

**The Educational Impact of the Time To Know Platform:  
A Quantitative Comparison to Traditional Pedagogy**

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## ***Introduction***

The Time To Know platform introduces a unique approach to the study of English Language Arts and mathematics in elementary classrooms. This platform provides an advanced technology, an interactive core curriculum and traditional learning materials to promote in an inquiry-based learning environment. The platform enables highly differentiated instruction and supports collaborative and interdisciplinary techniques.

The Time To Know Digital Learning Platform has been used in classrooms in Tel Aviv, Israel and in the greater Dallas, Texas, area since 2007. Throughout the development of the product in Israel, researchers conducted formative studies of the classroom experiences of teachers and students to guide that development. With development completed in 2007, the Time To Know company commissioned a quantitative study of the educational impact of the product. This paper reviews the results the empirical findings of that study.

This empirical study was conducted in schools in Tel Aviv during the 2008-09 school year. Students in the 5<sup>th</sup> grade classrooms in the treatment schools used Time To Know for two years. Students in the 4<sup>th</sup> grade classrooms used the product for just one year. The study was conducted by an independent research organization, the Henrietta Szold Institute, The National Institute for Research in the Behavioral Sciences at Jerusalem. The Szold Institute provides research, training and evaluation of programs that provide social and education services.

This empirical study tested students in three subjects: mathematics, reading language arts in Hebrew and reading language arts in English. Hebrew is the national language of Israel but all students also receive rigorous instruction in reading, writing and speaking English, as part of their elementary class instruction.

This white paper is the result of a careful review of the empirical findings of the Szold Institute and our development of an English-language analysis of those findings and their importance to education.

## ***Method***

The treatment in this study consisted of using the Time To Know educational software platform and core curriculum as the main component of instruction in Hebrew, English and mathematics, for all students in the participating classrooms.

Two schools provided treatment classrooms. Modi'im is an inner-city public elementary school located in an underprivileged neighborhood of Tel Aviv. The 200 students in the school come from a variety of backgrounds with the majority coming from low-income households, immigrant families or state-run group homes. Yisgav is a public elementary school with 400 students located in an upper middle-class neighborhood of Tel Aviv. The students reflect the demographics of the neighborhood, but the school has had frequent changes in teachers and administrators in recent years. The study also identified two comparison schools that matched the two treatment schools in demographics and achievement levels. Students in the comparison schools did not use educational software as part of their classroom instruction.

Students in all four schools were given tests in three subjects: reading in Hebrew, reading in English and mathematics. Students took a pretest at the beginning of the 2008-09 school year and the same test as a post-test at the end of the year. These tests were developed by content experts from T2K, accompanied by psychometric examination of researchers at the Szold Institute, to measure the concepts and skills of reading and mathematics that students learn in the 4<sup>th</sup> and 5<sup>th</sup> grades.

The study analyzed the results from these three performance measures. For each student the pretest and post-test scores in each subject were used to calculate a gain score for that student; these gain scores were analyzed statistically by the Szold Institute to measure learning during one year of instruction. The analysis looked separately at two groups of students: one group consisted of students in 5th grade who had used Time To Know for two school years, 2007-09. A second group were 4th grade students who used Time To Know for only one year, 2008-09. We refer to these as the two-year group and the one-year group. For both groups gains in learning were measured for one school year, 2008-09.

## **Findings**

Table 1 shows the results of this analysis for the Two-year Group. These students had used Time To Know in 4<sup>th</sup> and 5<sup>th</sup> grade and their learning was measured in 5<sup>th</sup> grade.

**Table 1: Two-Year Group:  
Statistical Analysis of Gain Scores for  
Fifth Grade Students in Treatment and Comparison Schools  
in English, Hebrew and Mathematics**

### **Reading Language Arts in English**

	<b>Treatment School</b>	<b>Comparison School</b>
n	79	114
Mean gain score	21.7	10.3
t-value	5.39	
significance	p < .001 ***	

### **Reading Language Arts in Hebrew**

	<b>Treatment School</b>	<b>Comparison School</b>
n	84	119
Mean gain score	11.6	6.6
t-value	2.42	
significance	p = .02 *	

### **Mathematics**

	<b>Treatment School</b>	<b>Comparison School</b>
n	84	120
Mean gain score	24.6	20.1
t-value	1.95	
significance	p < .05 *	

Students in the treatment group had significantly higher gains in their test scores over the course of the school year than 5<sup>th</sup> grade students in the comparison schools in all three subject areas, reading language arts in Hebrew, reading language arts in English and mathematics.

A similar analysis was conducted for 4<sup>th</sup>-grade students in the one-year group.

**Table 2: One-Year Group  
Statistical Analysis of Gain Scores for  
Fourth Grade Students in Treatment and Comparison Schools  
in English, Hebrew and Mathematics**

**Reading Language Arts in English**

	<b>Treatment School</b>	<b>Comparison School</b>
n	80	73
Mean gain score	16.2	13.1
t-value	1.22	
significance	p = .22 (ns)	

**Reading Language Arts in Hebrew**

	<b>Treatment School</b>	<b>Comparison School</b>
n	74	71
Mean gain score	12.6	5.8
t-value	3.84	
significance	p < .001 ***	

**Mathematics**

	<b>Treatment School</b>	<b>Comparison School</b>
n	74	69
Mean gain score	31.3	50.3
t-value	-6.17	
significance	p < .001 *** (negative)	

Here students in the treatment group had significantly higher gains than the comparison schools in reading in Hebrew; they had higher gains in English but the difference was not statistically significant. In this analysis the students in the comparison schools were found to have significantly greater gains than the treatment group in mathematics. Researchers carefully reviewed the data contributing to this unexplained result.

It appears that the inconsistent manner in which the pretest was administered in the comparison schools can be a possible explanation for the negative effect in mathematics. All teachers in the study were told to give the pretest without comment, but some teachers in the comparison schools told their students to skip any question on a topic that was new to them. Researchers found that the pretest scores in those comparison classrooms were very low and the gains on the post test extremely high. In contrast, the pretests in Hebrew and English for these classrooms, where no special instructions were given, fell in the normal range. This suggests that the teachers' special instructions in the math pretest contributed to the large gains and the statistical result.

## ***Analysis***

Overall, the study finds that the Time To Know platform can have a significant impact on learning in classrooms where students have used the product for two years. It increases student learning a measurable amount in reading and writing and in mathematics, when that learning is compared to students who have not used the Time To Know product and when other contributing factors are controlled. The educational impact of the Time To Know treatment with students who were using the Time To Know product for the first time in 4<sup>th</sup> grade was not found to be significant in all subjects.

The two-year impact of Time To Know might indicate that the learning gains of the product are cumulative – the gains made in the second year build on those of the first year, while gains in the first year are too small to measure in a study of this size.

This finding might also be result of students and teachers adapting to the innovative technology. They must master the software and a new way of handling classroom interactions. That process of adaptation might interfere with content learning for part of the first year of implementation of the product. It is not unusual to find that an innovation to classroom practice impedes learning when it is first implemented.

## ***Conclusion***

For a new product in the first few years of classroom use, these are important findings of educational impact. Measuring learning quantitatively by comparing the treatment to a comparison group is critical to understanding the true educational value of the product. The results show that student experience with Time To Know was important to their learning. And two-year experience produced a stronger treatment effect than a one-year of experience. This is not surprising given the innovative nature of the Time To Know platform. Many empirical studies on innovation and technology find the same thing.

These results are encouraging, but preliminary. Further research can now be designed to explore the educational effects of the Time To Know treatment with more precision, exploring such questions as these: Will the treatment effect increase in subsequent years as teachers and students gain even more experience with the technology? Can learning effects be measured with state tests or commercial standardized tests? Will the unusual effect found the 4<sup>th</sup> grade classrooms be confirmed and overturned in a replication? Will the one-year results change as teachers become more adept with the technology?

Finally, the test developed by content experts from T2K, accompanied by psychometric examination of researchers at the Szold Institute, concentrated on the math and reading skills found in state tests of learning standards and that test did not include questions on thinking skills and problem solving. These “higher order” skills are a key element of the Time To Know curriculum and future research should examine their development in students using the product.

All in all, to us the results of this initial empirical investigation are important and impressive. The study was conducted with a rigor and fairness that eliminated many competing and confounding variables. Given the demands of the technology and the challenges of classroom experimentation, we find these results compelling.

## ***Contact Information***

For more information on the research on the T2K product, contact us at:

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