Effects of computer technology as a teaching method in primary level

Technology, Computer

Effects of Using Instructional Technology in Colleges and Universities: What Controlled Evaluation Studies Say. This report and related issue briefs are available at: http://sri. com/policy/csted/reports/sandt/it/Kulik_IT_in_colleges_and_universities. pdf http://www. sri. com/policy/csted/reports/sandt/it Copyright © 2003 SRI International Early studies of effectiveness By 1991, this author's research team at Michigan had carried out meta-analyses of findings from 121 controlled studies of teaching in colleges and universities (J. Kulik et al., 1980; C. Kulik & Kulik, 1986; C. Kulik & Kulik, 1991). The studies contained results from a variety of computer applications in a number of different disciplines. Among the 121 studies were a substantial number on computer tutorials and computer simulations in science. The results from these early studies provide a good standard for gauging recent contributions of tutorials and simulations to science teaching, and are therefore reviewed here. Listed in the 1986 and 1991 reviews were achievement effect sizes from 37 studies of computer tutoring in college courses. Results of these studies favored the computer-tutored students by a small amount. In 26 of the 37 studies, the tutorial group outperformed the control group; in the remaining 11 studies, the control group scores were higher. The effect sizes in the 37 studies were between —1. 20 and 1. 25. The median effect size was 0. 15. This effect is not large enough to be considered educationally meaningful. It suggests that computer-tutored students would perform at the 56th percentile on relevant achievement tests, whereas conventionally taught students would performat the 50th percentile. Results of computer tutoring in science courses were similar to results in nonscience areas. These reviews also contained findings

from 13 studies of computer simulations in science. Results of these studies were favorable to the groups that worked with the computer simulations. In 11 of the 13 studies, the simulation group outperformed the control group, but in the remaining studies, the control group outscored the simulation group. The effect sizes in the 13 studies were between —0. 14 and 1. 27. The median effect size was 0. 25. Effect sizes of 0. 25 and over are usually considered to be educationally meaningful. By this standard, the effects of computer simulations are just large enough to be judged as educationally meaningful. An effect size of 0. 25 suggests that students who worked with simulations would perform at the 60percentile on relevant achievement tests, whereas conventionally taught students would perform at the 50th percentile. Computer tutoring Seven studies of computer tutorials from the 1990s were identified for this literature review. The studies examined two kinds of instructional outcomes: student achievement and student attitudes (Table 7). Effects of computer tutorials on both outcomes were mixed. Large or moderate positive effects. The effects of computer tutoring were large and positive in two studies (Kitz & Thorpe, 1995; Vitale & Romance, 1992). Both of these studies examined effectiveness of videodisc software from Systems Impact Corporation. Conclusion It is clear that computers can contribute substantially to the improvement of college teaching. Evaluation studies of the past decade usually found that college courses taught with computer help were more effective than similar courses taught without such help. These recent studies produced far more favorable results than did studies of the 1960s, 1970s, and 1980s. In 119 studies carried out between 1967 and 1986, the median effect of instructional technology was to raise scores on

examinations by 0. 30 standard deviations (C. Kulik & Kulik, 1986, 1991). In the 46 more recent studies reviewed in this report, the average effect of instructional technology was to raise student scores by 0. 46 standard deviations. Both gains are large enough to be considered educationally meaningful, but a gain of 0. 46 standard deviations on achievement tests is clearly a more important gain. There were clues in the earlier reviews that computer applications were becoming increasingly effective as the years rolled on, but early reviewers did not chart the change in evaluation results over time (e. g., C. Kulik & Kulik, 1986, 1991). Now, the time trend is impossible to ignore. Analysis of results in the earlier reviews shows that the median effect size was —0. 13 in 5 evaluation studies of instructional technology published during the 1960s, 0. 22 in 85 studies published during the 1970s, and 0. 35 in 35 studies published during the 1980s. This review found a median effect size of 0. 46 in 46 studies published during the 1990s. In other words, computer-based teaching was as likely to shortchange college students as to help them in the early years of the computer revolution, but today's students are likely to gain substantial educational benefits when their teachers incorporate instructional technology into their courses. The effectiveness of computer applications in college courses is not restricted to a single area. This review shows that computers have made significant contributions to a variety of instructional areas. Computer contributions were clear in mathematics courses, where computers are being used as algebra and calculus tools; in science courses, where older computer applications such as tutoring and simulation programs are being used along with such newer applications as computer animations; and in the field of

language learning, where a diversity of computer approaches are now being tried. Of all the results reviewed in this report, the most notable came from studies of computer and calculator use in algebra and calculus courses. Twelve studies focused on this topic. Six of the 12 studies took place in algebra courses. The remaining six studies took place in calculus courses. In each of the studies, experimental group students used computers or graphing calculators while doing coursework, whereas control group students completed their coursework without using such tools. In the typical study, computer and calculator use raised student scores on tests of conceptual understanding a total of 0. 88 standard deviations. This means that students who used computers and graphing calculators while studying algebra and calculus scored 0. 88 standard deviation units higher on conceptual tests than did students in the control group. If control group students scored at the 50th percentile on a conceptual test, scores of students using computers or calculators would be at the 80th percentile or above. Evaluations of educational innovations rarely report average effect sizes this high. 40 Results on computational exams, on the other hand, were strongly influenced by the conditions under which the exams were taken. In studies in which experimental group students were permitted to use computers or calculators on final exams, they outscored control group students by a large amount on computational items. In studies in which neither the experimental group nor the control group was allowed to use computers and calculators on final exams, students in the experimental group performed computations about as well as students who learned in more traditional classes. Overall, these studies suggest that students who used calculators and computer tools

when learning algebra and calculus did not suffer in their ability to solve computational problems with paper and pencil alone. Finally, a review of study results did not yield any definite conclusions about the effects of computer and calculator use on student attitudes toward mathematics. In two studies, mathematics attitudes were clearly higher in the experimental groups, but in three other studies, mathematics attitudes were not significantly different in the experimental and control groups. No definite conclusion about computer and calculator effects on attitudes can be drawn from such conflicting results. Studies of computer effects on science learning examined both older and newer instructional approaches. The two older approaches still being evaluated during the 1990s were computer tutoring and computer simulations. The newer approach that was extensively evaluated during the 1990s was computer animation. Reviewed in this report were 7 studies of tutoring, 11 studies of simulations, and 9 studies of animations. The seven studies of tutorial instruction examined two kinds of instructional outcomes: student achievement and student attitudes. Effects of computer tutorials on student achievement were mixed. Four of the six studies of student learning reported significant positive effects of tutoring, and two studies reported trivial effects. The median effect size in the studies was 0. 33. Tutorial effects on attitudes were likewise mixed. One study reported strong positive effects of computer tutoring on student attitudes; one study reported a strong negative effect; and one study reported a nonsignificant positive effect. Eleven studies of computer simulations in science also presented a somewhat mixed picture of effectiveness. In 7 of the 11 studies, effects were large enough to be considered statistically

significant and educationally meaningful, but in 2 other studies computer results were nonsignificant and in the remaining 2 studies results were significant and negative. Median effect size in the 11 studies from the past decade was 0. 39. While the most likely outcome of using simulations in teaching was an increase in student test performance, using simulations could also have a negative effect or no effect at all on student test scores. The studies suggest that computer simulations can be valuable tools for teachers, but teachers must use some care in deciding on how to use simulations and which simulations to use. Computer animation is the most recent addition to the science teacher's toolkit, but this instructional innovation has already compiled a record of strong contributions to science instruction. In each of nine studies of computer animations, the group that viewed the animations outscored the control group, but the effects differed in size from small to large. In seven of the nine studies, the improvement was large enough to be considered educationally meaningful. The remaining two studies reported positive effects of animations, but the effects were not large enough to be considered practically important. The median effect of computer animations in the nine studies was to increase student scores on science tests by 0. 48 standard deviations. As a group, therefore, these studies suggest that animations can help students substantially in their attempts to understand scientific phenomena. Computer searches yielded a total of only seven controlled quantitative evaluations of computer-assisted language learning (CALL), and these studies were extremely varied in focus. 41 Each of the studies examined its own approach to improving language instruction with technology, and so the studies do not provide a sound basis

for conclusions about CALL effects. Several years ago, Miech and his colleagues observed that the area of CALL lacks an agreedupon research agenda (Miech et al., 1996). Their point seems to be as valid todayas it was when they first made it. Diverse though evaluations of CALL may be, they have yielded enough strong positive results to encourage CALL enthusiasts. In each of seven evaluations, CALL had at least a small positive effect on instructional outcomes, and in five of the seven studies, CALL effects were large enough to be considered educationally meaningful. The median effect of a CALL program in the seven studies was an increase in language test scores of 0. 60 standard deviations. This is a moderate to large improvement in student performance, equivalent to a jump in scores from the 50th to the 73rd percentile. These results suggest that a number of approaches to CALL may have positive results on student learning. Although the various approaches still need in-depth examination, the future of CALL appears to be promising. Overall, computer-based teaching approaches have come a long way during the last four decades. Originally almost a hindrance to learning, computer-based instruction is now an important ingredient in many successful college courses. The growing effectiveness of instructional technology in college programs should not come as a great surprise. Computers have improved dramatically during the last three decades. They are faster, friendlier, and vastly more sophisticated in their operations than they were 35 years ago. In addition, many educators have become sophisticated designers of instructional software, and most college students have become proficient users of computing technology. Recent evaluation studies suggest that instructional technology can thrive in this climate and

that computers–which have transformed society in so many ways–are also making college teaching more effective. The Effects of Computer Assisted Instructions in Teaching & Learning in Primary Education By Kara Schmidt, eHow Contributor Computer-assisted instruction provides another avenue to academic success. Computer-assisted instruction offers teachers and students another avenue to learn the required academic material. Educational computer programs are available online, at computer stores or through textbook companies. Stick with programs that are user-friendly and hold your students' attention. Make sure the programs are at the correct grade level. Decide if you want the computer program to supplement your lesson, practice basic skills, or assist in teaching a new concept and make sure it does just that. 1. Student Benefits Computer-assisted instruction provides differentiated lessons for varied levels of learning, including students with disabilities and gifted students. Students are able to work at their own pace while receiving instant feedback which enables them to self correct before moving on to the next skill. If a student answers incorrectly, the computer programs will provide instructions to assist the student in correcting their work. The programs are interactive and students can work individually or in groups. This allows them to compete with their individual scores or the scores of the students within their group. Students also gain valuable computer skills which will continue to benefit them throughout life. 2. Teacher Benefits Teachers are better able to track their students' strengths and weaknesses through computer-assisted learning. Computer programs can enhance the lessons and allow teachers to pick different levels of a program or different programs altogether for students who may be

behind or students who are advanced. When students are learning and actively involved with learning, teachers will have less behavior problems in the classroom which in turn sets up a cycle for more learning to take place. Computer-assisted learning benefits teachers by allowing them to work with small groups of children on a particular skill while the other students in the class are working on their computer program. The nature of the program allows the students to work independently; minimizing distraction to the teacher while she works with the other students. Disadvantages Computer programs can evaluate students' progress on many levels although it is the teacher's responsibility to make sure students develop critical thinking skills which are essential to solve problems encountered throughout life. Too much time spent learning through computer programs can also reduce time students spend interacting with each other and their teacher. This can result in less time for learning appropriate social skills. Computer-assisted learning can be a great asset to the classroom and curriculum as long as they are not overused. Too much of any mode of teaching can lead to boredom and frustration in the students. Use good judgment and find computer programs that enhance the learning process. Sponsored Links * Bulk Email--Free Trialwww. iContact. com Email marketing to fit your needs. Start a Free 30-Day Trial Today. * Educational Technologywww. met. ubc. ca International Master's Program 100% Online - Apply Now * The Knowledge Engineerstheknowledgeengineers. com/ Leading digital training company, accelerate your digital knowledge * Search Cebu hotelsAgoda. com/Cebu_Hotels Instant confirmation. Trust Agoda. Save up to 75% Don't miss out! Related Searches: * Teaching Students * Teaching Career *

Computer Technology * Video Teaching * Learning Online Read more: The Effects of Computer Assisted Instructions in Teaching & Learning in Primary Education | eHow. com http://www. ehow. com/list_7408273_effects-teaching-learning-primary-education. html#ixzz1qFW4xJoO Brief History of Computers in Education Computers and related technologies are now in most of the schools in all around theworld. Advancements in technology are inevitably reflected in educational systems. In most of the developed countries education has been penetrated by informationtechnologies (IT); schools have computers, a large numbers of teachers usecomputers and new technologies while teaching, and more over textbooks have someparts devoted to new technologies. New technologies are integrated into disciplines and more disciplines are beinginfluenced by the new technologies in an integrated way. Most of the educators andresearchers try to use technologies in various subject matters, and this integrationchanges the nature, concepts and methods of work in each subject. For example, inmathematics education, the way of teaching and learning, the roles and functions of the most concepts have changed with the use of technology. 19Although the wide-spread interest in computers as an instructional tool did not occuruntil the 1980s, computers were first used in education and training at a much earlierdate. Much of the early work which computers introduced in education was done inthe 1950s by researchers at IBM, who developed the first Computer AssistedInstruction (CAI) author language and designed one of the first CAI programs to beused in public schools. Students followed the commands on the computer screenreceiving rewards for correct answers within the framework of behavioristapproaches. In 1959, PLATO, the first

large-scale project for the use of computers ineducation was implemented by

Donald Bitier at the University of Illinois (Carter, 2003). Atkinson and Suppes'

(1959) work led to some earliest applications of computers at both the public

school and university levels during the 1960s. By theearly 1980s many

educators were attracted to microcomputers because they wererelatively

inexpensive, compact enough for desktop use, and could perform many

of the functions performed by the large computers that had preceded them.

The dominant use of computer-based instruction in the 1980s was typified by

theemploy of " behavioral-based branching" software that based greatly on

drill-andpractice to teach programmed content and/or skills. The educational

software that ranon the computers of the early 1980s were at first based on

Skinner's " methods of branching": first separating into small sections,

rewarding combined responses, andteaching disconnected facts. Although

the learning is passive where learners do notwork together with problems

and content, research studies indicate that learner didadvantage from the

technology when the learning objectives were behavioral. During the 1990s,

computers eventually started to have a major impact oninstructional

practices in schools. With the help of advances in technology andlearning,

science researchers consider learning with technology as means

forconstruction problem-solving skills and for achieving learner

independence. Thecognitive approach to instructional technology

emphasized " looking at how we knowrather than how we respond, and

analyzing how we plan and strategize our thinking, remembering,

understanding, and communicating" (Saettler, 1990, cited inhttp://www.

ncrel. org/ tplan/cbtl/toc. htm, 2003). Besides, students would also tolearn

through playing games and simple simulations with the help of cognitive

20school of thought. The worth of using a word processor has been

discovered bywriting teachers and almost immediately students were using

the advantages of wordprocessor by writing, deleting, formatting and

revising with effortlessness. Othersubject matter teachers perceived the

importance of the computer in creating a richlearning environment by using

databases, spreadsheets, presentation, and researchtools. Since 1995, rapid

advances in computer and other digital technology, as wellas the Internet,

have led to a rapidly increasing interest in and use of these media

forinstructional purposes (Reiser, 2001). Swiftly there was a volume of

informationobtainable to students with a network of people all through the

world that improvedcommunication and the exchange of thoughts.

Additionally, distance educationcourses are offered and in this way students

in geographically isolated schools haveextended learning opportunities in a

diversity of subject areas. For example in UnitedNations, Kalu (2006) states "

the proportion of instructional rooms with Internetaccess increased from 51

percent in 1998 to 93 percent in 2003" (p. 3). Theoreticalexplanations could

now be demonstrated and manipulated with the help of technology

innovations. A complete innovative learning environment becamepossible.

Since the advent of the personal computers in the mid 1980s, computers

have rapidlybecome one of the key instructional technologies used in both

formal and informaleducation. The computer's role has changed because of

two factors: first, it canprovide rich learning experiences for students and

secondly, computer givingstudents the power to manipulate depth and way

of their learning. Furthermore, teachers can use the computer as an aid to

manage classroom activities; it has amultitude of roles to play in the curriculum which can range from tutor to studenttools.