

"Mere Vehicles"

An Argument for the Age

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INTRODUCTION

The COVID-19 pandemic has skyrocketed the use of media in education to the frontlines. Lockdowns have forced physical therapy schools to move to online platforms. Instructors have had to quickly acquaint themselves with the many types and uses of technology and media available to educate their students. Although the debate about whether or not media improves learning has been hashed out repeatedly over the last few decades, the pandemic seems ripe for spurring yet further discussion.

In 1983 Richard Clark wrote a seminal paper that reviewed research on media

used in education and its effect on learning. He stated that

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 our nutrition. The choice of vehicle might influence the cost or extent of distributing instruction, but only the content of the vehicle can influence achievement. (Clark, 1983)

This statement has spawned much-heated debate, both sides of which will be explored in this paper.

TARGET AUDIENCE

Physical therapists are educators, be they clinicians or in academia. While the settings are different, the challenges are similar. There is a lack of time, and the increasing need for efficiency and cost-effectiveness of media is paramount when considering the usage of certain types. The available media used in education are vast and range from affordable to extremely expensive. Does it make sense to invest significant amounts of time and money on sophisticated and complicated types of media? Does this all matter to learning, or will use of the simplest, easiest media available suffice? These are some of the questions physical therapists must contemplate when determining their media choices for educating students, colleagues, or patients. Therefore, the purpose of this white paper is to present both sides of the debate. It is then hoped that the reader



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may conclude the best answer based on the evidence.

THE DEBATE

CLARK'S ARGUMENT

Clark stated that media does not influence learning and strongly advises against any future media comparison research until a new theory can be developed. He based his conclusions above on the review of numerous publications in the literature, which was done twice within 10 years. He drew the same conclusions after each review (Clark, 1983, 1994).

Clark appraised media comparison studies, reviews, and meta-analyses on media and learning. The great majority of the research showed no benefit of one medium over another. He also discovered strong evidence of confounding issues in studies that have found correlations between media and achievement and stated that there are rival hypotheses that can explain these correlations (Clark, 1983).

Examples of these confounding effects include the instructional method and content differences between treatments that are compared. Clark argued that many studies that showed positive media effects over traditional instruction had different instructors or course designers executing the compared treatments. When the same instructor produced the material for all treatments, this positive effect disappeared (C.-L. Kulik, Kulik, & Cohen, 1980).

Clark also took issue with studies that showed time efficiency due to specific media. He noted that a plausible hypothesis could be that greater effort is devoted to creating content for new media than traditional presentations of the same content. He argued that improved instructional design and development for new media resulted in more effective instructional methods (Clark, 1983).

Further to this, Clark noted that students might attend more to media that is

new to them. Owing to this novelty effect, they may place more effort and persistence into their work, resulting in more significant learning or achievement. However, studies have shown that this effect decreases as the students become accustomed to working with the media (Kulik et al., 1983).

In addition, Clark also pointed out research (Kulik et al., 1991) that showed that publishers tend to print studies that showed positive results. When unpublished studies were reviewed together with the published studies, the effect on learning was negligible.

The above confounding variables give credence to Clark's claim that media are mere vehicles for transmitting content. Instead, as he posited, it is the content and instructional design that matters in determining learning. Therefore, media selection should be determined by the cost and efficiency of the media themselves, not by their influence on learning.

THE DETRACTORS

Kozma is the foremost scholar disputing Clark's stance. He claimed that "if we preclude consideration of a relationship in our theory and research by conceptualizing media as 'mere vehicles,' we are likely never to understand the potential for a relationship (Kozma, 1994). Kozma (1994), Salomon (1979), and Dede (2007) argued that while it was not the medium itself that influenced learning, attributes of the media can encourage cognitive processes that can aid learning. Examples of these attributes include zooming and other aspects that enable the learner to attend specific tasks/details, allowing complex interaction between media and learner. It is these attributes, Kozma argued, that interact with cognitive and social processes to stimulate learning, and it is through this lens that we may find a relationship between media and learning.

Kozma (1994) advocated reframing the approach to media and learning, suggesting that we attend to the “complex interrelationships among media, method and situation.” He claimed that Clark’s dichotomy of media and instructional methods creates a rift between the two. Rather we should view them as interrelated since he argued, media’s capabilities enable instruction to be effective, thus influencing learning.

CLARK’S REBUTTAL

Clark responded to Kozma’s suggestion of looking at how the attributes of media can influence learning. He stated that the attribute argument is weak because there is strong evidence that different media attributes achieve the same learning goal. In that respect, there is no single media attribute that can serve a “unique cognitive effect for the same learning task” and that therefore, the “attributes must be proxies for some other variables that are instrumental in learning gains” (Clark, 1994, p. 22). He challenged his detractors to find a well-designed study that shows a medium or attribute that is not replaceable by another attribute or medium to achieve a learning effect. This replaceability test is the crux of his argument. If several media/attributes have the same learning effect, the cause is a shared characteristic of the media/attributes, not the media/attributes themselves. This shared characteristic, he posited, is likely an instructional method. Clark claimed that Kozma confused the constructs of method and medium, as Kozma stated that the two are inextricably linked such that media is an important aspect of method. Clark maintained that the two are separate and that any gains in learning from media result from the instructional method used. Tamim et al. (2011) support this stance in their second-order meta-analysis and validation study done more recently. Therefore, the choice of media for a learning task should be

dependent on its efficiency and cost-effectiveness, not whether it influences learning.

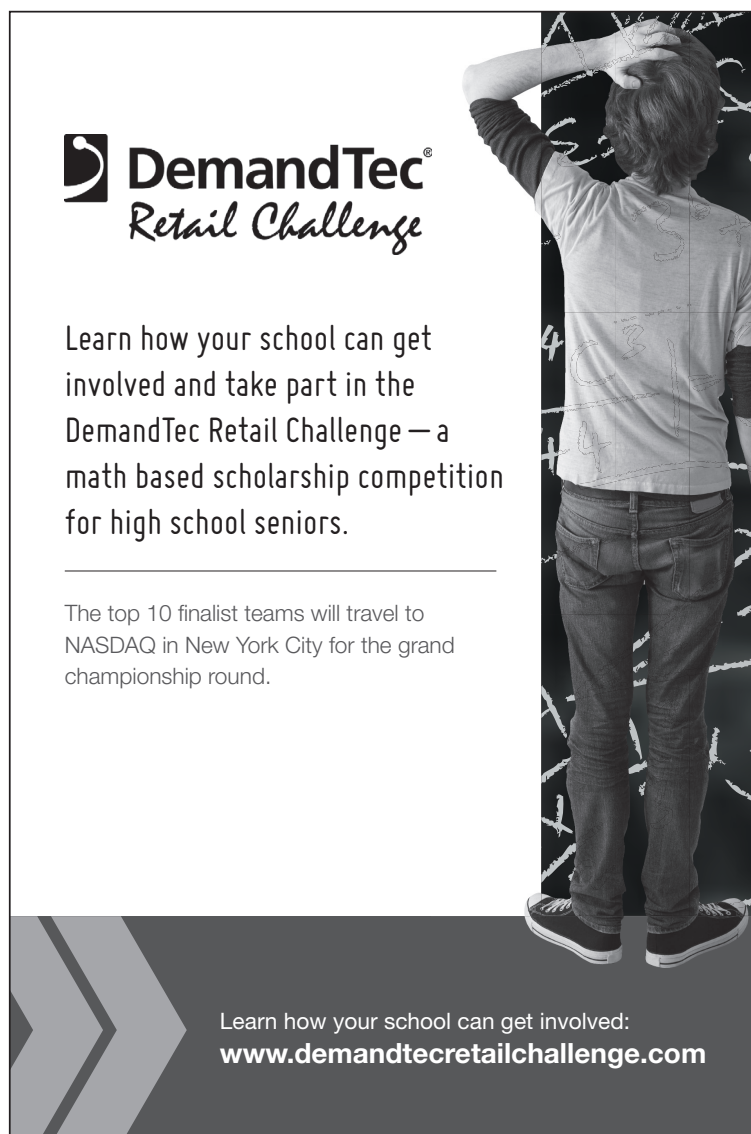
CONCLUSION

Clark’s justification for his stance that media does not, and will never, increase learning is quite convincing. He draws from strong research, including meta-analyses and reviews. The opposing viewpoint taken by Kozma and others, as described above, is more theoretical and with relatively weak arguments drawn from less stringent research. Therefore, at this time, the research seems to indicate that media are indeed mere vehicles and that it is the content and methods of instruction that matter when it comes to achievement. The choice of media is dependent more on cost-effectiveness and efficiency rather than how they affect learning.

REFERENCES

- Clark, R. E. (1983). Reconsidering research on learning from media. *Review of Educational Research*, 53(4), 445–459. <https://doi.org/10.3102/00346543053004445>
- Clark, R. E. (1994). Media will never influence learning. *Educational Technology Research and Development*, 42(2), 21–29. <https://doi.org/10.1007/BF02299088>
- Dede, C. (2007). Theoretical perspectives influencing the use of information technology in teaching and learning. In J. Voogt & G. Knezek (Eds.), *International handbook of information technology in primary and secondary education* (pp. 43–62). Springer Science+Business Media.
- Kozma, R. B. (1994). Will media influence learning: Reframing the debate. *Educational Technology Research and Development*, 42, 17–19.
- Kulik, C.-L., Kulik, J. A., & Cohen, P. (1980). Instructional technology and college teaching. *Teaching of Psychology*, 7(4), 199–205. <https://doi.org/10.1002/tl.37219883305>
- Kulik, J. A., Bangert, R. L., & George, W. (1983). Effects of computer-based teaching on secondary school students. *Teaching of Psychology*, 75(1), 19–26.

- Salomon, G. (1979). Media and symbol systems as related to cognition and learning. *Journal of Educational Psychology*, 71(2), 131–148.
- Tamim, R. M., Bernard, R. M., Borokhovski, E., Abrami, P. C., & Schmid, R. F. (2011). What forty years of research says about the impact of technology on learning: A second-order meta-analysis and validation study. *Review of Educational Research*, 81(1), 4–28. <https://doi.org/10.3102/0034654310393361>

The advertisement is a vertical rectangle. On the right side, there is a black and white photograph of a young person with long hair, seen from the back, standing in front of a chalkboard. They have their right hand on their head, appearing to be in deep thought. The chalkboard has some faint, illegible chalk markings. On the left side of the advertisement, there is a white background with black text and a logo. The logo consists of a stylized 'D' inside a square, followed by the text 'DemandTec' in a bold sans-serif font, and 'Retail Challenge' in a script font below it. Below the logo, there is a paragraph of text. At the bottom of the white section, there is a horizontal line. Below the line, there is another paragraph of text. At the very bottom of the advertisement, there is a dark grey section with a large white arrow pointing to the right, and a line of text with a website URL.

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