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ABSTRACT

The purpose of this study was to examines the relationship between students' core knowledge and their achievement in mathematics and reading on the Iowa Test of Basic Skills. The study was based on E. D. Hirsch's theory that having a strong foundation of core knowledge in one grade is necessary for growth and the understanding of new and more complex information in the upcoming grades. A student who does not have the core knowledge in one grade could struggle as he or she becomes more and more "informationally deprived" (D. Rogner, 1997). The study, which evaluated 38 sixth graders, did reveal correlations between the core knowledge and mathematics and reading achievement scores. The majority of the students in this sample seemed to have a low level of core knowledge for their grade. The question is asked if some problems, such as poor daily performance, low achievement scores, and discipline problems, can be related to students' having a low level of core knowledge. (Contains 2 scatterplots, 2 charts, 2 graphs, and 17 references.) (Author/SLD)

A Teacher's Perspective On What Students Know And Should Know About Common Knowledge

By

Brian K. Butterfield

Abstract

The purpose of this study was to examine the relationship between students' core knowledge and their achievement in math and reading on the Iowa Test of Basic Skills. The study was based on E.D. Hirsch's theory that having a strong foundation of core knowledge in one grade is necessary for growth and the understanding of new and more complex information in the upcoming grades. A student who does not have the core knowledge in one grade could struggle in school as he/she becomes more and more "informationally deprived" (Rogner, 1997). The study did reveal correlations between the core knowledge and math and reading achievement scores. The majority of the students in this sampling seemed to have a low level of core knowledge for their grade. Can some problems such as poor daily performance, low achievement scores, and discipline problems be related to students having a low level of core knowledge?

Low test scores, unprepared students for the current grade in which he or she is in, and children who are falling further behind are just a few of the complaints teachers, parents, and anyone else concerned with our educational system in the United States seem to have. Some feel that students are lacking the "core knowledge" that is necessary for that particular grade level. What is core knowledge (CK)? According to E.D. Hirsch (1988) author and editor of several books on CK education, CK is the common base of knowledge that is needed to function well in a democratic society. The Core Knowledge Foundation (CKF) Web site (1999) defines common base as the knowledge that allows one to participate in society by being able to read newspapers, to understand where current events of all kinds are taking place, and to understand local, state, and national politics and government. The theory is based on the fact that people learn new knowledge by relying on what they already know. When it comes to the problems we face in schools, the CKF argument is that children who lack certain knowledge are at risk as they move up through the school system (1999). As children miss out on certain information in their primary classrooms, their inability to understand new material that is presented increases and thus it becomes harder for some children to keep up with their peers or to catch up with their peers.

E.D. Hirsch (1996) feels that everyone needs a CK of information in order to build upon that foundation in obtaining and understanding new information. It is thought that CK allows for higher level of thinking skills needed to understand and make sense of new information. "Informationally-deprived" people states Hirsch, struggle because "although they can read the individual sentences, they can't make sense out of the whole" (Rogner, 1997 p.2). Lacking specific information makes it difficult for one to participate in the classroom discussions. A study which examined knowledge, literacy, and power concluded reading is a key to developing knowledge and that knowledge was a consistent predictor of social and political power (Hofstetter, Sticht, and Huie, 1999).

The word "accountability" is a word that makes most educators interested in the topic of how to prove that students are leaving the public schools with the necessary skills to survive in our democratic society. Accountability has caused schools to be concerned with passing children onto the next grade who are not

meeting the "standards" that are set for that grade. Trying to raise students' achievement scores is a national issue that districts face every year. The purpose of this research was to examine the relationship between the CK a sixth grader has based on What Your 5th Grader Should Know to that of his/her achievement score from last spring.

In his book, The School We Need And Why We Don't Have Them, (1996) Hirsch states that the CKF now has approximately 200 schools in thirty-seven states using the CK curriculum developed by the CKF. He also states that there is an uncounted number of schools that are using the foundations, principals, and materials of the curriculum. A three-year study of twelve schools in various states that were implementing the program has been done. An evaluation of the program was done after the first year of implementation and after the third year. According to the first year study, Stringfield, Datnow, and Nunnery (1996) there were several benefits of teaching Core Knowledge. The first-year evaluation found that children gained self-confidence, students were able to connect to previously learned material, and students seemed to be more interested in learning and reading than before, and discipline problems decreased. They went on to say that CK is good for all kids, it increased interaction among teachers, teachers' work lives became more interesting, support from teachers increased over time, and parents were thought to be more satisfied with their children's progress. The final report of the evaluation after the third year done by the same people revealed several benefits of using the program. For the students it provided a broader base of knowledge and enriched their vocabulary, it motivated students to learn and provided the necessary skills for higher learning. For the school, CK provided an academic focus and a consistent instruction, a coherent plan from grade to grade, and promoted learning for all. A Maryland study revealed that five Maryland CK schools out performed state test averages (Marshall, 1998).

Just like any issue in America there is always two sides. The Institute for the Learning Sciences (1994) claims that Hirsch's method for helping children to read does not work very well. The institute claims children want to read about things to which they can relate. They feel that the teaching of reading should include materials that builds upon the child's own experiences that relate to the child's knowledge

that were acquired in a natural way.

Fleming (1992), who is opposed to Hirsch's first book about what every American should know says that Hirsch loses his credibility when the list of items that Americans should know goes from politicians to American entertainers. The author felt that in all of the categories there were omissions of very influential people of American culture that are as important to remember as the ones that were included in the list.

Postman (1998), another opponent to Hirsch's theory felt that Hirsch's argument of teachers becoming more interested in teaching the processes or skills of learning than with teaching content is ludicrous for one main reason. He feels that when a teacher is concerned with the teaching of the process of something then the content is automatically included with the instruction. His example is the teaching of how a poem is read; how can it be done without also teaching the poem? The article alludes to the fact that no method of teaching is better than the other when there is learning taking place.

Method

Participants

The school is a Chicago Public School. The school is 19.3% White, 28.5% Black, 47.6% Hispanic and 4.0% Asian/Pacific Islander. The school is 86.2% low-income and 15.5% of limited-English-proficient. It was a convenience sampling in this school using sixth graders. This grade was chosen on the premise that their reading skills would be better than perhaps a lower grade and a written test could be used for the study.

Two sixth grade classes were used and on the day when the Core Knowledge Test (CK-TEST) was given there were sixty-one participants. However, the final examination of test scores only includes thirty-eight participants. Ten of the sixty-one students were excluded because they were found to be fifth graders in the sixth grade classroom. It was a split $5^{th}/6^{th}$ grade class. Three students were excluded because the Chicago Public Schools categorized them as "category A" that being bilingual students with the least amount of English speaking skills. Students in categories B and C were included in the study.

Ten were excluded because ITBS scores were not in their files. These students may have been absent on exam day or had transferred from other schools. Of the thirty-eight students left in the study whose scores could be examined; twenty were Hispanic, five were White, eleven were Black, and two were Asian.

Procedures

The Core Knowledge Test was given to the two classes on two separate days but at the same time of day. The time was 10:00 A.M. The tests were graded according to the answers in the book What Your 5th Grader Needs to Know (1993) by the Core Knowledge Foundation.

In the study the students' Iowa Test of Basic Skills (ITBS) scores were used. The total reading and total math scores were used. These scores were the results of when they took the test in the spring of 1999 as fifth graders and they are now sixth graders. The reading and math scores were compared to the scores of their Core Knowledge Tests from October of 1999. The Core Knowledge scores were graphed and correlated using Person *r* with the students' math score from their ITBS test. The Core Knowledge scores were then graphed and correlated the same way to their reading score on the ITBS.

Instrumentation

The CK-TEST was based on information from the book What Your 5th Grader Needs to Know (1993) by the Core Knowledge Foundation. The test had twenty-eight questions with a total of sixty-six points. Some of the parts of the test were matching and each answer was given a point. The first part of the test came from the language arts section of the book and it had seven multiple-choice questions and three fill-in-the-blank questions. Geography was the next part. It had a map of one half of the world with six reference points to match such as North America and South America. This part of the test also had a matching part of eight states to their appropriate region. Geography concluded with two fill-in-the-blank questions. The third part of the test was a world and U.S. history part. It had a map to match three ancient Indian Civilizations to their area of existence. It had a matching of nine facts to the nine people responsible. It also had one multiple-choice and three fill-in-the-blank questions about the Civil War.

The Math portion had seven problems to solve and one word problem to solve that had more than one step to it. Last was the science part. It had a matching of seven parts of a cell. Two multiple choice questions were on the test. It also had a matching of four parts to a flower. The test concluded by putting in order the five stages of the development of the embryo.

Validity of the Core Knowledge Test

The validity I examined on the test was content validity. I created the Core Knowledge Test (CK-TEST) based on the book by the CKF. This book contains the information the CKF claims every fifth grader should know when leaving the fifth grade. I had four teachers who examined it for the content of it. They were a fifth grade teacher, a seventh grade teacher, curriculum coordinator of the school, and the case manager/counselor (formally a third grade teacher). The original test was revised by giving students more space to work problems and less reference points to identify on the world map. The test was designed to test for the CK a sixth grader in my school should have after having left the fifth grade last June.

Evidence of Reliability of the ITBS

The Eleventh Mental Measurements Yearbook (Lane, 1992) states that reliabilities for the sub-tests and total scores are given in the manual. They vary from test to test and grade to grade. The estimates of reliability are quite good, with most in the .80's and .90's. The coefficients for the five main area scores range from .89 to .96. Also presented in the manual are the means, standard deviations, and standard errors of measurement, separately for raw scores, grade equivalent, and standard score.

Evidence of Validity of the ITBS

According to Lane (1992) the content validity is based on over forty years of research in curriculum, measurement procedures, interpretation and use of test results. Over 200 skills objectives represented in the tests were determined through systematic consideration of courses of study, statements of authorities in method, and recommendations by national curriculum groups. Independent reviews were conducted by professional from diverse cultural groups for fairness and appropriateness of content for students of

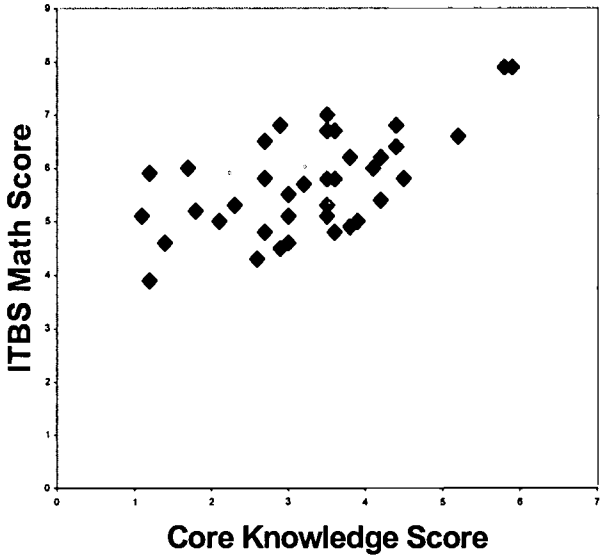
the tests were determined through systematic consideration of courses of study, statements of authorities in method, and recommendations by national curriculum groups. Independent reviews were conducted by professional from diverse cultural groups for fairness and appropriateness of content for students of geographic, urban/rural, sex, and race, etc. Empirical studies were conducted for possible item bias.

Results

The hypothesis of the study was to show that there is a correlation between a student's CK-TEST score and that of his/her ITBS score of reading and math. Person *r* is a correlation coefficient, which represent quantitatively the extent to which scores on two variables occupy the same relative position. Although small, Pearson *r* indicated a moderate correlation between the students' CK-TEST score and their ITBS math and reading score. The correlation between their CK-TEST score and ITBS math score was $r = 0.56$. The correlation between their CK-TEST score and ITBS reading score was $r = 0.74$.

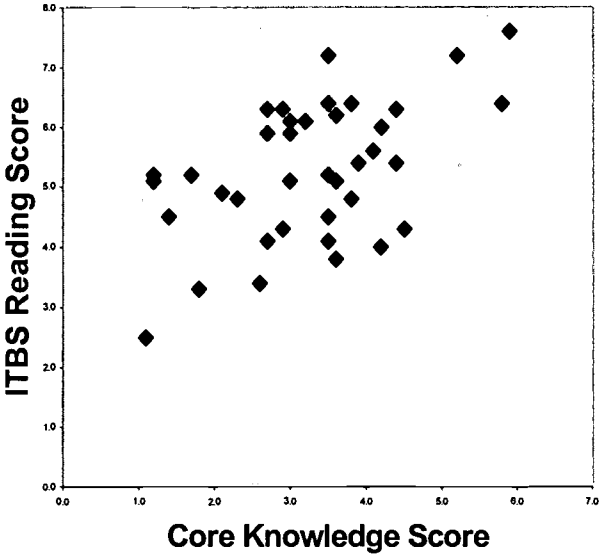
Scatterplot 1 shows the $r = 0.56$ correlation of the students' CK-TEST score to their ITBS math score from last spring. Graph 1 shows the two different scores together. The graph shows that when a student scored relatively low or high on the CK-TEST they had scored similarly the same way on the ITBS. Out of the thirty-eight scores there is a small correlation between approximately twenty-five scores while approximately thirteen scores had no correlation.

Scatterplot 1



Scatterplot 1 shows the correlation between the Students Math ITBS score and Core Knowledge score.

Scatterplot 2



Scatterplot 2 shows the correlation between the Students Reading ITBS score and Core Knowledge score.

Scatterplot 2 shows the $r = 0.74$ correlation of the students' CK-TEST score to their ITBS reading score from last spring. Graph 2 shows the two different scores together. There is a smaller correlation between these two scores than that of the CK-TEST and math scores. There are a less number of scores on Graph 2 that show the correlation between the two scores. Out of the thirty-eight there are approximately eighteen that appear to have a slight correlation.

CHART 1.

Student	CK Score	ITBS Math Score
1.	3.0	5.5
2.	2.7	5.8
3.	4.1	6.0
4.	4.4	6.8
5.	1.8	5.2
6.	3.0	4.6
7.	3.6	4.8
8.	2.9	6.8
9.	3.5	5.8
10.	3.8	6.2
11.	5.8	7.9
12.	4.4	6.4
13.	3.5	5.1
14.	1.7	6.0
15.	2.3	5.3
16.	2.6	4.3
17.	3.0	5.1
18.	5.9	7.9
19.	4.2	6.2
20.	5.2	6.6
21.	3.5	6.7
22.	1.2	3.9
23.	3.8	4.9
24.	2.7	4.8
25.	3.2	5.7
26.	3.5	5.3
27.	1.2	5.9
28.	3.6	5.8
29.	3.6	6.7
30.	1.4	4.6
31.	2.1	5.0
32.	2.9	4.5
33.	4.5	5.8
34.	2.7	6.5
35.	4.2	5.4
36.	3.9	5.0
37.	3.5	7.0
38.	1.1	5.1

CHART 2.

Student	CK Score	ITBS Reading Score
1.	3.0	5.9
2.	2.7	5.9
3.	4.1	5.6
4.	4.4	5.4
5.	1.8	3.3
6.	3.0	5.1
7.	3.6	5.1
8.	2.9	6.3
9.	3.5	4.5
10.	3.8	6.4
11.	5.8	6.4
12.	4.4	6.3
13.	3.5	5.2
14.	1.7	5.2
15.	2.3	4.8
16.	2.6	3.4
17.	3.0	6.1
18.	5.9	7.6
19.	4.2	6.0
20.	5.2	7.2
21.	3.5	7.2
22.	1.2	5.1
23.	3.8	4.8
24.	2.7	4.1
25.	3.2	6.1
26.	3.5	6.4
27.	1.2	5.2
28.	3.6	6.2
29.	3.6	3.8
30.	1.4	4.5
31.	2.1	4.9
32.	2.9	4.3
33.	4.5	4.3
34.	2.7	6.3
35.	4.2	4.0
36.	3.9	5.4
37.	3.5	4.1
38.	1.1	2.5

Chart 1:
Lists each Student by Student number and that Student's scores on the Core Knowledge test and Math ITBS test.

Chart 2:
Lists each Student by Student number and that Student's scores on the Core Knowledge test and Reading ITBS test.

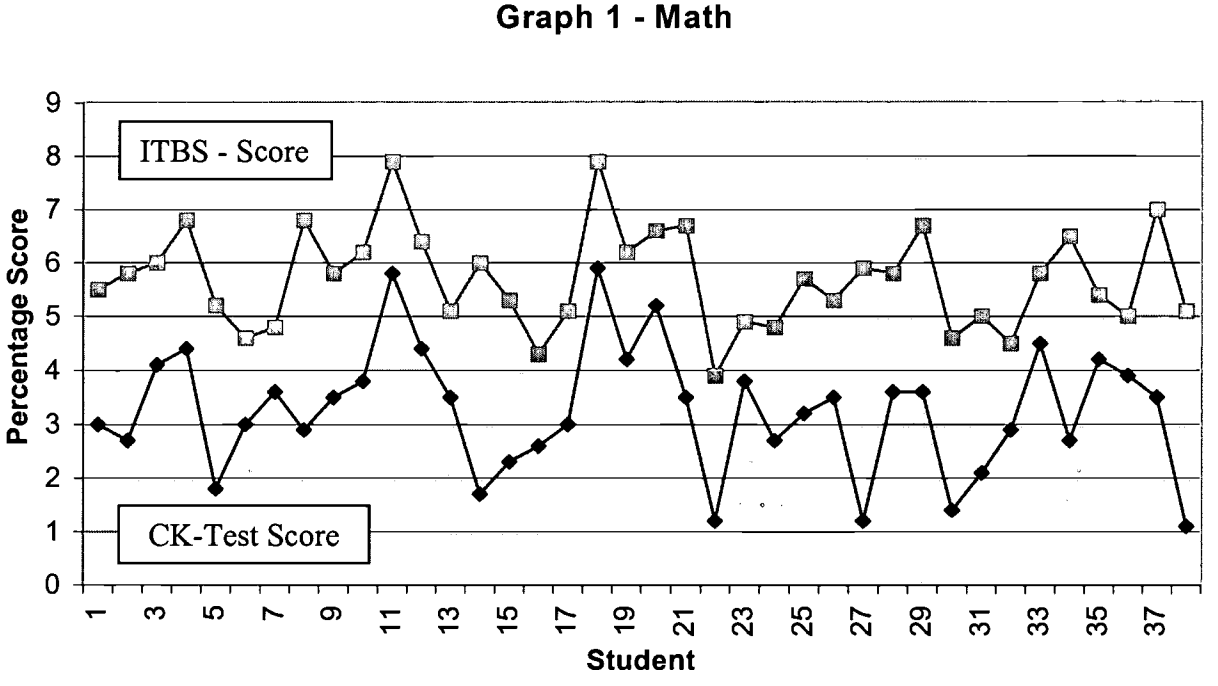
Descriptive Statistics
of all Student scores combined for each of the tests; Core Knowledge, Math ITBS and Reading ITBS scores listed in Chart 1 and Chart 2

CK-Test
Mode = 35 @ 5
Median = 35
Mean = 32.6
Range = 48
SD = 1.77

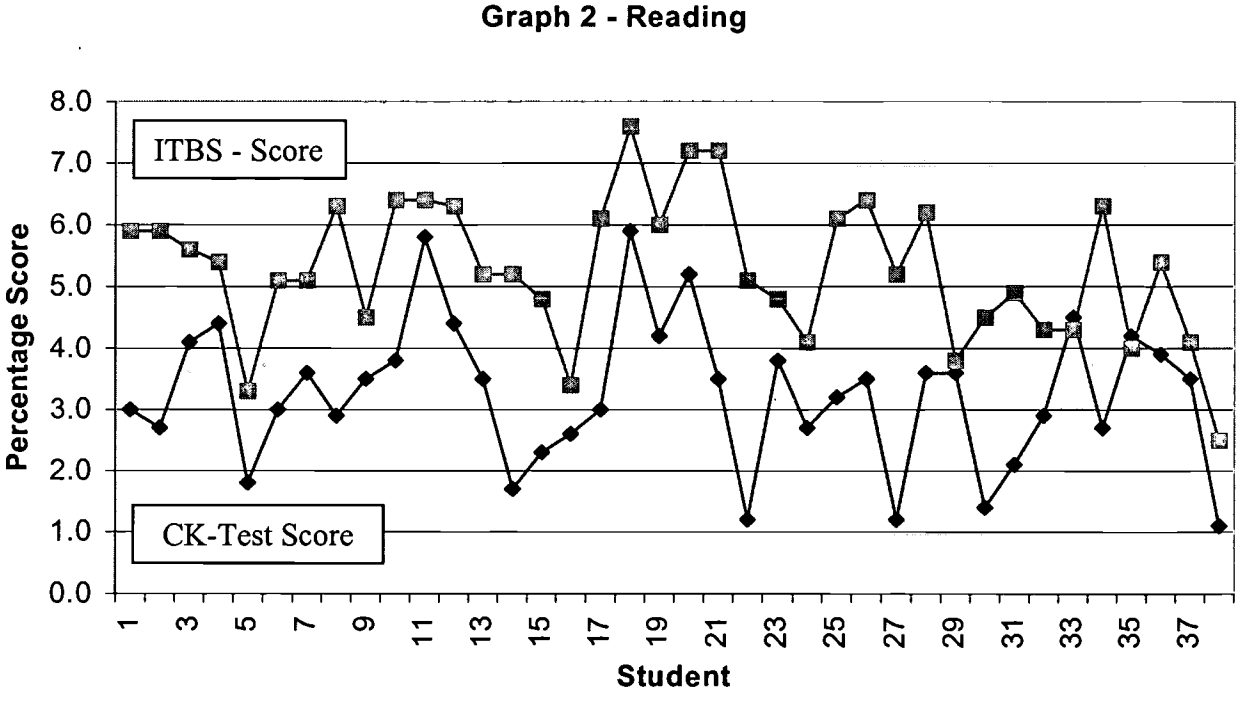
ITBS-Math
Mode = 5.8
Median = 5.7
Mean = 5.7
Range = 4
SD = 0.91

ITBS-Reading
Mode = no mode
Median = 5.2
Mean = 5.3
Range = 5.1
SD = 0.96

Graph 1 shows the Students' Math ITBS scores and Core Knowledge scores.



Graph 2 shows the Students' Reading ITBS scores and Core Knowledge scores.



Additional Demographic Findings

According to the CKF these children do not have the common base of knowledge that is needed for them to succeed in the sixth grade. The highest score on the CK-TEST was 59%. Following are samples of questions and the number of students out of the thirty-eight students who were able to answer those questions. Seventeen students were able to identify Mark Twain as the author of The Adventures of Tom Sawyer and nineteen were able to identify Huck Finn as one of the characters in the story. A map identifying Europe, Africa, South America, North America, the Northern Hemisphere, and the Southern Hemisphere was given. Twenty to twenty-three students were able to identify these reference points. A matching part of the eight regions in the United States to a state within that region was given. Three to nine students were able to match the state to its appropriate region. Twelve students were able to identify Canada as the country that shares our Northern border and eleven were able to identify Mexico as the country that shares our Southern border. Ten students could name the two sides involved in the Civil War. Nine could share a little bit of what the war was about and who had won. Twenty-three could identify Abraham Lincoln as the President during this time.

Discussion

The study examined the relationship between a student's CK-TEST score to that of his math and reading score on the Iowa Test of Basic Skills. There does seem to be a moderate correlation between the students' CK scores and their ITBS math scores. There was also a correlation between the students' ITBS reading scores and their ITBS scores. The correlation between the CK-TEST score and math score is slightly higher than the CK-TEST score and reading score.

Prior research studies (1999) have shown that having a fair amount of knowledge will lead to some sort of success. E.D. Hirsch and the CKF (1999) are among those that believe "Knowledge is power". According to the CKF and their research (1999), students who have a solid foundation of CK will continue to build upon that knowledge and perhaps have less difficulty understanding the new material.

The CK-TEST was given to show the relationship between the students' CK to that of their math and

reading scores on their 5th grade ITBS test. The test revealed to me as a teacher in that school; that the sixth grade class is lacking information that is relevant to our history and our country's geography. Could this lack of knowledge at the sixth grade level cause the students to score low on their sixth grade ITBS test in the spring of 2000?

I believe it will be informative for future research to examine knowledge retention verses lack of knowledge. That being, teaching fifth graders the exact facts from the CK-TEST and giving the test to the same students once they are in the sixth grade. Those who answer incorrectly will do so because of lack of retention which may include a learning disability thus skewing the validity of the CK-TEST and what the CKF claims.

Limitations

The study of course has certain limitations that must be acknowledged. Since the largest group of children in the study were Hispanic, it is not known how long they have lived in the United States; therefore not having had a chance to learn U.S. history or some parts of our geography. It is also not known how seriously the students took the test of Core Knowledge. It was presented to them in a way that they would receive in-class credit for their efforts; however, it seemed at the time of the test that some students may have hurried through it in order to go back to what they were doing previously. The ten tests of CK-TEST that could not be used because the students' ITBS scores could not be located may have changed the outcome altogether. Another limitation is the reliability of the CK-TEST itself. Examining just the content validity of it may not have been enough.

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