

DEER VALLEY UNIFIED SCHOOL DISTRICT
Educational Services

Memorandum

Date: June 30, 1999

To: Senator Brenda Burns, President of Senate
Rep. Jeff Groscost, Speaker of the House
Rep. Robert Burns, Chairman of JLBC
Mr. Richard Staveak, Director for JLBC
Mr. Steve Schimipp, Budget Analyst for K-12
Dr. Mary Garcia, President of State Board of Education

From: Judy Aldrich, Ed.D., Associate Superintendent

Re: Report on 1998 Pilot Technology Assisted Project-Based
Instruction Program

Enclosed please find a copy of the Deer Valley Unified School District's report to the Joint Legislative Budget Committee regarding the 1998 Pilot Technology Assisted Project-Based Instruction Program pursuant to Senate Bill 1400.

The Deer Valley Unified School District would be most pleased to provide a formal presentation to the Joint Legislative Budget Committee regarding the program. Please contact me at (602)581-7746.

CC: Gerald Cuendet, Ph.D., Superintendent
Don Covey, Ed.D., Phoenix Special Programs and Academies

Technology Assisted Project-Based Instruction Program

Report on 1998 Pilot

June 1999

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SPEAKER'S OFFICE

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Introduction

The Deer Valley Unified School District, in partnership with Phoenix Special Programs, offered a technology-based instructional program to two (2) special groups of students. **The first group** included eleven (11) students who have been formally long-term suspended by the Governing Board. These students were formally removed from the Deer Valley schools for drug offenses, weapon offenses, and violent behavior offenses. In past years, the number of high school students disciplined for these serious offenses has been much greater and the use of an alternative, technology-based program was implemented so that these youngsters would have an opportunity to stay in school during the time of their long-term suspension. This year, the District was pleased that fewer students were disciplined for serious offenses but disappointed that the technology-based program did not receive larger numbers with which to work. **The second group** of eighty-seven (87) students included those who needed to make up credits to remain on track for graduation. These students were identified during the last few weeks of school and were given the opportunity to enroll in technology-based, distance learning instruction rather than the traditional summer school classroom. A group of these students are completing, among other courses, government courses and a computer courses as student cadres. All toll, 47 students were enrolled in 75 technology-based courses.

Section C.1 – A description of the educational services that are offered under the program and that specifically relate to the depth and breadth of the curriculum choices offered by the school.

The courses offered to these students were those services needed for each individual's continuing education.

Each long-term suspended student, accompanied by a parent, participated in an intake session with a trained school counselor. During these sessions, the academic choices were discussed as were the student's short and long-term goals. Students were registered in either one (1) or two (2) self-paced Internet courses depending on their familiarity with technology and their ability to

succeed in this individualized instruction. The number of courses was based on the length of time a student was to be in the program. Some students were in the program as little five weeks while some were in the program for eighteen (18) weeks.

The second group of students in a traditional high school setting, who needed to make up credits, also received individualized counseling at the school level. Their transcripts were reviewed and they were able to choose courses which would allow them to continue their high school careers with their classmates and graduate on time. Students were allowed to register in either one (1) or two (2) courses depending on their individual need and ability to work independently. These courses began immediately after the traditional school year ended.

The curriculum and instructional services offered by the program afforded students the depth and breadth needed by both groups. There were **Self-Paced Internet** courses (SPI) available from the beginning of the project. Self-Paced Internet (SPI) classes are quality textbook-based virtual campus curriculum and elective courses, which provide the advantage of immediate online feedback for students' lessons and exams. All 24 SPI courses cover core classes of a high school diploma program. During the second semester, interactive CD-ROM based mathematics and English courses called Proficiency for Online Mathematics and Skills Development (PrO) became available for the students.

Proficiency for Online Mathematics and English Skills

Development PrOMESD (PrO) is a dynamic online, CD-ROM curriculum designed especially for students who have an educational need to accelerate and/or remediate for grade level promotion or graduation. Diagnostic pre-tests and post-tests are built into every lesson along with real-time feedback to students as they learn and practice each concept. The pre-test generates a customized "Learning Plan" that recommends how the student should focus his or her course of study. The 16 PrOMESD courses are stimulating, entertaining, and challenging. Both the Mathematics and English grammar and writing programs are proven to increase student

academic achievement, involvement and attention to the learning process PrOMESD remains student-oriented. The list of courses is below:

Keyboarding (SPI)
Computer Education (SPI)
Modern Reading Strategies (SPI)
First Semester Freshman English (SPI)
First Semester Sophomore English (SPI)
First Semester Junior English (SPI)
First Semester Senior English (SPI)
Basic English 1 (PrO)
Basic English 2 (PrO)
Intermediate English 1 (PrO)
Intermediate English 2 (PrO)
Advanced English 1 (PrO)
Advanced English 2 (PrO)
College Composition 1 (PrO)
College Composition 2 (PrO)
Health (SPI)
Algebra 1 (SPI)
Geometry 1 (SPI)
Pre-Algebra 1 (PrO)
Pre-Algebra 2 (PrO)
Elementary Algebra 1 (PrO)
Elementary Algebra 2 (PrO)
Intermediate Algebra 1 (PrO)
Intermediate Algebra 2 (PrO)
Advanced Algebra 1 (SPI)
Advanced Algebra 2 (SPI)
Psychology (SPI)
Interpersonal Relations 1 (SPI)
Interpersonal Relations 2 (SPI)
Parenting (SPI)
Earth Science 1 (SPI)
Earth Science 2 (SPI)
Biology 1 (SPI)
Biology 2 (SPI)

Chemistry 1 (SPI)
American/Arizona History 1 (SPI)
American/Arizona Government(SPI)
Free Enterprise (SPI)
World Geography 1 (SPI)
World Geography 2 (SPI)

The following is a summary of the curriculum, instruction and student services provided for the project:

Technological Student Interactive Methods of Instruction:

World Wide Campus is a state of the art Distance Learning Program using Version 2.7.2 of the Einstein Network. PrO is an interactive CD-ROM-Internet based program. World Wide Campus Online provides four (4) technological student interactive methods of instruction. In addition, it also provides comprehensive online student services.

The online student interactive methods of instruction and student services may be summarized as follows:

Instructor to Student

- Online Instruction
- Interactive Course Syllabus
- Course Learning Objectives and Requirements
- Classroom Text-Based Instruction
- Whole Class and Individual Instruction
- Instructor Presentations and Lectures
- Audio/Visual Classroom Presentations
- Online Graded Lessons and Immediate Feedback
- In-Class Discussions
- Testing, Assessments and Evaluation
- Immediate Test Feedback
- Online Testing
- Instructor Office Hours
- Classroom Attendance Taking

I. Student to Instructor

- Direct Questioning
- Inquiry
- Threaded Discussion
- Electronic Notebook

II. Student to Student

- In-Class Discussions
- One to One
- Small Group Collaborations
- Whole Class Discussion

III. Student to Resource

- Webliography, Direct links to other reference sites (organized) on the Internet
- Direct link to online library
- Door-to-Door delivery of hard copy books and articles

IV. Student Services

- Academic Advising
- Career Counseling
- Course and Program Catalogs
- Admissions and Registration
- Attendance Reporting
- Course Transcripts, Grades
- Policies and Procedures

Section C.2 – A description of the effects of media and technology on the delivery of specific educational services to specific pupil populations.

The technology-based courses have provided specific educational services to the two (2) groups of students who have participated in the project. Special features are listed below:

Course Content – The Partnership transfers course content from the traditional classroom to interactive online formats.

Course Features – Students have ready access to chat rooms, virtual tutors, threaded discussion, audio and video clips, writing coaches, online testing and feedback, interactive syllabus, Webliography and class assignments. There are over thirty (30) separate instructional strategies to heighten the online learning experience. Phoenix Special Programs and Academies have the ability to customize each course, eliminating the need to learn HTML code or any other web language.

School Level Features – Convenience is underscored through online access to admissions, library, academic advising, career advising, bookstore, student union and all other services found on a traditional school campus.

Campus And Teacher Training – Phoenix Special Programs and Academies and Deer Valley Unified School District can provide a comprehensive Internet and on-campus training program designed for teachers and staff willing to receive hands-on experience with online courses. Based on the in-depth research into the pedagogy of online learning, teachers can receive frequent updates on the content from the latest technology so that they can provide the highest quality online education.

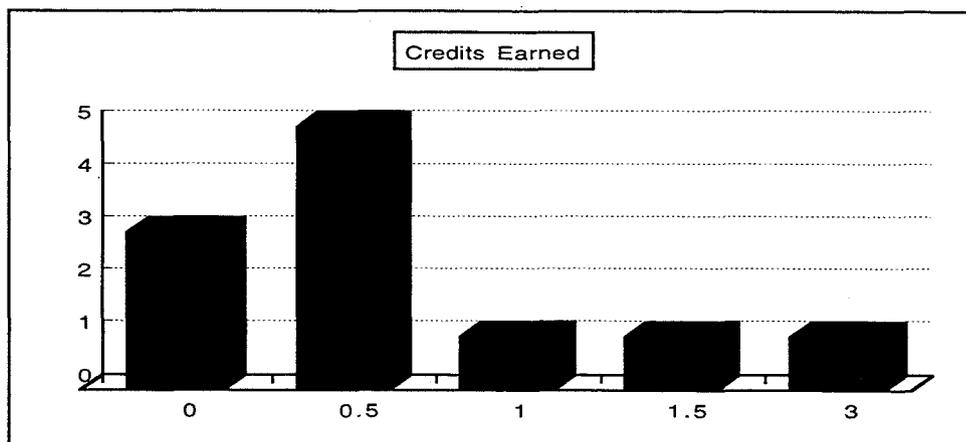
Help Desk – An online help desk assists faculty, staff and students with answers to frequently asked questions. In addition, Phoenix Special Programs and Academies technical support staff responds to questions throughout the school day and evenings. Additionally, information can be found on the website:

www.phoenixacademies.org or
Email@phoenixacademies.org.

Database Administration – Phoenix Special Programs and Academies relational database is a massive, secure, fully redundant data store for everything from course content, student records and other administrative files, essentially everything it takes to deliver an online educational system.

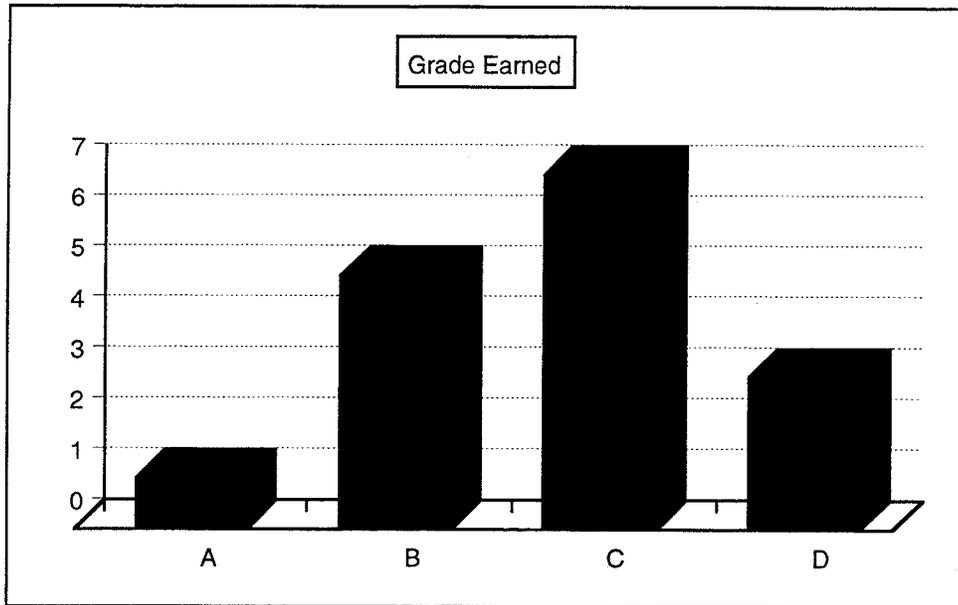
Section C.3 – A measurement of academic achievement of pupils in the programs, including academic advancement as measured by the increase in grade level equivalent scores each academic year on the nationally standardized norm-referenced achievement test prescribed in Section 15-741 and a summary of essential skills test scores, scores on the nationally standardized norm-referenced achievement test, individual pupil portfolios and other assessment tools used by the school.

The assessment measurement for these students rests primarily on their success or failure with the coursework and the issuance of credit. The key component of the long-term suspension program was to keep students in school, making progress toward earning the necessary credits for graduation. Seventy-three (73%) percent of the students earned at least .5 credit, meaning that they finished at least one course successfully. Considering that most of these students would have become a “drop-out”, the results are quite surprising. The following graph shows students with credits earned.



<u>Number of Credits Earned</u>	<u>Number of Students</u>
0.0	3
0.5	5
1.0	1
1.5	1
3.0	1

Also of interest were the grades received by the students using the technology-based instruction. Following is a graph showing the number of each letter grade given.



<u>Grade Earned</u>	<u>Number of Students</u>
A	1
B	5
C	7
D	3

Each student's progress in the course was monitored electronically and by an adult supervisor. Each student received letter grades in all 15 lessons, a midterm test and a final test. There were reports due midway through the course and at the end of the course.

The district will be studying the norm-referenced test scores of these students as soon as the current scores are received by the district from the state.

Students who enrolled in SPI courses made slow progress unless they were self-directed or highly encouraged to complete courses

according to strict timelines. A remedy may be to e-mail regular “tickler” messages to the students. When students and their families make an investment in education, financially and/or with definite short-term goals, progress is better. Students may be asked to buy, rent, or lease textbooks to instill a vested interest in course completion.

A few of the course assessments for the SPI courses contain an inadequate number of critical thinking type of assignments. To improve the quality of course assessments, teachers may include more short essay test items which must be evaluated by the teacher or computer checked through key-word recognition.

The second set of students, those using technology based courses to remain on track for graduation, have not completed their courses as of the due date of this report. It is anticipated that an addendum report will be provided regarding this second group prior to a formal presentation to the Joint Legislative Budget Committee (JLBC). Deer Valley District proposes the submission of an addendum to this report, which will focus on students’ completion rate.

Section C. 4 – Academic advancement as measured in grade level equivalents each academic year based on a standardized norm-referenced achievement test.

None of the students in the two (2) groups for the pilot technology based program were registered for an entire year. The purpose of the program was to give students an opportunity to earn credits in an effort to have them continue in school. Any effort made by the District to keep students in school in a quality fashion meets the interest of the District and the community.

Section C.5 – The results of a survey of pupil satisfaction with the program.

Surveys were mailed to each of the eleven (11) students who participated in our long-term suspension program. A copy of that

survey is attached. All students were contacted a minimum of five (5) times, with the exception of one (1) student whose family moved and left no forwarding address. Five (5) students completed the survey. The following is a summary of those survey results including the requested data.

(a) Pupils' attitudes about delivery modalities employed by the school

Students were generally pleased with the delivery method. Some commented that the course content was significant and the convenience of being able to work on a computer at their individual pace was beneficial.

Students also felt positive about the experience of using a computer for course work and gaining computer experience that could be helpful with future jobs. They indicated the combination of a computer and a textbook was a positive experience. One (1) student commented that his inability to receive instant answers to questions made course work more difficult.

(b) Changes in pupils' attitudes toward learning in general

Students appreciated being able to continue their education with Internet courses. They indicated that individualized programs improved their attendance rates. There were mixed responses regarding students' ease in understanding new concepts introduced by Self-Paced Internet courses.

Students felt better about learning due to the Internet experience. A key to that positive experience was being able to work at an individualized pace. There was a mixed reaction regarding the level of difficulty of courses, pointing to various academic levels of the students enrolled.

(c) Changes in pupils' attitudes about their own ability to learn and about their own academic progress

Four (4) out of five (5) students indicated they enjoyed attending school for their individualized program. The majority of the students indicated they believed their scores improved using on-line learning.

(d) Pupils' attitudes about the school they attend

Students indicated they were impressed with programs from Phoenix Special Programs and Academies and that those courses met their needs. They believe that those courses helped them stay on track for graduation.

There was a mixed reaction regarding the affect of classroom facilitation. Generally, students felt the environment was conducive for student learning.

Section C.6 – The results of a survey of parental satisfaction with the program.

All parents of the eleven students who participated in our long-term suspension program were mailed a survey. A copy of that survey is attached. Each parent was contacted a minimum of five (5) times. Four (4) parents responded. The following is a summary of those survey results including the requested data.

(a) Parents' and their children's attitudes about the delivery modalities employed by the school

Parents responded very positively regarding their youngsters' attitude toward class. Parents were pleased with the use of technology combined with textbooks. They were glad their children had the opportunity to experience the Internet and still use conventional textbooks.

(b) Changes in their children's attitudes about learning in general

Personnel from Deer Valley Schools and Phoenix Special Programs and Academies are especially pleased with parent reaction to the change in their child's attitude toward learning. All parents felt their student's attitude had improved this year. Parents also expressed satisfaction with the delivery of new learning through the Internet. This supports a Board goal of offering many alternatives to the traditional educational format.

(c) Changes in their children's attitudes about their ability to learn and about their academic progress

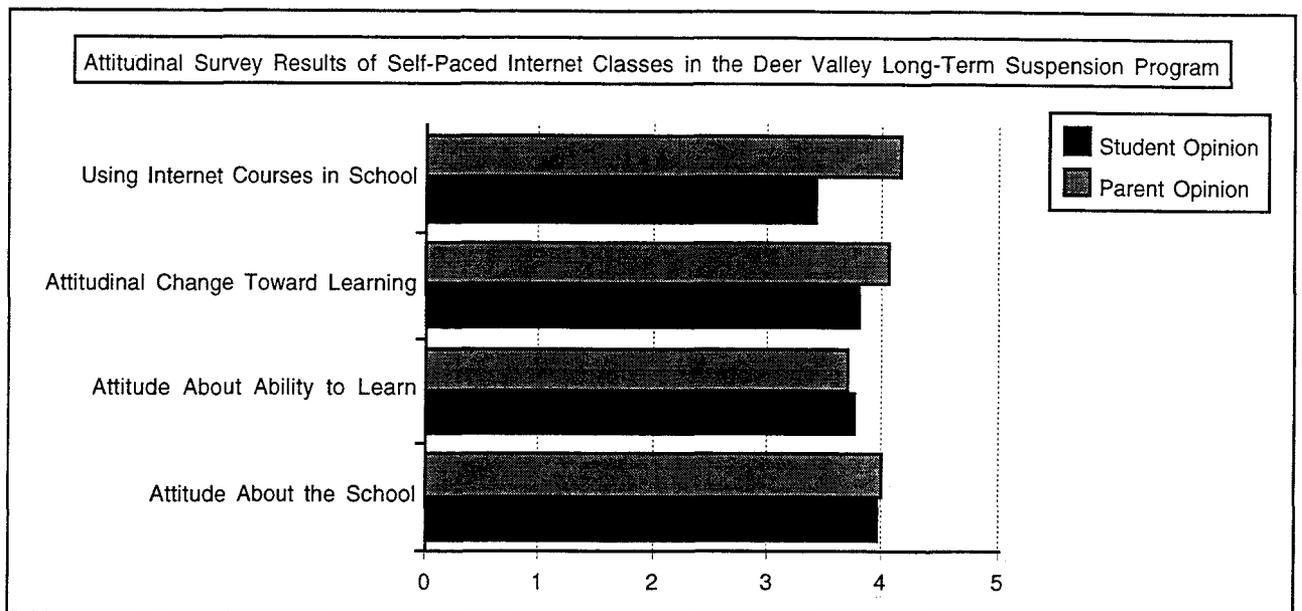
All parents were grateful for the opportunity offered through this program to allow their students to continue their education. Parents generally felt their students' chance of success upon returning to their home schools would be improved.

Parents felt the innovative Internet coursework was challenging and that the challenge provided motivation for improved test scores. Students' attitudes toward learning did improve during this educational experience.

(d) Parents' and their children's attitudes about the school that the child attends

Parents were generally satisfied with the entire school experience. Class facilitation and the learning environment received very good ratings. Parents reported an improved, excellent attendance rate for their children. They recognized that the staff, both at the school and Phoenix Special Programs and Academies, responded to questions and concerns adequately and with a courteous and caring manner.

One parent commented that their student enjoyed the course he completed last year and looked forward to going to school next year because he liked learning with computers rather than the traditional classroom.



Section C.7 – A description of the availability and equitable distribution of educational services provided under the program including specific descriptions of the effectiveness of technology tools and modalities used to address the needs of any underserved populations targeted by the school.

The two groups of students involved in the technology-based program included students with varying academic needs. All students received academic advising as they reviewed their transcripts in relation to the graduation requirements. When appropriate, career counseling was provided by trained counselors. The long-term suspension program participants received help with conflict resolution, and there were parent conferences when serious decisions needed to be made.

The Internet courses provided a wide range of educational modalities, which allow individual learners the opportunity to use several of their seven (7) intelligences. These intelligences, identified by Harvard professor, Howard Gardner, include logical muscular, kinesthetic, visual, spatial, intrapersonal, interpersonal, and linguistic.

Each course/unit/module has, at a minimum, the following components: reading assignments, learning exercises, threaded discussion, audio clips, Webliography searches and submissions, and a quiz/exam. The instructor, at his discretion, can add additional video clips, slide show with audio, Power-Point presentations or library submissions. Students are able to share ideas and have discussions through the use of e-mail. There is also a help desk staffed through Phoenix Special Programs which is available to students throughout the school day and evenings.

Section C.8 – A description of the operational and administrative efficiency of the program.

The long-term suspension program was housed in a classroom at the district's vocational center after regular school hours. There were teachers available on-line and instructional techs supervising the students. The building administrator and the school's counselor were available when needed.

Deer Valley is interested in expanding the Internet classroom to include students who may want to take classes away from the traditional high school setting, but who have not been formally suspended from school. The District is interested in moving homebound instruction to this technology-based program, rather than the traditional visiting teacher concept.

The students needing credit to meet their graduation plan goals are working individually away from the traditional classroom.

Depending upon the success of the students currently enrolled, the District may expand the program to include students from smaller districts which may not be able to offer advanced course work. The District may offer computer-based courses to secondary home-schooled students in need of advanced course work. This is contingent upon approval from the Arizona Department of Education's Fiscal Department allowing the District to claim Average Daily Membership (ADM) for students who are not physically located in a traditional classroom or school campus.

Section C.9 – A description of the cost-effectiveness of the program.

The cost effectiveness of the program was not a key factor in determining whether or not to pilot a technology-based program for specific groups of students. The key factor was, in fact, an effort on the part of the Deer Valley School District to provide an alternative method of instruction for students who are not achieving total success in the traditional secondary school. Initiating technology-based curriculum involves a significant commitment to a philosophy of providing an innovative curriculum to students backed by a significant financial commitment.

The following is an eight point overview of capital and maintenance and operations cost to initially start and maintain a comprehensive Technology Assisted Project-Based Instruction Program.

First, the hardware system and management platforms are initially high cost whether you have one (1) student or one hundred thousand (100,000) students. (Capital Cost)

Second, the translation from a traditional print-based teacher-centered instructional course to the Internet is time consuming and detailed. Once a well-constructed, instructionally sound course is designed and aligned with its objectives, content, learning activities and assessments, it can be translated into the Internet format. (M&O Cost)

Third, the validation of each designed and translated course takes additional time on the part of all parties and is costly. (M&O Cost)

Fourth, the staffs who are assigned to facilitate and implement the online courses need to be provided inservice training. Teaching with the Internet and moving education beyond the traditional four walls of the classroom takes real inservice education. (M&O Cost)

Fifth, the hardware required for the students' use must be acquired and available for the students to use. (Capital Cost)

Sixth, the staff required to facilitate student learning on the Internet needs to be provided. (M&O Cost)

Seventh, the special facilities or space to operate the Internet is also a cost. (Capital Cost)

Eighth, the assessment, evaluation and survey of students, parents and staff, as well as, the determination of increasing student academic achievement must be provided. (M&O Cost)

The aforementioned cost centers are perhaps only a few that need to be addressed. However, many of the items, i.e., facilities, students' computers, and print-based curriculum may be "in-kind" support. Therefore, a unique approach to budgeting for a Technology Assisted Project-Based Instruction Program is presented.

The proposed budget is designed for each course provided on the Internet. There is the initial cost for course design, course translation to the Internet and staff development. A separate cost for student hardware and equipment is also identified. Staffing requirements and capital cost for providing the delivery of an online course, as well as cost for textbooks and materials have been identified. Therefore, using a projected class of thirty-five (35) students, the following projected budget has two (2) dimensions:

DIMENSION I. Initial cost for development, equipment and facilities. Projected cost is based on a single course being developed and available on the Internet. The cost for providing the equivalent of a classroom and equipping it with thirty-five (35) computers is calculated below. Therefore:

1.0	Initial cost for development, equipment, and facilities.	
1.1	Course Design*	\$45.00 per student
1.2	Course Translation to the Internet*	\$145.00 per student
1.3	Staff Development*	\$20.00 per student
1.4	Course Validation*	\$20.00 per student
1.5	Classroom Facility**	\$480.00 per student
1.6	Computer Hardware*	\$500.00 per student
1.7	Student Textbooks*	<u>\$60.00 per student</u>
		\$1,270 per student per course

The initial cost for development, equipment and facilities to service a minimum of 315 courses or 32.0 F.T.E. students equate to \$1,270 X 315 or \$400,050.00.

* Computed with 35 students per classroom and offering a minimum of 315 Internet courses.

** Computed at a minimum of three (3) classrooms (\$50,000 each) and one hundred five (105) computers.

DIMENSION II. Initial cost for delivery, staffing, support and evaluation. Projected cost is based on the equivalent of a single classroom serving thirty-five (35) students with each student taking a single course. Therefore:

2.0	Initial cost for delivery, staffing, support and evaluation.	
2.1	Internet Delivery System	\$260.00 per course
	Of Course-Certified Teacher	
2.2	Staffing (paraprofessional)*	\$60.00 per student
2.3	Staffing Support*	\$5.00 per student
2.4	Project Assessments and Evaluation	<u>\$5.00 per course</u>
		\$330.00 per student per course

*Computed at a minimum of 315 course enrollments.

It is envisioned that by the end of the project more than fifty (50) different Internet courses will be developed by Phoenix Special Programs and Academies. Phoenix Special Programs and Academies will fund the "initial cost" for course development; thereby, bringing the initial cost down \$230.00 per student per course or an "in-kind" support of the project in a total award

of \$72,450.00. Additionally, Phoenix Special Programs and Academies will ensure that all hardware, software, links, management platforms and computers required to bring a course to a Deer Valley classroom building will be provided. (Phoenix Special Programs and Academies will serve as the “host” and chief designer for each online course for the World Wide Campus to each Deer Valley classroom building) This is a “Partnership” commitment by Phoenix Special Programs and Academies. As a part of the “Partnership”, Deer Valley Unified School District will provide all classrooms, computers and student textbooks required in the Internet cost of the project. This amounts to a total of \$1,040.00 per student per course times 315 courses totaling \$327,600.00 of “in-kind” support.

Again, the reader of this proposal needs to be aware of the “real cost” for the initial cost of development, equipment and facilities required to supplement the academic educational programs of the Deer Valley Unified School District with a computer-assisted Internet World Wide Campus.

CONTINUING COST

Pursuant to the initial cost for development, equipment and facilities; and assuring the “core” Internet courses have all been developed, the following continuing cost for each course is projected.

- 3.0 Continuing cost for the initial 315 courses and a minimum of 32 F.T.E. students.
 - 3.1 Internet Delivery System of Course-Certified Teacher designed and monitored \$260.00 per course
 - 3.2 Staffing (paraprofessional)* \$60.00 per student
 - 3.3 Staffing Support* \$5.00 per student
 - 3.4 Textbook Supplement \$12.00 per course
 - 3.5 Assessment and Evaluation \$5.00 per course
- \$347.00 per student per course

Economy of Scale After
100 Students Enroll in the
Same Course for Delivery
System 3.1

Reduction to \$235.00 <\$25.00>per course
\$317.00 per course per student

Assuming during the second year of operation that all initial costs are realized, the per student cost for each enrolled course would be \$317.00.

During the typical school year, a student enrolls in at least ten (10) courses. Therefore, it is conceivable that a student taking all his/her courses through a virtual World Wide Campus, within the Deer Valley Unified School District, the direct classroom cost would be a total of \$3,170.00 per year per student.