

How to Improve the Actual Effect of Computer-Assisted Teaching?

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“The computer was born to solve problems that did not exist before.”

–Bill Gates

CLARK & STARR (1986) found in a study that the amount of memory of students varies depending on the situation: 10% of people can remember the information or knowledge “read”; 20% can remember the “heard” information; 30% of people can remember what they “see”; 50% of people can remember what they “hear and see”; 70% of people can remember information “said”; 90% can Remember the “said and done” things. Therefore, if the learner only uses reading or listening or seeing methods when studying, the amount of memory of information is limited, but if the learner can do it by hand, it can deepen the impression and increase the memory capacity of information. Although traditional textbooks can assist learners to record external information in words, they still have certain limitations on abstract mathematical knowledge or scientific learning, and the rapid development of computers can make up for this deficiency. Computers can present dynamic images and provide learners with a powerful learning and perceptual experience, enabling learners to be more perceptive to abstract concepts (Fan, 2014).

Therefore, since IBM designed the first computer-assisted teaching system based on the IBM650 computer in 1958, computers have become an important form of auxiliary teaching (da Cruz, 2021). During this period, due to the large computer mainframe, it was not until the advent of microcomputers

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in the late 1970s to the late 1980s that the Computer Assisted Instruction (CAI) project was applied in schools, and then interactive multimedia entered schools. With the influence of long-distance communication and the Internet, the model and method of CAI have undergone major changes: using computers to help or replace teachers to discuss teaching content with students in a dialogue mode, arrange teaching progress, transmit teaching information, and conduct teaching training, which makes computers supplementary teaching has received wider attention.

In terms of purpose, this kind of attention is more about the effect of CAI. Since then, whenever a new media or software appeared, the first question that education researchers asked was: Can this media or software be used for teaching? Can learning be done through this media/software? Compared with the original teaching media or similar teaching software, can this new media/new software be more effective in improving learning efficiency and teaching quality and optimizing teaching goals?

In the process of research on teaching effects, two opinions have gradually formed. One group believes that computer-assisted teaching can improve student performance more than traditional methods, and is especially beneficial to poor students and elementary school students (Kulik & Kulik, 1991; Cheung & Slavin, 2012). The other faction believes that the effect of computers on performance is only a “carrier”, and it has no effect on the improvement of student performance, and even has a negative effect on student development (Clark, 1989; Fang & Huang, 2019). Even with the development of multimedia software so far, more forms of auxiliary teaching have emerged, such as electronic schoolbags (Li, 2019), education big data (Li & Xia, 2020), etc. But on the whole, the two parties have failed to reach a consensus.

In this issue of the magazine, Gu et al. (2021) discussed whether *Abra-cadabra* (ABRA), electronic software that focuses on natural spelling and aims to improve English reading ability, can improve the English reading ability of Chinese elementary school students. They explored the effect of using ABRA software on students of different grades by way of experimental research. The research results show that ABRA software can improve the abilities of students of all grades to varying degrees. From the perspective of language acquisition, this proved that the use of electronic software for teaching plays a positive role in students' academic performance. At the same time, the authors also noticed that under the same teaching conditions, the use of ABRA reading software for teaching in the second and third grades was not as effective as in the first grade. It is believed that the factors affecting this result were students' learning level and teachers' attitudes and methods towards e-learning software (Gu et al., 2021).

Based on this article, we can draw a conclusion: Internet teaching using electronic teaching software or other multimedia can play a certain role in promoting academic performance, just like traditional teaching. Therefore, the problem is not that schools do not use computers or the Internet, but how

to best use them, and should explore what methods are most effective for what kind of students under what conditions.

As Schramm said that any media, within its own limits, could complete any educational task, whether a student could learn more from one media than from another, and it seemed that it depends not only on what media was used, but also on how the media was used (Simonson & Thompson, 1997).

The study by Gu et al. (2021) gave us some enlightenment. For the same e-learning software, the implementation effect will be different due to the school's software/hardware conditions; teacher's teaching style, teacher's mastery and understanding, and students' learning characteristics. Then, when conducting computer or Internet-assisted teaching, we should comprehensively consider the influence of students, teachers, application environment and other factors. Pay attention to every link from software design to its application and the important role played by teachers. The characteristics of individual development of students cannot be ignored, and their abilities to solve problems and learn how to learn should be cultivated.

References

- Cheung, A.C.K., & Slavin, R.E. (2012). How features of educational technology applications affect student reading outcomes: A meta-analysis. *Educational Research Review*, 7(3):198-215. DOI: <https://doi.org/10.1016/j.edurev.2012.05.002>
- Clark, L.H., & Starr, I.S. (1986). *Secondary and middle school teaching methods* (5th ed.). New York: Macmillan Publishing Company
- Clark, R.E. (1989). Current progress and future directions for research in instructional technology. *Educational Technology Research and Development*, 37(1):57-66. DOI: <https://doi.org/10.1007/BF02299046>
- Da Cruz, F. (Last accessed 2021, August 18). The IBM 650 Magnetic Drum Calculator. *Computing History-A Chronology of Computing*. Columbia University. Archived from the original on, 02-15. Retrieved from <http://www.columbia.edu/cu/computinghistory/650.html>
- Fan, L. (2014). *Research on the influence of dynamic geometry software on students' attention*. Dalian: Dissertation of Liaoning Normal University; Liaoning Normal University. [Chinese]
- Fang, C., & Huang, B. (2019). Can information technology promote academic performance of school-aged children? An empirical study based on CEPS. *Best Evidence in Chinese Education*, 2(2):209-227. DOI: <https://doi.org/10.15354/bece.19.ar1045>
- Gu, H., Yao, J., Bai, P., Zhou, L., Cheung, A.C.K., & Abrami, P.C. (2021). Does Abracadabra help improve the English reading ability of Chinese elementary school students? A quasi-natural experimental study. *Science Insights Education Frontiers*, 9(2):1221-1240. DOI: <https://doi.org/10.15354/sief.21.re041>

- Kulik, C.L.C., & Kulik, J.A. (1991). Effectiveness of computer-based instruction: An update analysis. *Computer in Human Behavior*, 7(1-2):75-94. DOI: [https://doi.org/10.1016/0747-5632\(91\)90030-5](https://doi.org/10.1016/0747-5632(91)90030-5)
- Li, C. (2019). How does e-book bag promote learning? Video analysis based on classroom recordings. *Science Insights Education Frontiers*, 3(1):135-154. DOI: <https://doi.org/10.15354/sief.19.ar071>
- Li, X., & Xia, J. (2020). School-based practice based on supplemental instruction of big data in education. *Science Insights Education Frontiers*, 7(2):913-933. DOI: <https://doi.org/10.15354/sief.20.or063>
- Simonson, M.R., & Thompson, A. (1997). Educational computing foundations. Prentice-Hall (Merrill) Publishing Co.

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