FRAME WORKS INSTITUTE

A Hands-On Approach to Talking Learning and Digital Media

A FRAMEWORKS MESSAGE MEMO

Susan Nall Bales, Eric Lindland, Moira O'Neil, Adam Simon, Yndia Lorick-Wilmot and Nat Kendall-Taylor • August 2012

About FrameWorks Institute:

The FrameWorks Institute is an independent nonprofit organization founded in 1999 to advance science-based communications research and practice. The Institute conducts original, multi-method research to identify the communications strategies that will advance public understanding of social problems and improve public support for remedial policies. The Institute's work also includes teaching the nonprofit sector how to apply these science-based communications strategies in their work for social change. The Institute publishes its research and recommendations, as well as toolkits and other products for the nonprofit sector, at www.frameworksinstitute.org.

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BACKGROUND

"A growing body of scholarship suggests potential benefits … of participatory culture, including opportunities for peer-to-peer learning, a changed attitude toward intellectual property, the diversification of cultural expression, the development of skills valued in the modern workplace, and a more empowered conception of citizenship," reports an occasional paper on digital media and learning from the MacArthur Foundation.[2]To achieve this goal, scholars acknowledge the need "to shift the focus of the conversation about the digital divide from questions of technological access to those of opportunities to participate and to develop the cultural competencies and social skills needed for full involvement."[3] But how is such a shift to take place? What prevents it from happening naturally? How can scholars, education reformers and digital media advocates better communicate to the public their enthusiasm for, and experience with, curricular innovations that achieve these ends? In sum, what are experts up against in broadly disseminating their vision for the 21st century learning environments and pedagogies that produce 21st century skills? And, finally, how does talking about digital media affect public understanding of other aspects of the education reform agenda, such as advancing interest in such 21st century skills as critical thinking, communications, collaboration and higher-order problem-solving?

These were the questions posed by the John D. and Catherine T. MacArthur Foundation to the FrameWorks Institute, beginning a research process in 2010 that culminates in this MessageMemo. Over the course of two years, FrameWorks spoke with nearly 5,000 individuals — including experts, influentials and ordinary people — and analyzed nearly 700 articles from media and leading education organizations. Drawing on the Strategic Frame Analysis™ approach,[4] FrameWorks researchers documented how people think about digital media and learning (DML), identified where this thinking diverges from that of experts in the field, determined how these patterns in thinking influence the public's policy support for pedagogical reforms, explored new ways of framing the issue that fill explanatory holes in public thinking, and developed a new evidence-based narrative that demonstrates strong potential for bringing the public on board with digital media's affordances for learning. This MessageMemo chronicles these outcomes, selecting the most important findings from the series of reports that resulted from the research process. It is, however, not meant as a substitute for the research reports, which offer many valuable insights in greater depth than this document can provide.[5]

The research sponsored here is complemented by a larger and overlapping inquiry — the Core Story of Education Project[6] — that explores public thinking about topics such as the purpose of education, skills, education assessment, inequities and teaching in order to arrive at a master narrative about education and learning. It is important to recognize that the questions raised in the DML project align closely with broader issues of learning and, in this way, offer important foundational understanding for all those who wish to address education reform.

After a brief summary of the research process, this MessageMemo is organized as follows:

1. We first **Chart the Landscape** of public thinking by describing dominant patterns of thinking that are chronically accessible to Americans in reasoning about digital media and learning.

2. We identify the **Gaps in Understanding** between experts and the public that provide clues about where translation is needed if expert knowledge is to become accessible to ordinary people, and, in turn, to advance public understanding and reasoning about the affordances of digital media in advancing learning.

3. We provide an outline of **Redirections** that are research-based recommendations prescribing strategies for improving public thinking about necessary changes to the education system that encourage more inclusion of digital learning.

4. We specify **Traps**, or common and seemingly logical ways of framing the issue, that, in fact, trigger problematic ways of thinking.

This MessageMemo is further complemented by a toolkit, *Talking Digital Media and Learning*,[7] that demonstrates numerous ways to apply these observations and recommendations to situations common to DML experts and education reformers.

Methods

From 2010 through 2012, FrameWorks Institute:

Interviewed 10 experts in the field of digital media and learning by phone, and analyzed transcripts to capture expert understandings about the field and its core ideas, definitions,

principles and findings, as well as perceived challenges and implications; supplemented these findings with a literature review of relevant terms from the scholarly literature; and conducted 21 in-depth, in-person Cultural Models Interviews with members of the American general public in Philadelphia, Pa., Jacksonville, Fla, and Los Angeles, Calif.[8]

Completed a Field Frame Analysis, sampling 277 materials drawn from 20 organizations in order to capture the patterns of communications that leading education organizations use to frame DML issues.[9]

Analyzed the frames used to describe DML in 412 national newspaper articles, television broadcasts and radio segments from mainstream news outlets from February 19, 2010, to November 19, 2010.[10]

Developed and tested a series of candidate metaphors to explain underappreciated or underconceptualized aspects of DML, involving roughly 1,700 informants in qualitative and quantitative tests.[11]

Facilitated and analyzed six Peer Discourse Sessions — two sessions in each of the following cities: Los Angeles, Calif., Tampa, Fla., and Chicago, Ill. — with a total of 54 informants to identify the norms and expectations that social groups share and the social discourses that participants feel empowered, permitted or expected to say in the public square.[12]

Conducted an experimental survey of 3,200 American respondents who, as a group, statistically represent the population of registered voters in the United States to test the efficacy of seven candidate values on attitudes to DML, perceived benefits of DML and curriculum policies.[13]

It is on the basis of this suite of research reports that the following observations and recommendations are made.

Charting the Landscape: How People Think About Digital Media and Learning

Americans hold largely contrasting models of learning and digital media, and do not have a clear or well-articulated model of their positive interaction. Rather, the two domains are viewed in largely dissimilar, even oppositional, terms — especially with reference to the learning that is supposed to occur within scholastic settings.

Models of In-School Learning are At Odds with DML

"In-school" learning is thought to occur within a hierarchal structure, where teachers are in positions of authority, both in terms of *content* (which they transmit to students via instruction from the front of the classroom) and *discipline* (which they maintain via the rules of the classroom and with the support of other staff and regulations). In-school learning is perceived as something that should be difficult and challenging, requiring both a focused effort and willingness by students to subject themselves to teachers' instructive authority. It is, moreover, fundamentally dependent upon teachers creating a safe and secure environment where students can focus their efforts without fear, anxiety or distraction.

Digital media, on the other hand, carry a very different set of associations for most Americans. Four dominant models of digital media emerged from FrameWorks' cultural models research — all of which present challenges to the effort to build a constructive and positive model of digital media *and* learning:

1. Americans see digital media use as primarily about recreation, and, therefore, as a rather trivial and unnecessary luxury — an escape or a break from "real life."

2. People understand digital media as a relatively passive way in which children and young people spend their time — one that requires little effort, discipline or practice for its realization.

3. Americans view digital media as a powerful source of distraction; FrameWorks' informants described children and youth as so absorbed by their digital screens that they neglect or ignore other important activities in life — familial, scholastic and otherwise.

4. Digital media use by children and youth is viewed as *dangerous* because it is thought to subject them to unfriendly and even abusive contacts with strangers and other parties.

Relatedly, in Peer Discourse Sessions, there emerged the consensus that digital media is *isolating*, which leads to the atrophy of social skills as well as increasing children's vulnerability to online predation. By contrast, "in-class learning" was seen to hone children's social skills.

These starkly contrasting models of scholastic learning, on the one hand, and digital media, on the other, were elicited from informants through separate discussions of each topic. When an effort was made to bridge the two topics — to talk about "digital media and learning" — the results were predictably complicated by the oppositions between the models. The models of *play*, *passivity*, *distraction* and *danger* used to think about digital media were understood as distinct from, and even a threat to, the demands and goals of a scholastic mode of learning that, informants assert, is supposed to be *difficult*, *disciplined*, *focused* and *safe*. When informants did talk about how digital media and learning might intersect, the most common pattern employed was a description of digital media as a fundamental threat to the educational project writ large — in particular, as a source of distraction and entertainment that did not, and should not. have a place in "real learning."

Hands-On Learning can be Used to "Think" Productively About DML

At the same time, members of the public evinced a strong and positive model of a particular kind of learning called "hands-on" learning. This form of "learning through doing" was said by many to be a more effective way to learn, especially for learning *how* to do something. It was also described as more conducive to cultivating interest on the part of students, who can experience a sense of engagement in the process of doing a learning activity. While informants saw scholastic learning as typically dominated by a contrasting style, many spoke to the positive potentials of building curricula that incorporate more experiential, engaged, "hands-on" learning in the classroom. For the few informants who were able to articulate a positive model for digital media and learning, the strengths of this hands-on action and engagement were central to their sense of its potential promise.

Media Reporting is not About Learning and Kids, Reinforces Risks

What accounts for the disconnect between digital media and learning in the public's mind? One answer comes from media treatment of digital media in news narratives. First, most discussion of digital media is not related to student learning at all, but rather to digital platforms in the business and political sectors, where it is discussed in terms of applications for professional development and adult civic engagement. When digital media is connected to learning, these stories tend to call attention to the risks that children face: protecting children from cyber-bullying and avoiding digital distractions from "quality" social time.

Education Reporting Shallow on Skills Development, Ignores DML

Even those members of the public with an active interest in education are unlikely to be exposed to stories that explain digital media's affordances for learning. Our Field Frame Analysis[14] found DML to be largely ignored by most education reform communications, overshadowed by and expunged from more important issues like teacher training, college readiness and educational inequities. Moreover, most discussions of learning in the education reform field focus on building basic skills in traditional content areas. In this context, digital media is often discussed, at best, as a "fancy" supplement to learning or, at worst, as a distraction from basic skills. The paucity of discussions of "how learning happens" precludes the introduction of more sophisticated information about skill development, in which DML might play a role. Finally, the education reform narrative on technology does not specify how technology can facilitate learning. When education reform organizations talk about technology, discussions frequently focus on administrative applications or standardized testing. When technology is mentioned as a vehicle for learning, organizations make vague references to "using computers in classrooms."

Concrete Examples Help, but are Insufficient

Given this thin diet of DML-related information, it is hardly surprising to find that concrete examples of pedagogical uses of digital technology showed promise in invigorating public thinking. When Peer Discourse participants were given concrete examples of the effective use of digital media in classrooms, they were able to think beyond the dominant and unproductive cultural models, contesting their "priors" that DML is inherently dangerous or distracting. This suggests that the public needs better examples of what the use of digital media in the

While important to public rethinking, this strategy is also insufficient because it ignores the profound distance between expert and lay understanding of the processes of learning. Communications about digital media and learning must be lodged in a broader discussion about how learning happens. As long as the public believes information flows uni-directionally to students who are passive vessels, it will be very difficult to help people understand digital media as a pedagogical tool in the way that Jenkins et al.[15] describe at the top of this Message-Memo. In this respect, DML advocates and scholars join a significant swath of education reformers who are challenged to explain the benefits of innovative curricula that enhance 21st century skills without being met with hostility from a public that prioritizes "the basics" over all other skills.[16]

A Consumerist Approach Dominates Thinking

Finally, as has been documented in other FrameWorks inquiries,[17]Americans view education and education-related issues through a consumerist lens. Adopting this stance on DML, they perceive the advantages of ready access to information, but largely as a business tool or for individual career enhancement (further reinforcing the adult focus on DML).

Moreover, from this perspective, there are few consequences to society from differential access (the "digital divide"), or reasons for ensuring equity across school districts. The consumer frame provides the rationale for differential quality in the educational goods people can "afford." If some are left out, this is simply attributable to a free market that is presumed to self-correct. Compounding this individualist bent is the tendency to assign responsibility for acquiring good information to acts of choice. Accumulating more information is "good," and good choices in the information one accesses lead to good outcomes, with individual responsibility as the key variable. This central predisposition to see DML as a commodity to be acquired and used judiciously is part of the broad backdrop of cultural models people bring problematically to the topic from their understanding of education more generally.[18]

Experts See Digital Media as Intimately Connected to Learning

The magnitude of challenges inherent in these patterns of public thinking about DML are revealed when contrasted with expert views.[19] Experts articulate a robust vision of the benefits of digital media to learning, including societal benefits and curricular innovation.

Here is a summary that emerged from FrameWorks' expert interviews:

Raw Elements of an Emerging Story of Digital Media and Learning

Why to promote digital media and learning
- 21st century world and job market require new skills.
- Current model of education is broken, need to rethink schools as learning institutions.
- Students need context and meaning for learning.
- To close the digital divide and participation gap.
- Digital technology and new media are here to stay.

Affordances of digital media
- Accelerated and expanded learning.
- Enhanced participation and collaboration.
- Experiential learning.
- Contextualized learning and empowerment.
- Engagement.
- Personalization of learning.
- Transferability of skills.

Skills cultivated through digital media
- Basic skills.
- Networking and collaboration skills.
- Systems-thinking, causal-reasoning and problem-solving.
- Critical reflective literacy.

Social benefits of digital media
- Connect schools and community.
- Improve working conditions for teachers.
- Decentralize power and control.
- Build civic participation and citizen learning.
- Enhance innovation and production.
- Broaden horizons and heightened respect for difference.

Policy Frontiers
- Shrink the participation gap.
- Change school policies.
- Build support for media literacy training for parents and schools.

This set of principles, then, comprises the "untranslated" story[20] of DML, or the basic data that must be framed effectively in order to overcome dominant and entrenched patterns of thinking. In the following section, we offer a more strategic view of this comparison between expert and lay views on DML, and target specific areas for reframing.

Gaps

While experts and the lay public shared some ways of looking at the world of DML, there were a set of particularly conspicuous gaps that pose challenges for reframing these issues:

- *The Temporal Gap, in which different perspectives dictate forward versus backward facing:* Expert discourse revealed a perspective in which the future necessitates new skills and, in turn, new means of learning. By contrast, interviews with lay informants suggested a different temporal perspective — that the uncertainty of the future necessitates "going back to the basics" and the "good old days," "when kids knew how to read."

- *The Function Gap, or whether digital media provides function or frivolity:* Experts saw

a deep and powerful function for digital media in learning. Members of the general public attributed a superficial and inessential role to these materials.

- *The Accessibility Gap, or whether we should increase or limit usage:* Experts focused on increasing access to, and availability of, digital media. Public assumptions of the dangers of digital media and the role of education in limiting distractions structured a dramatically different perspective — that access to digital media is something to be *restricted*.

- *The Learning Gap, or whether it happens actively or passively, focuses on process or content:* Experts understood learning as an active skill-based process, while, for members of the public, learning was modeled as a fundamentally passive process of receiving information.

- *The Guidance Gap, or whether teachers should function as mentors and guides or as the center of the educational universe:* Experts maintained a pivotal place for teachers, but saw these professionals as mentors and guides in a student-centered model of learning. For the public, teachers were the focal purveyors of learning.

In evaluating the efficacy of their communications, DML advocates should first question whether they have effectively addressed these gaps, which stand to undermine their messaging if left untended. Closing these gaps, through the use of powerful frame elements, constitutes the central challenge of reframing. FrameWorks accomplishes this by experimenting with various ways to "translate" the expert view into robust, concrete conceptual nuggets that can be demonstrated to override automatic understandings, engage curiosity in alternative ways of looking at the topic, and pull forward latent, but more promising, models of thinking about DML.

Redirections

- *To close the Temporal Gap and prime people to be forward-looking, invoke the value of Progress.* **"As we set out to improve learning, our most important goal should be to move our country forward. If we fail to act with this goal in mind, our country will be stuck with old ways of learning that are both impractical for our needs and**

unsuited to moving us forward." The value of Progress produced substantial and statistically significant increases in support on all policies and attitudes tested: attitudes toward DML, benefits of DML and curricular innovation. The core aspect of this value dovetails productively with the more positive American notions of technology — that proficiency in the use of technology is compulsory for our nation's success. Because it pedestals all the good aspects of technology and backgrounds all the bad, it helps inoculate against "back to basics" thinking about learning and skills. Moreover, because progress collectivizes the end goal of learning as being about our country's future, it avoids the damaging directions of consumerist and individualist thinking, in which one student's success is won independently from, or at the expense of, others.

- *To close the Function Gap, align DML with the value of Pragmatism.* **"The best way we can move our country forward is to take a common-sense approach to ensuring that our children's learning is not outdated. This means identifying and teaching our children real-world, useful skills that our country will need to improve its workforce and grow vibrant communities."** This value also had strong positive effects on all DML policies and attitudes tested. By contrast to more visionary positioning of DML, common to the field, pragmatism aligns digital learning with Americans' strong desire to see education yield specific commodities. When combined with the Progress value, it inoculates against individualism and consumerism by aligning education with a practical future for our country.

- *To trump the Accessibility Gap, communicators need to get out of the "less or more" equation, which is an unproductive dichotomy*. This Gap is effectively overcome by using either of two explanatory metaphors that make practice a key component of mastery. These two metaphors — Cooking with Information[21] and Information Drivers[22] — substitute a new and equally familiar equation: Practice yields proficiency. Both insinuate a new question: Why would you limit opportunities to practice an important skill?

Cooking with Information

✦Because learning needs to be **active**, not **passive**;

✦Because models of outside learning need to be pulled in;

✦Because function and ability need to be **outcomes**, not **basics**:

✦Think about information as an ingredient: You need to be able to find it, judge its quality and mix it with other information to make things.

✦Think about kids as cooks who can take different ingredients and use their tools to turn them into any kind of food they want.

✦The only way to learn how to do this is by getting your hands on the ingredients and tools and actually trying to make things.

✦And to become a masterful chef, you need a mentor or master chef who can guide your training.

Information Drivers

✦Because learning needs to be **active**, not **passive**;

✦Because teachers need to be mentors/guides, not dumpers.

✦Think about children as being on an information journey.

✦Kids have to be able to find information and use it to get where they are going.

✦The only way to learn how to do this is by getting your hands on the wheel and your feet on the pedals.

✦And to become an expert driver, you need the help of someone with lots of experience on the road who can guide your traveling.

- *To address the Learning Gap, either of the two explanatory metaphors is effective*, but Cooking with Information works best for this task. By modeling a process of trial and error, of active engagement and experimentation, Cooking with Information overcomes the public's passive model of learning.

- *To address the Guidance Gap, either of the two explanatory metaphors is effective*, but Information Drivers works best for this task. By modeling a familiar process in which parents and educators play a key role in scaffolding the skills of the amateur driver, Information Drivers automatically supplants the public's teacher-centric model with a more interactive, guided model in which interaction is required for positive outcomes.

- *Narrative coherence is crucial in realizing the power of these frame elements to reframe public thinking*. In the Toolkit that complements this MessageMemo,[23] we demonstrate numerous ways to order, combine and enumerate these frame elements into a robust narrative. DML advocates should avail themselves of these examples — and then go beyond them in creating stories about DML that incorporate these frame elements into even better stories.

- *Other features of the Core Story of Education Project hold promise for reframing DML — from "teachers as scaffolded" to "reform as remodeling."* While this MessageMemo highlights reframing recommendations specific to DML, there are significant advantages to combining these frame elements with those developed as part of the larger Core Story inquiry. When discussing DML, it is inevitable that dominant ways of thinking about education, reform, teachers, skills, assessment, etc., will emerge with the potential to derail the message. Both the frame elements tested by FrameWorks to date and those that will emerge from this ongoing project should be woven into DML communications to reinforce the coherence and completeness of the story. They should be viewed as ways to inoculate against holes in the narrative that people will fill in with distracting and incongruent elements of their dominant models about education.

Traps

Traps are defined as habits of the field that, in light of FrameWorks' research, we now know are problematic in that they actually trigger, rather than overcome, unproductive cultural models. Traps are especially pernicious because they often respond logically to the challenges enumerated above; however, reframing is often counterintuitive and even the best reframers can end up shooting themselves in the foot without confirmatory research results. DML communicators will want to check themselves to be sure they have not inadvertently fallen into these traps in articulating their message.

- The Teacher Trap

  The importance of mentored use and effective teaching using digital tools must be emphasized in discussions of digital media. While this is an assumed aspect of DML, it can easily drop out of communications. There are two primary consequences of leaving teachers out of communications about digital media. First, the public conceptualizes digital media as inherently isolating technologies, which leaves young children vulnerable to online predation. Without an adult mentoring students in the use of these tools, fears about children's safety overwhelm any potential benefits of digital media in learning environments. Second, the public also easily defaults to understandings of digital media as a *replacement* for teachers, which in certain contexts was understood as a benefit of digital media. Digital media could be used as a cost-saving strategy and a more efficient manner of teaching students, people say. These conversations were often laced with anti–teachers' union sentiments. Although both are very different approaches to understanding the role that teachers and other adults play in using digital media in learning environments, both are very serious traps that the public can fall into if effective teaching with digital media is not explained.

  Recommendation: Use Cooking with Information and/or Information Drivers as a way to get the mentor/teacher into the frame.

- The Individual Success Trap

  Try to avoid making individual career success the goal of learning. By doing so, you commodify the outcome and privatize it. If you want to emphasize the need for public investment in education, establish the goal at the societal level, where public funds

yield public benefits for everyone.

Recommendation: Use the values of Progress for our country, Future Preparation for a viable society, etc., to counter the strong pull toward privatization of outcome.

• The Unspecified Skills Trap

DML advocates, like other education reformers, tend to avoid specifying the skills that constitute 21st century learning goals, assuming the public can "fill this in." FrameWorks' research is very clear on this topic — people do not have enough specific information or conceptualization to process this empty definition. Without additional direction, unspecified skills will default to "the basics." Similarly, in-class only skills will equate to discipline and willpower, and will remind people of their default position that "real" learning requires avoidance of distractions from the world outside the classroom.

Recommendation: When explaining digital media in the context of learning goals, always enumerate the skills you are addressing: problem-solving, communications, critical thinking, collaboration, etc. Connect these to the explanatory metaphors of Cooking with Information or Information Drivers, or with the value of Progress and a strong workforce to meet the demands of the 21st century.

• The Connection Order Trap

DML advocates have sometimes elevated the idea of connecting students to others and to a world of information to the level of a value. That is, they have made the logical assumption that "connection" can prime thinking in the same way that Progress and Pragmatism were shown to do in FrameWorks' research. Unfortunately, this is not borne out by the research. When tested against other values and a control, Connection moved people in detrimental directions on DML attitudes and policies. We interpret these results as follows: Connection is not a sufficiently powerful reframing value and, without other reframing elements, can remind people of the dangers of DML, rather than the affordances. This is not to say that "Connected Learning" as a title is problematic, but rather to alert DML advocates to the necessity of framing DML before the term is introduced. In this sense, Connection is an "order" trap — as is the trap that follows — in that a key principle of DML (connectedness) has been elevated to a role it

cannot play.

Recommendation: This trap can be overcome by using more powerful frame elements at the top of the message to prime a better understanding of the importance of connection.

• The Civic Engagement Order Trap

There has been considerable interest in the affordances of DML for civic participation. The related framing question is whether a concern for civic participation as a societal goal is sufficiently powerful to pull support for DML attitudes and policies.

FrameWorks' values experiment tested this explicitly and found that civic participation as a value had no effect, positive or negative, on support for DML. Again, this finding should not discourage advocates from talking about the benefits of DML for civic engagement.

Recommendation: Civic engagement as a principle will require substantial set-up from other frame elements (values and explanatory metaphors) in order to prime people for a positive discussion of DML benefits in this regard.

• The "Science Says" Trap

There has been some interest in wielding the power of scientific authority as a way to engage Americans in rethinking learning. FrameWorks tested the proposition that science and the work of learning researchers could motivate Americans to improve learning and education.[24] Unfortunately, this appeal failed to produce any noteworthy effects on policy support. We conclude that scientific messengers without more effective reframing tools will be insufficient to dislodge dominant default habits of thinking.

Recommendation: Learning scientists should familiarize themselves with the framing elements that have proven effective in communicating about DML and use these in their public engagement strategies.

• The Global Competition Trap

The concept of global competition continues to fare poorly in communicating about education. The idea that the U.S. is falling behind other countries is far more

effectively conveyed by using the Progress value. The consequences for our society of ignoring 21st century skills is better expressed by connecting to the public's concern about workforce development. The core concept of competition reinforces zero-sum thinking about whose children will get ahead at whose expense, and can even have a xenophobic backlash.

Recommendation: Evoke the need for change by using the value of Progress and connecting to workforce and explicit descriptions of 21st century skills.

While the intersection of digital media and learning poses a thorny set of challenges in navigating the swamp of public thinking, FrameWorks' research reveals how powerfully these challenges can be overcome with strong reframing tools. Unlike more calcified issues (welfare or race, for example), digital media suffers more from its lack of definition — which, in turn, results in a quick default to problematic associations — than with an entrenched negative assessment. When combined with learning, digital media as a rather undefined issue gets overwhelmed by strong, patterned ways of thinking about in-class learning that are at odds with DML principles. However, even the small doses of reframing elements used in this research inquiry revealed extraordinary power in helping people rethink the confluence of digital media and learning. Now is the time for DML proponents and education reformers to embed these reframing strategies into a larger narrative about how learning happens, to what ends, and with what implications for change. Doing so promises to yield important benefits for both digital media and for learning advocates, as the new ways of conceptualizing learning explained here also show strong promise in breaking open the classroom bubble, the caring-teacher model and other conceptual impediments to education reform.

EndNotes

[1] Jenkins, H., Clinton, K., Purushotma, R., Robison, A.J., & Weigel, M. (2006). *Confronting the challenges of participatory culture: Media education for the 21st century*, p. 1. Chicago, IL: MacArthur Foundation. http://www.macfound.org/media/article_pdfs/JENKINS_WHITE_PAPER.PDF

[2] Ibid.

[3] See http://www.frameworksinstitute.org/sfa.html

[4] See http://www.frameworksinstitute.org/digitalmedia.html

[5] See Bales, S.N., Kendall-Taylor, N., Lindland, E., O'Neil, M., & Simon, A. (2012). *Talking about skills and learning: A FrameWorks MessageMemo for the Core Story of Education Project*, pp. 1-2. Washington, DC: FrameWorks Institute.

[6] : http://frameworksinstitute.org/toolkits/dml/

[7] See Kendall-Taylor, N., & Lindland, E. (2010). *Faster and fancier books: Mapping the gaps between expert and public understandings of digital media and learning*. Washington, DC: FrameWorks Institute.

[8] See Arvizu, S., Santo, R., Arena, D., Wardrip, P., Johnson, B.Z., Simon, A., … Kendall-Taylor, N. (2012). *The stories we are telling: How digital media and learning is communicated by education reformers*. Washington, DC: FrameWorks Institute.

[9] See Arvizu, S., Simon, A., Lindland, E., & O'Neil, M. (2011). *Where's the learning?: An analysis of media stories of digital media and learning*. Washington, DC: FrameWorks Institute.

[10] See Erard, M. (2012). *Information is the main ingredient: Using metaphor to enhance understanding of digital media and learning*. Washington, DC: FrameWorks Institute.

[11] See O'Neil, M., & Arvizu, S. (2011). *Informational not pedagogical: Peer group perceptions of digital media and learning*. Washington, DC: FrameWorks Institute.

[12] See Simon, A. (2012). *Valuing digital media and learning*. Washington, DC: FrameWorks Institute.

[13] Arvizu, S., Santo, R., Arena, D., Wardrip, P., Johnson, B.Z., Simon, A., … Kendall-Taylor, N. (2012). *The stories we are telling: How digital media and learning is communicated by education reformers*. Washington, DC: FrameWorks Institute.

[14] Jenkins, H., Clinton, K., Purushotma, R., Robison, A.J., & Weigel, M. (2006). *Confronting the challenges of participatory culture: Media education for the 21st century*, p. 1. Chicago, IL: MacArthur Foundation. http://www.macfound.org/media/article_pdfs/JENKINS_WHITE_PAPER.PDF

[15] Bales, S. (2009). *Framing education and education reform: A FrameWorks MessageMemo*. Washington, DC: FrameWorks Institute.

[16] Bales, S. (2009). *Framing education and education reform: A FrameWorks MessageMemo*. Washington, DC: FrameWorks Institute.

[17] For a complete explanation of the consumer frame and its effects, see Bales, S. (2009). *Framing education and education reform: A FrameWorks MessageMemo*. Washington, DC: FrameWorks Institute.

[18] Kendall-Taylor, N., & Lindland, E. (2010). *Faster and fancier books: Mapping the gaps between expert and public understandings of digital media and learning*. Washington, DC: FrameWorks Institute.

[19] Shonkoff, J. and S. N. Bales. (2011). Science Does Not Speak for Itself: Translating Child Development Research for the Public and its Policymakers. Society for Research in Child Development. *Child Development, 82 January/February(1)*, pp.17–32.

[20] A full execution of the explanatory metaphor that emerged from testing is as follows: A lot of people are thinking about how learning can be improved. Some say that in order to improve learning children need practice working with information as a basic ingredient – they need to be able to find it, judge its quality and know how to mix it together with other information to make things. In this way, children are like information cooks who can take ingredients and use their tools to mix them together in a variety of ways. The only way to really learn how to do this is by tasting the ingredients, putting your hands on the tools, spending lots of time trying things out in the kitchen and then trying out the things you've made. Likewise, children need to get experience with all kinds of information ingredients and need opportunities to mix them together to make things. If they're always eating prepackaged food or cooking directly from recipes, they'll never really learn how to cook. We also know that they can't learn these skills by themselves — they need to have guidance and support from master chefs who have more kitchen experience. Children have to be able to use information like cooks use ingredients.

[21] A full execution of this explanatory model is as follows: A lot of people are thinking about how learning can be improved. Some say that in order to improve learning children must go on an information journey. This means they have to learn how to find information and use it to get where they need to go, like *Drivers* learn how to get in a car and get wherever they want. The only way to really do this is by getting your hands on the wheel and your feet on the pedals. We also know that you can't learn to drive by yourself—you need to have help from people who have more experience on the road. Likewise, children need to learn how to get behind the wheel of new information vehicles, and they can't do this if they're always in the passenger's seat. They need to be mentored in these new information technologies so that they can get good at getting where they're going. Children have to be able to use information to get to where they're going.

[22] http://frameworksinstitute.org/toolkits/dml/

[23] Simon, A., O'Neil, M., & Kendall-Taylor, N. (2012). *Steps toward valuing education: A FrameWorks research report.* Washington, DC: FrameWorks Institute.