Evaluation of New Century Education Software

7th Grade Mathematics

Academic Year 2004-2005
at
Grant Joint Union High School District

Evaluation Prepared By:

Cometrika, Inc.
cometrika@gmail.com

Franklin J. Boster, Ph.D.

James Ah Yun, Ph.D.

Renee Strom, Ph.D.

Linda J. Boster

TABLE OF CONTENTS

Executive Summary

- An experiment was conducted during the 2004-2005 academic year in which 454 7th Grade students participated in a mathematics experiment in order to assess the effectiveness of the New Century Education Integrated Instructional System. Experimental group students received exposure to the New Century Education system; control group students did not.
- Student performance was assessed by comparing 2004 and 2005 CST and CAT6 scores for experimental group and control group students.
- This was part of a larger controlled study that assessed 1,293 7th and 9th Grade students who participated either in a mathematics experiment, a reading experiment, or both.
- Mathematics results indicated a strong effect for 7th grade. The 7th grade effect indicated that students exposed to the New Century Education Integrated Instructional System outperformed those who were not exposed to New Century.
- Limitations of the experiment include relatively modest sample sizes and relatively large attrition.

Since 1995 local communities, states, and the federal government have invested heavily in technology for the nation's schools and classrooms. This first national technology plan challenged America's schools to reach four goals: train teachers, provide computers for students, connect classrooms to the Internet, and develop effective software and online learning resources (United States Department of Education, 1996). It is the last of these goals, the development of effective software, which has received the most attention from policy makers looking for positive effects on large-scale assessments linked to content standards.

Currently few research areas have been more controversial than studies of the impact of technology on student learning of content (Oppenheimer, 1997). A marked increase in computer and network technology in United States schools has occurred (National Center for Education Statistics, 2000). Both pro and con positions concerning the use of technology for student learning abound. Proponents envision students and teachers participating in technology-supported learning environments featuring individualized instruction, interactive simulations, and tools for knowledge representation and organization. Developers and proponents of using technology in the classroom argue that technology in the school can be used to provide learning experiences that are impossible to provide by any other means (Means, Hartel, & Moses, 2003). Some argue that traditional approaches to schooling have resisted change in response to the availability of technology (e.g. Cuban, 2000). Other critics argue that the effects of technology in the classroom are largely negative and divert resources from pursuits like art and music (e.g. Healy, 1999). In the last 20 years few large-scale experimental studies, or even studies with carefully matched comparison groups, have been conducted to assess which technology-supported educational

approaches are most effective (Mislevy, Penuel, Means, Korbak, Whaley, A., & Allen, 2003). Yet the recent passage of the No Child Left Behind Act, with its call for long-term evaluations of the impact of educational technology on student achievement by using scientifically based research methods and control conditions, creates a greater need for large-scale experiments. Pertinent to the conduct of such experiments the following pages review what is known concerning the effect of technology on student learning.

Effect of Technology on Student Learning

A considerable amount of research is consistent with the idea that students and teachers believe that the use of multimedia and technology in the classroom improves learning more than instruction with only one medium. Herron, Cole, and Corrie (1999) note that today's students are part of the television era, and that concrete visual images exercise a powerful influence on learning. For example, teachers interviewed and surveyed by Ertmer (1999) and Perry and Perry (1998) believed that technology in the classroom is especially useful for students with learning and attention problems because large amounts of information may be presented quickly and in an interesting manner. Technology also has the advantage of reaching students with different learning styles and incorporating visual and audio elements (Cohen, 1997). Furthermore, in studies conducted by Lehman and Brickner (1996) and Wise and Groom (1996) teachers reported that they believed their students were more receptive, interested, alert, attentive, and curious during multimedia presentations than they were during instructor lectures alone. A primary reason for these beliefs is that technology brings a feeling and understanding of the world into the more restricted setting of a traditional classroom. Teachers believe this increased attention leads to increased retention and motivation, each of which leads to better learning and improvement in student grades.

Similarly, students interviewed and surveyed by Blake, Holcombe, and Foster (1998), Perry and Perry (1998), and Wise and Groom (1996) preferred to attend classes that use technology, stating they find classes that use multimedia and other technology more interesting, hold their attention longer, and make it easier to learn and retain complex material. Yet, some critics argue that many computer-based instructional studies are designed poorly and that variables such as instructional method, curriculum content, or novelty are seldom controlled (Clark, 1983, 1985). It is clear that further investigation into the effects of technology on student learning is necessary to clarify matters of fact to inform this debate. One type of classroom practice that has received attention from the proponents and developers of technology is programming and software tailored to individual student instruction.

Individual Instruction and Technology

Instruction is considered individualized when it focuses specifically on the needs, learning styles, talents, interests, and academic background of each learner (Jenkins & Keefe, 2001). It provides insight into metacognitive awareness and divergent and convergent thinking of students, as well as the most applicable mastery assessment for each student (Lederhouse, 2003). Research on effective educational practices suggests that students are more successful at new tasks when those tasks are targeted closely to their academic skills, developmental stages, and the resources they bring to these new tasks, as well as families and schools structuring tasks in ways that provide both challenges and support (Roderick & Camburn, 1999). Scholars studying effective teaching at both elementary and secondary levels have reported that instruction tailored to individual student needs helped those students to experience more personalized teaching and discussion (Langer, 2001; Taylor, Pearson, Clark, & Walpole, 2000).

Additionally, effective student performance has been linked to students receiving several options to help match assignments to students' abilities and learning styles, a technique that enhances their motivation to learn (Allington & Johnston, 2002; Baumann & Duffy, 1997).

Students learn class content at different paces. Some absorb information quickly and are ready to move on to the next topic, whereas others struggle to grasp the most elementary concepts. This pacing divide can create conflict for teachers. They must choose between directing presentations to the slowest learners, knowing that accelerated learners may get bored. Or, they may direct their lessons in a pre-established manner (i.e., lesson plans) even though it may mean that some students are left behind. Technology programs, like the products that New Century offers, are cited as potential solutions to these types of pacing and learning problems. DuBosq (2002), a high school teacher, notes that technology in education has the potential to promote independent critical thinking and problem solving while introducing students to new concepts. Such outcomes occur when students make effective use of information and materials to solve problems and accomplish tasks. To do so requires combining teamwork, planning, and communication skills to achieve desired goals. One important aspect of computerized individual instruction involves feedback, i.e., comments or responses, about learning progress. Due to the number of students for whom a teacher must provide feedback, computerized feedback (e.g., student works on the computer and is constantly receiving messages from the computer about performance) can be much quicker than traditional teacher feedback. More timely feedback, as provided by the New Century Integrated Instructional System, allows students to adjust quickly and correct mistakes. Moreover, it encourages them if they are doing well. In a meta-

analysis on effective instructional practices, Marzano (1998) cites reinforcing effort and providing recognition as important for enhanced student achievement. Individualized instruction programs offer this type of reinforcement, sometimes almost immediately, providing the student with feedback through participation in such activities as computerized tests, questions, cues, and advanced organizers (Brabec, Fisher, & Pitler, 2004). The New Century Integrated Instructional System provides immediate feedback at multiple levels: cues to lesson questions, confirmation of correct responses, progress updates following each lesson, and a continuous motivational point system with award certificates for gains achieved. There is not an abundance of research on the effects of computer-based individualized instruction programs on learning, partly because until recently traditional (i.e., non-computerized) adaptive instruction and individually guided instruction was created only for students with special needs (Jenkins & Keefe, 2001). With the application of individualized instruction by computer programs, like New Century, it is much more feasible for students at any ability level to improve learning, although more research in this area is needed.

Research on Mathematics and Technology

As a consequence of the "Nation at Risk" headlines of two decades past, standards were put into place in core academic subjects, along with tests to measure performance, in order to increase student ability in mathematics and science achievement (Steen, 2003). Data from the National Assessment of Educational Progress (NAEP) reveal that almost none of the objectives had been met by the year 2000. Results indicate that mathematics performance remains substandard. According to the National Council of Teachers of Mathematics (NCTM) (1996), mathematics helps students to develop the ability to solve problems and reason logically, and offers a way to explore and make sense of the world. Yet, the NCTM laments that many students view the current mathematics curriculum as irrelevant, dull, and routine. One specific aspect of the mathematics curriculum with which students have reported difficulty is word problems (National Assessment of Educational Progress, 1992a). A major cause of the difficulty appears to be student inability to convert the problems into the mathematical operations that must be performed to solve them (Hart, 1996). Lack of familiarity with word problem structures may also contribute to poor student performance (Mayer, 1982).

Recently, the United States Department of Education has undertaken a study to determine the effectiveness of educational technology for both mathematics and reading, and to measure how technology can improve student achievement in these subjects (Roach, 2004). This effort is, in part, due to teacher reports of having trouble integrating technology with a high-quality mathematics instructional program (Rich & Joyner, 2002). Many mathematics instructors rely on traditional techniques of teaching

their subject matter (e.g., having students do drills for much of class); namely, an approach dominated by behaviorist learning theory and one which has been used for the last 40 years in mathematics classrooms (Battista, 1999). Nevertheless, numerous scientific studies have shown that traditional methods of teaching mathematics are not only ineffective but also seriously stunt the growth of students' mathematical reasoning and problem solving skills (Battista & Larson, 1994; Lindquist, 1989). Conversely, technology has facilitated teachers engaging different types of learners in mathematics instruction. Videos, DVDs, or software programs, like those of New Century, that have animation, graphics, and concrete examples are cited as potentially engaging for visual learners, and kinesthetic learners seem to have success working with manipulatives on the computer. Finally, audio prompts help auditory learners to engage in learning in a different way than just reading the information (Saylor, 2004). New Century lessons incorporate substantial audio as feedback, instruction, and support to students. Unfortunately, few studies have been conducted with experimental and control conditions to assess how technology interventions affect student learning of mathematics. Recent work by Boster et al. (2004), an exception, found that a technological intervention (videostreaming) enhanced mathematics examination performance for both 6th and 8th grade experimental groups.

Research shows that instruction tailored to individual student needs helps them to be more successful at learning (e.g., Langer, 2001; Roderick & Camburn, 1999; Taylor, Pearson, Clark, & Walpole, 2000). Thus, the reinforcement, recognition, feedback, phonics, strong audio content, and personalization features central to New Century's individualized instructional program make it a strong candidate for helping students to learn more effectively. In order to test the extent to which this technology

promotes academic achievement, it is predicted that students exposed to the New Century Education Integrated Instructional System will outperform those unexposed on standard measures of academic achievement.

Method

Subjects

A total of 454 7th Grade students from a large and diverse urban school district in Northern California participated in this experiment. These students were classified as *strategic students*. Strategic students are those performing one to two years below grade level. Six schools from this district were involved in the experiment.

Slightly more than one-half of the students were male (51.3%). Caucasians (30.4%), Hispanics (30.8%), and African Americans (18.9%) comprised the majority of the sample, most of the remainder being composed of students with various Asian and Pacific Island origins (15.2%). Only 1.1% reported being Native American or Native Alaskan.

The predominant language spoken in the home was English (65.2%). A sizable proportion of the sample reported Spanish as the predominant language spoken in the home (18.3%). Approximately two-thirds of the students were classified as English-speaking only (65.6%), and less than one percent (0.7%) of them were classified as LEP Beginner or LEP Early/Intermediate.

Few students were placed in special education categories (3.8%). Less than one-half of these students participated in the free-and-reduced lunch program (39.0%). The data indicated a lack of substantial attendance and discipline problems. The mean number of days absent was 10.17 (*SD* = 9.30). There was a mean of 3.99 disciplinary referrals (*SD* = 6.41). There was a mean of 1.03 days suspended (*SD* = 1.78).

Design

Students were assigned randomly to either the control or the experimental condition. The experimental induction involved exposure to the New Century Education curriculum. Experimental students had use of this curriculum for the academic year 2004-2005, and were expected to use it for a minimum of 90 minutes per week. Control students did not have access to this technology; instead receiving the same instruction that they would have received had no experiment taken place.

Instrumentation

There were two measures of mathematics performance, the California Standards Test (CST) and the California Achievement Test (CAT6). Scale scores were employed for the CST mathematics component as a measure of performance; whereas, percentiles were used for both the CAT6 mathematics component. Available data were obtained both from the 2004 administrations of these examinations and the 2005 administrations of these examinations.

Additionally, standard demographic measures were obtained from the school database. Finally, measures of time on task (TOT) for the experimental students were obtained from the New Century Education tracking system. These measures included the number of activities that the students completed, the number of minutes on task, and the number of days logged on to the New Century Education Integrated Instruction system.

Procedure

This experiment was conducted during the 2004-2005 academic year, the start date being in late September to early October of 2004 and varying slightly in different classrooms. Teachers instructing control group students were directed not to use New

Century Education materials. Teachers instructing experimental group students were directed to integrate the New Century Education materials into their curriculum for a minimum of 90 minutes per week.

New Century Education TOT measures were tracked throughout the academic year, and the New Century Education diagnostic tests were administered to experimental group students three times during the academic year, these tests being spaced at approximately equal intervals. The CST and the CAT6 were administered near the first of May, specific dates varying slightly by school.

Results

A total of 454 students participated in the mathematics experiment. Examination of these data indicated that both the experimental and control groups contained students with extremely limited English Language proficiency (LEP Beginner and LEP Early/Intermediate) and with special education needs. These students were eliminated from analysis.

Furthermore, examining the distribution of New Century Education TOT data indicated that some mathematics control group students received access to the New Century Education curriculum, generally through after school programs or as a result of transferring to another school within the district. As a consequence of attrition some mathematics experimental group students had no, or very limited, TOT data. All of these students were eliminated from analysis as well. Specifically, data for those students completing less than 31 activities, with less than 356 minutes on task, and logging on for less than 13 days were removed. The reduced sample size was 373.

The CST

A total of 167 7th grade control group students had data available for both the 2004 (the pretest) and 2005 (posttest) administrations of the CST mathematics examination. In 2004 the distribution of control students' scores ranged from a low of 235 to a high of 410, and they did not differ markedly from the normal distribution. The mean was 313.55 with a standard deviation of 32.84. In 2005 the distribution of control scores ranged from 225-421, and again did not differ markedly from the normal distribution. The mean was 313.60 with a standard deviation of 40.21.

A total of 139 7th grade experimental group students had data available for both the pretest and the posttest administrations of the CST. In 2004 these scores did not differ markedly from the normal distribution. They ranged from 235 to 410 with a mean of 317.53 and a standard deviation of 31.15. In 2005 the distribution of these scores did not differ markedly from the normal distribution. They ranged from 237 to 454 with a mean of 327.73 and a standard deviation of 41.84.

These data are presented in Table 1. From this table one may observe that pretest scores tend to be slightly higher in the experimental condition, but that posttest scores tend to be substantially higher in the experimental condition, suggesting the possibility that the New Century Education program has an impact on CST mathematics scores.

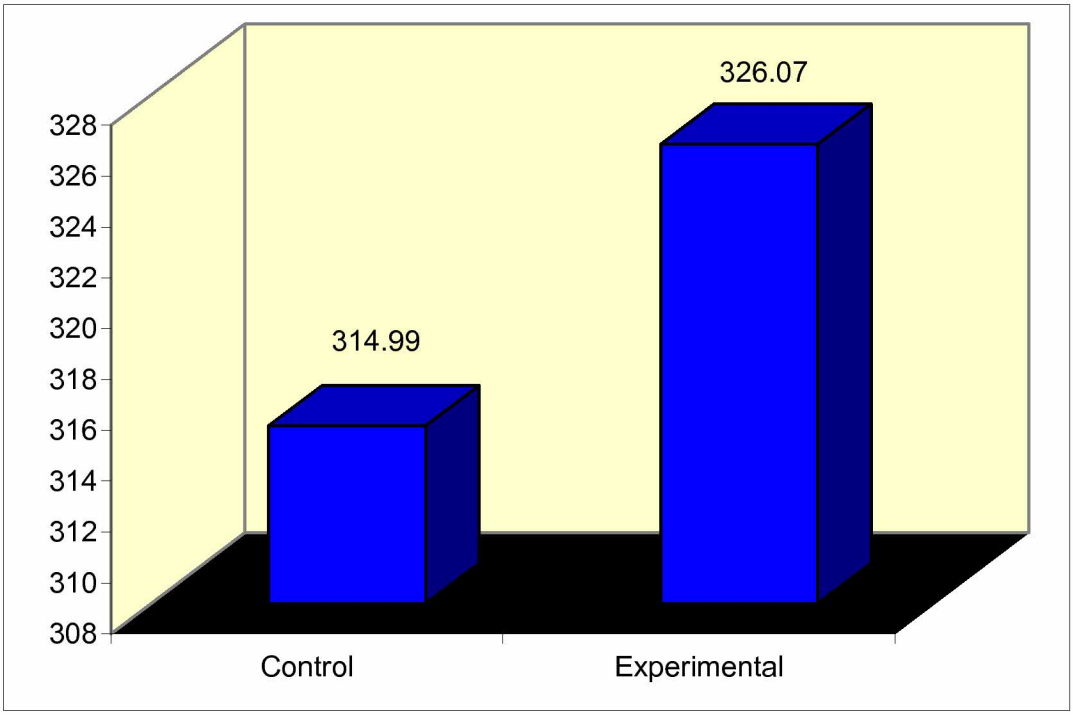
Table 1
CST 7th Grade Mathematics Scores Partitioned by Condition and Grade

	Control	Experimental
	M=313.60	M=327.73
Posttest	S=40.21	S=41.84
	N=167	N=139
	M=313.55	M=317.53
Pretest	S=32.84	S=31.15
	N=167	N=139

An analysis of covariance (ANCOVA) in which condition was treated as a fixed, independent groups factor and the pretest was treated as a covariate was performed on these data. The results of this analysis produced a statistically significant effect for condition ($F(1,303)=8.61$, $p=.004$). The effect for condition indicated an advantage for experimental students over control students (Control: $M_{adj}=314.99$, $SD_{adj}=32.86$; Experimental: $M_{adj}=326.07$, $SD_{adj}=32.87$; $\beta=.13$, $r=.17$, $d=.34$).

This effect is illustrated in Figure 1 where one may observe the adjusted experimental mean juxtaposed with the adjusted control mean.

Figure 1. Mean 2005 CST 7th grade mathematics scores adjusted for 2004 CST mathematics scores and partitioned by condition.



The CAT6. A total of 153 control group students had data available for both the 2004 (the pretest) and 2005 (posttest) administrations of the CAT6 mathematics examination. The distribution of change scores for the control students' ranged from a low of -60 to a high of 49. The mean was -10.89 with a standard deviation of 21.70.

A total of 139 experimental group students had data available for both the pretest and the posttest administrations of the CAT6 mathematics examination. They ranged from -62 to 67 with a mean of -2.64 and a standard deviation of 21.64.

These data are presented in Table 2. From this table one may observe that the change in CAT6 mathematics percentile was less negative in the experimental

conditions, suggesting the possibility that the New Century Education program has an impact on CAT6 mathematics percentile scores.

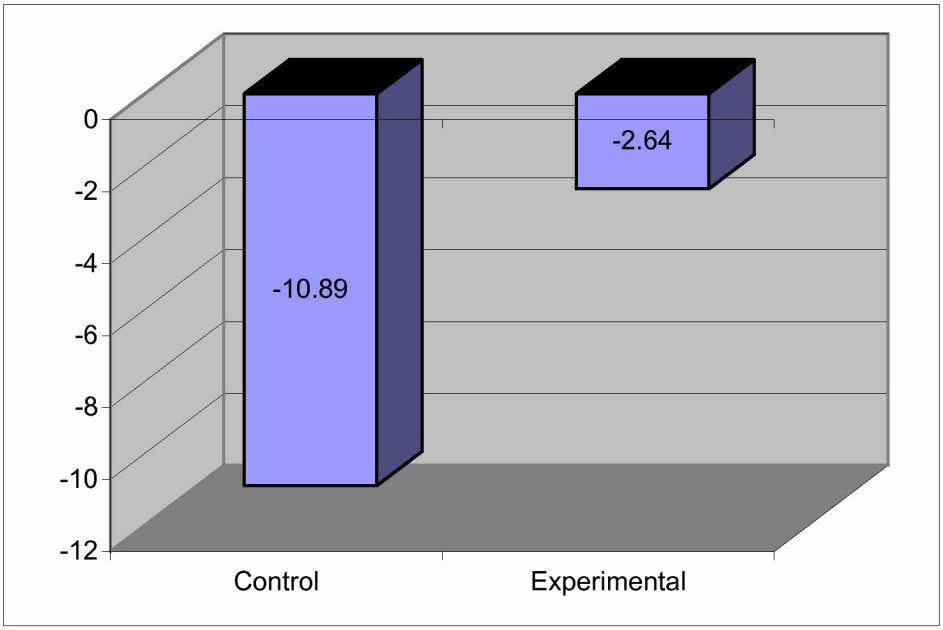
From Figure 2 it appears that for 7th grade students those in the experimental condition outperformed those in the control condition.

The results of a t-test were consistent with this impression. Experimental students changed less negatively than did control group students ($t(290)=3.25$, $p=.001$, $r=.19$, $d=.37$).

Table 2
CAT6 7th Mathematics Percentile Change Scores by Condition

Control	Experimental
M= -10.89	M= -2.64
S=21.70	S=21.64
N=153	N=139

Figure 2. Mean change in CAT6 mathematics scores by condition.



Discussion

The data provided substantial evidence consistent with the hypothesis that the New Century Education curriculum promoted performance on important dimensions of the CST and CAT6 examinations. In mathematics statistically significant and substantial effects (e.g., as indicated by a mean *d* of approximately .36, i.e., more than 1/3 of a standard deviation) were found in the 7th grade.

In addition to the effects of the New Century Education Integrated Instructional System the performance of the students merits comment. On average, these students performed at relatively modest levels. Because they are nationally normed, evidence for this conclusion is clearest when examining the CAT6 percentile scores. The analysis of changes in these percentiles indicates that on most indicators these students continue to lose ground relative to other students nationwide.

This evaluation effort was limited in some ways. For instance, it was conducted in only one geographical area and in only one school district. It is important for subsequent studies to address this limitation by expanding the scope of the research to additional locations and additional schools.

Three additional limitations, however, may have been more important in shaping the outcomes of this evaluation. First, the sample size was relatively modest. Therefore, tests of statistical significance lacked power sufficient to detect small but important effects, and point estimates of parameters are not as stable as decision makers would desire. Again, subsequent research can overcome this limitation, or possibly be added to these data to form a more extensive database.

Second, one of the reasons for the modest sample size was that there was a substantial amount of attrition in the course of the experiment. In the mathematics experiment 33% of the sample was missing on the 7th grade CST. Although the attrition is attributable primarily to students moving during the course of the school year, absences, and other understandable factors, it indicates that the student population in this school district may be more transient than the national average. If so, in addition to the loss in statistical power, there may be other substantive differences in the student characteristics that affected the generalizability of the obtained outcomes. And, it is possible that stronger effects would emerge in a more stable student population.

Third, the experimental induction was conservative. Specifically, in the mathematics experimental group students averaged less than 90 minutes per week of exposure to the New Century Education system. Had the product been used more frequently it is reasonable to anticipate that experimental group performance would have been enhanced, and consequently, that the observed experimental group-control group differences would have been more pronounced.

Nevertheless, despite the possibility that these three limitations had the effect of attenuating the observed effect of the New Century Education Integrated Instruction System, statistically significant and substantial differences did emerge. It will be for future experiments to address these limitations so that the impact of this system on education achievement can be estimated more accurately.

References

Abelson, R.P. (1985). A variance explanation paradox: When a little is a lot. *Psychological Bulletin*, *97*, 129-133.

Allington, R. L. (2001). *What really matters for struggling readers: Designing research-based programs*. Boston: Allyn and Bacon.

Battista, M. (1999). The mathematical miseducation of America's youth: Ignoring research and scientific study in education. *Phi Delta Kappan, 80* (6), 424-433.

Battista, M. T. & Larson, C. N. (1994). The role of JRME in advancing the learning and teaching of elementary school mathematics. *Teaching Children Mathematics*, pg. 178-182.

Baumann, J. F. & Duffy, A. M. (1997). *Engaged reading for pleasure and learning*. Athens, GA: National Reading Research Center, University of Georgia.

Boster, F. J. (2004). 2004 unitedstreaming evaluation: 6th and 8th grade mathematics in the Los Angeles unified school district. A draft report.

Brabec, K., Fisher, K., & Pitler, H. (2004). Building better instruction: How technology supports nine research-proven instructional strategies. *Learning and Leading with Technology, 31* (5), 6-11.

Christenson, S., Thurlow, M., Ysseldyke, J., & McVicar, R. (1989). Written language instruction for students with mild handicaps: Is there enough quantity to ensure quality? *Learning Disability Quarterly, 12*, 219-229.

Cronbach, L.J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, *16*, 297-334.

Clark, R. E. (1983). Reconsidering research on learning from media. Review of Educational Research, 53 (4), 445-460.

Clark, R.E. (1985). Confounding in educational computing research. *Journal of Educational Computing Research, 1* (2), 137-143.

Cuban, L. (2000). So much high-tech money invested, so little use and change in practice: How come? Report to the CCSSO State

Educational Technology Leadership Conference-2000: Preparing teachers to meet the challenges of new standards with technologies. Washington, DC: Council of Chief State School Officers. (Available: http://www.sri.com/policy/designkt/found.html)

Cunningham, P. (2002). Project smart: Science and mathematics achievement revived through technology. *The Mathematics Teacher, 95* (3), 238-239.

DuBosq, J. F. (2002). Take it to the next level: Individualized instruction in technology education. *Tech Directions, 61* (7), 29-31.

Ertmer, P. A. (2003). Transforming teacher education: Visions and strategies. *Educational Technology, Research and Development, 51*,124-130.

Hart, J. M. (1996). The effect of personalized word problems. *Teaching Children Mathematics, 2* (8), 504-505.

Healy, J. (1999). *Failure to connect: How computers affect our children's minds-and what we can do about it*. New York: Simon & Schuster.

Heise, D.R. (1971). Separating reliability and stability in test-retest correlation. H.M. Blalock, Jr. (Ed.), *Causal Models in the Social Sciences* (pp. 348-363). Chicago: Aldine.

Herron, C. A., Cole, S. P., & Corrie, C. (1999). The effectiveness of a video-based curriculum in teaching culture. *The Modern Language Journal, 83*, 518-533.

Hunter, J.E. (1997). Needed: A ban on the significance test. *Psychological*

Science, *8*, 3-7.

Jenkins, J. M., & Keefe, J. W. (2001). Strategies for personalizing instruction: A typology for improving teaching and learning. *NASSP Bulletin, 85*, 72-82.

Killeen, P.R. (2005). An alternative to null-hypothesis significance tests. *Psychological Science*, *16*, 345-353.

Krueger, J. (2001). Null hypothesis significance testing: On the survival of a flawed method. *American Psychologist*, *56*, 16-26.

Labovitz, S. (1968). Criteria for selecting a significance level: A note on the sacredness of .05. *The American Sociologist*, *3*, 200-202.

Lederhouse, J. N. (2003). The power of one-on-one. *Educational Leadership, 60* (7), 69-71.

Lindquist, M. M. (1989). *Results from the fourth mathematics assessment of the national assessment of educational progress*. Reston, VA: National Council of Teachers of Mathematics.

Marzano, R. J. (1998). *A theory-based meta-analysis of research on instruction*. Aurora, CO: Mid-continent Research for Education and Learning.

Mayer, R. E. (1982). Memory for algebra story problems. *Journal of Educational Psychology, 74* (2), 199-216.

Means, B., Haertel, G. D., & Moses, L. (2003). Evaluating the effects of learning on technologies. In G. D. Haertel & B. Means (Eds.), *Evaluating Educational Technology*, (pgs. 1-13). New York: Teachers College Press.

Mislevy, R., Penuel, W., Means, b., Korbak, C., Whaley, A., & Allen, J.E. (2002). Design patterns for assessing science inquiry. Technical Report 1. Menlo Park, CA: SRI International.

National Center for Education Statistics (NCES). (2000). Internet access in U.S. public schools and classrooms, 1994-99. (Statistics in Brief #NCES 2000-086). Washington, DC: Author.

National Council of Teachers of Mathematics. (1996). Curriculum standards for grades 5-8.

National Assessment of Education Progress (1992a). NAEP 1992 *mathematics report card for the nation and the states*. Washington, DC: National Center for Education Statistics. Report No. 23-ST02.

Oppenheimer, T. (1997, July). The computer delusion. *The Atlantic Monthly*, pp. 45-62.

Perry, T. & Perry, L. A. (1998). University students' attitudes toward multimedia presentations. *British Journal of Educational Technology, 29*, 375-377.

Reinking, D., McKenna, M. C., Labbo, L. D., & Kieffer, R. D. (Eds). (1998). *Handbook of literacy and technology: Transformations in a post-typographic world*. Mahwah, NJ: Erlbaum.

Rich, W., & Joyne, J. (2002). Using interactive web sites to enhance mathematics learning. *Teaching Children Mathematics, 8* (6), 380-383.

Roach, R. (2004). Education department to study technology, learning. *Black Issues in Higher Education, 21 (3)*, 43.

Roderick, M., & Camburn, E. (1999). Risk and recovery from course failure in the early years of high school. *American Educational Research Journal, 36*(2), 303-343.

Rosenthal, R., & Rubin, D.B. (1979). A note on percent variance explained as a measure of the importance of effects. *Journal of Applied Psychology*, *9*, 395-396.

Saylor, K. (2004). Enjoying math through interactive approaches. *Media and Methods*, January/February, pg. 4-5.

Skipper, J.K., Guenther, A.L., & Nass, G. (1967). The sacredness of .05: A note concerning the uses of statistical levels of significance in social science. *The American Sociologist*, *2*, 16-18.

Snyder, I. (Ed.). (2002). *Silicon literacies: Communication, innovation and education in the electronic age*. London: Routledge.

Steen, L.A. (2003). Math education at risk. *Issues in Science and Technology, 19* (4), 79-81.

Taylor, B. M., Pearson, P. D., Clark, K., & Walpole, S. (2000). Effective schools and accomplished teachers: Lessons about primary grade reading instruction in low-income schools. *Elementary School Journal, 101*, 121-165.

U.S. Department of Education, Office of Educational Technology. (1996). *E-learning: Putting world-class education at the fingertips of all children*. Washington, DC: Author.

Wise, M., & Groom, F. M. (1996). The effects of enriching classroom learning with the systematic employment of multimedia. *Education, 117*, 61-69.

New Century Education Corporation

220 Old New Brunswick Rd., Piscataway, NJ 08854 • 800-833-6232, ext. 5562 • http://www.ncecorp.com

From: Harps, Shauna N [SHarps@icfi.com]
Sent: Wednesday, September 05, 2007 11:24 AM
To: Mark Dynarski
Cc: Jill Constantine; Porowski, Allan W
Subject: WWC call

Hi Mark,

I'm one of Allan Porowski's colleagues responsible for answering calls to the WWC call center. This morning I received a call from Jim Griffin, the Chief Executive Officer for Century Education Corporation, who asked to speak with Phoebe Cottingham. I asked him if there is a specific question I can forward to her, and he said that he submitted a study over a year ago and has not heard anything in response, so he would really like to speak with her. I did an online search, and I think that he may have been referencing the following: http://www.ncecorp.com/GJUSTUDY.htm, http://www.ncecorp.com/GJUSTUDY.pdf. Please let me know how to proceed. His phone number is (732) 981-5566.

Thank you,
Shauna

Shauna N. Harps, Ph.D.
ICF International
10530 Rosehaven St., Ste. 400
Fairfax, VA 22030
Direct Line: (703) 219-4310
Fax: (703) 385-3206
SHarps@icfi.com

From: What Works
Sent: Tuesday, June 09, 2009 3:51 PM
To: 'jgriffin@ncecorp.com'
Subject: RE: What Works Clearinghouse (WWC 1271)

Dear Mr. Griffin,

The order in which interventions are reviewed by the WWC is based, in part, on the availability of scientific studies about the effectiveness of an intervention. Thus, one of the reasons New Century has not yet been reviewed is that there are other interventions with a greater number of studies examining their effectiveness. If there are additional studies about the effectiveness of New Century Education Software, please submit them to the WWC. It is important to note that the WWC website does not list all products/interventions that are the subject of research submitted to the WWC, but rather interventions for which we have completed full literature searches and reviewed all eligible studies against evidence standards.

We apologize if any previous communication has been unclear, including communication provided under the previous WWC contract.

We hope that you will find this information helpful in understanding the study submission and WWC review process.

What Works Clearinghouse

The What Works Clearinghouse was established by the U.S. Department of Education's Institute of Education Sciences to provide educators, policymakers, researchers, and the public with a central and trusted source of scientific evidence of what works in education. For more information, please visit http://ies.ed.gov/ncee/wwc/.

From: James Griffin [mailto:jgriffin@ncecorp.com]
Sent: Tuesday, June 02, 2009 8:10 AM
To: WhatWorks
Subject: RE: What Works Clearinghouse (WWC 1271)

To Whom It May Concern:

When I look at the WWC website among middle school math interventions, New Century is not even listed among those publishers whose products are the subject of research submitted to WWC. In addition, I note that you do list several direct competitors (e.g. Plato and Compass) whose products are used in the same supplementary fashion. Again, I do not understand why New Century is neither being listed nor reviewed if these other products are the subject of review.

Also, the study by Cometrika was submitted nearly three years ago. With all due respect, the restrictions noted in your 2008 email below came into being well after submission. When submission of the Cometrika study was made, the WWC had been contacting us requesting submissions and had a representative communicating regularly who confirmed receipt of the study and assured us the study would be reviewed in the next cycle.

Jim Griffin

Chief Executive

From: WhatWorks [mailto:WhatWorks@icfi.com]
Sent: Monday, June 01, 2009 6:41 PM
To: jgriffin@ncecorp.com
Subject: What Works Clearinghouse (WWC 1271)

Dear Mr. Griffin,

Thank you for contacting the What Works Clearinghouse (WWC).

The WWC is currently working to revise the Middle School Math review and as such will be revising the review protocol. Under the revised protocol, the study by Cometrika, Inc. may be eligible for review.

Please note that particular studies and interventions are not reviewed immediately upon request by the public, authors or developers. Rather, the WWC and IES determine the topics and interventions for review and the review teams proceed with the reviews in accordance with the topic protocols. Also, please note that the WWC does not contact researchers or the public who submit studies once they are reviewed or deemed ineligible for review. All publicly available information about our reviews is on our website (http://ies.ed.gov/ncee/wwc/).

Please note that we have included an email below sent to your email address in April 2008 that includes an explanation of the current Middle School Math protocol.

Thank you for your interest in the WWC.

What Works Clearinghouse

The What Works Clearinghouse was established by the U.S. Department of Education's Institute of Education Sciences to provide educators, policymakers, researchers, and the public with a central and trusted source of scientific evidence of what works in education. For more information, please visit http://ies.ed.gov/ncee/wwc/.

-----Original Message-----
From: jgriffin@ncecorp.com [mailto:jgriffin@ncecorp.com]
Sent: Saturday, May 30, 2009 10:06 PM
To: info@whatworks.ed.gov
Subject: IES Website: Contact Us: Check on the Status of a Submission,
Reference ID Number: 1287593303

info@whatworks.ed.gov, this email was automatically sent through the Contact link on the WWC website.

From: jgriffin@ncecorp.com

Message: To Whom It May Concern:

A randomized/controlled study of New Century Math as an intervention with middle school students was submitted nearly three years ago. Can you provide an update as to the status of that review?

Jim Griffin

From: WhatWorks
Sent: Wednesday, April 09, 2008 12:11 PM
To: 'jgriffin@ncecorp.com'
Subject: What Works Clearinghouse response

Dear Mr. Griffin,

We apologize for the delay in responding to your concern about our review of Middle School Math interventions. When you contacted us, you inquired about the status of a study by Cometrika, Inc., examining the New Century Education Software. We did receive the study and gave it an initial review. At the moment, the study does not fit within the Middle School Math review protocol (http://ies.ed.gov/ncee/wwc/PDF/MSM_protocol.pdf). The current protocol is to only examine core curricula. While the New Century website explains that the software can be used as a core curriculum, the Cometrika study did not implement it as such. Instead, the Cometrika study tested the impact of using the software in a supplemental way.

The WWC will continue to examine Middle School Math interventions, and these reviews may be expanded to include curricula beyond only those defined as core curricula. Please feel free to submit any additional studies examining New Century curricula at the following link http://ies.ed.gov/ncee/wwc/openinvite.asp.

Thank you,
What Works Clearinghouse

The What Works Clearinghouse was established by the U.S. Department of Education's Institute of Education Sciences to provide educators, policymakers, researchers, and the public with a central and trusted source of scientific evidence of what works in education. For more information, please visit http://ies.ed.gov/ncee/wwc/.

From: James Griffin [jgriffin@ncecorp.com]
Sent: Tuesday, June 02, 2009 8:10 AM
To: WhatWorks
Subject: RE: What Works Clearinghouse (WWC 1271)

To Whom It May Concern:

When I look at the WWC website among middle school math interventions, New Century is not even listed among those publishers whose products are the subject of research submitted to WWC. In addition, I note that you do list several direct competitors (e.g. Plato and Compass) whose products are used in the same supplementary fashion. Again, I do not understand why New Century is neither being listed nor reviewed if these other products are the subject of review.

Also, the study by Cometrika was submitted nearly three years ago. With all due respect, the restrictions noted in your 2008 email below came into being well after submission. When submission of the Cometrika study was made, the WWC had been contacting us requesting submissions and had a representative communicating regularly who confirmed receipt of the study and assured us the study would be reviewed in the next cycle.

Jim Griffin
Chief Executive

From: WhatWorks [mailto:WhatWorks@icfi.com]
Sent: Monday, June 01, 2009 6:41 PM
To: jgriffin@ncecorp.com
Subject: What Works Clearinghouse (WWC 1271)

Dear Mr. Griffin,

Thank you for contacting the What Works Clearinghouse (WWC).

The WWC is currently working to revise the Middle School Math review and as such will be revising the review protocol. Under the revised protocol, the study by Cometrika, Inc. may be eligible for review.

Please note that particular studies and interventions are not reviewed immediately upon request by the public, authors or developers. Rather, the WWC and IES determine the topics and interventions for review and the review teams proceed with the reviews in accordance with the topic protocols. Also, please note that the WWC does not contact researchers or the public who submit studies once they are reviewed or deemed ineligible for review. All publicly available information about our reviews is on our website (http://ies.ed.gov/ncee/wwc/).

Please note that we have included an email below sent to your email address in April 2008 that includes an explanation of the current Middle School Math protocol.

Thank you for your interest in the WWC.

What Works Clearinghouse

The What Works Clearinghouse was established by the U.S. Department of Education's Institute of Education Sciences to provide educators, policymakers, researchers, and the public with a central and trusted source of scientific evidence of what works in education. For more information, please visit http://ies.ed.gov/ncee/wwc/.

-----Original Message-----
From: jgriffin@ncecorp.com [mailto:jgriffin@ncecorp.com]
Sent: Saturday, May 30, 2009 10:06 PM
To: info@whatworks.ed.gov
Subject: IES Website: Contact Us: Check on the Status of a Submission,
Reference ID Number: 1287593303

info@whatworks.ed.gov, this email was automatically sent through the Contact link on the WWC website.

From: jgriffin@ncecorp.com

Message: To Whom It May Concern:

A randomized/controlled study of New Century Math as an intervention with middle school students was submitted nearly three years ago. Can you provide an update as to the status of that review?

Jim Griffin

From: WhatWorks
Sent: Wednesday, April 09, 2008 12:11 PM
To: 'jgriffin@ncecorp.com'
Subject: What Works Clearinghouse response

Dear Mr. Griffin,

We apologize for the delay in responding to your concern about our review of Middle School Math interventions. When you contacted us, you inquired about the status of a study by Cometrika, Inc., examining the New Century Education Software. We did receive the study and gave it an initial review. At the moment, the study does not fit within the Middle School Math review protocol (http://ies.ed.gov/ncee/wwc/PDF/MSM_protocol.pdf). The current protocol is to only examine core curricula. While the New Century website explains that the software can be used as a core curriculum, the Cometrika study did not implement it as such. Instead, the Cometrika study tested the impact of using the software in a supplemental way.

The WWC will continue to examine Middle School Math interventions, and these reviews may be expanded to include curricula beyond only those defined as core curricula. Please feel free to submit any additional studies examining

New Century curricula at the following link
http://ies.ed.gov/ncee/wwc/openinvite.asp.

Thank you,
What Works Clearinghouse

The What Works Clearinghouse was established by the U.S. Department of Education's Institute of Education Sciences to provide educators, policymakers, researchers, and the public with a central and trusted source of scientific evidence of what works in education. For more information, please visit http://ies.ed.gov/ncee/wwc/.

From: WhatWorks
Sent: Monday, June 01, 2009 5:41 PM
To: 'jgriffin@ncecorp.com'
Subject: What Works Clearinghouse (WWC 1271)
Dear Mr. Griffin,

Thank you for contacting the What Works Clearinghouse (WWC).

The WWC is currently working to revise the Middle School Math review and as such will be revising the review protocol. Under the revised protocol, the study by Cometrika, Inc. may be eligible for review.

Please note that particular studies and interventions are not reviewed immediately upon request by the public, authors or developers. Rather, the WWC and IES determine the topics and interventions for review and the review teams proceed with the reviews in accordance with the topic protocols. Also, please note that the WWC does not contact researchers or the public who submit studies once they are reviewed or deemed ineligible for review. All publicly available information about our reviews is on our website (http://ies.ed.gov/ncee/wwc/).

Please note that we have included an email below sent to your email address in April 2008 that includes an explanation of the current Middle School Math protocol.

Thank you for your interest in the WWC.

What Works Clearinghouse

The What Works Clearinghouse was established by the U.S. Department of Education's Institute of Education Sciences to provide educators, policymakers, researchers, and the public with a central and trusted source of scientific evidence of what works in education. For more information, please visit http://ies.ed.gov/ncee/wwc/.

-----Original Message-----
From: jgriffin@ncecorp.com [mailto:jgriffin@ncecorp.com]
Sent: Saturday, May 30, 2009 10:06 PM
To: info@whatworks.ed.gov
Subject: IES Website: Contact Us: Check on the Status of a Submission,
Reference ID Number: 1287593303

info@whatworks.ed.gov, this email was automatically sent through the Contact link on the WWC website.

From: jgriffin@ncecorp.com

Message: To Whom It May Concern:

A randomized/controlled study of New Century Math as an intervention with middle school students was submitted nearly three years ago. Can you provide

an update as to the status of that review?

Jim Griffin

From: WhatWorks
Sent: Wednesday, April 09, 2008 12:11 PM
To: 'jgriffin@ncecorp.com'
Subject: What Works Clearinghouse response

Dear Mr. Griffin,

We apologize for the delay in responding to your concern about our review of Middle School Math interventions. When you contacted us, you inquired about the status of a study by Cometrika, Inc., examining the New Century Education Software. We did receive the study and gave it an initial review. At the moment, the study does not fit within the Middle School Math review protocol (http://ies.ed.gov/ncee/wwc/PDF/MSM_protocol.pdf). The current protocol is to only examine core curricula. While the New Century website explains that the software can be used as a core curriculum, the Cometrika study did not implement it as such. Instead, the Cometrika study tested the impact of using the software in a supplemental way.

The WWC will continue to examine Middle School Math interventions, and these reviews may be expanded to include curricula beyond only those defined as core curricula. Please feel free to submit any additional studies examining New Century curricula at the following link http://ies.ed.gov/ncee/wwc/openinvite.asp.

Thank you,
What Works Clearinghouse

The What Works Clearinghouse was established by the U.S. Department of Education's Institute of Education Sciences to provide educators, policymakers, researchers, and the public with a central and trusted source of scientific evidence of what works in education. For more information, please visit http://ies.ed.gov/ncee/wwc/.

From: jgriffin@ncecorp.com
Sent: Saturday, May 30, 2009 10:06 PM
To: info@whatworks.ed.gov
Subject: IES Website: Contact Us: Check on the Status of a Submission, Reference ID
Number: 1287593303

info@whatworks.ed.gov, this email was automatically sent through the Contact
link on the WWC website.

From: jgriffin@ncecorp.com

Message: To Whom It May Concern:

A randomized/controlled study of New Century Math as an intervention with middle school students was submitted nearly three years ago. Can you provide
an update as to the status of that review?

Jim Griffin

From: WhatWorks
Sent: Wednesday, April 09, 2008 12:11 PM
To: 'jgriffin@ncecorp.com'
Subject: What Works Clearinghouse response
Dear Mr. Griffin,

We apologize for the delay in responding to your concern about our review of Middle School Math interventions. When you contacted us, you inquired about the status of a study by Cometrika, Inc., examining the New Century Education Software. We did receive the study and gave it an initial review. At the moment, the study does not fit within the Middle School Math review protocol (http://ies.ed.gov/ncee/wwc/PDF/MSM_protocol.pdf). The current protocol is to only examine core curricula. While the New Century website explains that the software can be used as a core curriculum, the Cometrika study did not implement it as such. Instead, the Cometrika study tested the impact of using the software in a supplemental way.

The WWC will continue to examine Middle School Math interventions, and these reviews may be expanded to include curricula beyond only those defined as core curricula. Please feel free to submit any additional studies examining New Century curricula at the following link http://ies.ed.gov/ncee/wwc/openinvite.asp.

Thank you,
What Works Clearinghouse