Valuing Digital Media and Learning

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 sciencebased 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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TABLE OF CONTENTS

INTRODUCTION

The research presented here was conducted by the FrameWorks Institute and sponsored by The John D. and Catherine T. MacArthur Foundation. This work forms part of a larger project that seeks to facilitate more effective ways of communicating about the field of "digital media and learning" (DML). Here, we present the results of an experimental survey of 3,200 American respondents who, as a group, statistically represent the population of registered voters in the United States. This research represents one of the final stages in FrameWorks' Strategic Frame Analysis™ research process — a prescriptive approach to analyzing public opinion, developing framing strategies and testing message strategies — on DML. The purpose of this particular survey is to investigate the effects of values on a comprehensive set of attitudes and policies deemed by experts to promote DML. The goal of this work is to identify a value that can bridge the gap between expert and lay understandings of DML, and create more productive public conversations. These conversations, in turn, will lead the public to see the utility of digital media as a learning tool and as a valuable aspect of learning environments, leading to new perspectives on learning and increased support for efforts to incorporate digital media into education.

EXECUTIVE SUMMARY

The experiment assessed the ability of seven candidate values to promote more productive thinking on three dimensions related to DML. The seven values tested were as follows:

1. ***Global Competition* plus *Workforce Preparedness*.** This value concentrates on the competition that the United States faces from other countries and the need for an educated workforce for the country to remain competitive in the face of this challenge.

2. ***Future Preparation* plus *Common Good*.** This value concentrates on the need for students to learn skills that will make the United States successful in the future, adding the idea that this education benefits us all.

3. ***Pragmatism*.** This value concentrates on the idea that we need to be practical and take a step-by-step, common sense approach to improving learning.

4. ***Progress*.** This value is similar to *Future Preparation* but is more oriented toward moving forward and making improvements from our current state rather than on future needs. In other words, *Progress* has a linear component rather than being more temporal.

5. ***Civic Development/Empowerment*.** This value emphasizes the benefits of improving learning in terms of increasing the vibrancy of American political culture through enhanced and more intensive participation.

6. ***Scientific Authority*.** This value tests the proposition that respect for science and for the work of learning researchers can motivate improving learning.

7. ***Connection*.** This value revolves around the idea that a connected society is a valuable end goal.

These seven values were tested against three groups of questions — what we refer to as "batteries" — that were crafted to assess respondents' attitudes toward, and thoughts about, specific aspects of DML. The batteries were as follows:

1. **Attitudes toward DML.** These questions capture the degree to which respondents view digital media as a useful learning tool, as opposed to a superfluous or unproductive adjunct that distracts from learning.

2. **Benefits of DML Programs.** Questions comprising this battery tap into the degree to which respondents recognize the benefits of digital media for learning that emerged from FrameWorks' earlier interviews with DML experts.

   3. **Curriculum Policies.** These questions assess respondents' support for concrete policy steps that implement digital media programs into current educational contexts.

Results

1. *Progress* was the highest scoring value on all three batteries. That is, *Progress* was the most successful value in: (1) creating more favorable views for a role for digital media in learning, (2) increasing respondents' acknowledgement of the benefits of digital media that experts cite, and (3) expanding support for policies that implement the kinds of interactive and experiential learning supported by DML experts and advocates. It proved highly statistically significant on all three batteries.

We suspect that *Progress'* success in reframing DML stems from its core assertion that a set of national needs and functions exist that are not currently being met, and that they must be met in order to get the country "unstuck" and moving forward. This core aspect of the value dovetails productively with more positive American notions of technology — that proficiency in the use of technology is compulsory for our nation's future success. We suspect that the *Progress* value activates this more-productive and pragmatic orientation to technology, and makes this the operative lens as people think about the importance of combining technology and learning. In addition, we feel that a good deal of the value's success derives from its ability to inoculate, by providing an alternative orientation, against the public's default reservations about incorporating interactive technology into learning contexts.[1] In short, the value of *Progress* provides a compelling public reason for proficiency with digital media, and connects this notion with learning and learning outcomes, all the while preventing people's default assumptions from gaining steam.

2. The value of *Pragmatism* was nearly as successful across the three outcome measures. *Pragmatism*'s positive reframing effect appears to work for many of the same reasons as *Progress.* It offers a positive notion of the role of technology — as a tool we must be able to use to get work done now and in the future — and recruits this notion in thinking about the synthesis of the domains of technology and learning. We suspect that combining the values of *Progress* and *Pragmatism* would provide a potent "one-two" punch that would cause significant changes in the way people orient themselves toward these topics. While slightly less powerful than *Progress*, it was statistically significant on all three batteries.

3. None of the other values tested generated positive, statistically significant movement on any of the outcome measures. As many of these values are currently in use in the field, this finding suggests that DML advocates would do well to rethink aspects of their messaging. Put simply, findings from this study show that extant approaches do not elevate

support for DML issues and that, when taken with the findings presented above, refashioning messages around an alternative set of values — *Progress* and *Pragmatism* — represents a superior use of scarce communication resources.

4. The value of *Connection* was particularly unsuccessful. It moved attitudes in *detrimental* directions on all three measures. The notion of *connectedness*, which represents the heart of what is currently a common framing strategy in the field, seems to backfire in relation to the goals of DML advocates. This finding shows that respondents not only failed to see *Connection* as an adequate reason to move away from the status quo, but also that this value actually drove them in the opposite direction, that is, *away* from incorporating new technology into education. We would thus strongly caution against using *Connection* **as a value** in communications connected to DML.

BACKGROUND

Why Values?

Values play a fundamental role in advocacy communication. Research by the FrameWorks Institute and others strongly suggests that the best route toward changing attitudes and moving support for particular policies lies in improving issue understanding via framing. A critical part of this process is the application of the values that are inherent in all frames. Research has shown that, absent a value at the top of a communication, people struggle to see the point of engaging with an issue in the first place. Values therefore can be seen as serving as fundamental organizing principles by which people evaluate social issues and reach decisions.[2] In addition, the values contained within frames compete for use in any given situation.[3] When one frame and its integrated value "wins," people tap into accessible patterns of higher-level reasoning that guide subsequent responses. Thus, how social issues are aligned with specific values has a significant impact on how the public reasons about and evaluates both the causes of, and solutions to, social problems. In short, values are a potent reframing tool that can be used to align messages with the public's interpretations.

However, public perceptions of social issues clearly show that finding an effective reframing value in a given situation is difficult; if an obvious one existed, advocates would be using it and its success would be apparent in the way people think. We define a successful value as one that is both "sticky," or easily repeatable and applied to various situations, and, importantly, that also yields the desired directional orientation; that is, a good value is one that allows ordinary people to appreciate meaningful policy solutions. FrameWorks' research on DML demonstrates that the dominant modes of thought on learning, education and digital media are highly unproductive in relation to the goals of DML advocates and education reformers more generally. FrameWorks has a potent advantage in this search for effective values: We are not starting from scratch. FrameWorks' existing research provides evidence that we can find effective values for communicating about education. In this way, the current study builds on previous efforts by exploring the relationship between values — both new values that have emerged from FrameWorks' qualitative research on DML as well as values that have previously been tested on other, related issues — and new sets of outcome measures that capture the goals of DML issue experts and advocates. The goal of the study is to identify values that have the potential to instill different ways of thinking about DML.

Expert-Public Gaps in Understanding

At its core, the field of DML revolves around blending these two domains to create more effective practices of teaching and learning. Before starting to discuss effective values, we need to review the perceptual barriers that inhibit support for this blend in the general public. FrameWorks has discovered a great deal about pervasive modes of thinking, which we call

dominant cultural models, that shape people's attitudes toward digital media, learning and the intersection between the two. Through a set of one-on-one interviews, focus groups (called Peer Discourse Sessions), and media content analyses, FrameWorks has identified the gaps between expert and public understanding that messages need to cross if they are to be productively understood and interpreted by citizens and policymakers. Here, we do not attempt to address, nor discuss, every potential pitfall; rather, we concentrate on those gaps that an effective value has a good chance of bridging.

For our purposes, expert understandings of DML can be reduced to a few main points uncovered by FrameWorks' in-depth expert interviews and literature reviews. Here, we concentrate on those areas that pose the greatest conflict when compared with the views that the public brings to this issue. This summary, then, represents the core messages of DML that experts are trying to communicate in their messaging. Contrasting this expert account with the public's existing beliefs pinpoints the terrain that effective values must traverse. Specifically, our interviews with experts in the field suggest the following as key points to be communicated:[4]

1. Productive future lives necessitate new skills and, in turn, new means of learning.

2. There is a deep, powerful function that digital media can play in creating more effective learning.

3. Increasing access to digital media is a key aspect of successfully reforming the education system.

4. Learning is an active skill-based process.

5. Teachers play a pivotal role in effective learning, but this role is as mentors in a student-centered model of learning.

These points form the basis for the outcome measures detailed below; in other words, they represent the communication objectives that values are trying to reach.

The challenge in communicating these messages became apparent through a series of "cultural models" interviews that FrameWorks researchers conducted with members of the American general public on issues of DML. Findings from these interviews demonstrate that Americans' understanding of DML issues differs significantly from the expert account summarized above. In fact, many of most dominant ways in which American understand these issues act as perceptual barriers to endorsements of these expert messages.

Specifically, Americans hold a powerful, implicit assumption in thinking about learning in which current failures in educational outcomes, coupled with uncertainty about the future,

necessitate "going back to the basics" and "the good old days," "when all kids knew how to read." This "back to basics" thinking about skills and learning comes together with a deep zero-sum understanding of educational resources to structure a staunch resistance to "new" or "innovative" approaches to learning which, from this vantage point, are seen as taking educational resources away from "what we have always focused on in education." In addition, there are powerful cultural understandings of technology — as a recreational distraction — and scholastic learning — as by definition hard, and entailing the limitation of distractions — that contribute to Americans' resistance to the core idea of the DML movement. Together, this cultural stew of powerful implicit understandings leads the typical interviewee to, at best, demand that schools restrict or carefully monitor access to digital media or, at worst, eschew this affront to traditional learning.

This, then, is the challenge our research seeks to address — to frame the expert messages distilled above in such a way that they do not spark this unproductive tinder of culture, and instead ignite patterns of understanding from which people can more productively consider expert messages.

In order to meet this challenge, our experimental design employs two components: 1) *values*, whose conceptual role we described above, and 2) outcome measures, which attempt to distill the crux of the expert account into a set of propositions that our respondents should be more likely to endorse after being exposed to an effective value.

Candidate Values

FrameWorks' research has demonstrated the effectiveness of several values at positively orienting people toward education reform.

One of the most effective values we have tested is *Future Preparation*.[5] (The exact wording of each of the candidate values is presented in the Appendix.) Constructing a message around *Future Preparation* means including notions of the challenge to our country's future, the need to bring in new skills, and planning for the world of tomorrow. In addition, we include notions of *Common Good* in this value in an attempt to give respondents a sense of what is at stake for the U.S. when we talk about education.

Pragmatism is another value that has proven to be successful in previous FrameWorks studies.[6] The idea here is that we need to take a practical, step-by-step approach to solving our nation's problems. *Pragmatism* has been demonstrated to be particularly good at overcoming senses of determinism and fatalism in public thinking — notions that the system is broken beyond repair and that problems are intransigent. *Pragmatism* is intended to provide a different perspective on current challenges — that there are proven and practical solutions we can use to solve problems and fix the system.

Progress is closely related to *Future Preparation* plus *Common Good*, the signal difference being that *Progress* is focused on moving forward from the current position, while *Future Preparation* plus *Common Good* revolves around thinking about the future without reference to current states. *Progress'* inclusion tests whether a cousin of the *Future Preparation* value would be more effective in the face of the obstacles discussed above. Like *Future Preparation*, *Progress* is expected to work as an antidote to "back to basics" ways of thinking about education and promote views of the necessity and potential for technology.

The value of *Global Competition* has become a staple in the messaging of education reform organizations and in the media.[7] We find that the invocation of this value does little to change Americans' attitudes toward education and, in many cases, actually depresses support for progressive policies and programs. This is not to say that all elements of the *Global Competition* value are equally ineffective — FrameWorks' previous research suggests that the idea of workforce preparedness may prove successful based on the logic outlined in the section on *Future Preparation*. Therefore, *Global Competition* was tested for two reasons: to benchmark current communications practices, and to see if, with a stronger dose of workforce preparation, the value might have positive effects.

Civic Development/Empowerment is another value that is currently deployed in the education reform field, and more specifically by DML advocates. The value is intended to highlight the importance of learning and education in relation to its potential to foster civic engagement. Thus, this value portrays education as a platform for students to learn, discuss and participate in communities and society. It is included here because of its use in expert and advocate communications materials.[8]

Scientific Authority is intended to capture the argument that we need to adopt changes in the way we educate and learn insofar as such changes are demonstrated to be effective in scientific research — a kind of "science says" argument. This value is included to test whether such a rationale is sufficient to displace the obstacles impeding the public's adoption of new approaches to education, and because it is frequently used in expert and advocate communications materials.[9]

The value of *Connection* works in much the same way as *Civic Development*, the signal difference being that *Connection* is a less political concept. Instead, this value asserts that advances in learning and education can move children away from a state of isolation. *Connection* is frequently used in expert and advocate communications materials as well, with visions of a connected society permeating requests for spending on technology.[10] Once again, the value is included to see whether this current practice has the potency to displace thinking driven by extant dominant cultural models that the public brings to bear in thinking about issues of DML.

Outcome Measures

The outcome measures deployed in this experimental survey were developed as ways to rigorously assess the performance of candidate values and were distilled from the elements of the expert core story described above. These outcome measures were combined into three scales, which are batteries of related questions. Each scale taps into a critical dimension of the DML domain.

The first, *Attitudes Toward DML*, taps into respondents' broad feelings about DML. In a way, this represents the first hurdle that the values must overcome when reorienting perspectives. This scale taps into twin pillars in the expert core story. First, that digital media have a deep, powerful function to perform, as opposed to being more of an adjunct to — or affront on — traditional methods. Second, that experts strongly advocate expanding access to digital media, while members of the public often believe access to digital media distracts from learning and education and so should be limited. *Thus, the questions in this scale capture the degree to which respondents see digital media as a useful tool to incorporate into education as opposed to an unproductive distracting adjunct.*

The second scale, *Benefits of DML Programs*, measures the degree to which respondents recognize the benefits of digital media in learning that experts tout. So when experts discuss how productive future lives necessitate new skills and, in turn, new means of learning, they forecast a tangible set of benefits that accrues to children under the new paradigm. This scale enumerates those benefits with an eye toward seeing whether respondents agree that they are, in fact, benefits. We would expect productive values to increase levels of acknowledgement that these outcomes are indeed beneficial. *Thus, the questions in this scale capture the degree to which respondents recognize the benefits of digital media that stem from its incorporation into education.*

The third and final scale, *Curriculum Policies*, assesses respondents' support for concrete policy steps to implement digital media programs or change the learning paradigm in current educational contexts. For example, experts are inclined to support notions that teachers be mentors and guides in the learning process, as opposed to "fact dumpers." In addition, this scale measures whether respondents are willing to take a more expansive view of the educational process insofar as it includes more active and experiential learning. Here again, the expectation is that successful values would increase respondents' willingness to take these steps to alter the format and content of learning and education. *Thus, the questions in this scale assess the respondents' willingness to take concrete steps toward incorporating digital media.*

DATA

The findings reported here are drawn from an experimental online survey designed by the FrameWorks Institute and administered by YouGov Polimetrix.[11] The survey took place between November 3 and November 29, 2011. The study sample includes 3,200 registered U.S. voters, weighted on the basis of age, gender, education level and party identification to statistically represent all adult registered voters in the United States. Of these, 400 respondents were randomly assigned to the control group, which saw no treatment but answered all outcome questions, while the remaining 2,800 respondents were randomly assigned to one of the experimental conditions, in which case they read one of the seven value treatments before answering the sets of outcome questions.

Analysis

A value's effectiveness is measured by determining the effect that exposure to that value's treatment has on the outcome measures. Multiple regression was used to compute these estimates. This statistical technique fits a straight line to the pattern of data made up of all the variables in the analysis. The line is fitted simultaneously across all dimensions of the data. We report the slopes of this line as regression coefficients that chart the magnitude of each variable's effect, so the larger the coefficient, the greater the effect of the value on the outcome measure. Because each of the treatment variables is scaled to 100 points, the coefficients can be interpreted as percentages.

Multiple regression has a salient advantage as a way to analyze the results of this experimental design. The coefficients are accompanied by a measure of statistical significance that represents the chance that the estimate is actually equal to zero. For the *Progress* value, the Attitudes Toward DML scale estimate significance level is less than 0.05, which means that there is a less than 1-in-20 chance that the estimate is actually zero. Low significance levels — ones that indicate a lower likelihood that an estimate is due to chance — increase our confidence in the results. Below, we examine the values' performance on each outcome measure in turn, and then move on to discuss more general findings in the last section.

Findings

Table 1 reports each value's effectiveness in elevating support for the Attitudes Toward DML scale. These finding indicate that two value treatments — *Progress* and *Pragmatism* — elevate support for these polices at levels that surpass conventional statistical significance cutoffs.

Table 1. Value Treatments' Effects on DML Attitudes

Value	Effect	Significance
Progress	4.1	**
Pragmatism	2.9	+
Future Prep. + Common Good	-0.1	
Global Comp. + Workforce Prep.	2.4	
Scientific Authority	2.4	
Civic Development/Emp.	2.3	
Connection	-1.6	

"**" and "+" indicate significance levels of < .05 and < .15, respectively

Here, *Progress* outperforms all other values, causing a four-percentage-point increase in favorable attitudes to digital media as a learning tool. It appears that the emphasis on moving forward in the here and now resonates powerfully with the expert notions. Further, this increase represents a substantial jump — sufficient to tip the balance in many public discussions. *Pragmatism* also performs well on this scale, but does not achieve the movement or significance levels of *Progress*.

Notable for its poor performance on this scale is the value of *Connection*, which causes a one-and-a-half percentage point drop in favorable attitudes toward DML. This outcome supplies the first evidence of a backlash effect that we will discuss in the Conclusion.

Table 2 details the values' performance in relation to the Digital Media Benefits scale. These estimates again indicate that two values treatments reached conventional levels of statistical significance — in other words, the results show that we can say with confidence that the values of *Progress* and *Pragmatism* increase acknowledgment of the educational benefits of using digital media as a learning tool.

Table 2. Value Treatments' Effects on Acknowledging Digital Media Benefits

Value	Effect	Significance
Progress	3.3	*
Pragmatism	2.8	+
Future Prep. + Common Good	0.3	
Global Comp. + Workforce Prep.	1.9	
Scientific Authority	1.9	
Civic Development/Emp.	2.5	
Connection	-1.5	

"*" and "+" indicate significance levels of < .1 and < .15, respectively

Once again, *Progress* and *Pragmatism* are the top two performing values. Again, we see that *Connection* depresses support for this scale.

Table 3 reports each value's performance on the Attitudes Toward Interactive and Experiential Learning measure. Again, these results show that two values — *Progress* and *Pragmatism* — create more productive attitudes toward interactive and experiential learning at conventional levels of statistical significance.

Table 3. Value Treatments' Effects on Attitudes Toward Learning

Value	Effect	Significance
Progress	4.3	**
Pragmatism	3.0	+
Future Prep. + Common Good	1.6	
Global Comp. + Workforce Prep.	2.3	
Scientific Authority	1.2	
Civic Development/Emp.	1.1	
Connection	-0.1	

"**" and "+" indicate significance levels of < .05 and < .15, respectively

Once again, we see the same pattern of results; *Progress* and, to a lesser degree, *Pragmatism*, outperform the other values.

CONCLUSIONS

To summarize our findings:

- The value of *Progress* was the top performing value across the board, with strong movement on all three outcome measures.

- The value of *Pragmatism* performed almost as well as *Progress* on the three outcome measures.

- None of the other values produced meaningful movement on any of the target variables.

- In fact, the value of *Connection* exhibited detrimental effects across the outcome measures.

The main result of this study is the strong showing by the value of *Progress* at reorienting respondents to be more supportive of the main tenets of experts' views concerning DML. We believe that the success of this value is tied to the linkage between the idea of *Progress* and enthusiasm for new technology. Once awakened, the optimism accompanying this value allows people to think differently about what a role for technology in learning would look like and the potential benefits that such a synthesis would confer. Thus, when primed with the idea of *Progress*, people become more supportive of the components and goals that comprise the DML expert story.

Due to its strong performance in the experiment, FrameWorks strongly recommends that DML advocates use the value of *Progress* in communicating about their issues, in order to supply a compelling motivation for endorsing the arguments contained therein. Results suggest that mentions of *Progress* at the top of communications can productively reorient the public's views and overcome many of the negative default reactions to combining concepts of technology and learning. In this vein, notions of danger and distraction, two relatively automatic reactions to proposals to integrate digital media in education, are squelched when members of the public are primed with a *Progress*-oriented frame. In this way, the elements of *Progress*, such as acting now to improve education by incorporating up-to-date methods and moving forward toward a tangible goal, stand as powerful tools in efforts to increase the likelihood that citizens will accept and endorse DML messages.

On a related note, the value of *Pragmatism* was nearly as successful across the outcome measures. This suggests that communicators would do best not to present a "pie in the sky" version of *Progress* but, rather, take advantage of the natural symmetry between these two values to temper their message of moving forward with notions that such movement can be best achieved by taking informed, sequential, practical and common-sense steps towards goals.

It is equally important to point out the values that failed to move support for the outcome measures. This is especially true here, as many of the values that failed to achieve positive effects were drawn directly from extant communications practices.[12] To the extent that advocates are using these values, they are wasting valuable communication resources and real estate, or, as our research shows, may actually be working against their aims. Some of these unproductive values are staples that almost automatically arise when experts discuss their work. Here, references to *Global Competition* come to mind. This value is not only easy to deploy, but seems almost intuitively productive. In fact, this research shows that while *Global Competition* may be easy to incorporate into communications, its presence as a value does not engender productive change in respondents' views on, or support for, DML issues. This is likely due to this value's activation of "us versus them" thinking, as evidenced in FrameWorks' qualitative research on this and other issues.[13] As a point of fact, employing *Global Competition* as an orienting value should be avoided. In similar fashion, employing values of *Scientific Authority* and *Civic Engagement* should be avoided, as well.

The same point, even more strongly, applies to the value of *Connection*. Advocates may firmly believe in the promise of a connected future, where digital media can be an effective means of tying individuals and communities together. This is certainly a worthwhile goal for our educational system and society more generally. However, empirical evidence shows that this social analysis is not good communications practice, at least not at the top of a communication where the reorienting work of a value is most powerful. This this is a case where the end of a communication looks dramatically different from its means. The evidence produced by this experiment suggests that the public has a negative reaction to the notion of *Connectedness* when used as a lens on DML. Specifically, exposure to this value caused a retrograde movement in respondents' views on all three outcome measures. This kind of backlash should serve as a note of caution to digital media advocates in relying on the idea of *Connection* to orient people to the benefits of DML.

Despite this values backfire, this study finds ample reason for optimism; there are two values that generate the kinds of views and perspectives that advocates seek to inculcate. It is extraordinary that *Progress* and *Pragmatism* produced remarkably consistent gains on all the target variables. Moreover, these were substantial and statistically significant movements. These values represent valid and beneficial choices for DML communicators.

The experiment discussed here provides a solid empirical base from which to strongly recommend that DML experts and advocates employ combinations of the values of *Progress* and *Pragmatism* in their communications. As described above, these two values are consonant and complementary. Pragmatic progress or progressive pragmatism exist within the realm of sensible message choices. That is, these values fit together and create a natural

synthesis that is readily understandable to members of the public. We believe this combination of values at the top of messages could translate into four to six percentage points of movement on the target dimensions, a profound gain in the public's appreciation of the goals of the DML enterprise.

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

[2] Rokeach, M. (1973). *The nature of human values*. New York, NY: The Free Press.

[3] Nelson, T.E., & Willey, E.A. (2003). Issue frames that strike a value balance. In S. Reese, O. Gandy, & A. Grant (Eds.), *Framing public life* (pp. 227-243). Mahwah, NJ: Lawrence Erlbaum.

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

[5] Bales, S.N. (2010). *Framing education reform: A FrameWorks MessageMemo*. Washington, DC: FrameWorks Institute.

[6] Ibid.

[7] Arvizu, S., Santo, R., Arena, D., Wardrip, P., Johnson, B., Simon, A., et al. (2012). *A field frame analysis of digital media and learning in the education reform field: A FrameWorks research report*. Washington, DC: FrameWorks Institute.

[8] Ibid.

[9] Ibid.

[10] Ibid.

[11] For methodological details, see www.yougov.com.

[12] Ibid.

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

APPENDIX: EXACT WORDING OF VALUE TREATMENTS AND OUTCOME MEASURES

Values

(Insert in all:) The following passage was taken from an editorial that appeared in a major newspaper.

Progress

Header: Our Nation's Progress Depends on Improving Learning

As we set out to improve learning, our most important goal should be to move our country forward. To do this, we must make sure that our children's learning is not outdated and that we are advancing. This means identifying and teaching our children the skills that they and our country will need to take the next step towards improvement. If we fail to act with this goal in mind, our country will be stuck with old ways of learning that are unsuited for the needs of tomorrow. (87 words)

Sidebar: By improving learning we can move our country forward.

Pragmatism/Relevance

Header: A Common-Sense Approach Will Improve Learning

As we set out to improve learning, our most important goal should be to use a common-sense approach. To do this, we must make sure that our children's learning is practical and designed to meet our needs. This means identifying and teaching our children the things that they will need by replacing irrelevant programs with those that provide useful skills. If we fail to act with this goal in mind, our country will continue to approach learning with impractical methods and solutions instead of proven techniques. (87 words)

Sidebar: Improving learning requires a common-sense approach.

Common Good plus *Future Preparation*

Header: Preparing our Country for the Future Depends on Improving Learning

As we set out to improve learning, our most important goal should be to prepare our

country's children for our common future. To do this, we must make sure that our children's learning contributes productively to our society. This means identifying and teaching our children the skills that would ensure our common well-being in tomorrow's world. If we fail to act with this goal in mind, our country's lack of preparation will harm us all in the future. (87 words)

Sidebar: By improving learning we can prepare our country for the future.

Global Competition/Workforce Preparedness

Header: Winning the Global Competition Depends on Improving Learning

As we set out to improve learning, our most important goal should be to make our country's workers competitive in the global economy. To do this, we must make sure that our children's learning prepares them to compete with workers in other countries. This means identifying and teaching our children the skills that would allow them to perform as well as children from other countries. If we fail to act with this goal in mind, other countries will pass us by. (87 words)

Sidebar: By improving learning we can win the global competition.

Scientific Authority

Header: The New Science of Education Will Improve Learning

As we set out to improve learning, our most important goal should be to pay attention to what scientists know about how children learn. To do this, we must make sure that our children's learning is informed by experts who know what works and who can update our thinking. This means identifying and teaching our children the skills that learning science has shown to be important. If we fail to act with this goal in mind, we will not be taking advantage of the latest research about learning. (87 Words)

Sidebar: Improving learning requires a new science of education.

Civic Development/Empowerment

Header: Civic Participation Will Benefit from Improved Learning

As we set out to improve learning, our most important goal should be to encourage children to participate in civic life. To do this, we must make sure that our children's learning helps

them become active citizens who can work on important issues that our country faces. This means identifying and teaching our children the skills that empower them to participate in society and create positive change in the world. If we fail to act with this goal in mind, we risk losing our country's vibrant democracy. (87 Words)

Sidebar: Improving learning will increase civic participation.

Connection

Header: Community Connections Will Benefit from Improved Learning

As we set out to improve learning, our most important goal should be to connect our children with people and places that expand their horizons. To do this, we must make sure that our children's learning allows them to interact and share information and ideas. This means identifying and teaching our children the skills they will need to work with people from a variety of backgrounds. If we fail to act with this goal in mind, we may lose our chance to connect and collaborate with others in creating a better country. (87 Words)

Sidebar: Improving learning will increase community connections.

Outcome Measures

(Insert in all:) The following are a number of statements about education and learning. Please indicate whether you agree strongly, agree, disagree or disagree strongly with these proposals:

Attitudes toward DML[14]

1. Our educational system should incorporate digital media in order to stay in touch with how knowledge is produced and used in our world today.

2. Students today need digital media skills to prepare for the challenges and opportunities of a changing economy.

3. Our schools should continue to rely primarily on textbooks and teacher lectures in order to educate our children (reverse code).

4. We need more programs to train teachers to use and apply digital tools in the classroom.

5. Having access to digital media programs will help improve students' education.

6. Parents need access to good information on how to mentor their children in using digital media effectively.

Benefits for Children/Appropriate Use[15]

1. Digital media can improve students' basic skills, including reading, writing and math.

2. Using digital media can improve children's ability to solve problems.

3. Digital media provides an opportunity for students to learn about and get involved in local and global communities.

4. Digital media distracts children from learning and should mainly be used for recreation (reverse code).

5. Schools' web filtering, that is the use of software that prevents accessibility to some websites, should be less strict at higher-grade levels.

6. Students should be permitted to publish their artistic, intellectual and civic products on the Web without restrictions on who may have access.

Curriculum Policies[16]

1. Schools should emphasize more hands-on, experiential learning rather than merely drilling the basics.

2. Students should receive school credit for outside school activities that advance their learning.

3. School curricula should integrate digital media sources to make learning relevant to students who live in an increasingly high-tech world.

4. School districts should allow students to take high-quality online courses that will count toward their high school diploma.

5. Students should be able to contribute to what is taught and how it is assessed in the classroom.

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[14] The factor analysis of these items accounted for 53 percent of the total variance.

[15] The factor analysis of these items accounted for 44 percent of the total variance.

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