

If Technology is the Medium and Instruction is the Method: Then

Do Media Influence Learning?

LST 403: Learning Environments – Dr. Bishop

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The debate between Clark and Kozma has instigated many discussions on the topic of whether or not media influencing learning. It has caused us to ponder the effects of technology on the way we learn. Clark, who first presented his opinion, claimed that “technology not only does not influence learning, but it will never influence learning, and that media is neither sufficient for nor necessary to learning” (Clark, 1994, p.23). Kozma responded to Clark’s basic assertion by agreeing, but hopes that future media research will prove more positive. Although Kozma agreed with Clark on his initial premise that media does not influence learning, Kozma contended that “if we can find a relationship between media and learning then we will be able to see how technology influences learning”(Kozma, 1994, p. 8).

#### Background on the Debate

A little background on the debate reveals the key issues that are critical to Kozma’s and Clark’s argument: Do media influence learning?

#### *Clark’s position*

In 1983, Clark’s argument was framed by the differences between instructional method and medium. According to Clark, media are only vehicles that deliver instruction; they do not influence student achievement, learning or motivation.

Critical to Clark’s argument was Salomon’s assertion that certain attributes of media, for example zooming, shaped the development of unique “cognitive processes” in the learners who used them. Clark (1994) used Salomon’s reasoning to try out his “replaceability” test “if no single media attribute served a unique cognitive effect, then the media attribute must be a substitute for a replaceable variable that is responsible for the learning gains” (p.22). Clark

decided that if the media or media attributes could be replaced without any differences in learning outcome, then the success is not due to the media, but to instructional method. Clark also supported his position by using studies that demonstrate media attributes sufficient to cause learning. He said these studies are “confounded” because they fail to control for instructional method (Clark, 1994).

### *Kozma’s position*

In 1994, Kozma fueled the debate, but because technology changes over time, he wanted to replace Clark’s original statement with “*Will media influence learning?*” Kozma said that the reason Clark held this position is because he had not yet found a relationship between media and learning. Kozma said that if we do not strive to understand the potential relationship between media and learning, then one will never be made and we are unlikely to ever understand the prospective for such a relationship (Kozma, 1994).

### Thesis

If technology is the medium and instruction is the method, then I am inclined to conclude that learning is influenced more by method than by medium. Although this statement gives credibility to Clark’s position, my position ultimately must be with Kozma. I believe that technology does influence learning, in the way we learn, when we learn, and what we learn.

*Influence* is the power of persons or things to produce an effect; the complicated networking of computers has made a connection to a global community that is unprecedented in education’s history. This factor alone gives us access to a multitude of learning venues available, night and day, through an Internet connection. Some of these learning venues include online classes, tutorials, language dictionaries, encyclopedias, and newspapers from around the world. The field

of educational technology offers educators many unique learning tools that have never been available before. It is now the educator's responsibility to make use of the abundant resources the World Wide Web has to offer by providing sound instructional methods to harness the power of technology.

In addition, if we do not allow our minds to remain open for the possibility of a connection between technology and learning, then scholars will not be motivated to improve on a pedagogy resulting from the relationship. Admitting defeat before the battle has begun determines absolute failure. This paper emphasizes significant points related to technology and how it affects learning.

#### Supporting Kozma

We cannot ignore or forget the importance of the learning theories that have brought us to this juncture. Constructivism, for example, assumes that the learner is not the passive receiver of knowledge; instead, constructivism assumes that the learning is a result of actively constructing knowledge. According to Driscoll (2005), constructivism is gaining in popularity at the same time interactive, user-friendly computer technologies are becoming more obtainable. Although Driscoll contended that other media can also be effectively employed within constructivist pedagogy, which is suggestive of Clark's replaceability theory. She added that the computer offers an effective means for implementing constructivist strategies that would be difficult to accomplish in any other media.

Kozma emphasized the importance of continued research and development in educational technology by saying that "educational technology will have no future if our researchers do not

see ways of pushing the boundaries of thinking and moving them forward” (Kozma, 2000, [p. XX](#)). Kozma claimed that many researchers, including Clark (cited 1983), have resolutely maintained that the instructional technology field has given up on the role media and technology play as a theoretical investigation in the field. Driscoll, further advocating constructivism, alleged that no new research paradigms are necessary to define educational technology. Driscoll, along with other researchers, argued that simply spending more time and funding on what we already know will produce the needed results (Kozma, 2000). Although spending more time and funding on existing educational paradigms is a valid proposal, I don’t think that it will cause the domino effect of successful learning that will provide the challenges and meet the requirements of the future educational system.

Jonassen (2001) confronted the resurfacing Clark and Kozma debate in his review of the book titled *Learning with Multiple Representations*. Representations are single forms of student assessment such as multiple-choice test, essay, or research paper that determine what learners know. According to Jonassen, Clark in 1994 continued to claim that “media and the representations implicit in them were mere vehicles for carrying the message” and Kozma countered that “because of the unique representational characteristics of different media, they influenced the message and therefore the learning.” Jonassen extended Kozma’s position by posing this question: “How can we learn best from multiple representations?” ([p. X](#)). Jonassen argued that we should be less concerned with using multiple representations for the transmission of information and more concerned with how representation can be used to assist knowledge construction and understanding on the part of the learner (Jonassen, 2001).

According to Jonassen, while most chapters in this book featured representations as conveyors, leaning towards the Clark perspective, the representations are combined in ways that “allegedly” communicate messages more effectively. Clearly, this shows the impetus to focus attention on facilitating knowledge constructions for learning using multiple methodologies, supporting the Kozma viewpoint, and not simply using the technology as an instrument to convey the learning. Many of the contributing authors of the book *Learning with Multiple Representations* agreed with Kozma’s position, that recognizing representations as understanding influenced the message and therefore the learning.

Debevec, Shih, and Kashyap (2006) examined student’s use of technology for learning relative to more traditional learning methods. The results showed that students were integrating the technology offered by the instructor into their course preparation and study routine. Although previous studies indicated that technology-assisted instruction benefited student achievement, other studies have shown no significant differences in student learning between the technology-assisted classrooms and traditional classes, the challenge persists. In the Debevec et al. study, there were notable differences among students’ learning skills. If the students were both high users of technology and high achievers using traditional learning methods or low users of technology and low achievers using traditional learning methods typically scored low on performance exams. If students were categorized with minimal technology experience but a high-level achiever using traditional learning methods or categorized with high-level technology experience but a low achiever using traditional learning methods typically scored higher on performance exams. The results of the data suggested that there is more than one path to optimize student learning and performance. It is the instructor’s challenge to adopt appropriate technology to support and create different types of learning environments that replicate and

expand the tradition classroom to enhance student's learning experiences and maximize their performances. (Debevec, Shih, & Kashyap, 2006).

Another interesting study by Nicaise and Crane (1999) showed how hypermedia authoring is used to support learning through the constructivist's view that learning is an active process of exploring concepts or learning through teacher-guided inquiry. Students used technology to design and develop multimedia artifacts. Results indicated that students were highly satisfied with the class, students transferred learning, and students developed skills and knowledge with instructional design, educational theory, and technology. According to the authors, technology becomes a tool that promotes learning because students are using the technology to build and display an understanding about a topic (Nicaise & Crane 1999).

Kozma (2003) continues to study technology in the classroom. One of his latest endeavors was an international experiment that looked at how technology, used in the classroom, changed the practices of teachers and students. Kozma's study follows the second information technology in education study: Module 2 (SITES m2) that addressed a broad range of questions which included: "How is technology influencing the curriculum as is it implemented in the classroom?" Kozma focused his article on the roles and practices of teachers and students, their differences and similarities, and innovated changes due to technology. (Kozma, n.d.).

### Technology can influence learning

Technological advancements, especially in software creation, have not only made learning easier for many people, but these advancements have also influenced the way we teach educator's to teach. The field of educational technology is offering educators many unique

learning tools that have never been available before in education's history. Basic software programs, such as those included in the Microsoft (MS) Office Suite, are very influential in helping students make advancements in learning. MS Word is a basic word processing program that is most useful to the students for composing and editing documents. These features support learners' writing skills by assisting their efforts in the early stages of writing a paper. Note-taking and rewriting drafts have become effortless tasks, allowing the student more time to concentrate on the content of the paper. MS PowerPoint, a widely used presentation tool, takes students to the next level of learning, whereby they become the teacher presenting their work to the class. According to learning theories, teaching a topic is the best way to learn a topic. MS Access, database software, can be very beneficial to subjects that require data gathering and reporting; and MS Excel, spreadsheet software, can be used to teach subjects that require number crunching. All these programs are great thought organizers, which according to the constructivist learning theory is essential for learning.

More specialized software programs created for learning in an educational environment offer significant benefits to the learner. Curriculum-based software is now created for every student's grade level. Authoring software is becoming a popular way for non-professionals to create multimedia environments that integrate problem solving, communications, and collaboration. Students can use authoring software to create interactive simulations and models that extends their classroom learning experience.

### Conclusion

This debate will continue for as long as people continue to find new ways to make the learning process more efficient. There will always be Clarks and Kozmas posing the questions

and trying to find the answers. I think it would be inappropriate to state that technology does not influence learning, because *influence*, the power to produce an effect without coercion, is a perfect description of what a computer *does* do. Influence is not only within the realm of computers, but it is a particularly strong point of computers. Although computers have had a slow start to popularity since they were first introduced, with the innovation of the Internet, advancements in high- tech equipment, new theories regarding the learning process, and novel ideas to promote learning and performance in the classroom all have had a widespread influence on the future outlook of computers (Reiser, 2001).

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