

Digi-Block Learning SystemSM

Research Study of Digi-Block Implementation¹

Research on the Digi-Block Learning System reflects a wide array of topics. This particular study was done in Israel with students in first and second grade. This study reflects the usage of the Digi-Block Learning System to improve student understanding as reflected through various types of assessment.

The purpose of the Israel study was to determine if using the Digi-Block Learning System over a two-year period with first and second graders would make a significant difference in student achievement. The initial hypothesis was that given appropriate implementation of the Digi-Block Learning System, including Professional Development for teachers, children would develop a more thorough understanding of number and the base ten system at earlier grades. Based on this hypothesis, the study ran for a two year time period with a group of students using Digi-Block and a control group. Digi-Block usage was the only measure set up as variation for the student groups. Students represented a wide array of socio-economic groups, thus allowing findings to reflect across groups. The study also reflects the ability to use the System with a non-English speaking student population. This is particularly relevant in areas of the United States where the issue of non-English speakers presents challenges to education systems.

Beginning in September 1999, the Israel Ministry of Education conducted a pilot of the Digi-Block Learning System over a two-year period with a group of first graders through their second grade year. The pilot was held in two cities: Netanya and Dimona. Classroom usage involved daily instruction utilizing Digi-Block as a means for understanding the place value system and base ten numeration. Evaluation of the pilot took the form of two assessment instruments: individual one-on-one assessments and group paper-pencil tests. Final evaluations were based on not only the students' performance using the Digi-Blocks, but also achievement results on standardized tests. Tests were administered at the beginning, middle and end of the year.

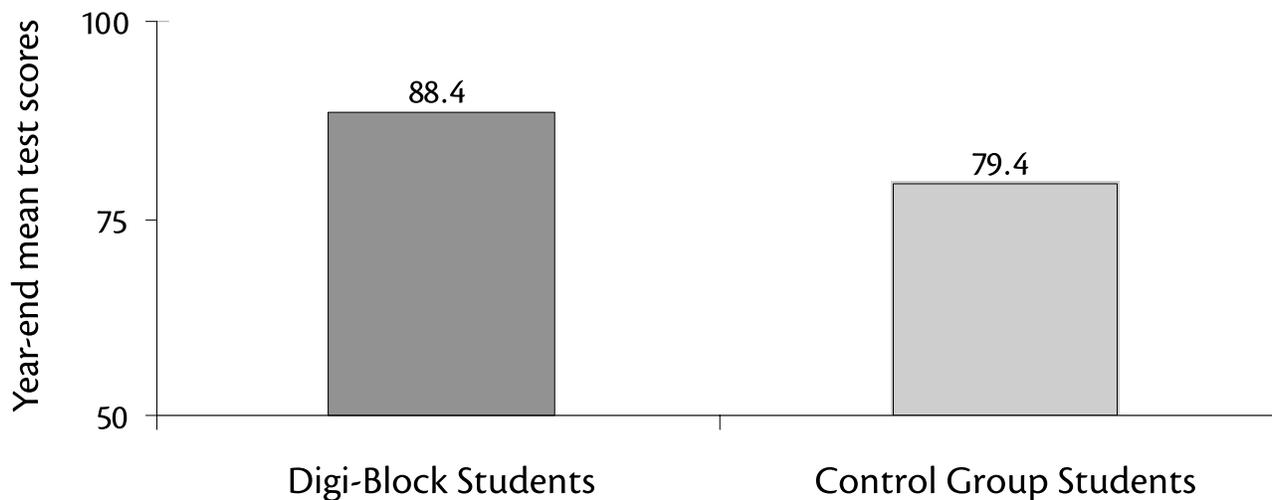
The test administered at the beginning of the year was used as a benchmark to determine the starting point of all students. At that point, students were divided into those using the Digi-Block Learning System, and those using standard teaching methodology. Students in the Digi-Block sample performed better on the middle of the year and end of year follow-up tests. These students performed better on questions dealing with mastering counting up to 40, large numbers and base ten representation. The base ten representation took the form of exercises with whole tens, arranging two-digit numbers in order and place value questions. Information from the first year was used to refine the study protocol for the second year of the study.

¹ Sela, Anat (2000). Evaluation of the use of Digi-Block in Israeli pre-schools. Israel: National Supervisor for Science and Technology, Preschool Education Division.

Year two of the study included students from the first year (now in second grade) in addition to new first grade students. Students still represented Netanya and Dimona. Students were divided into those using Digi-Block and those using traditional methods.

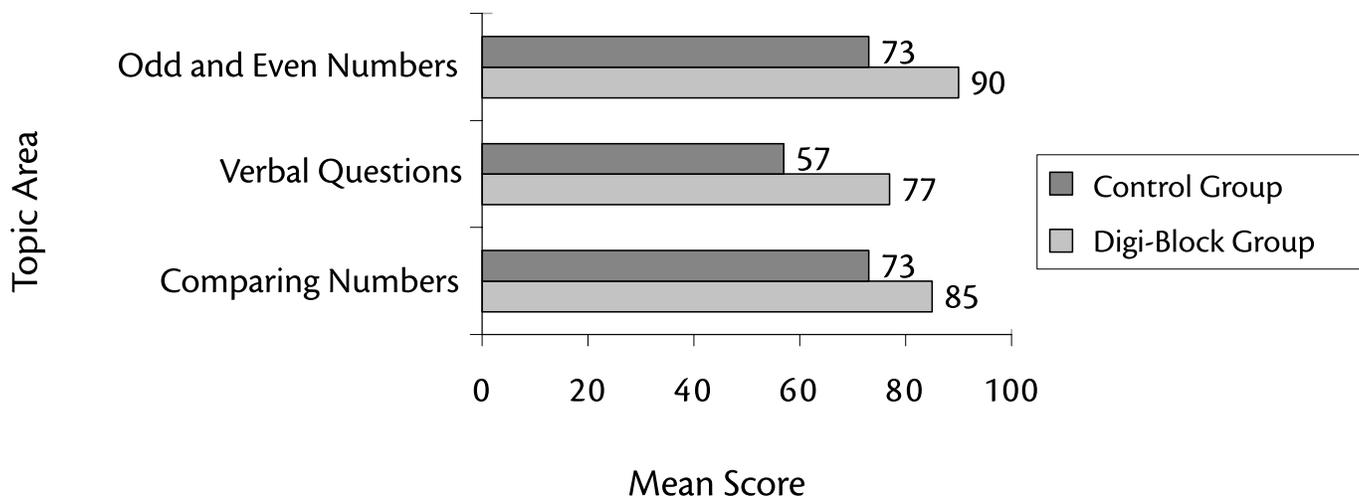
Based on the testing, a number of significant findings arose:

Year-End Test Results



- Students using the Digi-Block Learning System, with teachers trained in usage of the System attained a mean score of 88.4. This score is **significantly higher** than the mean score, 79.4, of the control group, which utilized traditional methods.
- A full 24% of the students in a Digi-Block classroom, with a trained teacher, **scored 100%** on the test.
- There was a **significant difference** in the area of comparing numbers between Digi-Block students and the control group. Students using the Digi-Block Learning System attained a mean score of 85 in comparing sequential numbers, while the control group scored 73.
- There was a **significant difference** in answering verbal questions between Digi-Block students and the control group. Students using the Digi-Block Learning System attained a mean score of 77 on verbal questions, while the control group scored 57.
- There was a **significant difference** in understanding and recognizing odd and even numbers. Students using the Digi-Block Learning System attained a mean score of 90 on odd and even number recognition, while the control group scored 73.
- In almost all cases, there was a **significant advantage** for the Digi-Block students in all types of questions.

Comparison of Digi-Block and Control Group Mean Scores



After 1.5 years students using the Digi-Block Learning System showed a significantly higher score than children using traditional methodology. With such a substantial difference in the verbal questions section of the test, several findings were suggested concerning the use of the Digi-Block Learning System. Most considerably, the usage of the System allows students to engage in more complex and integrative types of mathematics. This is supported by the fact that students using the Digi-Block Learning System scored significantly higher in odd and even numbers, verbal questions, and comparing numbers.

Also reflected in this study is the importance of Professional Development for teachers. Those students who scored significantly higher were taught using the Digi-Block Learning System in conjunction with a trained teacher.

Overall findings show that students using the Digi-Block Learning System, in conjunction with a trained teacher, scored significantly higher in number activities on standardized test in grades one and two.

Summarized by Donna Leak, Ph.D.

Funding Source Glossary

Organization	Website	Information
Catalog of Federal Domestic Assistance	www.cfda.gov	The Catalog contains financial and nonfinancial assistance programs administered by departments and establishments of the Federal government.
Federal Register	www.access.gpo.gov	Lists grant notices as published by the Federal Government.
National Council of Teachers of Math (MET Grant and Toyota Time Grant)	www.nctm.org/about/met www.nctm.org/about/toyota/index.asp www.nctm.org	<p>Established by the National Council of Teachers of Mathematics, the Mathematics Education Trust (MET) offers opportunities to expand teacher's professional horizons. MET provides funds to support classroom teachers in the areas of improving classroom practices and increasing teachers' mathematical knowledge.</p> <p>Toyota's Investment In Mathematics Excellence (TIME) is a grant awarding teachers up to \$10,000 for innovative projects that enhance mathematics education within a school.</p>
National Education Association	www.nfie.org	The NEA's National Foundation for the Improvement of Education provides grants and technical assistance to teachers, education support personnel, and higher education faculty and staff to improve student learning in the nation's public schools.
NSF	www.nsf.gov/home/grants.htm	The National Science Foundation funds research and education in science and engineering, through grants, contracts, and cooperative agreements.
The Foundation Center	www.fdncenter.org	The Foundation Center provides information on virtually every facet of grant seeking, it is a must for anyone looking to secure funding.
School Grants	www.schoolgrants.org	This is a comprehensive and oft up-dated source – a definite site to consult.
Thomas – Library of Congress	http://thomas.loc.gov	This online site from the U.S. Library of Congress, offering up-to-date information on the legislative activities of both Houses of Congress.
U.S. Department of Education	www.ed.gov	Department guidelines, regulations, and Federal Register documents are available here.