Teaching Beyond a Print Mindset: Applying Multimodal Pedagogies Within Literacy Teacher Education

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Introduction

As teacher educators, now that we have moved on from the realization that technology, media, and communication have reshaped the ways that younger generations think and act in the world, we face the challenge of teaching future educators about pedagogy and policy that does not exist (Burnett, Davies, Merchant, & Rowsell, 2014). That is, although internationally and nationally, there have been strides in developing 'twenty-first century policy' (Gallagher & Rowsell, 2017) that speaks to contemporary literacy practices, we have far to go in teaching future educators about modern ways of thinking and learning in digital worlds. Some educational policy and curricula foreground technical acumen with technologies as an answer to teach digitally, while other policy initiatives

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and curricular outcomes focus on media and communication skills, and still others promote digital citizenship and thinking globally rather than locally. Although collectively these approaches to twenty-first-century pedagogy have made some strides, we argue in this chapter that there needs to be radical changes in teacher education generally, and literacy teacher education more specifically, to equip teacher candidates and in-service teachers with the knowledge and skills required to teach future generations of learners.

The chapter presents a bird's eye view of literacy teacher education planning and pedagogy from a participatory, multimodal perspective is presented. Participatory literacies (Rowsell & Wohlwend, 2016; Wohlwend & Rowsell, 2016) reflect new ways of thinking about learning to read and write with technology that move away from the model of an individual reading or typing print on a computer screen. Instead, participatory literacies reflect the principles of social media like Twitter, YouTube, or Facebook, as well as, global participation, multiplayer collaboration, and distributed knowledge. In addition to a need for participatory ways of thinking and navigating literacy teacher education pedagogy, there needs to be multimodal ways of planning, teaching, and assessing new generations of learners. Teaching teacher candidates about pedagogical content and teaching methods might be best transmitted through words in PowerPoints with image supports, however, much of the time another modality is necessary and preferable such as film, interactive apps, or even arts-based work.

In this chapter, we foreground Dane's philosophy of multimodal literacy teacher education work that he has honed with time—from the genesis of a literacy teacher education course to final assessment components—in order to illustrate what constitutes, in our view, authentic 'twenty-first century literacy teacher education pedagogy' that is participatory, multimodal, and digitally informed. Underpinning this is the notion that through this pedagogy teacher educators can engage teacher candidates and build their self-efficacy. As a researcher and teacher educator, Jennifer's perspective in the chapter is informed by her fieldwork in K-12 and adult learning contexts applying multimodal and ethnographic methods to literacy pedagogy (Pahl & Rowsell, 2005; Rowsell, 2013, 2014). With twenty years of experience researching and teaching through a multimodal lens, Jennifer infuses a multimodal and modular approach to teacher education (Kress & Rowsell, 2019) to complement Dane's significant teacher education experience. In this way,

Jennifer's role in the chapter is as a critical colleague and peer. The chapter is structured as follows: We begin by presenting what we mean by *participatory* teacher education pedagogy; then, we move into concrete examples primarily from Dane's multimodal approach to literacy teacher education to illustrate what we mean by hacking, planning, and literacy teacher education; we foreground forms of in-class communication and content sharing; and then present a brief look at discrete skills that our teacher candidates exhibit; finally, we conclude the chapter with a call to action for teacher educators to prepare teacher candidates the requisite knowledge in multimodal literacies.

Participatory Literacy Teacher Education Pedagogy

Planning and facilitating literacy teacher education courses from a participatory lens involve more of a 'do-it-yourself' and 'hacker' mindset to literacy teacher education work. This means teacher educators need to be prepared to be interactive and improvisational in their teaching and less didactic and authoritative. In participatory cultures, players often work together based on shared goals and social relationships across networks as they exist in online and offline spaces. Within the chapter, teacher education work is framed around digital literacy components that Rowsell and Wohlwend (2016) set out as ways to assume digital literacy competencies which are: multiplayer, productive, multimodal, open-ended, pleasurable, and connected. This is needed as participatory literacies offer the latitude and greater fidelity to contemporary literacies that other frameworks do not offer. Teacher candidates and students need to shift mindsets and practices so that they can move far more in and out of digital, analogue, and connected spaces and also, engage in more talk, experimentation, and critical framing work. This kind of teaching demands flexibility coupled with meta-talk about modern literacy practices and ways of targeting teaching to these particular practices.

Starting with multiplayer competencies, Dane plans, teaches, and assesses teacher candidates as if they exist within a network where each individual co-produces in a common physical or digital environment (most often both) in synchronous or asynchronous time. Just as players within videogames exist as single players/avatars, they also exist within multi-player worlds with fellow players sharing strategies, tips, feedback, and talking in chat rooms. In this way, participatory literacies are co-constructed, in conversation or in the midst of play with others.

For example, video game play merges each individual player's moves into a joint production, whether this is a coordinated sequence of moves and countermoves or a simultaneous orchestration of each player's performance (Gee, 2007). Modern literacy teacher education methods need to be governed by a multi-player logic so as to bolster teacher candidates' knowledge of multimodal pedagogies through experience and practice.

From multiplayer methods come productive, in-process, iterative methods of teaching concepts to teacher candidates. Thus, it is critical that teacher educators develop teaching methods that allow for collective production and collective ways of thinking through forums, blogs, or interactive documents. The key point here is to have both an offline and online presence and there is fluidity across them. Productive teaching is responsive teaching that allows teacher candidates to move from one modality or medium to the next—so in one instance have written text and then in another instance, moving image texts. There is a multiplicative (Lemke, 2002) dimension to this kind of teaching that Dane has found works well with teacher candidates. Natural, productive thinking grows from navigating and producing texts together and embedding different modalities to illustrate, explain, and understand content; this is precisely what students need to learn to do.

Fidelity to multimodality is essential in the truest and most authentic sense. Multimodal approaches to literacy teacher education should involve more than simply varying modalities; multimodality immerses people within sensory worlds that have two or more modes in play at once for meaningful, relevant, and participatory engagements with teaching. What follows closely from multimodal logic is taking an open-ended approach to literacy teacher education work. Within Dane's immersive, multimodal literacy teacher education work, he gives teacher candidates freedom to experiment, problem-solve, and use varied texts to engage in inquiries. Journeying with open-ended goals allows teacher candidates to have open-ended goals, thereby avoiding narrow, reductionist models of learning and it gives future teachers ways of personalizing learning. This kind of teacher education needs to be flexible and responsive and open to happy accidents. There is a 'do-it-yourself' (DIY) quality to open-ended teacher education and teacher educators do not always know where a lesson or activity will end up. This is analogous to teaching from this stance in the 'real' classroom.

Participatory teacher education must be connected within face-to-face class time and in virtual environments. Participatory literacies are rooted

in notions of connected learning (Ito et al., 2013), where users not only link to and navigate online texts, but also future teachers learn to participate in online cultures on digital networks that host affinity groups (Gee, 2003), in fan communities, or on social media such as Facebook, Twitter, or Instagram. These networked spaces and connections are expected to be reciprocal—members expect that when they post content to these sites, others will respond, comment, 'like,' or follow. A participatory culture is a culture with relatively low barriers to artistic expression and civic engagement, strong support for creating and sharing one's creations, and some type of informal mentorship whereby what is known by the most experienced members is passed along to novices (Rowsell & Wohlwend, 2016; Wohlwend & Rowsell, 2016). Often participatory approaches allow teachers to feel like their contributions matter and, in turn, they feel a sense of connection and community.

As a final dimension of participatory approaches, literacy teacher education work should be engaging for teacher candidates. Typically, the average adult has an eight-minute attention span and we live within an attention economy (Goldhaber, 1997; Knobel & Lankshear, 2007); therefore, our literacy teacher education pedagogy has to be dynamic and align with contemporary expectations of audiences. This means thinking, planning, and teaching with open, multimodal, and connected teaching methods. It is the kind of teaching that requires some planning, but also a degree of spontaneity that allows for impromptu curation of information online or the sudden production of powerpoints or short movies on topics. These practices offer a literacy teacher education pedagogy that is playful, ludic (Rowsell, 2014), and driven by creativity. Making teaching playful and DIY replicates what happens in the real-world when people engage with digital texts. In digital environments, people navigate across texts, they tap and click on videos and game-based texts, and they follow hypertext. It is incumbent on teacher educators to find ways of imbricating these practices (and their logic) into literacy teacher education.

Multimodal Teacher Education Teaching

Our teacher candidates are not passive receivers of content, but instead they actively consume, remix, design, and produce within multimodal logics all of the time. It is important to see them as active consumers—not passive consumers of texts—who participate in and shape their own

learning and in turn need to teach their students within this mindset. We want our students in school to have a similar mindset and it stands to reason that it is necessary to have teacher candidates experience these very same pedagogical principles. Teacher educators need to be able to draw on diverse modes learners use to tell the story of their academic content.

At this point in the history of teacher education, there is a realization that education is a very different landscape from the twentieth-century literacy landscape and with this, there needs to be an incorporation of technology and digital devices. Although teacher educators use some digital tools, there is generally less take up by teacher educators of newer ways of making meaning through vernacular, print, and digital texts. This means including ways that people read digital texts; different forms of multimodal 'writing' that students engage in; visual practices such as building on the notion of selfies with more traditional tropes like portraiture; and thinking, planning, and offering assessment guidance for all forms of new literacies. Teacher educators need to acknowledge and teach to these skills as well as more traditional skills such as phonemic awareness, guided reading, and literature circles. One way of bridging the gap between old wine and new wine (Lankshear & Knobel, 2003) is to use the affordances of technology and, importantly, critically frame and engage in meta-talk about how modern versions of topics like phonemic awareness are different. For instance, teacher educators can offer a session on the range of decoding apps and how to use the features in them to differentiate.

There are varied combinations of modes that change the meaning of texts. To be specific, there are instances when modes exist as separate units of meaning in texts, but there are links between modes. For instance, in film, sound or music can exist as separate modes to work alongside visuals. Hence, literacy teacher education work should really be driven by this kind of logic and be deliberate as Dane shows later in having multiple modes in play. Future understandings about multimodality need to continue to be grounded in both offline and online worlds (without dichotomizing these) and need to consider the affordance of modalities (e.g., visual vs. auditory modes). As well, future understandings and applications of multimodal literacies need to explore these issues in finer ways, the complexity of modes that come together in multimodal literacy moments, events, and representations. A key element of transforming pedagogical practice for the twenty-first century is the concept

of teachers and students as multimodal meaning makers (Kress, 1997) and critical producers and consumers of digital media and multimodal texts.

Teaching Beyond a Print Mindset

In infusing literacy pedagogy with multimodality, how classes are created, planned, and executed must undergo a radical shift from traditional lecture style classrooms. What follows is an examination of the pedagogy of an immersive, multimodal course and how a teacher educator can teach beyond a print mindset in order to provide a model for teacher candidates to follow when they ultimately have their own students. This provides teacher candidates with dual roles, playing the part of 'student' in an immersive, multimodal classroom, and seeing how practices can be utilized, adapted, and shaped into their own future classrooms. This serves to not only engage teacher candidates during a lesson, but to also build their self-efficacy in terms of enacting these practices in the classroom.

A fair amount of time should be given, during the development phase of the literacy course, to allow for opportunities for research, exploration, and playing with multimodalities. From a pedagogical standpoint, multimodal teacher education teaching aligns with the principles of Universal Design for Learning (Rose & Meyer, 2002), an educational framework that supports flexible learning environments that can accommodate individual learning differences. Integration of this framework involves reshaping the manner in which content is delivered through multiple modes of representation, how teacher candidates communicate and engage with course content inside and outside of the classroom, and how they represent or express what they know.

Additionally, teacher educators must allow for spontaneous opportunities for content creation utilizing a variety of modes as needed. Teacher candidates need to be given ample time to research, explore, and play with a variety of modes. The university classroom is akin to the tutorial levels of video games. Before a player heads out into the main game, the player is guided and supported through a series of tutorials to prepare for navigating the game independently in the future. Teacher candidates need to experience a richly multimodal teacher education classroom, where they are guided and exposed to a variety of modalities. They need to be active participants in their learning, consuming, remixing,

designing, and producing within a multimodal context. They need to be given the freedom to experiment, problem-solve, and use a variety of resources and texts to engage in inquiries. Then, they will be prepared to guide their future students to navigate today's media rich, multimodal world.

Hacking the Lecture

Admittedly, teacher educators often tell teacher candidates they need to engage their students in the classroom, providing activities that excite and incite learning, yet still predominantly teach within a print mind-set. Why is it that teacher educators continue to lecture, reading directly from a long list of bullets on a never-ending presentation slide? If this is the case, they are not practicing what they are preaching, nor are they instructing in a way to engage and captivate an audience. In developing the multimodal university classroom, teacher educators can begin by reshaping how they teach, and with what materials. One of the first places to start is by reshaping and repurposing the function of the presentation slide.

Reclaiming the Presentation Slide. Many are all too familiar with the typical presentation slide: a heading followed by a series of bullet points, filled with so much text it often serves the function of notes. It may or may not have a clipart image haphazardly stuck on the side of the slide, battling with the text. The goal is to present as much information as possible to teacher candidates and is done so by a teacher educator who reads the slides, often word for word, talking *at*, rather than *to* or *with*, the teacher candidates.

Interestingly, teacher educators are quick to criticize teacher candidates if this was how they engaged their students in the K-12 classroom. Teacher educators need to model, through their own teaching, a more engaging way to instruct our teacher candidates, so they can, in turn, follow our example in the K-12 classroom. We can start by redesigning the role purpose, and function of the presentation slide to emulate multimodal pedagogy.

The teacher educator (and the classroom) should be an integral part of the presentation and the slides should guide and enhance the content. Multimodal elements should capture student interest, supplement the content and be a springboard for the activities that teacher candidates will engage in. To enhance concepts or ideas, embedding video, animation,

or images allows teacher educators to communicate meaning in a more nuanced and powerful way. Many presentation programs (e.g., Keynote, Explain Everything) have annotation tools that can be used in real-time with screenshots. Through annotation, attention can be drawn to particular areas of the screen, allowing for a more immersive learning experience. These are the rich, multimodal methods that teacher candidates need to both experience themselves and get experience using within the classroom.

Restructuring the Class. Multimodal follow up activities should be interspersed throughout the class to allow teacher educators the opportunity to engage with teacher candidates, through a variety of modalities, to apply what they have just learned. For example, after instruction on what makes a good storyteller, teacher candidates are given the opportunity to film themselves telling a story. They then post their stories for their peers to view and provide other with two stars and a wish (two things done well, one area for improvement). This activity gives the teacher candidates the opportunity to put what they've just learned about storytelling into practice, while also working together as a community to reflect and provide feedback to their peers. Following the activity, time should be taken to come together as a class and consolidate understandings about applying this type of activity into the 'real' classroom.

Teacher candidates should also be given the opportunity to problem-solve and use a variety of resources and texts to engage in inquiries they have identified in their field experience. Under the guidance and support of the teacher educator, who can act as a facilitator, mentor, or co-learner, teacher candidates can explore a host of multimodal resources (e.g., research articles, videos, physical materials) to seek answers to their questions. Allowing teacher candidates time to solve these problems, find answers to their questions and become experts in these areas, prepares them for life in the 'real' classroom. This is also consistent with the experiences of students in the classroom who are encouraged to engage in inquiry-based learning.

Communication and Collaboration: Twenty-First-Century Competencies

Building any cohesive class community takes time and thoughtful planning to create a system for communication and collaboration. Creating a professional learning atmosphere and providing opportunities for

collaboration in shared work spaces all contribute to this commu-
nity. The following examples build on teacher candidates' and students
twenty-first-century competencies.

Using a flexible grouping structure for teacher candidates to work
as a part of a professional learning community is at the core of build-
ing a cohesive class community. The group members are expected to
work together and support each other inside and outside of the class-
room, in both physical and digital spaces. This involves a multiplayer
logic; teacher candidates can thereby navigate different environments as
a team. By working cohesively, anticipating each other's movements and
roles allows tasks to be completed at a faster rate and with more accu-
racy than tasks that may be more disjointed and disconnected. Building
team unity, rapport, and accountability for each participant's role as part
of their group is due, in part to carefully selected educational oppor-
tunities or challenges by educators who support students in building
twenty-first-century competencies.

Given our connected world, it is important to mirror this level of
local-global, physical-virtual connection within our literacy teacher edu-
cation courses. When in-class activities capitalize on a variety of web and
related resources, it is important (for the sake of efficiency and organiza-
tion) to have a central hub where teacher candidates can find all of the
tools, resources, links, etc. that they need for any particular class.

Shared digital spaces take on a communicational role that affords
teacher educators to capitalize on how meaning can be expressed
through other modes. Depending on the purpose and nature of the
planned activity, spaces should allow for the creation or publication of
videos, images, or their combination with print (e.g., iMovie, Instagram,
Padlet). These activities might involve tasks such as creating short vid-
eos or combining image and text. Ultimately, these spaces serve as digital
workspaces or a meeting ground for teacher candidates to collaborate in
real-time.

Shared digital spaces can also be used as a place to share ideas and
work with peers or with teacher educators. When teacher candidates
work in shared, digital workspaces, the teacher educator also has the
opportunity to see, in real-time, how teacher candidates are interacting.
This allows teacher educators to identify and correct misinformation
immediately, guide teacher candidates back on track, or provide specific,
meaningful praise accordingly.

Video discussion boards (e.g., FlipGrid) are digital spaces where short videos can be created or uploaded for teacher candidates to express their opinions on an article or share a video they created. For example, after several classes where the teacher educator models an effective read-aloud, teacher candidates might be ask groups to record and upload short videos of themselves as they practice conducting a read-aloud. Teacher candidates can then watch their peers practice a read-aloud, evaluate the inflection, prosody, pacing, and voice of their peers' work, and then compare these features with their own.

Another activity that can capitalize on expression of meaning through multiple modes is the creation of an image text with a graphic-design tool website, such as Canva. Teacher candidates read an article and select a quote that resonates with them. They then find an image that aligns with their selected quote and combine the two creating a piece layered with meaning through both image and text. They then can record a screencast using a program, such as Shadow Puppet EDU, to create an explanation of the meaning-making processes behind their quote, image, font, and design decisions. Once again, these examples of multimodal pedagogies within the literacy teacher education course are models of practices that teacher candidates can take away and implement in their respective 'real' classrooms.

Reading

While reading is most often considered the act of deciphering print-based text, from a multimodal standpoint there are many things that can be 'read,' such as videos and images. Providing a vast array of modalities for students to glean information allows teacher candidates to engage and explore content on a deeper level.

As a society, we have experienced shifts in how we read screen-based texts that need to be addressed in our contemporary literacy teacher education work. Reading today is more multisensory than it was in the twentieth century (Mangen, 2008). For instance, e-textbooks often combine the strengths of written text coupled with visuals, podcasts/audio text, and short films/videos on topics which call on different cognitive, sensory, and affective responses to text content and design. With the use of tablets in schools, there has been a dramatic increase in haptically based reading practices that are not present in literacy policy (Kucirkova & Falloon, 2017). Contemporary reading works on a screen logic in a

F-pattern from the top left corner down (Rowsell, 2013) and what is more, the act of making sense of texts on screens most frequently entails choreographing several hybrid on-screen texts at once. We foreground reading because in our experiences, teacher candidates have different ways of reading texts and we need to shape literacy teacher education approaches to their reading practices that will be more in line with how they read and experience texts. That is, modern readers are used to reading shorter texts to access information and broadly speaking, longer texts in the form of articles and books tend to be challenging if not laborious for teacher candidates. As a result, we recommend alternative approaches to the traditional notion of class readings, to include shorter articles, 'TED Talks,' and YouTube videos.

There are other creative ways to simulate modern reading processes. Programs like EDPuzzle allow teacher educators to monitor video engagement, even if it occurs outside of the classroom. Videos can be uploaded or embedded from a host of streaming services (e.g., YouTube, Khan Academy). With programs like EDPuzzle, teacher educators have the ability to digitally annotate the videos with voice or print content, embed quizzes (short answer or multiple choice), and trim unwanted segments of video. Additionally, there is the ability to prevent skipping, so teacher educators or students must watch the video as it plays, without skipping over sections or content. Taken together, these multimodal pedagogies take reading beyond the act of deciphering print-based text to include 'reading' videos and images in a domain that is more accessible and multisensory.

Evidence of Multimodal Learning

From a multimodal perspective, tasks and assessments should include multiple modalities. On the whole, educators have impoverished methods for assessing multimodal ways of using, understanding and producing screen-based texts. It is a challenge to effectively assess learning given the dearth of research and frameworks on multimodal ways of making meaning.

Through the following example, we share our own experiences with assessing teacher candidates in terms of multimodality. This assignment in a literacy education class, a Personal Literacy Story, requires teacher candidates to explore, through knowledge and appreciation, the way they became literate. This assignment necessitates an awareness of how

their literacy history impacts their behaviors, beliefs, values, and relationships with others. In this assignment, teacher candidates need to recall, document, and present their personal literacy stories as a means to understand themselves as literacy teachers, acknowledging how social and cultural practices have shaped these histories. Focusing on one particular event, mentor, or text that has shaped their beliefs and values about literacy, teacher candidates tell their stories utilizing multiple modalities. In this assignment, teacher candidates examine the experiences that have included that contribute to them becoming the literate individuals they are, connecting learnings to the course and their future practice. To do this, teacher candidates must produce a text to share with their peers and receive feedback. They have the opportunity to rework the piece into a polished, final product.

The most comprehensive personal literacy stories are those that express meaning through as many modalities as possible. For example, one student created a digital storybook, combining images and text using the platform StoryBird. While the story was engaging, this particular teacher candidate was prompted (through peer evaluation) to enhance her piece by including additional modalities such as narration and music. The finished piece was more layered and nuanced with meaning than it was in its rough form using image and text alone. This example of layering modalities in composition is also transferrable to the 'real' classroom. Teacher candidates can engage their students in multimodal thinking and processing during meaning making and compositional tasks. By offering a variety of options that exist beyond print text, teacher candidates are pedagogically capitalizing upon multimodal thinking by allowing students to express themselves in complex, multimodal ways. In seeing the value of multimodal composition, having a greater understanding of how students make meaning through different modalities, teacher candidates can focus on aiding their students in building proficiency in those methods.

PREPARING TEACHERS FOR TOMORROW

If we are to be honest with ourselves as teacher educators, when we teach the fundamentals of contemporary literacy education, we are not entirely equipped to educate teacher candidates for their future practice. With the tremendous shifts in communication, media, and technology over the past decade, the face of teaching and learning has

changed so rapidly, that it has been a challenge to keep pace with the shifting landscape. One way into modern literacy teaching methods is to build bridges between younger generations' passionate engagements in virtual spaces and the potential to draw on these generative engagements fruitfully within schools (Gillen, 2015). For instance, in Jennifer's research she incorporates professionals into planning and teaching by focusing on particular modes such as coding, photography, documentary film-making, writing comics; these kinds of more modally complex assignments often bring in students' outside interests into the classroom (Rowsell, 2013). It can be a challenge to bring in artists and media professionals, but so often they work in our communities and it requires just a bit of coordination. Teacher educators can facilitate partnerships between community-based professionals and in-service teachers to plan units around varied forms of expression and representation such as the selfie example we offered above. Teacher educators can build on the momentum of such work by working with different genres of texts as a part of their pedagogy and by using these different text genres as a platform for addressing how to teach and assess new literacies.

Literacy teacher educators need to shape their work around the principles of multimodality and participatory approaches to pedagogy in addition to having enthusiasm, knowledge, and interest in technologies and new literacies (Merchant, 2009). Our approach to transforming literacy teacher education resembles what needs to take place in mainstream schooling: an opening up of pedagogic spaces to provide on-screen and off-screen spaces for students to connect and interact; concrete, specific multimodal frameworks and activities that teachers can incorporate into their repertoires of practice and aligned assessment frameworks; a shift in the temporal rhythm of schooling so that teachers have blocks of time to hack, experiment, offer mini workshops on discrete topics, and allow time to practice on technologies; and, perhaps most of all, we need far more research and scholarship on how to transform literacy teacher education pedagogy in the twenty-first century. Such transformations to literacy teacher education carry great promise for future teachers (Ito et al., 2009).

Nevertheless, before one can honestly say that one is a twenty-first-century literacy teacher educator, one needs to move beyond an 'old wine in new bottles syndrome' (Knobel & Lankshear, 2007). That is, using technology in our literacy teacher education work is not enough to teach through and with twenty-first-century literacies, teacher

educators have to shift what they teach and how they teach it based on the kinds of communication systems we use and understand. Using tools goes some way in speaking to new literacies, however, it fails to equip teachers with strategies and conceptual experiences with digital ways of thinking about texts.

The calls to action within this chapter and indeed the entire collection represent a sampling of the ways that literacy teacher education requires reimagining. The recommendations carry some potential for teacher candidates and in-service teachers to experience for themselves the kinds of participatory and passionate learning that students experience outside of school and that can ultimately equip them with the skills and wherewithal to be digital citizens. Yet, we have some distance to go before we are in a position to build capacity and productive futures for K-12 students.

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