
MIRROR NEURONS, THE DEVELOPMENT OF EMPATHY, AND DIGITAL STORY TELLING

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Abstract

This article explores the intersection of work in media education, religious education, concerns about digital cultures' impact on human relationality, and the possible role that mirror neurons might play in the development of empathy. Digital story telling—particularly as embodied in the work of the Center for Digital Storytelling (<http://www.storycenter.org>), and the Storytelling as Faith Formation project (www.storyingfaith.org)—is proposed as a mechanism within which to foster mirror neuron development, and thereby provide one promising route for deepening empathic learning within religious education.

I have to begin this article in as situated and transparent a way as possible, not simply for all the usual reasons I would do so (feminist epistemological concerns [Solberg 1997]), Christian humility [Edwards 2002], etc.), but because the field of neuroscience and learning is still very much in its infancy. One of the authors whose work in this area I most trust, James Zull (2002), points out that he regularly compares findings that emerge from neuroscience with the experience of excellent teachers and best practices in education. When these two disparate streams cohere and are congruent, he is more apt to accept the scientific findings. When they appear to diverge, he is even more careful to ask pointed questions.

Thus, in a similar vein, I need to note here, at the outset, that I am the parent of a child who endured a major stroke near birth. In the nearly twenty years since then, we have worked closely with a series of neurologists and neuropsychologists to help our son learn and grow as effectively and with as much health as possible, after such a significant brain injury. In the process I have gained a healthy skepticism for the claims of neuroscience, as well as a deep respect for the wisdom of parents and other caregivers who spend far more time with children than do their doctors.

Second, I have been deeply involved in media literacy education for many years. In that context I have gained, again, a healthy respect for the wisdom of experienced teachers, as well as a recognition of how little work has actually been published about the creative potential of media production. Frankly, I think media literacy teachers are often too busy teaching and working on producing with their students, to write much about it.

Given both of these contexts, I approach the intersection of religious education, neuroscience, and digital media with a deep skepticism and with a highly engaged experiential background. I am fully cognizant of the necessity of couching the argument I will make in this article with as much contingency and nuance as I possibly can. Please read what follows as an exploration of interesting lines of research which I believe ought to be pursued more directly by qualified researchers, rather than as a definitive or scientifically valid conclusion.

CURRENT CLIMATE

The last few years has seen an avalanche of publication seeking to answer questions about the ways in which digital media—and social media in particular—might be affecting human relationality. Just in the last year alone two major books have been published with strikingly different conclusions, although they draw on similar bodies of research. Sherry Turkle's *Alone Together* argues that our increasing experience of robotic and other computational objects is drawing us into experiences of relational attention that are disturbing in their intensity and focus on mechanical objects (2011). Cathy Davidson's *Now You See It*, on the other hand, argues that the widespread shifts taking place through the increasingly pervasive use of digital technologies are helping us to notice elements of our context and our attentional practices that we had previously ignored (2011). Such shifts are, in effect, helping us to “see” things we had previously been blinded to, and may be leading us to deeper and broader relationality.

Perhaps what these two highly divergent arguments most have in common is that each author recognizes that human practices are being shaped neurologically by the digital devices that now command, or entice, so much of our attention. How we manage those practices, and particularly how we parent and apprentice younger people in the midst of such practices, will, they argue, fundamentally shape our world for decades to come. Indeed, both of these authors draw

on psychological and neurological theories to describe how we are reshaping ourselves.

I have been intrigued by these discussions because in the fields of religious education and media education there are interesting convergences at the nexus of human practice. In both of these fields scholars and teachers are increasingly convinced of the necessity of exploring human *practices* as the center of learning. Scholars in our field are likely familiar with the consensus that the practices movement research is more adequately descriptive than almost any other line of inquiry of the challenges and opportunities facing religious educators (Bass and Volf 2002; Dykstra 2005; Roberto 2010). What such scholars may not know is that a line of inquiry within media education is coming to similar conclusions within that field.

Renee Hobb's work within media education, for instance, has described the ways in which working with school-aged children in the production of media has a profound and critical impact on their engagement of commercial media (2007, 2011). Kathleen Tyner surveys the vast landscape of participatory media (2010). Clay Shirky reminds us that our practices with digital media are reshaping and opening opportunities for creativity (2010). Douglas Rushkoff warns that we must "program or be programmed" as a way of talking about how crucial it is to take active control of our creative production in a digital era (2010).

CONTRIBUTIONS FROM NEUROSCIENCE

It is to this emerging consensus around the importance of practice in religious and media learning that I want to turn with a neuroscientific spotlight. Michael Wesch, an anthropologist who is doing participant observer ethnographic research within digital environments such as *YouTube*, has noted that there is a form of engagement taking place in that digitally mediated environment that is peculiar to the space. In his influential lecture "An anthropological introduction to *YouTube*," delivered to the Library of Congress in 2008, he called this experience one of "context collapse." "Context collapse" is when you are "trying to form your new mask in a space where everyone is watching, but no one is there; at once the most private space, but quite possibly the most public space on the planet" (Wesch 2008, 25:21).¹ This space

¹All references to this video will be in minutes elapsed from the beginning, in the version found here: http://www.youtube.com/watch?v=TPAO-lZ4_hU You can access her digital story here: <http://vimeo.com/27158110>

becomes a place in which, he argues, two paradoxical experiences can occur: “hatred as public performance” and the “freedom to experience humanity without fear or anxiety.”

Such a paradox emerges, in part, because of the ability to focus on watching/listening to someone within this space of “context collapse.” That is, the person who produces and distributes their videoblog does so speaking intimately to a camera knowing that no one may ever engage their video, but also knowing that the public element of *YouTube* means that potentially anyone can engage it. And the person who watches that video can do so with a degree of “up close” attention that would be uncomfortable were they to do the same thing in person.

Try it as a thought experiment. Imagine yourself speaking personally to your computer, knowing that a camera is recording you, but not having anyone else in the room at the time you are doing the recording. Then try watching a *YouTube* video that is a typical vlog (that is, a person speaking to a camera in this way, just a “head shot”). In both cases you might experience a kind of intimacy that is not typical when two or more people are in the room at the same time. If you are the person doing the speaking, when there is someone else in the room you are most often in some way attuned to their presence even if you are ignoring them. When you compose a vlog by yourself, speaking directly to a camera with no one else present, you can find yourself becoming much more self-reflexive, almost by default. In a similar process, if you are the person doing the watching/listening, you can watch a person in a video much more freely, for a much longer time, over and over again if you choose, in ways that you would find deeply uncomfortable were you to be doing so in person.

Wesch goes on to suggest that he and his student researchers have observed a paradox in the midst of this “context collapse.” They have observed what they term “the public performance of hatred,” as well as “the freedom to experience humanity without fear of anxiety” (29:13). That both such disparate experiences could co-exist is, they speculate, the sum of the equation of “anonymity + physical distance + rare and ephemeral dialogue.” That is, the ability to attend to, to watch closely, to be drawn into, these intimate performances gives rise to an *experience* of human freedom. That freedom can be enormously attractive, giving rise to creative and life-affirming movements (Wesch observes the “hug” movement, for instance, and the “sign love” movement). Yet that same experience carries a double-edged sword, since it can also

evoke or at least make easily possible, the expression of behavior (obscene language, non-verbal gestures, and so on) that would otherwise be repressed by ordinary social rules of behavior.

This space, which Wesch calls one of “context collapse,” this engagement with an experiential space that is unique to the digital environment, carries elements that may emerge from the dynamics of attention to which both Turkle and Davidson are pointing. Turkle finds herself deeply disturbed by the manner in which humans relate to non-human devices, fearing that we are moving away from the deep connections that fund human relationality, and in the process diminishing and impoverishing such relational experience. I wonder if perhaps a similar concern might underlie Wesch’s observations about “the public performance of hatred”? That is, might his observation of the ease with which people violate social bonds in the context of digital spaces come from a similar mechanism?

Davidson, on the other hand, points to the ways in which we are discovering anew certain aspects of human relationality within digital cultural spaces, and finding ways in which we not only *can*, but *must* develop broader and more diverse relationships as one way to deeper and truer knowing. The experience that Wesch’s participants speak of, an experience of deep connection and community, an experience he has called “freedom to experience humanity without fear or anxiety” might be an instance of Davidson’s observations.

The very different conclusions that Turkle and Davidson draw might actually be directly connected to the paradox that Wesch has observed.

Turkle and Davidson both draw on literature which describes the ways in which we “mirror” behaviors that we observe. Nicholas Carr, in another recent book that has received major notice, puts it this way:

There’s growing evidence, moreover, that our brains naturally mimic the states of the other minds we interact with, whether those minds are real or imagined. Such neural “mirroring” helps explain why we’re so quick to attribute human characteristics to our computers and computer characteristics to ourselves—why we hear a human voice when ELIZA speaks. (Carr 2011, 213)

Turkle is deeply concerned about our tendencies to attribute human characteristics to robotic devices. Davidson, on the other hand, sees opportunity in our ability to form relationships beyond those to which we might originally have been socialized (with the important caveat

that there are moral/ethical challenges involved). In both cases, however, their work is drawing on underlying theorizing about this process of “neural mirroring,” and it is here where I believe neuroscientific theory might be a pertinent and interesting conversation partner for our work in religious education, as well as shedding light on the anecdotal evidence from media education that digital story telling is a compelling form of learning.

Neuroscientific scholars have begun to identify a particular component of the brain—mirror neurons—that appear to be deeply implicated in the process of empathy development. Here is Daniel Stern’s description of mirror neurons:

Mirror neurons sit adjacent to motor neurons. They fire in an observer who is doing nothing but watching another person behave (e.g., reaching for a glass). And the pattern of firing in the observer mimics the pattern that the observer would use if he were reaching for that glass, himself. In brief, the visual information received when watching another act gets mapped on to the equivalent motor representation in our own brain by the activity of these mirror neurons. It permits us to directly participate in another’s actions, without having to imitate them. This “participation” in another’s mental life creates a sense of feeling/sharing with/understanding them, and in particular their intentions and feelings . . .

There is another feature of this system. It is particularly sensitive to goal-directed actions, i.e. movements with a readily inferable intention. Even more, the perception of an attributable intention seems to have its own brain localization. . . . If the exact same movement is seen but in another context where no intention can be attributed, the brain centre will not activate.

The longstanding idea of a human tendency of mind to perceive and interpret the human world in terms of intentions is strengthened by such findings. And the reading of another’s intentions is cardinal to intersubjectivity. (Stern 2007, 37)

I have quoted Stern at length here, because he so clearly and concisely explains what researchers currently theorize about mirror neurons. Further, I think it is possible that the mechanisms being explored in the research on mirror neurons, and the experiences being reported by ethnographic observations in digital landscapes, are multiple lenses exploring the same phenomena.

If we, as religious educators concerned about media culture, are going to draw deeply and well from the field of neuroscience, I believe it may be to this area of mirror neurons that we should turn, as we consider how best to develop empathy within our ongoing work

in religious identity development. Empathy is clearly an important function of religious identity development. As I have argued in other contexts, there is a clear distinction between “sympathy” and “empathy,” and empathy is to be preferred in the Christian context, indeed is clearly expressed in multiple places within scripture and tradition (Hess 2010). At the same time, our wider popular media culture tends to socialize us into sympathetic identification, not empathetic identification. So there is a bias within media culture that at the very least is not congruent with religious identity development in community, and which writ large might raise significant obstacles to such development (Hess 2008). The area of “intersubjectivity” would appear to be one of the more fruitful lines of inquiry for distinguishing between “sympathy” and “empathy,” and that is yet another reason why the work with mirror neurons is interesting.

So what do we know about supporting mirror neuron development in healthy ways? At the moment, we do not know much, although there are some tentative findings. One such finding is that children with disabilities such as prosopagnosia (more colloquially known as “face blindness”), in which the ability to recognize and organize facial information is impaired—a disability that is often present in children who are diagnosed as being on the autism spectrum—in these children, regular work with video programs that focus and repeat interaction with specific facial features associated with specific emotional states, can increase their ability to function more effectively (Bernier and Dawson 2009, 279).

The underlying mechanism that educators of children with autism are observing as effective seems to be one of repeated engagement, that is “practice” of behaviors, of facial movements for instance, that are important in social interaction. There appears to be some evidence that such practice nurtures growth of mirror neurons in the mechanisms that might be damaged or underdeveloped in such children, allowing for development of capability. I believe it might follow logically that doing similar work with children who do not have these impairments might also improve social interaction. In children without such impairments, the work could involve more complex states of interaction. What might it do with young people and adults? Still, there are important questions remaining about what it is that we ought to be “practicing.”

I do not in any way believe that I can make definitive claims about such mechanisms. All I am doing is suggesting that such a process

might be worth investigating. I will, however, go just one small step further, and suggest that the kind of close attention to story, the kind of “mirroring” of self-creation that can be involved in digital story production might be part of what underlies the emotional strength of the experiences Wesch is documenting with vlogs, and which digital story tellers document as present within digital story telling work.

Thus at a minimum, one element of what we might be practicing in this process is something that previous generations might call “witnessing” or “testimony”—that is, the sharing of individual narratives. Doing so in the context of religious education gives us room to renew and re-energize such practices. Scholars have also identified within religious education certain activities that we need to retrieve, activities such as silence, remembering (in the deep sense of history and continuity), making (in the tensive, sensual qualities of that verb), and attending (in deep listening and repetitive engagement). These are all activities that are important in the process of digital story telling as well (Lambert 2006).

It is to this opportunity that I turn now. Those of us who regularly work with digital story telling as a form of faith formation are struck, experientially and anecdotally, by how powerful a process it is, and by how often the process of learning how to tell a story, and then embedding that story in a digital format that can be widely shared, is transformative.

Media literacy educators do not often write about the work they are doing, but in the few papers that have been published about digital story telling, there is a continuing theme that involves an experience of empowerment, connection, even transcendence. Caleb Nathaniel Paull, for instance, investigated the experiences of participants in a digital story telling workshop in the context of his doctoral program in adult education. Among other observations, he notes that:

In the process of creating their digital stories, both Shannon and Arne came to feel validated and empowered both as the subjects they portrayed through story and as the “authors” of story. In reflecting on experiences they deemed important, then having to make conscious choices about how to represent these experiences, what to include and what to leave out, the digital storytellers were expressing experience to themselves in particular ways, objectifying their stories and shaping them around certain perspectives. The conscious construction of a point of view in the digital stories involved interpreting and repurposing the past from a present context. (Paull 2002, 217)

Roger McQuiston engaged in a participatory action project for his DMin degree that utilized a confirmation program in a Lutheran church as its foundation. He writes that:

As our students and parents have demonstrated, digital technology has something to teach us. It can make the study of the Bible and our traditions fun and entertaining, deeply immersive and engaging, but it can do much more. It can enable us to return to a kind of secondary orality that has at its core an experiential component that the written word yearns to teach us. The Word oftentimes lies captive, inert and lifeless on the written page. Yet as the story is creatively told and embodied, the Word can break free of its paper prison and breathe again. Digital technology can help the Word, the teller and the hearer, interact on a deeper level. An ancient way of experiencing the text can be recovered, if not completely, then in part. The recovery is well worth the effort and risk. (McQuiston 2007, 99–100)

Knut Lundby developed a pilot project for the Church of Norway, as it investigated new avenues for faith education. He concluded:

Research on media literacy demonstrates the capacity of children and young people to act as active participants and interpreters in relation to their media environment. . . . The young participants may compare any part in this faith-based programme with their general mediated experience. . . . The capacity and competence of children and young people as participants in their contemporary digital environments must be taken seriously in the performance of the reform on faith-based education in Norway. Their digital environments make a symbolic and social context that the adults who try to pass on the spiritual tradition will have to relate to. (Lundby 2006, 20)

Davis has discussed the ways in which digital story telling workshops have led to children expressing things that their parents were unaware of, and in the process building aspirational pathways that supported these children in pursuing their dreams:

In the end, there is evidence that each story served as a tool in the process of self-authoring. In each case, the youth reflected on events of his or her life and organized them into a coherent narrative that had not existed beforehand as an object of contemplation. Each of these narratives held the potential to contribute to a more developed “imagined life trajectory” for the teller. For the time being, Marion saw himself as a future pilot, Noah seemed to embrace the idea that he had moved on from his former “wild and crazy” self, and Adamma understood that she had lost status and relationships when she came to the US, but she was finally emerging with new ones. (Davis 2004, <http://thenjournal.org/feature/61/>)

Clark and Dierberg have noted that the youth in the youth groups with which they worked found, in their digital story projects, a venue for sharing their understanding of their faith in a way that their environment had previously suppressed:

Because of its accessibility and ease of use, digital storytelling has come to be of interest among religious groups, particularly among communities that wish to counter misinformation or stereotypes that might lead others to make false assumptions about who they are or what they stand for. Participating in such processes of story creation can help members of misunderstood communities to recognize their agency and claim their right to tell their own story, first within the story circle and later, advocates hope, within broader circles of influence. (Clark and Dierberg forthcoming, 4)

Each of these scholars is documenting ways in which the process of digital story telling had transformative elements. Might we draw on such elements intentionally, in the context of religious education?

DIGITAL STORY TELLING AS A FORM OF FAITH FORMATION

I believe that digital story telling might be particularly effective here, because the process of learning to tell a story—at least as practiced within workshops run by the Center for Digital Storytelling (storycenter.org) and related movements (storyingfaith.org)—requires a slowing down, and a set of processes that draw people into focused attention to the elements of story telling and its subsequent embedding in digital tools.

Let me give you an example that might illustrate this dynamic more clearly. In a recent digital story telling workshop sponsored by our Religious Education Association (REA)/Association of Professors and Researchers in Religious Education (APRRE) task force on peace and justice, workshop participants were given the preparation prompt in advance of the workshop to “write about something you left behind.” In addition, participants were asked to bring to the workshop seven images (“an image of you in your formative years, an image of a social justice inspiration, an image that represents your hopes, an image that represents your concerns, an image that represents your sense of place, an image of you in the work you do today, and an image that represents your commitment to others”).

Already you can begin to see that the process of gathering materials, prior to the workshop even taking place, provided a catalyst

for slowing down and focusing attention. The workshop itself then included an opportunity for people to “try out” their story in a small group setting.

The actual process of building the story as a *digital* story—recording the audio narration, choosing images, blending story, image and sound together—required a significant period of time spent both in individual crafting as well as shared work. It also required repeated hearings of the story, repeated attention to small changes made in editing, and so on. It was a process of *attending* to meaning-making that was significantly contemplative, in the deep sense of that word. Indeed, several participants in this workshop commented on the meditative aspects of the workshop, and expressed interest in considering the ways in which such learning might be useful in faith formation.

Following the workshop, several of the pieces created therein were published to Vimeo.com, a video sharing site. One in particular, a story told by Anabel Proffit,² has now been used in a number of other settings as both an example of digital story telling and faith formation, but also more directly as an illumination of the meaning of communion. Here you have an example, then, of a learning process that in both its process and its content is illustrative of faith formation.

But why is the experience of this process so engaging? I think it's possible that somewhere in the middle of the “context collapse” that comes from creating and publishing a digital story, persons might be building mirror neurons, supporting the underlying neurological structures at the heart of building empathy. Digital story telling, at least as defined and practiced in this article, emphasizes and highlights precisely the kind of focus on a person—in this case, one's own story as told and shared within community—a visual and aural attending that appears to be similar to the kinds of practices neuroscientists are using to promote the development of mirror neurons.

I cannot document scientifically that this is what is happening in digital story telling. Yet I cannot help noticing that there appears to be a resonance, an alignment, between the experiences media educators and digital story tellers speak of in their work, with the kinds of practices that therapists investigating the function of mirror neurons describe (Bråten 2007).

I am writing this article primarily as a way to juxtapose these three lines of inquiry: religious educators' concerns for developing practices that support health religious identity, neuroscientific observations of the role of mirror neurons in the development of social cognition and empathy, and digital story tellers' work with media education. I am

not suggesting any definitive conclusions, but I would point to the confluence of ideas that appear here. At a minimum I believe that neuroscientific investigations are promising for our work, and that we would do well to continue to attend to them, as long as we do not ignore our own experiences in various learning environments.

I also think that this work suggests that there is a balance to be achieved between the legitimate concerns raised by Sherry Turkle, and the optimism of Cathy Davidson. That balance requires recognizing the crucial role played by practice, and the necessity of intentionally creating learning environments that allow us to “practice the practices” involved in empathic relationship. We ought neither to be drawn solely into “robotic” relationships, nor into blithe disregard for the importance of slowing down and attending to silence, to practices of presence, and so on.

In the process we also have to be proactive about broadening and deepening the networks of relationality that we are consciously embedded in. The more difference there is in our midst, the more learning and unlearning is possible, and the more robust our knowing will become. This is an old recognition, an insight that Parker Palmer explores brilliantly in his work (Palmer 1983, 1998, 2011), but it is something Cathy Davidson helps us to see through the lens of neuroscientific theory as well.

Just as there is potential for positive growth and development present in these mechanisms the more diverse and thus robust our knowing becomes, there is also clear challenge and obstacle involved when we narrow our knowing. Karsten Hundeide is eloquent about the possibilities for dehumanization and objectification that are present when the “zone of intimacy” becomes a line before which is “we” and beyond which is “them.” As she writes:

Those who are on the outside of this zone on the other hand, we do not apprehend in the same sensitive and empathic way. These are people we have an external, at worst an objectifying “I-it relation” to, characterized by indifference or rejection. In this situation it is not easy to influence and promote good caring because the relationship does not invite this as a natural extension of the relationship. They are surely human beings, although they are strangers, and as participants within a shared community we understand them according to conventional codes and rights that apply among human beings. However, this tends to be *an outwardly conventional* relation (secondary care), different from the spontaneous co-experiencing we have when someone in our family is exposed to a tragedy or a great joy. In that case *we participate and our experience is inward as if it involves ourselves directly and personally.* (Hundeide 2007, 244, author’s emphasis)

As media literacy educators note, consuming only commercial media provides too many opportunities to “mirror” only destructive practices, or at least to narrow the range of human experience that is presented, to an impossibly constrained pool. Much commercial media supports dehumanization and objectification. Learning to tell our own stories, however, and then sharing them through digital distribution, opens up possibilities. What might be possible, for instance, if we could invite people to extend their zone of intimacy? Might digital story telling be one mechanism for doing so? Clearly there are difficult challenges, even very real dangers, in doing so. Turkle is eloquent about the dangers of entering “into relationship” with robotic devices. We might find ourselves narrowing our zone of intimacy to such an extent that we become, as she writes, “alone together.” But it is at least also possible that we might be able to “see” beyond ourselves, we might be able to expand our focus of attention and see in the new ways that Davidson suggests.

This is the point at which my discussion could become explicitly theological, a task for a different article. Here I will instead conclude by noting that there appear to be neurological rationales that describe, at least in part, some of the elements of the experiences observed in the midst of digital story telling. Religious educators would do well to engage this form of learning as yet another process by which to deepen and enlarge our repertoire of practices.

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REFERENCES

- Bass, D. and M. Volf. Eds. 2002. *Practicing theology: Beliefs and practices in Christian life*. Grand Rapids, MI: Eerdmans.
- Bernier, R. and G. Dawson. 2009. The role of mirror neuron dysfunction in autism. In *Mirror neuron systems: The role of mirroring processes in social cognition*, ed. J. Pineda, 261–286. San Diego: Springer.
- Bråten, S. Ed. 2007. *On being moved: From mirror neurons to empathy*. Amsterdam: John Benjamin Publishing Company.
- Carr, N. 2011. *The shallows: What the internet is doing to our brains*. New York: W.W. Norton.
- Clark, L. and J. Dierberg. Forthcoming. Digital storytelling and collective religious identity in a moderate to progressive youth group. In *Digital religion: Understanding religious practices in new media worlds*, ed. H. Campbell. London and New York: Routledge.
- Davis, A. 2004. Co-authoring identity: Digital storytelling in an urban middle school *Then* . (an online journal) <http://thenjournal.org/feature/61/> (accessed September 16, 2011).

- Davidson, C. 2011. *Now you see it: How the brain science of attention will transform the way we live, work, and learn*. New York: Viking.
- Dykstra, C. 2005. *Growing in the life of faith: Education and Christian practices*. Louisville: Westminster John Knox Press.
- Edwards, M. 2002. Characteristically Lutheran learnings? *Dialog* 41 (1), 1–12.
- Hess, M. 2008. Responding to the challenges of religious storytelling in a digital age: Building new opportunities through feautor.org. In *Erzählen—Reflexionen im Zeitalter der Digitalisierung [Storytelling—Reflections in the Age of Digitalization]*, eds. Y. Gächter, H. Ortner, C. Schwarz, and A. Wiesinger, 112–126. Innsbruck: Innsbruck University Press.
- . 2010. From ICT to TCI: Communicative theology(ies), pedagogy and web 2.0. In *Kommunikative Theologie: Zugänge—Auseinandersetzungen—Ausdifferenzierungen*, eds. M. Schärer, B. Hinze, and B. Hilberath, 130–149. Wien: Lit Verlag GmbH & Co.
- Hobbs, R. 2007. *Reading the media: Media literacy in high school English*. New York: Teachers College Press.
- . 2011. *Digital media and literacy: Connecting culture and classroom*. Thousand Oaks, CA: Corwin Press.
- Hundeide, K. 2007. When empathic care is obstructed: Excluding the child from the zone of intimacy. In *On being moved: From mirror neurons to empathy*, ed. by S. Bråten, 237–256. Amsterdam: John Benjamins Publishing Company.
- Lambert, J. 2006. *Digital storytelling cookbook*. Berkeley: Digital Diner Press.
- Lundby, K. 2006. Transforming faith-based education in the Church of Norway: Mediation of religious traditions and practices in digital environments. *Studies in World Christianity* 12 (1): 5–22.
- McQuiston, R. 2007. *Digital disciples: Reconceptualizing adolescent confirmation instruction by combining biblical storytelling and digital media*. DMin thesis, United Theological School, Dayton, OH.
- Palmer, P. 1983. *To know as we are known: Education as spiritual journey*. San Francisco: Harper & Row.
- . 1998. *The courage to teach: Exploring the inner landscape of a teacher's life*. San Francisco: Jossey-Bass.
- . 2011. *Healing the heart of democracy: The courage to create a politics worthy of the human spirit*. San Francisco: Jossey-Bass.
- Paull, C. 2002. *Self-perceptions and social connections: Empowerment through digital storytelling in adult education*. Ph.D. dissertation, University of California, Berkeley.
- Roberto, J. 2010. *FaithFormation 20/20: Designing the future of faith formation*. Minneapolis: Vibrant Faith Publishing.
- Rushkoff, D. 2010. *Program or be programmed*. Orbooks.com.
- Shirky, C. 2010. *Cognitive surplus: Creativity and generosity in a connected age*. New York: Penguin Press.
- Solberg, M. 1997. *Compelling knowledge: A feminist proposal for an epistemology of the Cross*. Albany: State University of New York Press.
- Stern, D. 2007. Applying developmental and neuroscience findings on other-centred participation to the process of change in psychotherapy. In *On being moved: From mirror neurons to empathy*, ed. by S. Bråten, 35–47. Amsterdam: John Benjamins Publishing Company.
- Turkle, S. 2011. *Alone together: Why we expect more from technology and less from each other*. New York: Basic Books.
- Tyner, K. 2010. *Media literacy: New agendas in communication*. New York: Routledge.
- Wesch, M. 2008. *An anthropological introduction to YouTube*. Lecture presented at the Library of Congress June 23. <http://www.youtube.com/watch?v=TPAO-IZ4.hU> (accessed September 16, 2011).
- Zull, J. 2002. *The art of changing the brain: Enriching teaching by exploring the biology of learning*. Sterling, VA: Stylus Publishing.