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The Clark-Kozma Debate in the 21st Century

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ABSTRACT

This paper takes a fresh look at the Clark/Kozma debate from the perspective of 21st century new media technologies in general and serious games in particular. After a brief re-cap of the key elements of the debate, a relatively recent article by R.E.Clark is summarized that brings serious games into the conversation. Clark's allegations are addressed and the case is made that digital games form a distinct medium that can not easily be lumped in with other educational technologies. The author draws on over a decade of personal experience teaching with games to move the debate to the next level and offer some recommendations for when and how games can be used effectively in formal contexts.

Introduction

Everything old is new again. Complaints about the role and use of technology in education have been with us since Socrates declared that students should not be taught to write because he believed that writing diminished memory. Similar complaints have accompanied every other technology introduced into schools to assist teaching and learning, and digital games have their detractors as well as their champions. Richard E. Clark first began this debate in the 80's, when computers were just starting to be seen as instructional technology for formal education. The now-classic Clark/Kozma "media effects" debate (Clark, 1983, 1994; Kozma, 1991, 1994) has once again been revived by Clark in a relatively recent editorial in *Educational Technology Magazine* (2007), and he has now moved it into the serious games space. Clark argues that serious games have little to offer that improves upon traditional methods such as lectures. He continues to invoke his 'vehicle' analogy which describes the medium as simply the vehicle of delivery for instruction - something that is not really a part of the instruction itself. What Clark fails to acknowledge is that this analogy doesn't work with digital games (nor with a great many other modern technologies - especially those that are interactive in some way).

The Debate

In 1983, Richard E. Clark published the results of a meta-analysis that examined the influence of media on learning where he concluded that media do not influence learning under any circumstances. This is quite a strong position and it is one that Clark has stood by for nearly 30 years, in spite of whatever media developments have occurred in the mean time. The medium is not the message according to Clark, but rather it is merely the vehicle whereby instruction is delivered and has no influence on instruction, just like the truck used to deliver goods to a store has no influence on the groceries it carries. He expands the analogy by explaining that the only factors affecting the choice of 'vehicle' are practical ones, such as cost and distribution, and that the only influence on learning comes from the instructional method. Any benefit that comes from the use of media is passed off as essentially wishful thinking. In 1983, Clark recommended that researchers give up on exploring the relationship between media and learning unless new theories are suggested (Clark, 1983).

The response that triggered the 'classic debate' did not appear until 1991, when Richard Kozma met Clark's challenge and proposed a new theory outlining the synergy between media, content, and the interaction of the learner with that environment (Kozma, 1991). Kozma reviewed literature on the use of various media forms, including books and television, and concluded that various media have distinct symbol systems and processing capabilities that can compliment those of the learner and produce a unique experience.

In spite of various volleys back and forth by Clark, Kozma, and others there remains no *conclusive* evidence that any one medium is more effective than any other. Clark still uses this to conclude that specific media choices are irrelevant to educational outcomes, while Kozma remains optimistic that effects will become noticeable and suggests we consider the effects based on the attributes of the medium rather than the specific medium itself. It is noteworthy that Clark bases this conclusion on research conducted before the turn of this century as much has changed in the last decade. The “technology” of Educational Technology was vastly different now and discussing the effectiveness of media, potential or otherwise in 2007 using reports from more than ten years ago is like discussing today's traffic issues using data from 1820.

21st Century Clark

Times have indeed changed, and what we can do with the technologies available for use in education and elsewhere are fundamentally different in many ways from the kinds of technologies on which Clark based his conclusion of technology's irrelevance. In 1983 Clark concluded that "based on this consistent evidence, it seems reasonable to advise strongly against future media comparison research. Five decades of research suggest that there are no learning benefits to be gained from employing different media in instruction, regardless of their obviously attractive features or advertised superiority. All existing surveys of this research indicate that confounding has contributed to the studies attributing learning benefits to one medium over another and that the great majority of these comparison studies clearly indicate no significant difference." (Clark, 1983, p. 450)

While this position may have been defensible nearly three decades ago, to fail to acknowledge the monumental character of the changes brought on by technological developments in the last decade is to reveal a complete lack of understanding of New Media. In 1983 Internet protocols had just been standardized and Tandy produced the first laptop computer. Few people had home computers and even fewer had access to the Internet. "Mobile" phones were clunky and required mobile operators and a link to a land line – the 3G phones of today are part of the current century. In 1983 the Windows operating system had not yet been released and home videogame consoles were in their infancy. While the fundamentals of how computers function have not changed radically in the mean time, what we can do with computers and how we can access them and each other using them has changed a great deal, and the rate of change for newer, faster, and more ubiquitous ways to access communication technologies and the information now stored digitally continues to increase.

While many teachers are still acclimatizing to the use of email for communication, their students have already left email behind in favour of instant messaging, social networks and utilities like Google Docs (Rideout, Foehr, & Roberts, 2010). Clark's position that the choice of media is irrelevant to the effectiveness of instruction may come as a relief to many educators who must cope with shrinking budgets and a technological landscape that changes faster than anyone can keep up with, but it does not reflect reality and ultimately contributes to an ever growing digital generation gap. The current generation of students, known by some as “Gamers” (Beck & Wade, 2004) is the first to grow up in a world which, from a technological standpoint, is radically different from the one in which most of their teachers grew up, especially if we remember that the average age of teachers in Canada is about 45 (according to the demographics listed on the ad rate page at canadianteachermagazine.com). That means that the average teacher was trained when computers were hardly ‘personal’ at all, and the Internet was only accessible by universities and militaries.

Serious Games

In 2007, Clark revived his debate by claiming that serious games suffer from the same shortcomings as other media and that the lack of irrefutable evidence of superiority justifies the dismissal of the medium as a primary mechanism of instruction. Unfortunately, Clark's article contains numerous misapprehensions and errors which do more to undermine Clark's credibility

as a qualified critic than they do to support his claims. He again rehashes his 'vehicle' analogy and he continues to use largely outdated and selectively biased sources to support his claims. The next sections will address some of the misconceptions in Clark's arguments.

Serious Games ≠ Educational Games, But all Games are Simulations

The first issue that needs to be cleared up is that when it comes to games, the terms serious and educational are NOT synonymous. Serious games do include educational games, but the term also includes games for health, the military, social justice, exercise, politics, advertising, and more. Related to this is the notion that digital games and digital simulations are somehow distinct. It is interesting that Clark chose to reference the older edition of Gredler's chapter (1996) to support his argument about the confusion between games and simulations when a newer chapter was available (2004). The confusion over the distinctions between games and simulations is unique to education – the digital simulation community and the video game industry are not similarly confused (Becker & Parker, 2006). The software underlying digital games contains the same algorithms as those for discrete event simulations.

The Vehicular Metaphor Applied to Digital Games

It is possible to view games as receptacles for content rather than teaching methods as Clark would have us do, but *only* in a select subset of games such as puzzles and those that emulate a typical television game show format. Such games represent a very small portion of the ways in which games can be and have been used to facilitate learning, and in fact most educational games where the game component is obviously a receptacle for the content are now widely accepted as poor designs (Jenkins, 2002).

The design of a digital game is a complex process, as is the design of instruction and one cannot simply be imposed onto the other, nor can one hope to design a good educational game if one knows only about instructional design and not about game design - the success of any game for learning can only come from a successful synergy of both. Ultimately, if a game designed for learning is a success or failure, the credit (or blame) cannot be attributed to either the game design OR the instructional design, but must be placed squarely on the shoulders of both. The medium of the videogame isn't just a vehicle, like a car that gets us from one place to another. Even if we did want to stay with the vehicle analogy, we would have to use land vehicles, planes, ships, and submarines and not just trucks. They are all vehicles and they all get us from one place to another (much like successful instruction is supposed to do), but however much I like nice cars, I wouldn't want to have a Ferrari when what I really need is a submarine.

Instructional design is about message design and when it comes to games and other interactive technologies, the medium is absolutely part of the message. Designing instruction is a wicked problem (Becker, 2007) and it does instructional designers a great disservice to imply that the delivery method they use makes no difference.

Serious Games and Clark's Replacibility Test

In Clark's second original article written just 15 years ago, he argues that since no single media attribute forms a unique cognitive effect, the attributes are not important. Clark tells us that "Whenever you have found a medium or set of media attributes which you believe will cause learning for some learners on a given task, ask yourself if another (similar) set of attributes would lead to the same learning result" (Clark 1994, p.28). Humans are incredibly adaptable when it comes to learning, and when there is sufficient need or motivation most people are able to compensate for less than optimal conditions. Many students still learn what they need to even when the intervention is poorly designed or the facilitation is inadequate but one would hope that this would not form the basis of an argument for eliminating teacher training or careful instructional design.

We all know it is possible to make do with nothing but lectures and textbooks, but we acknowledge the importance of creating a learning environment that actively engages the learner in the task at hand (Schank, Berman, & Macpherson, 1999) and whether we refer to videogames as media or simply 'delivery methods' does not alter the fact that games and game technology offer a mechanism for 'learning by doing' that in many cases would be too expensive or dangerous to do in real life (Aldrich, 2009). There are lessons that simply can not be done without the use of modern technology. It is hard to imagine the space program succeeding without the help of the simulators they used for training.

More Errata

Although some of Clark's arguments appear to be quite convincing, they turn out to be somewhat less weighty when the correct numbers are inserted. For example, Clark claims that the gross revenue for serious games in 2005 was estimated at 500 million dollars as reported by Ben Sawyer (Clark, 2007). This number is off by a factor of 10 as Sawyer states that the real figure was closer to 50 million (Parker, Becker, & Sawyer, 2008). Similarly, he states that the development cost of a serious game is one to ten million dollars, when in fact that was the typical cost for a *commercial* title in 2005, which is also considerably less than commercial titles cost at the time Clark wrote his article. When using numbers to support an argument it always helps to have the right numbers.

The Challenge of Combining Instructional Design and Game Design

Games are indeed expensive to make if one is trying to make them look like big-budget commercial games. Many of the well-known commercial games have Hollywood-sized development budgets and development timelines that span several years. Obviously, most serious games and especially most educational games can not even begin to compete in these arenas and should probably not try to. Where does that leave us? The use of games for learning has tremendous potential, but we can not succeed if we merely try to copy the commercial model, nor can it succeed if we try to superimpose our favorite instructional design models onto a game. The design of effective and compelling games for learning requires creativity and a thorough understanding of instructional design to be sure, but it requires much more than this - it requires a thorough understanding of games AND of game design. One can not teach what one does not practice (Stroustrup, 2010) and, one cannot design what one does not understand. One would not expect to be able to write a best-selling novel if one had never read one, nor should one expect to be able to design a good game if one does not play games.

The truth of the matter is that technology, in and of itself, can neither improve nor impoverish instruction. "Instructional technology only works for some kids, with some topics, and under some conditions – but that is true of all pedagogy. There is nothing that works for every purpose, for every learner, and all the time." (Mann, 2001, p. 241)

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Biography

Katrin has taught Computer Science for over 30 years. She also teaches game design and technical writing. Her PhD in Educational Technology focuses on instructional game design. She's been teaching about digital games since 1998 and taught one of the first Digital Game Based Learning courses for an Education faculty.