

The Media Debate

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Abstract: In 1983, Richard Clark, reviewing the literature on instructional technology, stated that instructional media have no effect on learning. He claimed that “media are mere vehicles that deliver instruction but do not influence student achievement any more than the truck that delivers our groceries causes changes in nutrition,” and his statement has attracted a flood of response from educational researchers for over thirty years. In response to criticism, Clark proposed a “replacability test,” a challenge that there is no medium that can’t be replaced with another instructional method that will produce the same result. Due to its length and inconclusiveness, some researchers, such as Richard Mayer (2010), have suggested that the media debate is unproductive, and researchers should instead direct their attention to finding the most effective instructional techniques. This paper proposes, as does Sharon Shrock (1984), that the media debate is well worth revisiting because it involves issues of central importance to instructional research. The debate is also worth another look because the development of new media has shifted the context of the discussion.

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1. Introduction

In 1983, writing a now famous review of the literature on instructional technology concerning the use of media in instruction, Richard Clark claimed that any positive effects that educational technologies have on instructional results are not due to the media used, but result from the teaching content embedded within them. There was a flood of response which has not abated. Recently, though the debate whether media do intrinsically produce learning effects has become less mainstream, it is still a topic that is discussed, and its major points are worth reviewing. Universities still require students to become familiar with the arguments, as Clark notes (2001 page 2).

2. The Beginning of the Media Debate

Clark began the media debate in 1983 when he wrote an article which claimed that media do not influence learning. His now famous and often quoted metaphor was that of a truck delivering groceries.

The best current evidence is that media are mere vehicles that deliver instruction but do not influence student achievement any more than the truck that delivers our groceries causes changes in nutrition... only the content of the vehicle can influence achievement. (Clark quoted in Simonson et al. 2012 page 7)

Clark was writing in response to what he considered to be a pervasive, uncritical, sentiment in the field of teaching that using newer technologies is somehow “better” than more traditional “chalk and talk” methods.

This research [of the influence of media on learning] has led to so-called “media selection” schemes or models (eg., Reiser & Gagne, 1982). These models generally promise to incorporate existing research and practice into procedures for selecting the best medium or mix of media to deliver instruction. Most of these models base many of their prescriptions on presumed learning benefits from media (Jamison, Suppes, & Welles, 1974). (Clark 2001 page 2)

Clark at the time concluded that media have no effects on instruction, they are, like trucks, delivery

mechanisms that merely transport instructional content.

3. The Media Debate: Major Arguments

In 1994, reviewing the reaction to his previous article a decade earlier, Clark mentions his bewilderment concerning the reaction that occurred as the result of his previous article being published. He points out that other researchers had also concluded that media themselves do not have an effect on instruction, and that what he had done in his 1983 article was merely make this argument more explicit.

I made the explicit and clear claim that there were no learning benefits possible, and urged that we not continue to waste effort on the question until a “new theory” was developed. I intended to stimulate discussion and I was not disappointed. (1994 page 22)

Clark’s article in 1983 has certainly stimulated discussion, and it has done so for over thirty years.

One of Clark’s key arguments is that different types of media can give the same results, and if this is so, then it is not the medium itself, but rather different attributes embedded within a medium that are responsible for any effects. He points out that “If there is no single media attribute that serves a unique cognitive effect for some learning task, then the attributes must be proxies for some other variables that are instrumental in learning gains” (1994 page 24). Clark also mentions a “replaceability test.” He proposes, in a challenge to other researchers, “to find evidence, in a well designed study, of any instance of a medium or media attributes that are not replaceable by a different set of media and attributes to achieve similar learning results for any given student and learning task. This replaceability test is the key to my argument since if a treatment can be replaced by another treatment with similar results, the *cause* of the result is in some shared (and uncontrolled) properties of both treatments.” (1994 page 22 emphasis in original).

Clark mentions Petkovitch and Tennyson (1984) felt that certain media attributes contribute to learning, giving the example of a computer simulation teaching

skills that are necessary for flying.

They seemed to agree that media comparison studies are useless but claimed that certain media attributes make necessary contributions to learning. The evidence they offered was a study where a computer simulation was used to teach students some skills required to fly a plane. (Clark 1994 page 25)

Clark counters that people learned to fly before there were computers, though his comment ignores some advantages that computer simulations have over human instructors, particularly for large numbers of dispersed students. It should also be noted that crashing a computer simulation of a jet is somewhat different than crashing a real jet. Certainly there is an initial cost in software development, but this is offset over time as it is used in instructing larger and larger numbers of students.

Software is suited to completion of many tasks that would be difficult for a human instructor to engage in. One example of this is software that tirelessly provides repetitive drill of poorly performed items of a question bank to improve the user's performance on rote learning types of tasks, such as achieving a passing score on an examination. Clark would counter that such advantages of cost effectiveness and efficiencies in delivery are examples of delivery strategies, rather than methods of instruction. He points out that:

Delivery technologies influence the cost and access of instruction and information. Design technologies make it possible to influence student achievement. In my view, there is a long history of a basic confusion between these two technologies that strangles our study of the contribution of media. (Clark 1994 page 23)

In 2001, in a review of the media debate, Clark edited a series of contributions to the debate, including his original 1983 article and other articles that expand the debate and contribute different viewpoints. Of particular interest is the contribution of Robert Kozma. Kozma feels that Clark's example of a truck delivering groceries is not an appropriate metaphor, since media do not merely "deliver" instruction. He suggests that "The theoretical framework supported by the current review presents an image of the

learner actively collaborating with the medium to construct knowledge" (2001 page 138). That is, Kozma is saying that media do not merely deliver content, but allows students to interact with content.

In *Multi-Media Learning* (2010) Richard Mayer notes that many regard the media debate as unproductive. He notes that it is very difficult to separate media attributes from the media in which they are contained. He further points out that many of the previous articles on the media debate have been flawed, poorly controlled, or both. Rather than focus on the media themselves, he suggests that researchers instead devote more time to attempt to find the best techniques to produce effective learning techniques.

Media scholars have come to the conclusion that it is not productive to continue with traditional media research in which one medium is compared to another ... Media research can be criticized on empirical, methodological, conceptual, and theoretical grounds. First, media research has a somewhat disappointing history, with inconclusive empirical results ... Second... there are serious methodological confounds in comparing learning from two media... a third problem with media research is that learning depends on the quality of the instructional message rather than on the medium per se... The fourth problem with media research concerns the theory that underlies it. Research on media effects is based on an information-delivery view of learning in which media are delivery systems for carrying information from teacher to learner... This theory conflicts with the cognitive theory of multimedia learning and with several key ideas in cognitive science ... (Mayer 2010 page 230)

4. Why the Media Debate Matters

In 1983 Clark expressed his conviction that, unless some new research paradigm is introduced, further research on the media debate is wasteful.

It seems reasonable to recommend, therefore, that researchers refrain from producing additional studies exploring the relationship between media and learning unless a novel theory is suggested." (Clark 2001 page 10)

Clark has, with considerable evidence supporting his

conclusions, suggested that no further research is needed in the media debate. Mayer has also suggested that the media debate is not very productive. Is there some reason, then, to revisit the debate?

There are some very good reasons to consider the media debate when selecting instructional media. As Sharon Shrock notes, "The debate has merit because it helps us to clarify who [instructional technologists] are, what we are trying to do, what we know and how we might best invest the limited resources devoted to future research (1994 page 49)." Shrock divides the possible responses to the debate into three categories. In a section entitled "The Logic and Definitions of the Debate," she points out that the argument is influenced by the definitions used for the major terms used to construct it. She notes that Clark defines terms in ways that favor his own position. Since this sort of definitional problem occurs in other fields of enquiry, it is a good exercise to consider what the operational terms of the argument are before proceeding with any debate. In a section entitled "Behind the Debate: Strengths and Weaknesses in Instructional Technology," Shrock expresses her opinion that the media debate is important in reflecting constructively on the field of instructional technologies, stating that "As professionals, we would do well to consider seriously the merits of these implications of the media/influence argument. I agree with Clark that an uncritical endorsement of media and a failure to distinguish between instructional design technology and delivery technology are very serious problems for our field" (1994 page 50). Shrock also notes that other areas of educational research could apply this debate to their own areas of inquiry. She points out that:

I think it is notable that we do not see a serious debate over the hypothesis that "*teachers* will never influence learning." Yet our colleagues in the larger field of education are not asking this or related questions about their preferred medium, the teacher. If Clark's argument is true of media, it must be true of teachers. And if our independent variables are collections of ill-defined media attributes, theirs tend to be even more cumbersome, for example, cooperative learning. (1994 Page 51 emphasis in original)

What Shrock seems to be advocating here is viewing the debate "writ large" in a way that allows considerations of cost effectiveness, as well as educational outcomes, in employing educational technologies to provide the most benefit to students as well as the institutions that serve them. In her third and final section, entitled "Consequences of Acting Upon Either Position," Shrock considers the position of Clark, that media have no effect on construction in contrast to the opposing view of Kozma who disagrees. Shrock concludes that:

"Like most worthy debates, there is reason, insight, and merit in both positions. To state my reaction to the pieces in the most blunt and over-simplified terms, I think they are both right and they are both wrong. More specifically, I like Clark's research question and Kozma's research methods. However, even though I like Clark's search for the underlying instructional methods that are required for learning, I don't think we will ever discover a single set of stimuli essential to learning. And Kozma is correct in pointing out that instructional technologists don't control technology. We should not remain blind to the effects of its growing presence in our lives, even though that presence was not orchestrated by us. (Shrock 1994 page 52)

The machinery and technological systems used to deploy media in all their forms often cost money as well as resources in terms of commitment of staff and students. Is it imperative that the media debate stay at the forefront of decisions concerning the sorts of instructional technologies employed. As Clark has convincingly shown, the medium is not the message. And, in contrast to Marshall McLuhan who in 1964 famously stated that "The medium *is* the message" (emphasis added), Clark suggests that media are merely conveyances that are used to deliver instruction. What Clark has done is throw into relief the difference between technologies and instructional content in a way that makes it imperative to consider the content that is to be delivered before the "truck" is selected for delivery. Others have suggested that the type of media "truck" chosen can, in turn, influence the sorts of messages that can be delivered, perhaps, to extend the metaphor somewhat, even put students in the driver's seat.

Some of the best reasons to return to reexamine the media debate are given by Clark who states:

Like many interesting issues in education, this one cannot be fully understood from an analogy or from oversimplified accounts of the arguments. Many of the key issues in the debate are connected to the very foundation of our reasoning about the scientific method, the design of experiments, and how we reason about what causes things to happen. Issues connected with these topics are often poorly understood.” (2001 page x)

Though the debate may appear dated, it is a useful exercise to return to its roots, not only in order to carefully select instructional technologies, but because the debate deals with issues that remain important, even though the instructional technology landscape has changed.

5. The Media Debate in the Age of Twitter

The media debate began with Clark’s article in 1983. Though Clark reviewed “over six decades of educational media research” (Simonson et al. 2012) it is important to note that Clark’s article preceded many recent important technological developments, such as the World Wide Web, which have significantly changed the types of instructional tools available. Clark’s article appeared before personal computers were available. The Macintosh, for example, was first introduced in 1984. It was several years after this before the World Wide Web was introduced in the early 1990s. Even more recently, social networking tools, such as Twitter and Facebook, have altered the environment in which current electronic media are deployed. Though Clark feels that most effects achieved with media can be replicated by using another medium, or collection of media, it is difficult to envision how something like Twitter could be easily be replicated using a different medium. Certain media allow different sorts of communication to take place. A phone allows interaction with another person, Twitter allows broadcasting of small messages, called tweets, to many “followers,” and is known for being responsible for the rapid distribution of breaking news. One of the most famous cases of this was when US Airways flight 1549 crashed in the Hudson River in New York. People sending messages on Twitter

announced news of the crash before the major media.

Twitter, the increasingly popular microblogging service, was, as ever, leading the pack. When dozens of New York-based Twitter users started sending ‘tweets’ about a possible plane crash in the city, the news spread like wildfire across the Twitterverse. Indeed, Twitter users broke the news of the incident around 15 minutes before the mainstream media alerted viewers and readers to the crash. (The Telegraph 16 Jan 2009)

In the era of Facebook, Pinterest, LinkedIn, Twitter and many other types of social media, the media debate has taken on a new importance, and perhaps, shifted in form somewhat. Kozma noted that media are not just delivery mechanisms, but interact with users in unpredictable ways. His comments seem to have become more applicable as media evolves.

6. Conclusion

As Shock has stated, the media debate is important, since it throws several key features of instructional design into sharp relief, particularly the importance of selecting instructional techniques that will result in the best results. Though the media debate remains important, it is necessary to keep in mind that media have changed enormously in the past three decades. The media debate began before the World Wide Web was invented, before cell phones were introduced, and before personal computers became available. Recently, new forms of media have allowed social networks to form, and this has greatly changed the landscape in terms of the media tools available, and the way in which media and users interact. Anderson mentions that Siemens has proposed that a connectivist theory of learning is more appropriate for the digital age.

According to Siemens (2004), connectivist theory is for the digital age, where individuals learn and work in a networked environment. As a result, we do not have control over what we learn since others in the network continually change information, and that requires new learning, unlearning old information, and/or learning current information. (Anderson 2008 page 34).

Finally, it seems that the emphasis of the major arguments in the media debate is on media, the software and hardware used, as well as various

instructional techniques used, rather than on people. The voices of students are seldom heard. It is interesting that thousands of pages have been written about the effect of media on learning without much of a contribution from the people most affected by instruction; the students themselves. Richard Clark is a well-known researcher who is responsible for initiating the media debate and contributing extensively to its development. Richard Mayer is respected as one of the most prolific writers on Multi-Media Learning (on his faculty Website at UC Santa Barbara it states “[Mayer] was ranked #1 as the most productive educational psychologist in the world for 1991-2002 and for 2003-2008 by *Contemporary Educational Psychology*”). Yet, in both Clark’s text reviewing the media debate *Learning From Media: Arguments, Analysis, and Evidence* (2001) and Meyer’s text *Multi-Media Learning: Second Edition* (2009) there is one word that does not appear in either index—the word “student.”

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