Never Trust an Engineer

Case History

Category: *Electronic Calculators, Mathematics Training*

Methods: *Focus Groups, Depth Interviews, Ethnography, Telephone Survey*

Summary

A large, worldwide manufacturer of electronic components and devices developed handheld calculators and mathematics training program for children in the first, second, and third grades. Field visits by the engineering team confirmed that the new calculators were terrific, and that the children were deeply engaged and emotionally involved with the devices. Senior marketing managers wanted to know how to market the new calculators and training program, and hired Decision Analyst. The research revealed some surprises.

Strategic Issues

The education market in the U.S. is huge, but U.S. students still lag behind much of the world in mathematics and science. Our client, a worldwide electronics manufacturer, saw the education market as a profit opportunity, but also as an opportunity to improve mathematics education in the U.S. The electronics manufacturer assigned an engineering team and development staff to design electronic calculators and training materials for elementary schools in the U.S.

Once working models of the calculators were ready, they were placed in a number of classrooms to determine how students interacted with the calculators and how they responded to the training materials. Engineering teams visited the schools, talked to the teachers, and observed students using the calculators in class assignments. The engineers reported that the product was a great favorite of the students, and that students were deeply engaged and deeply involved in the calculators, as evidenced by the fact that students held calculators with both hands up close to their faces and worked the keyboard with their thumbs. The manufacturer was eager to roll out this new calculator and new training system to schools across America. Decision Analyst was called in to conduct primary research to help guide the marketing of the new product.

Research Objectives

The primary objective of the research was to determine how to position and how to market the new mathematics calculator and training system to schools in the U.S.

- What were the attitudes, perceptions, and motivations of teachers, and how would these influence positioning, messaging, and strategy?
- What were teachers' reactions to the calculator and training materials, and did any opportunities for improvements exist?
- What would be the best channels of distribution?

Decision Analyst
strategic research ■ analytics ■ modeling ■ optimization

604 Avenue H East • Arlington, TX 76011-3100, USA
1.817.640.6166 or 1.800.ANALYSIS • www.decisionanalyst.com

Research Design and Methods

Since so much in-classroom testing had been completed by the client's engineering teams, we recommended that the research begin with ethnography (observing the classroom usage of the calculators and training materials) and focus groups among the classroom teachers who had tested the new calculators and materials (i.e., the "test" teachers). We also recommended that a "control" group of elementary school teachers be conducted at the same time in the same cities. The "control" teachers would be similar to the "test" teachers, except that they had never been exposed to the new calculator and training materials. We recommended the "control" groups just in case the "test" teachers might be biased in favor of the new program because of self-selection bias. We also conducted depth interviews among the manufacturer's executives, managers, and engineers who had been involved in the program's development and testing. At the same time as the qualitative research, a nationwide telephone survey was conducted among elementary educators to measure their attitudes toward the teaching of mathematics in elementary schools.

Results

The results surprised the electronics manufacturer. Contrary to the engineers' report that teachers favored the new calculator and training program for mathematics, the elementary school teachers were highly skeptical of using calculators to teach mathematics to elementary students (this was true of "test" and "control" teachers, as well as surveyed teachers). The teachers overwhelmingly favored teaching mathematics to children in traditional ways, so that students learned how to do basic arithmetic operations on paper and in their heads. Once students mastered traditional mathematics, then and only then would teachers be open to calculators and new training methods.

The second surprise involved the calculator itself. The engineers had reported to senior management that the elementary students loved the new calculator. Students were absorbed by and deeply engaged in using the new calculator, the engineers observed, as proven by the fact that students held the calculator with both hands very near to the face, and worked the keyboard with their thumbs. The teachers had a different interpretation.

The elementary teachers explained that the keys on the calculator were too small and too close together for the manual dexterity of elementary school children. That's why students held the calculator with both hands and worked the keyboard with their thumbs. As far as students holding the calculators close to their faces, teachers said that elementary students could not read the small digits in the "tunnels" display on the calculator, and that was why they held the calculator so close to their faces. Senior management killed the project and reassigned the engineers.

604 Avenue H East • Arlington, TX 76011-3100, USA
1.817.640.6166 or 1.800.ANALYSIS • www.decisionanalyst.com