and extend social dialogue.

Future research on preservice teachers' metaphors of teaching and learning should focus on exploring the actual extent to which metaphor is capable of helping them reflect on their beliefs. According to Mahlios and Maxson (1998), "there are observed instances in which root metaphors change [or hold] as students become teachers...What is not known at this point is how teachers actually enact the practices of teaching that grow out of their initial metaphor/cognitive systems" (p. 239). One of the ways that researchers can begin to address this gap in the literature is by conducting more longitudinal studies that explore teachers'

metaphors from the moment they enter a teacher education program through their first several years of practice, perhaps even longer. By examining how these structures may develop and change over time, teacher educators would be in a better position to provide preservice teachers with a metaphorical profile, which, in turn, could be used to help them reflect on any disconnects that may exist between their future practices and current beliefs.

## References

- Akinoglu, O., Tatik, R. S., & Baykin, Y. (2015). Pre-service teachers' metaphorical perceptions towards the concept of scientist. *Anthropologist*, 19(3), 577-584.
- Bullough, R. V. (1991). Exploring personal teaching metaphors in preservice teacher education. *Journal of Teacher Education*, 42(1), 43-51.
- Bullough, R. V., & Gitlin, A. (1995). *Becoming a student of teaching: Methodologies for exploring self and school context*. New York: Garland Publishing.
- Cameron, L. (2010). What is metaphor and why does it matter? In L. Cameron & R. Maslen (Eds.), *Metaphor analysis: Research practice in applied linguistics, social sciences, and the humanities* (pp. 3-25). London: Equinox.
- Capan, E. B. (2010). Teacher candidates' metaphoric perceptions of gifted students. *The Journal of International Science Research*, 3(12), 140-154.
- Dee, T. S. (2004). The race connection: Are teachers more effective with students who share their ethnicity? *Education Next*, 4(2), 53-59.
- Dewey, J. (1938). *Experience and education*. New York: Macmillan.
- Ersozlu, Z.N. (2013). Mirror, mirror on the wall: Prospective mathematics and science teachers' use of metaphors to conceptualize and understand reflective thinking. *Anthropologist*, 16(1-2), 7-19.
- Fairclough, N., & Wodak, R. (1997). Critical discourse analysis. In T. A. van Dijk (Ed.), *Discourse studies* (pp. 258-284). London: Sage.
- Foucault, M. (1986). Of other spaces. *Diacritics*, 16(1), 22-27.
- Fry, P. G., & Fleeners, M. J. (1997). An analysis of pre-service teacher-class interaction metaphors. *Journal of Classroom Interaction*, 32(1), 23-28.
- Gatti, L., & Catalano, T. (2015). The business of learning to teach: A critical metaphor analysis of one teacher's journey. *Teaching and Teacher Education*, 45, 149-160.
- Gök, B., & Erdoğan, T. (2010). Investigation of pre-service teachers' perceptions about concept of technology through metaphor analysis. *Turkish Online Journal of Educational Technology*, 9(2), 145-160.
- Guba, E. G. (1990). The alternative paradigm dialog. In E. G. Guba (Ed.), *The paradigm dialog* (pp. 17-27). London: Sage.
- Hill-Jackson, V., & Lewis, C. W. (2010). Dispositions matter: Advancing habits of the mind for social justice. In V. Hill-Jackson & C. W. Lewis (Eds.), *Transforming teacher education: What went wrong with teacher training and how we can fix it* (pp. 61-92). Sterling, VA: Stylus Publishing.
- Lakoff, G., & Johnson, M. (1980). *Metaphors we live by*. Chicago: University of Chicago Press.
- Mahlis, M., & Maxson, M. (1998). Metaphors as structures for elementary and secondary preservice teachers' thinking. *International Journal of Educational Research*, 29(3), 227-240.
- Martínez, M. A., Sauleda, N., & Huber, G. L. (2001). Metaphors as blueprints of thinking about teaching and learning. *Teaching and Teacher Education*, 17, 956-977.
- McAllister, G., & Irvine, J. J. (2000). The role of empathy in teaching culturally diverse students: A qualitative study of teachers' beliefs. *Journal of Teacher Education*, 53(5), 433-443.

- Nicholson-Goodman, J. (2009). *Autobiography of a democratic nation at risk: The currere of culture and citizenship in the post-9/11 American wilderness*. New York: Peter Lang.
- Nicholson-Goodman, J. (2012). Mapping the doctoral journey via autobiographical consciousness. *Journal of Curriculum Theorizing*, 28(1), 242-259.
- O'Dowd, M. (2001). Re-tracing the path to third order knowledge: How did we get here and can we move on? *Compare*, 31(3), 279-293.
- O'Loughlin, M. (1992). Engaging teachers in emancipatory knowledge construction. *Journal of Teacher Education*, 36(4), 12-16.
- Olthouse, J. (2014). How do pre-service teachers conceptualize giftedness? A metaphor analysis. *Roeper Review*, 36(3), 122-132.
- Ozdemir, S., & Akkaya, E. (2013). The analysis of secondary school students' and teachers' mental images of school and ideal school by using metaphor. *Educational Administration: Theory and Practice*, 19(2), 295-322.
- Paulston, R. G. (1993). Mapping discourse in comparative education texts. *Compare* 23(2), 101-114.
- Paulston, R. G. (1997). Mapping visual culture in comparative education discourse. *Compare*, 27(2), 117-152.
- Paulston, R. G. (1999). Mapping comparative education after postmodernity. *Comparative Education Review*, 43(4), 438-463.
- Paulston, R. G. (2000). Preface: Four principles for a non-innocent social cartography. In R. G. Paulston (Ed.), *Social cartography: Mapping ways of seeing social and educational change* (pp. xv-xxiv). New York: Garland Publishing.
- Paulston, R. G., & Liebman, M. (1994). An invitation to postmodern social cartography. *Comparative Education Review*, 38(2), 215-232.
- Pinnegar, S., Mangelson, J., Reed, M., & Groves, S. (2011). Exploring preservice teachers' metaphor plotlines. *Teaching and Teacher Education*, 27, 639-647.
- Rust, V. D. (1991). Postmodernism and its comparative education implications. *Comparative Education Review*, 35(4), 610-626.
- Sfard, A. (1998). On two metaphors for learning and the dangers of choosing just one. *Educational Researcher*, 27(2), 4-13.
- Star, S. L. (1991). The sociology of the invisible: The primacy of work in the writings of Anselm Strauss. In D. R. Maines (Ed.), *Social organization and social process: Essays in honor of Anselm Strauss* (pp. 265-283). New York: Aldine de Gruyter.
- Thompson, L. K., & Campbell, M. R. (2003). Gods, guides, and gardeners: Preservice music educators' personal teaching metaphors. *Bulletin of the Council for Research in Music Education*, 158, 43-54.
- Tobin, K. (1990). Changing metaphors and beliefs: A master switch for teaching? *Theory into Practice*, 29(2), 122-127.
- Tortop, H. S. (2013). Preservice teachers' metaphors about university teachers and metaphor as an evaluation tool. *Journal of Higher Education and Science*, 3(2), 153-160.
- Torres, C. A. (1996). Social cartography, comparative education and critical modernism: Afterthought. In R. G. Paulston (Ed.), *Social cartography: Mapping ways of seeing social and educational change* (pp. 417-433). New York: Garland Publishing.
- U.S. Department of Education. (2014). *Projections of education statistics to 2022* (NCES Publication No. 2014-051). Washington, DC: National Center for Education Statistics.
- Watson, K. (1998). Review of *Mapping multiple perspectives* and *Social cartography: Mapping ways of seeing social and educational change*. *Comparative Education*, 34(1), 107-108.
- Weidman, J. C., Jacob, W. J., & Casebeer, D. (2014). Conceptualizing teacher education in comparative and international context. In A. W. Wiseman & E. Anderson (Eds.), *Annual review of comparative and international education* (pp. 115-145). Bingley, UK: Emerald Group Publishing Limited.
- Yalcin, M., & Erginer, A. (2012). Metaphoric perception of principals in primary schools. *Journal of Teacher Education and Educators*, 1(2), 229-256.