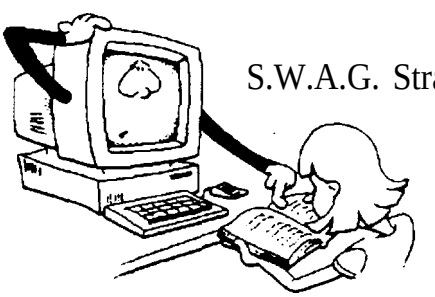
Computer Based Distance Learning & EPGY: A Strategic Plan



S.W.A.G. Strategies

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Executive Summary

Stanford's Educational Program for Gifted Youth (EPGY) is the leader in the distance learning market of computer-based courses for gifted and talented youth, and the only program offering CD-ROM based courses to gifted students. Since 1991, it has grown from a few students to about 1200 in 1996. As a result of this growth, EPGY faces many decisions concerning the future of the program.

EPGY's strategic decisions are as follows: what new courses to develop, which tutor services to provide, what prices to offer these services, and what strategy to pursue with the pilot school program. Evaluation of EPGY's situation indicates that they should follow a "Whole Product Solution"' strategy for curriculum development, tutorial support, course pricing, and the pilot school program.

A "Whole Product Solution" Strategy

- Develop the **3-8 Math Enrichment** sequence
- Seek R&D money for **9-12 Computer Science**
- Offer tutor support with **1 on 1 Virtual Classroom** and a **1-800 number**
- **Keep tutor support services costs to a minimum**
- **Offset tutor support services costs with tuition**
- **Include technical support and teacher training** in the pilot school program
- **Charge full price** for pilot schools programs
- **Improve the aesthetics** of the current courses before sending them to pilot schools

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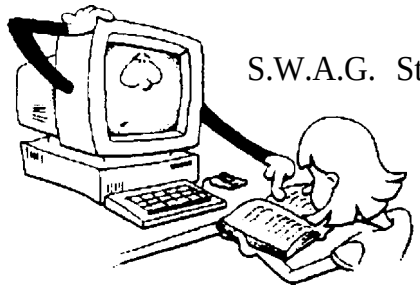


S.W.A.G. Strategies

Background

The Educational Program for Gifted Youth (EPGY) is an organization that offers a multimedia computer-based series of courses with tutor support in math and science to gifted and talented youth. It operates as part of Stanford University and has been offering courses on a quarterly basis through Stanford's Continuing Studies Program since 1991. To be admitted into the program, students submit standardized tests such as IQ, Achievement Tests, PSAT, or SAT. EPGY's mission is to provide gifted students with advanced courses that allow them to work independently and at their own pace. In some cases, a student can receive university credits for EPGY's courses.

EPGY currently offers K- 12 math as well as a number of college level courses, including multivariate calculus, linear algebra, and physics. Students receive course lectures on CD-ROM and perform exercises that complement the computer lecture. Unlike many computer-based educational products, the courses offered by EPGY include tutorial support. Tbe students can contact tutors by e-mail or telephone to ask questions. Each week, the tutors evaluate an electronic file of the student's work and maintain a record of the student's performance. Finally, the student must pass a final exam to complete the course.

To attract students, EPGY advertises through the World Wide Web, Johns Hopkins University's Center for Talented Youth Program, and Gifted and Talent Conferences in the United States. Also, there exists a grassroots network for the parents of gifted students which results in many word-of-mouth referrals.

Problem Statement

EPGY's enrollment has grown from a few students taking AB Calculus in 1991 to over 1200 students taking a range of courses in 1996. On average, EPGY answers 40-50 inquiries a week and admits 10 new students per week. EPGY recently admitted a student from Norway as the first international student in the program. Course tuition is currently $390 per class per quarter through Stanford's Continuing Studies Program. They are considering raising tuition as high as $500.

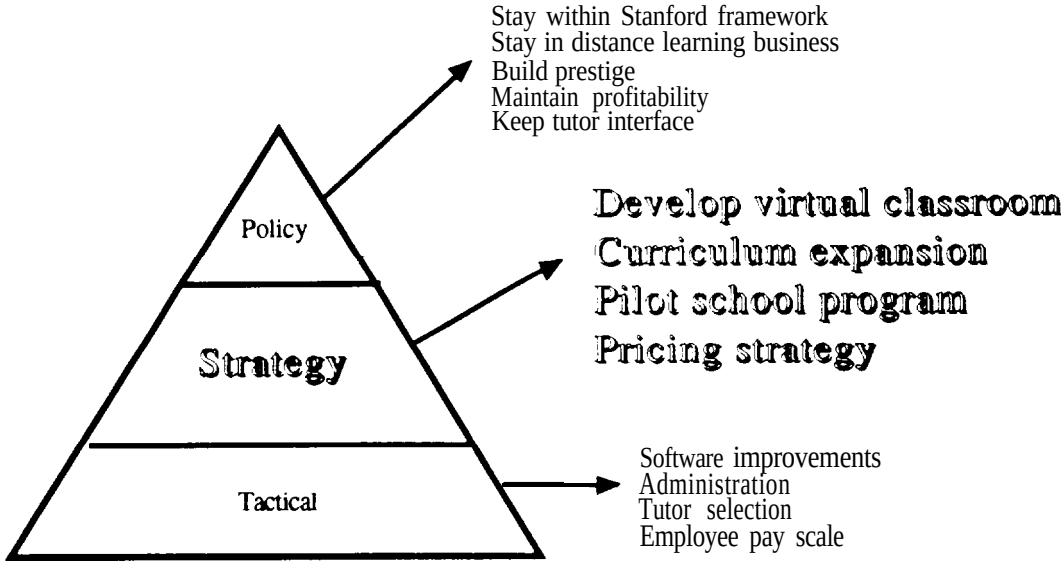
To provide more options to these students, EPGY is considering offering humanities classes and providing a virtual classroom where classes are held on-line. In the virtual classroom, the student's computer becomes the chalkboard on which they interact with the instructor and other students. EPGY has Beta tested this technology and desires to explore the potential of the virtual classroom.

In addition to individual clients, EPGY is developing a pilot school program in which an individual school or school district purchases EPGY courses to meet their students' needs. At this time, five schools participate in the program with three more expected to join the program next year.

The goal of this project is to define a development strategy for EPGY that focuses on what services to provide and how best to offer them. Specifically, we will suggest the new courses EPGY should offer, a strategy for pilot school program, methods for utilizing the virtual classroom, and an appropriate pricing strategy for these services.

Methodology

EPGY's situation was outlined using a Decision Analysis framework. The decision analysis cycle began by interviewing EPGY management to identify the uncertainties and decisions concerning the longevity of the organization. Significant resources were spent framing EPGY's problem and identifying relevant issues. Once the structure and scope of the problem were elucidated, a decision model was created that distinguished EPGY's strategic concerns. The following decision hierarchy highlights the issues discussed.



EPGY is evaluating strategic policies in two areas: determining product/service offerings and determining their relationship with the public schools. Three of the decisions examined focus on their products: what courses should they offer, what type of tutorial support should they provide, and how should they be priced. Their fourth decision involves their pilot school program and addresses their potential entry into the public schools. These decisions are highlighted below:

Curriculum Expansion.

EPGY is now deciding whether they should continue developing courses similar to their math and science courses or diversify their course offerings into the humanities and include courses such as English and Composition, US History, and Music Theory.

Tutorial Support Services.

Tutors are an integral part of EPGY's product. EPGY is considering expanding the types of tutorial support services to include the virtual classroom. The virtual classroom is a technology that allows simultaneous interaction via both voice and the computer screen. The alternatives for tutorial support which EPGY is considering among which they are deciding are a one-on-one or one-on-four virtual classroom session with a tutor, virtual office hours, and an Internet chatroom in addition to the current e-mail and telephone services.

Pricing Strategy.

The current quarterly tuition price is $390 per quarter with free tutor support via e-mail and telephone. EPGY is considering raising the tuition. They are also interested in determining the appropriate prices for their tutor support services.

Pilot Schools

The Pilot School program is a new venture in which EPGY teams with schools to provide courses. They are currently evaluating the value of this program to their overall mission. They are also interested in the best implementation strategy for

penetration into the school system. Specifically, what level of service to provide the schools and what price discounts to offer.

These decisions are difficult for EPGY because they are unsure of several critical factors such as the demand for their products and the availability of the necessary technology. After all of these uncertainties were initially identified, they were aggregated into two major uncertainties: demand and cost.

Demand

Although there is a large market of potential students, there is still uncertainty about how many students will enroll in the classes and even greater uncertainty in student's demand for the tutor support options such as the virtual classroom. This demand is very dependent on the availability of the technology as well as the student's preferred modes of learning.

The demand for the curricula via the Pilot School program is influenced by additional complications associated with the public schools. These uncertainties include the politics associated with public schools, the acceptance of the program by teachers, the success of training teachers to effectively integrate the courses into the classroom, and, of course, the availability of the appropriate computer and telephone hardware. For example only about 40% of schools have access to CD-ROMs.

cost

EPGY's cost is also an uncertainty. The majority of their current costs are for the salaries and benefits paid to the tutors. These wages vary depending on the background of the people they hire. There are also uncertainties associated with the development of courses which are dependent on contracting with teachers and

professors to act as consultants for the content of the courses. Additionally, the cost of teacher training to support the pilot school program influences profitability.

Values

To evaluate users' preferences, several EPGY students and parents were surveyed. Simultaneously, a conjoint analysis was completed by EPGY clients and potential clients to gain additional insight for EPGY. Results of the conjoint analysis and survey are in the appendices along with the decision model results. A copy of the survey questions is also included. In addition to identifying user preferences, a market analysis was done to examine EPGY's competitive position. Recommendations are made based on the findings of the conjoint and decision analyses and market information.

Market Analysis

EPGY competes in two markets, the gifted and talented market and the public school curriculum market_ Both markets supply EPGY with an increasing number of opportunities for computer based distance learning products.

The infrastructure of home computing is developing rapidly. "In 1995, for the first time, FC[s] outsold TVs as the most popular consumer electronic device sold into US households." As a result. there is an increase in demand for home educational software.

Furthermore, there is an intensifying dissatisfaction with the US public school system. The public school system is failing to meet the needs of all students. Frequently, gifted and talented students are forced to learn at a slower students' pace. 4 Because schools "in their zeal for egalitarian equality"' are unwilling to group students by ability, the best students often go unchallenged and become frustrated by the educational process. For example, when US students are compared internationally, the top 1% of US high school students consistently score last.

Another action taken by parents who are dissatisfied with public school education is to arrange home schooling for their children. Home schools are rising in numbers and public schools are beginning to work with them.'

One solution proposed by legislators to address public school dissatisfaction is an education voucher system. In this type of program, the money that public schools would normally receive for an enrolled student would be given to the parents instead when the student is withdrawn from public school. This money could be used towards home schooling, private schooling, and possibly EPGY courses. Although Proposition 174, which would have introduced a voucher system in California, was rejected by voters 1993, voucher systems are being tested across the country, and advocates expect that once one state approves them, other states will follow in a "domino effect".*

A Porter Model - The Gifted and Talented Market

EPGY has no direct competitors in its niche of distance learning products for gifted and talented youth. Of the five forces affecting EPGY's competitive position, two forces could disrupt EPGY's market advantage: the threat of substitutes and the potential for new entrants.

Private tutors, summer schools, community colleges, and private schools provide substitutes that compete indirectly with EPGY's courses. EPGY differentiates its product from the competition by providing a complete curriculum and tutor support.

In EPGY's market, most of the traditional barriers to entry are not significant. Consumer switching costs are low. Access to distribution is not an issue, and EPGY is not likely to retaliate strongly against a new entrant. However, EPGY markets their products under "Stanford University" which provides significant brand identity differentiation. In addition, students receive a transcript from Stanford's Continuing Studies Program, and EPGY's college level courses count for credit at Stanford. Only new entrants that are associated with major universities can be expected to compete successfully against the brand recognition advantage that EPGY enjoys. Other barriers to new entrants are the capital requirements for product development, and the cost advantage from a proprietary learning curve. However, a new entrant associated with a major university can also be expected to overcome these barriers.

A Second Porter Model[11] - The Public School Market

On the other hand, the public education market provides a significant challenge for EPGY. Since EPGY is not currently competing in this market, the competitive forces that may inhibit EPGY's success are examined. The greatest deterrent EPGY faces is the large barriers to entry.

Public school curriculum suppliers consist of large established companies such as Jostens and McGraw Hill. These companies dominate the market, control the major distribution channels, have brand identity with schools and state governments, and have deep pockets to retaliate against any threats introduced into the market. Given that public school administrators are often elected officials which creates a political environment, the shift to computer instruction may not occur as smoothly or quick as some expect. In a highly political environment, the decision makers have incentives to stay with the old technology. These gorilla companies have the money and power to leverage their political pull.

> ... in the shift from Industrial Age to Information Age education, most educators will lose money, status and power. They cannot be expected to accept this change without a fight. Given the formidable political clout of the country's 6 million public school employees, their fight for survival will not be ineffective. Although our nation's leaders would like to think otherwise, the Information Age brings the economics and politics of education into a sharp conflict."

Finally, potential pilot schools will be faced with high switching costs to purchase the required technology and software to use the CD-ROM courses. Public schools operating on an already tight budget may not have the resources to upgrade computer systems. For example, only 40% of elementary schools have 4 or more computers in the classroom.13

Customer Survey

To determine customer preferences, a survey was posted on EPGY's web page." The survey focused on potential new courses and tutorial services. EPGY patents and students were e-mailed to ask for their participation in the survey. Sixty responses were collected and this data is presented in Appendix 6.

In the survey responses, the students and parents indicate a strong preference for the 3-8 Math Enrichment curriculum and 9- 12 Computer Science. Questions regarding tutorial services show some interest in the virtual classroom technology with 1 on 1 Virtual Classroom being most preferred.

Conjoint Analysis

Conjoint Analysis evaluates price preferences against course and tutor support preferences. The Sawtooth program performs a linear regression comparing relative responses by potential customers to different permutations of product attributes. It does an initial analysis of all of the attributes to determine the most important ones, and then does a pairwise comparison to determine relevance issues. Once utility levels are established for the attributes, a market simulation is conducted pitting different product mixes against each other to determine the theoretical likelihood of purchase. The objective is to find the feasible mix that has the highest likelihood of purchase. The following attributes were considered for the conjoint analysis:

Curriculum:	3-8 Math Enrichment, 3-8 English Lang and Comp 3-8 Natural Science 9- 12 Computer Science 9- 12 Natural Science 9- 12 English Language 9-12 US History 9- 12 Music Theory.
Tuition	$200, $300, $400, $500, $600, and $700 per quarter.
Tutorial Support:	one-on-one virtual classroom four-on-one virtual classroom virtual office hours 1-800 tutor line EPGY chat room on the Internet.
Tutorial Hourly Fees;	the prices for hourly tutorial support were $5, $10, $20, $30, $40, and 50$.

To accomplish this analysis, a Sawtooth Software ACA System l5 program was written for the PC and given to 8 current EPGY parents and to 10 potential EPGY customers. The results are shown in Appendix 7.

A market simulation was then done with the following product options:

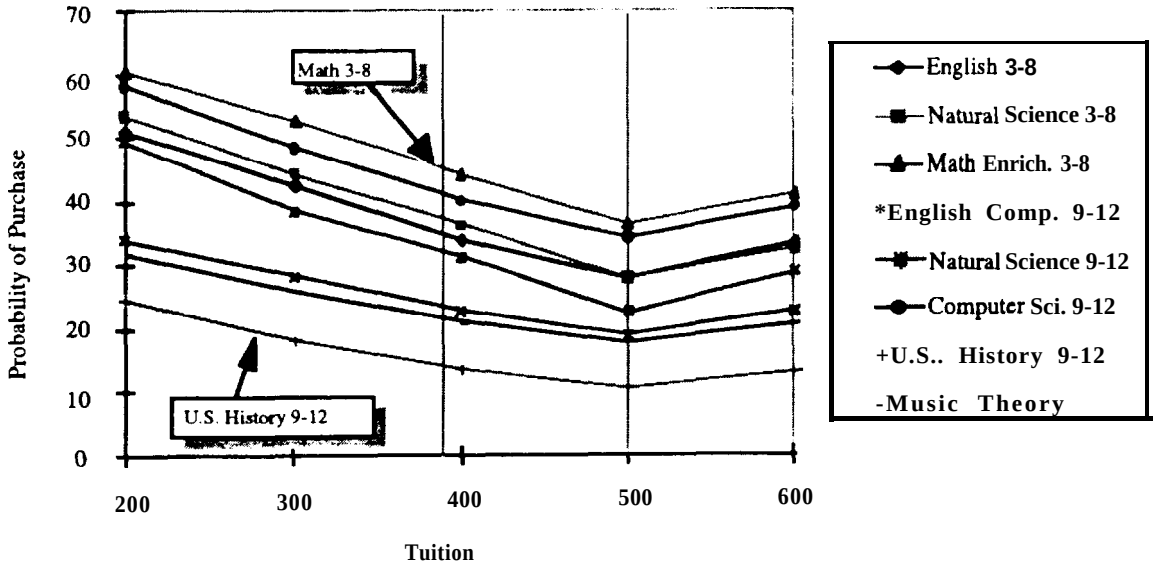
Curriculum	Tuition	Tutorial Support	Tutor Fees
3-8 Math Enrichment	$450	1 on 1 Virtual Classroom	$16
3-8 English Lang & Comp	$450	1 on 1 Virtual Classroom	$16
3-8 Natural Science	$450	1 on 1 Virtual Classroom	$16
9- 12 Computer Science	$450	1 on 1 Virtual Classroom	$16
9- 12 Natural Science	$450	1 on 1 Virtual Classroom	$16
9-12 English Language	$450	1 on 1 Virtual Classroom	$16
9-12 US History	$450	1 on 1 Virtual Classroom	$16
9-12 Music Theory	$450	1 on 1 Virtual Classroom	$16

Once 3-8 Math Enrichment was identified as the preferred class, the tuition, tutorial support, and hourly fees were analyzed by making different mixes of products to determine preferred product mixes. An example of the products used to analyze the tutorial hourly fees fol1ows:

Curriculum	Tuition	Tutorial Support	Tutorial Hourly Fees
3-8 Math Enrichment	$450	1 on 1 Virtual Classroom	$16
3-8 Math Enrichment	$450	4 on 1 Virtual Classroom	$16
3-8 Math Enrichment	$450	Virtual Office Hours	$16
3-8 Math Enrichment	$450	1-800 Number	$16
3-8 Math Enrichment	$450	Internet Chat Room	$16

The likelihood of purchase is relatively insensitive to price changes. As would be expected, the likelihood of purchase drops with an increase in tuition. However, over the range that EPGY plans on changing the tuition, this was a small change. This means that EPGY should be able to raise the price without losing a lot of students. The likelihood of purchase increased as the tuition dropped below the current tuition of $390 implying that if EPGY was to attempt to enter a bigger market, they could generate greater interest in their product by reducing the price. The following chart illustrates the sensitivity of the client to tuition price.

Tuition Pricing - Conjoint Analysis



The preference for classes is as follows (note that little interest was generated in the last three on the list):

1 3-8 Math Enrichment
2 9- 12 Computer Science
3 3-8 Natural Science
4 9- 12 Natural Science
5 3-8 English Language and Composition
6 9- 12 English Language
7 9- 12 U.S. History
8 9- 12 Music Theory

Tutorial support held the following preference ranking:

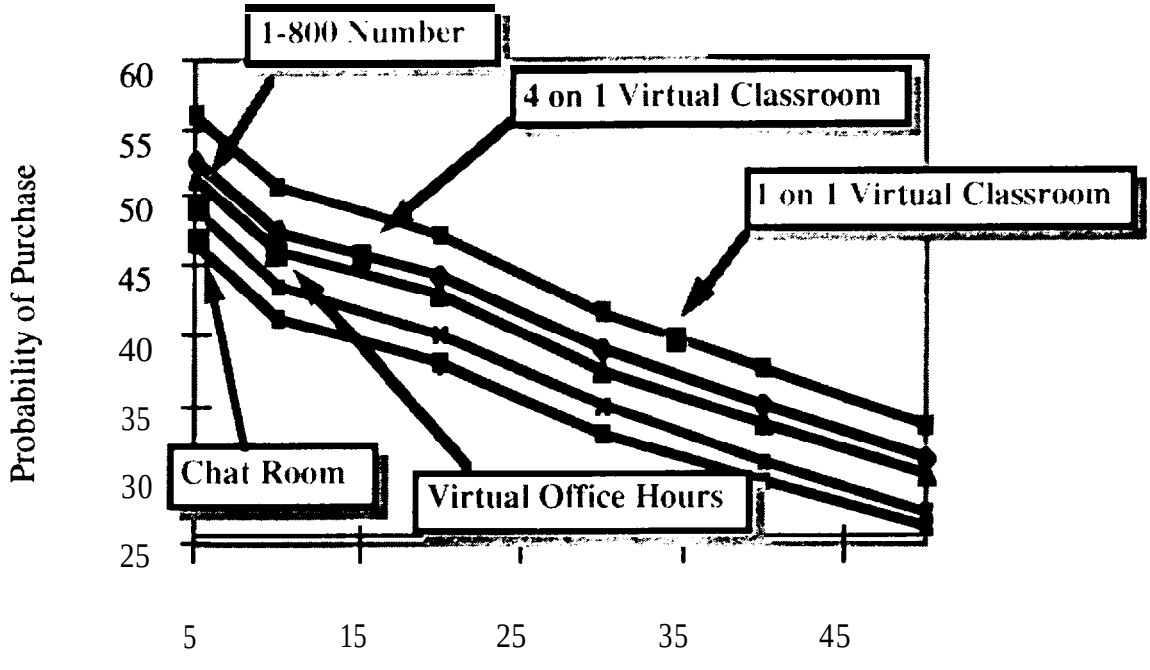
1 1 on 1 Virtual Classroom
2 4 on 1 Virtual Classroom
3 Virtual Office Hours
4 l-800 Phone Support
5 Internet Chat Room

However, after applying EPGY's estimated costs for each tutorial support option, the following preference ranking result:

	Tutorial Support	Price per Hour
1	l-800 Phone Support	$ 0-5
2	Internet Chat Room	$ O-5
3	Virtual Office Hours	$ 10
4	4 on 1 Virtual Classroom	$ 16
5	1 on 1 Virtual Classroom	$35

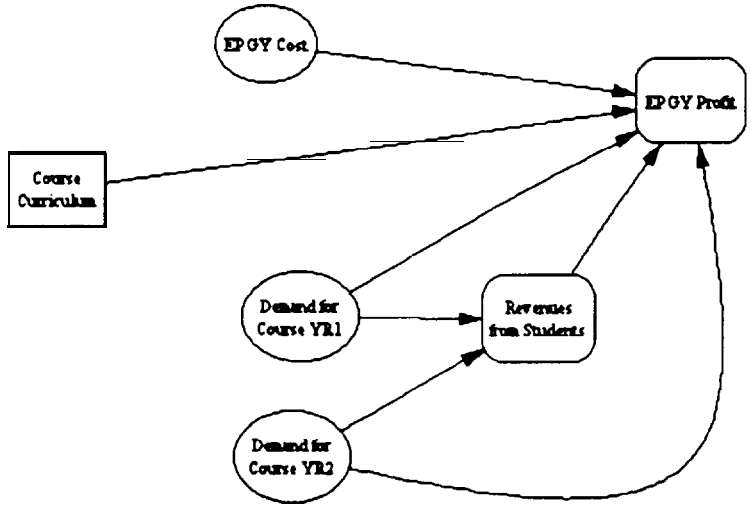
The following chart also illustrates the large preference for low or no cost tutor support. The boxes at specific data points indicate the base case numbers for tutor support prices as defined by EPGY management. These base case numbers are used in the decision analysis to evaluate EPGY costs versus student preferences.

Sensitivity of Tutorial Fees



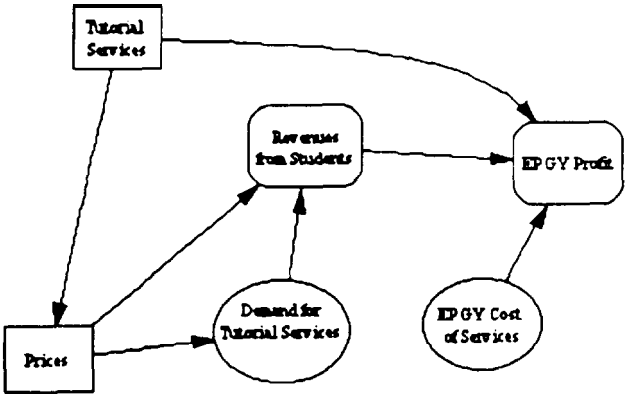
Decision Analysis

Survey results revealed the curriculum and tutor support preferences of parents and students. The effect of price on demand was neglected in the curriculum decision analysis given the expected small first and second year enrollment and the large market of students. Development costs for all courses except 9-12 Computer Science were given as approximately $40,000/course Computer Science development costs were estimated at $80,000. In addition, the student to tutor ratios were approximated at 150:1 for math and science courses versus a student to tutor ratio of 100: 1 for humanities course. The following decision model was evaluated using DPL software16.

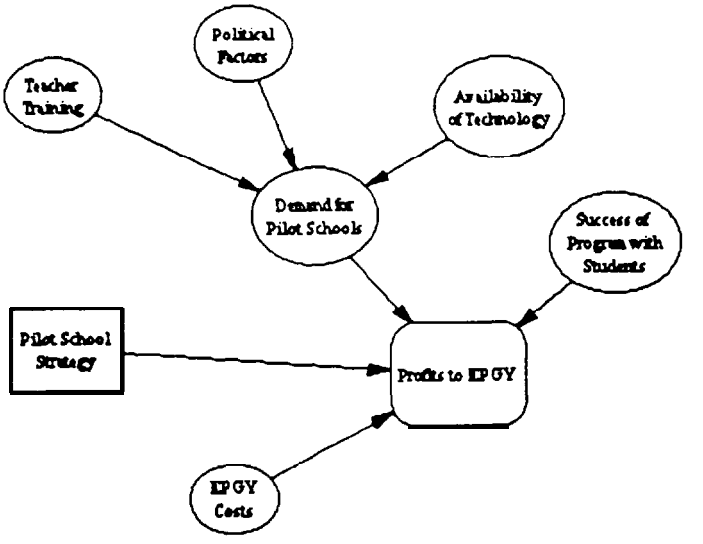


The tutor option preferences were also measured by the survey results. The conjoint analysis indicated that the price of tutor support will affect demand. However, the decision model, was evaluated with fixed prices. The demand figures used a student base of 1000. EPGY shows that only 20% of its students have the technology to use the virtual

classroom while 100% can access the l-800 number. The following influence diagram describes the tutor support decision.



Although the Pilot School program decision was not evaluated using DA tools, the following influence diagram describes the uncertainties affecting EPGY's success in the pilot school market



Scenario Analysis

Will EPGY succeed? Will they be a large independent corporation or will they remain small? Four scenarios are presented to examine how EPGY's whole product solution strategy will prepare them for the unexpected in a changing world: The Global ***Classroom, the Fall of American Education, the Young Einsteins, and System Overload.***

While all four of these scenarios furnish opportunities for EPGY. some promise richer futures than others. For example, the first two scenarios are The ***Global Classroom*** and The ***Fall of American Education. The Global Classroom*** is the world where all students are on the Internet and information from anywhere in the world is available on demand. The ***Fall of American Education*** scenario exists when the educational system is unable to provide a positive learning environment given a failing economy and lost social structure. In both of these scenarios, EPGY's products will be in high demand. Its products and technology can provide substitutes to the lack of education in The ***Fall of American Education*** scenario, which is starting to play out as more parents elect home-schooling for their children. In the ***Global Classroom*** scenario, it can continue to provide advanced courses on an international level.

Some pitfalls that EPGY might face in the first two scenarios are that people will no longer be willing to pay premium prices for EPGY courses. By improving their current products, EPGY may be able to provide a $59 off-the-shelf version if either of these scenarios arise. In each case, EPGY would have to go big to survive.

The last two scenarios, The ***Young Einsteins*** and ***System Overload are*** ideal situations for EPGY's current operating mode. The ***Young Einsteins*** is a net increase in the intellectual talent of youth. This phenomena would result in the public schools needing to offer more advanced courses. EPGY's courses could offset the schools costs of hiring more qualified teachers to develop the new curriculum. The pilot school program would

grow significantly in this case. System Overload results from overcrowding in the top schools and parents looking for alternate ways to supplement their children's education at an inferior school. Home schooling will increase and EPGY will be able to provide quality alternatives to parents.

In the last two scenarios, EPGY may have difficulty if the students taking their courses do not get credit or if the school systems reject the new technology. The current political atmosphere indicates it may be a long time before schools go on-line without classroom teachers. To address any resistance, EPGY should enter the market slowly and address each school's needs individually with lots of technical support and quality products. Once EPGY has established its reputation in this market, they can introduce a generic product that any school can use.

In general, EPGY is positioned well for any of these future scenarios. There is a large untapped market of gifted students and few direct competitors. Technology trends are leaning towards a global connected community and EPGY products lit that model well.

Conclusion

EPGY faces a number of strategic decisions as it grows. The analysis presented provides recommendations for their questions. From the analysis of EPGY's situation, EPGY appears to have established a niche in the distance learning by focusing on the gifted and talented. On the other hand, with the public school market, EPGY is a new entrant that is introducing a new product into public school education and that is competing with large corporations. In both cases, EPGY's CD-ROM courses provide a solution for students who want advanced courses that are not otherwise available."

The decision analysis results indicate that EPGY would profit most from developing a 3-8 Math Enrichment course, the most preferred class overall. However, when computer science's extra development costs were neglected, 9-12 Computer Science became the best option for EPGY. Therefore, EPGY should pursue the additional grant funding required to develop the computer science curriculum.

With tutorial support services, EPGY should offer the virtual classroom services to those students that have the technology because it will be profitable. However, they should also continue to provide telephone and e-mail tutor support to accommodate those students without virtual classroom technology. The reasoning is that EPGY needs to continue to provide support to its students and maintain good customer relations. The l-800 number is an effective way for students and parents to have personal contact with EPGY. To offset the costs of tutor support, EPGY should raise tuition prices and keep tutor support at no charge via the l-800 number.

Based on the attached analysis, it is recommended that EPGY pursue a whole product strategy that focuses on customer support issues and improving the current product. A whole product strategy is defined as one that provides the user with all the

necessary support and services required to integrate EPGY's product into an educational program.

The students taking an EPGY course in a public school may not be gifted and may require more assistance. These students may also lack motivation or be more easily distracted and bored by dull software. To ensure that the students in the pilot schools benefit from EPGY courses, EPGY should provide full tutor support. If reduced prices are possible based on the volume of students, then EPGY should consider offering reduced prices; however, they should not reduce service and support in order to lower prices to pilot schools. Most public schools lack the needed infrastructure and computer expertise to effectively use EPGY courses and, therefore, EPGY should require that teachers be trained on how the software works prior to beginning a pilot school program. By training teachers and working with the schools, EPGY will better position itself to deal with the politics of the public education system. Because of the competitiveness of the market, EPGY can establish a niche only by occupying one school at a time.

In conclusion, to have a successful program. EPGY will have to improve their current product and **focus on customer** support.

Final Thoughts

Our analysis began with the question "where does EPGY go from here." By defining and refining the key issues and uncertainties, we were able to frame the situation. With this understanding of the problem, we applied various analytical tools to gather information and provide insight into the preferences and values of the decision-makers. Although the analysis and this report meet the objectives of the project, the results are appropriately thought of as a first approximation. In reviewing this report it should be remembered that the conjoint analysis was only conducted on a total of 18 people and thus should be considered as a "back of the envelope calculation". To gain a higher statistical fidelity, EPGY should conduct the conjoint analysis again using a larger population and tie it to a demographics questionnaire. On the other hand, the results of the conjoint should not be entirely ignored because they are consistent with the results from the questionnaire that were sent out separately and had over 60 responses