

Funding Online Education

**A Report to the
Colorado Online Education Programs Study Committee**

John Adsit
for
Colorado Cyberschool Directors

Table of Contents

Executive Summary	2
Introduction and Methodology	3
Summary of Findings from Literature	5
Data and Profiles from Cyberschools Outside Colorado	8
Funding Analysis for Report Program Profile	15
Recommendations	24
Sources Consulted.....	25

Executive Summary

The purpose of this report is to identify the actual costs associated with operating a cyberschool in Colorado. This report examines national research on the topic, data from current Colorado schools, and data from established cyberschools outside of Colorado.

It is difficult, if not impossible, to define costs of cyberschools because of the large number of variables associated with program purpose and delivery. This report will focus only upon those programs whose students receive their education primarily online from locations remote from the educator. Variables of delivery include curriculum source and design, platform and Internet service, instruction, administration, student support, and other factors that affect funding needs. Variables of curriculum, instruction, and student support have an especially significant impact upon funding. This report will focus only upon those programs with an interactive curriculum; a student/teacher ratio similar to the traditional classroom; systemic student support, including special education when appropriate; and licensed instruction in all classes.

A review of literature shows that there has been nearly nothing published on costs of K-12 online education. Studies of college level online education programs have all shown that online education is more expensive than traditional education—no known study has shown otherwise. The difference could be even greater than research shows because low costs for curriculum development in these studies indicate that college online courses studied were not truly designed to make use of the technology but instead replicated lecture courses. Other studies emphasize the need for extensive student support and mentoring to improve course completion rates.

Reports from established cyberschools across North America indicate that the costs associated with online education are different from the costs associated with traditional education, but they are approximately the same or more in total. Cost of curriculum is a major variable in total funding needs. In the only cases in which cyberschools reported total costs that were less than those of a regular school, the schools had in past years invested so thoroughly in curriculum development that they now had total control of their curricular content at virtually no cost.

An analysis of the funding requirements for each of the components of online education indicate that the total costs are comparable to or higher than the costs of traditional education. Although many aspects of online education cost less than traditional schools, other costs are significantly higher. Schools can make adjustments in design that deviate from the model established for this report. These adjustments can lower the costs of education, but they are not in keeping with best practice for student learning.

Introduction and Methodology

This report was prepared by the online schools currently operating in Colorado at the request of the Colorado Online Education Programs Study Committee. The purpose is to provide information on the actual costs of creating and implementing an online education program.

For this purpose, three sources of information were used.

1. Nationally published research
2. Information provided by Colorado cyberschools.
3. Information provided through interviews with the leaders of established online education programs outside of Colorado.

Because online education is such a new and evolving concept, many different models are now being used to provide many different services. Research for this report has found that schools use a variety of delivery models. Rather than attempt to analyze all possible program profiles, this report examined variables in program purpose and delivery, then identified a model profile for its final funding analysis.

Variables of Program Purpose

Current Colorado school districts use online education, or components of it, for a variety of purposes. This report is limited to programs in which most or all of the student's educational program is delivered online and remote from the site of origin. It specifically does not include programs in which an online component is used to supplement the student's regular class schedule because these programs do not impact school funding decisions. Programs not covered in this report include:

- **Online Assisted Instruction.** Some schools purchase or create online, web-based curriculum that is used by the school's own classroom teachers in a lab setting within the school.
- **Online Supplemental Instruction.** Students who need individual classes not available in the normal school setting can get them through various outsourced vendors, including Colorado Online Learning. This differs from *Online Assisted Instruction* only in that the teacher is not part of the regular school staff.

Variables of Program Design

Over the centuries, traditional education has developed a consistency of design. Schools throughout the United States use similar approaches and have similar needs. This is not true with online education. Because it is so new, there is no consistency of approach. Cyberschools are still learning how to do what they do. They need to rely upon vendors who have developed products with their own visions, visions that do not necessarily match a school's vision or what we know is best practice in education. The funding requirements of the different designs are significantly different. For the purpose of this

report, the funding analysis will focus on programs that adhere to what initial research indicates is best practice in online education.

Model Program Profile

This report focuses on the funding requirements of schools that provide most (or all) of a student's educational program online and remote from the site of origin. These programs have the following characteristics.

- **A curriculum that requires student/teacher interaction and makes full use of the instructional benefits associated with computer assisted instruction.**
- **A student/teacher ratio at least similar to the traditional classroom.**
- **Licensed Instruction in all classes.**
- **Systemic student support, including special education when appropriate.**

Funding Analysis

Funding requirements for the model program profile were broken down into their component parts. Although the cost of each component is heavily influenced by the variations in program delivery and by other factors, information from national research, Colorado cyberschool data, data from schools outside Colorado, and information supplied by vendors to determine a cost range for each component. Component costs can be totaled to estimate total program costs.

Summary of Findings from Literature

Little research has been published on the typical costs of K-12 cyberschools. Most research has focused on higher education, where online education was first used extensively. Several studies provided at least some guidance for this report.

One important source of information comes from the Western Interstate Commission for Higher Education and its subgroup, the Western Cooperative for Educational Telecommunication (WCET). Working with National Center for Higher Education Management Systems (NCHEMS), they created the Technology Costing Methodology Project (<http://www.wcet.info/projects/tcm/index.htm>), which published two useful reports: the *Technology Costing Methodology Handbook – Version 1.0* and *Technology Costing Methodology Casebook*.

Technology Costing Methodology Handbook – Version 1.0 was prepared by Dennis Jones (2001). This handbook provides a detailed system for budget planning for an online program. Although this would be an excellent resource for a school district planning its online education program, it does not provide any data on actual costs.

Technology Costing Methodology Casebook, edited by Marianne F. Boeke (2001), is a collection of studies commissioned by WCET. These studies are all related to the inclusion of technology at the collegiate level, but the report does have several findings that are instructive for this study:

One important finding was that “Technology-mediated delivery is more expensive than face-to-face instruction, at least within the parameters of course enrollments and methods tested. There were no instances in which this finding was not true” (p. v). It did find, though, that scale matters, and that increasing the scale of delivery lowered the costs.

Costs for online education could have been higher, and the report suggests that “relatively small course development costs that are frequently found suggest many institutions are putting classroom-based courses on the Web rather than fundamentally reengineering courses to incorporate different pedagogies that have the possibility of making truly effective use of the available technology” (p. v).

Student support, especially mentoring, has a powerful effect upon student achievement. The study notes that “Course completion rates are affected by ‘mentoring’ activities and strategies. Cost effective incorporation of strategies for accomplishing this particular function is critical to successful online courses” (p. v) The casebook includes a study by Florida State University, which determined that “Mentor-supported courses resulted in a completion rate of 89 percent for the fall 1999 term and 86 percent for the spring 2000 term. These numbers are remarkably high for distance learning or any independent study model. Surveys of students and follow-up telephone interviews frequently highlight the value added of a mentor”(p. 5).

The most significant costs factors associated with online education and other technology-related issues are human. “Inclusion of technology and other capital costs in the calculation is not the difference maker. These costs pale in comparison to the people

costs in spite of the large sticker prices associated with acquisition of the capital items” (p. v).

Another important study indicates that funding is a significant issue. In a study on the development of online education, Tom Clark (2001) noted that cyberschools identified lack of adequate funding as their greatest barrier to success:

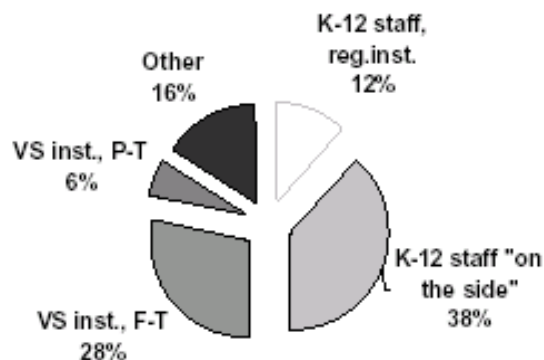
The virtual school peer group was asked if there been special challenges or circumstances to overcome in starting their virtual school or making it a success. Over 60 percent of those providing open-ended responses cited funding issues, such as startup funding for staffing and technology, and costs of course creation and revision. (p. 11)

Clark observed that many reporting schools used a combination of independent funding and tuition. He found that “schools reporting non-tuition funding received from one or more sources as averaging **\$957,566** for the 2000-2001 fiscal year, and **\$1,207,795** for the 2001-20002 fiscal year” (p. 6). He found that tuition fees varied widely, depending largely upon the degree of non-tuition resources available. The most frequently cited tuition was \$300 per semester course, with some schools charging as little as \$78 and some as much as \$385 per course (p. 6).

The Clark study also provided useful information on national trends in instruction:

Virtual schools responding to the survey reported different models for instructional staffing. About half of peer group schools responding to the survey reported using K-12 teachers who taught full-time in a regular school. Of these regular K-12 teachers, about 3 in 4 held supplemental contracts with the virtual school, while the other quarter were teaching for the virtual school as part of their regular instructional duties in their school. About 3 in 10 schools responding to the survey reported use of full time employees of the virtual school as instructors, while only about 6 percent said they used part-time instructors. The certification of teachers was not studied, but some noted that their teachers were certified in the subject areas they taught.

Course instructors, type used by percent



(p.16)

The North Central Regional Educational Laboratory (NCREL) has an emphasis upon educational technology in its mission. To this end it has published *the E-Learning Knowledge Base* (2002), a detailed report on online education (<http://www.ncrel.org/tech/elearn/index.html>). This report does not report on costs of operating a cyberschool, but it does emphasize the conditions necessary for student success. Consistent with the other studies, it found that interactive curriculum and effective instruction were critical to student achievement. The report says, “The most critical skill for successful e-moderators or online instructors is the ability to encourage and sustain a high degree of participation on the part of the students. Interactions should focus on the defined subject matter and should involve lots of opportunities to learn through exchanges of information with the instructor and with the other students” (<http://www.ncrel.org/tech/elearn/tandl.htm>).

Another valuable resource is *Virtual realities: a school leader's guide to online education*, edited by Ismat Abdal-Haqq for the National School Board Association. Like the *Technology Costing Methodology Handbook – Version 1.0*, it provides helpful information for schools starting an online program. It includes profiles of existing cyberschools. These profiles do not include specific total costs per program, but they do provide some funding information. This report has included that funding information in the *Data and Profiles from Cyberschools Outside Colorado* section.

Summary

Although published literature provides very little information about actual costs of K-12 cyberschools, it does provide strong evidence that online education at the collegiate level is more expensive than traditional education. It also demonstrates that successful schools must have curriculum and instruction that stress interaction among the participants. Skilled teachers who are knowledgeable in their subject matter are necessary. Successful schools also have support systems in place to improve student achievement. Schools that choose to skimp in these areas should not expect a high degree of student success. This research strongly supports the program profile identified for this report.

Data and Profiles from Cyberschools Outside Colorado

Profiles of Established Programs

Because it is difficult to draw useful conclusions from currently published data, this report examined specific schools to determine their costs of operation. Because each school reported data in ways that they had assembled it themselves, the format of presentation for each will vary. Except for the last section, each profile was determined by personal contact with the representative identified.

Florida Virtual School

Contact: Julie Young

JYoung@flvs.net

407-317-3326 x2742

Profile

This statewide school has operated under a generous grant from the state legislature for years, serving thousands of students across Florida as a supplemental program. It is moving to a state funding model for the coming year, though. Its plan is to operate as if it were a school district, getting state funding for each enrolled student

For the purpose of our report, we were given complete access to a draft of the report that will be submitted to the state legislature for this purpose in the spring. We have permission to use certain financial information for our purposes, but we cannot release other specifics until the final draft goes to the legislature.

This program has a financial advantage over new programs in that it was well funded during its developmental years. In the first years, 80% of its budget was devoted to curriculum development. They spent \$50,000 - \$100,000 per course in development. Consequently, they now have a fully developed curriculum at their disposal at no cost to themselves. They are now planning to sell that curriculum to others, which will provide a significant benefit to their cost of operation.

This program emphasizes student support to improve student achievement. This requires a highly interactive curriculum with significant teacher/student and teacher/parent interaction.

In its earliest years, the program costs were much higher per student on an FTE basis because of the emphasis on curriculum development. They project that next year their costs per FTE will be less than those of a traditional school. The declining per pupil costs result from the growth of their curriculum. At this time, curriculum development costs are very small.

The following chart shows their past and projected costs.

Florida Virtual School Cost per FTE Projections

Operating Cost Only

Fiscal Year	Credit Enrollment	FTE Enrollment	Cost Per FTE
2000-01	4,772.00	795.33	\$7,757.75
2001-02	6,323.00	1,053.83	\$5,489.48
2002-03*	9,263.00	1,543.83	\$4,523.80
2002-03 Florida Pub Sch System ave. per FTE			\$5,219.92
<u>Fixed Capital Outlay Cost</u>			
FLVS per FTE			-0-
2000-01 Florida Public School System per FTE			\$1,300.00

* Current year projected

Summary

Calculated on the basis of full time enrollment, costs for the preceding years exceeded the full state average FTE allotment. In 2000-2001, when they were still developing their own curriculum, their costs exceeded state per pupil funding by nearly 50%. When their curriculum was fully developed, they were able to bring per pupil costs below the average of funding for regular schools.

Illinois Virtual High School

Contact: Justin McMorro, eClassroom

justinm@ecollege.com

303.632.1650

Profile

Illinois Virtual High School is a state funded program serving primarily advanced student across the state. It is a fully supplemental program, with no enrolled full time students. Funding estimates were provided on a per pupil/course basis and do not include administrative/secretarial costs. Figures were then extrapolated to determine the costs for full time enrolled students.

Cost Analysis

Instructional costs: \$130 per class for full enrollment (25 students). [For partial enrollment (5 student minimum), costs rise to a maximum of \$400 per class.]

Platform/Internet costs: \$115 per student

Curriculum/Content: \$165-\$550 per student (higher costs are for special classes)
Total Instructional costs: \$410 per student per class minimum
Not included: Administration, secretary, other equipment.

Summary

Illinois Virtual High School does not accept full time enrollment, so it is not a cyberschool within the definition of this study. It is possible, though, to use its per pupil analysis to determine the cost of educating full time students. Assuming a six class (secondary) enrollment for each student, we can determine their estimate for serving full time students:

\$4,920 + Administrative costs

If instruction is 85% of a total budget, then the total cost of a full time student is \$5,788.

Durham High School

Ontario, Canada

Contact: Todd Hitchcock

Hitchcock_Todd@durham.edu.on.ca

905-666-6303

Profile

Durham is in the process of reporting on costs of operation to education ministry, and in doing so they developed a plan around what *should* be funded more than what *is* funded. According to Todd Hitchcock, other programs are doing it for less, but they are not necessarily providing a solid product. Durham is seeking to achieve economy through working together with other districts. Ten neighboring districts are now working with Durham to create curricula and share all results. Classes will all be hosted by the same platform (eClassroom).

Cost Analysis [Note: All dollar amounts are listed as Canadian/United States.]

Platform/Internet: They use a full service ASP (eClassroom). It costs them \$120/\$80 per student per class

Curriculum development: Per course \$10,000/\$6,500

Administration: They use (currently) a half time principal at \$35,000/\$23,000. They have grown to the point that they now need a full time principal.

Instruction: They have found that with an interactive curriculum, online instructors must have a smaller student/teacher ratio than face-to-face teachers. They use full time teachers. We were not given a total breakdown of instruction/administration as a part of the budget. They had not yet calculated that.

Important note on costs for Administration/Instruction:

Instructional/administrative costs are significantly lower than they would be in Colorado because the pay scale for educators is significantly less. For comparison sake, the following figures reflect current Ontario salary schedules:

Top of schedule teacher: \$70,000/\$46,000.

Full time principal: \$90,000/\$59,000

In Colorado, a school district can expect salaries as much as 50% higher, depending upon the district.

Summary:

Funding is calculated differently from the way we normally calculate it. They determined that the cost of educating an online student is approximately \$650/\$425 per credit awarded. This is about the same amount as regular schools. Although they do not incur some of the same costs that a regular school incurs, they need to provide other services not required by a regular school.

CCS Web School

North Carolina

Contact: Allan Jordan

ajordan@ccswebacademy.net

910-484-3391

Profile

This five-year-old program does all work in-house. They do not use a platform, creating all classes in MS FrontPage using templates previously designed. They also use a unique instructional model. Although the majority of students are at home, the classes are synchronous. Students must log in at a specified time. They have a daytime schedule and a nighttime schedule. The school has 60-100 full time enrolled students, and 1,300-1,400 part time students from 70 different schools in 23 districts. Their staff includes 8 full time teachers, 40-60 adjunct faculty, and 15 full time administrative and support staff.

Their curriculum is totally self-generated; and they have no vendor costs. They have trained staff developers who are able, using their templates, to create courses for only \$1,500.

Tuition is \$400 per full Carnegie unit (\$200 per semester). This puts them at a small loss per pupil. They rely upon outside funding for remaining funds.

Summary

By keeping curriculum development and Internet infrastructure costs at a level far below the costs of any other program encountered in this research, CCS is able to serve students at a cost of just under \$3,000 for full time enrollment.

SK Online

Salem-Keizer Public Schools, Oregon
Contact: Mary Jean Sandall, Principal
sandall_mary_jean@salkeiz.k12.or.us
503-399-3442

Profile

SK Online began as a pilot program with 85 part time students in 1999, and it projects 1650-1800 unduplicated enrollments for 2003-2004. (An unduplicated enrollment is any individual student taking from one course to full enrollment.) The curriculum was developed in-house, without the use of a commercially prepared platform. They are currently exploring the possibilities of using a commercial platform to improve the quality of their service.

Per student funding for fully enrolled students: \$4,800 + weighting factors.

Per course fee from other districts: \$400

Costs per course:

Instruction:	\$180-\$200
Platform/Internet:	\$60
Vendor licenses:	\$25-\$100
Program Infrastructure:	\$50
Program Housing	\$20
Administration/Support	\$25
Total	\$360-\$455
Total per FTE enrollment of six classes	\$4320-\$5460

Curriculum Development: No curriculum costs are included in the figures above because they were able to create curriculum up front using startup money and grants. When curriculum development is needed, they pay approximately \$3,500 per semester course.

Principal Mary Jean Sandall noted that the program does not make money, and she said that “quality programs cost money and should not be looked upon as moneymaking ventures. The programs [that cut save money through curriculum and instruction] are ones of efficiency but probably not effectiveness. They are the ones that portray us poorly through warehousing of students, poor completion rates, tutorial in nature with huge class loads and minimal teacher interaction.”

Summary

SK Online’s per pupil costs are slightly below state funding levels, but these estimates do not include any cost for curriculum because curriculum was fully developed under previous funding. Platform/Internet costs are low because of self-developed platform using web-based templates. The program is considering moving to a commercial platform.

Poway Unified School District

San Diego, CA

Contact: John Keiter, Ed.D.

Area Superintendent

jkeiter@powayusd.com

Profile

Poway serves over 300 students in 10 courses based in three high schools. Teachers created their own courses based upon California state standards, using BlackBoard as a platform for delivery. The school pays teachers for summer curriculum work, otherwise their online instruction duties are part of their school day. Classes are actually hybrid, meeting face-to-face once per week. They have no full time online students. They believe they need a “critical mass” of students before they can go to a fully online program.

Summary

According to John Keiter, online education in Poway costs slightly more than regular education. Their primary costs are instructional, and they use regular classroom teachers at their regular rate of pay. Additional costs are for the creation of curriculum, which is done during the summer.

Additional School Profiles

Source:

Abdal-Haqq, I. ed. (2002). *Virtual realities: a school leader's guide to online education*. National School Board Association.

Virtual Realities provides profiles of several online programs that are not otherwise included in this report. These profiles do not provide enough specific information about their funding to be fully utilized for this report, but the information they do provide can be helpful.

Cyberschool	Funding Sources
eHigh School Marietta, Georgia http://www.cobk12.org/~elearning	Base operating funds from district plus \$250 per ½ credit course / in-district students \$300 per ½ credit course / out-of-district students
Oakland Virtual Connection Waterford, Michigan http://www.ovconnect.org	Base operating funds from district plus \$350 per ½ credit course
Partners to Access Virtual Education (PAVE) East Petersburg, Pennsylvania http://www.iu13.org	Base operating funds from district plus grant funding plus \$300 per ½ credit
Plano ISD eSchool Plano, Texas http://www.planoisdeschool.net	Base operating funds from district plus \$220 per ½ credit course
Wichita eSchool Wichita, Kansas http://usd259.com/eschool	Fully funded by state per pupil appropriations

Summary

All but one receive an undisclosed amount of base funding plus an average of \$284 per semester class, or \$3,408 per FTE. The other school (Wichita eSchool) receives full per pupil funding from the state. Because the amount of base funding is undisclosed, the total FTE funding cannot be determined.

Summary of Data and Profiles from Cyberschools Outside Colorado

All schools reported program costs approximately the same as or somewhat higher than funding requirements for traditional schools, except in cases where schools had already completed curriculum development and no longer had costs in that area. Two such schools (SK Online and Florida Virtual School) had large grants and startup funds to allow them to create curriculum.

Funding Analysis

Because online education is new, there is no consistently agreed upon design for a program, especially at the K-12 level. All programs must have the same components, but the variations in the design of these components and their resulting costs are significant. They are also interrelated, meaning that one system might bring great cost savings in one component, but those savings would be compensated for by additional costs in another component. The primary reason for this is that educational vendors have designed their products in accordance to their own visions of online education, and there is no consensus among vendors or schools on what that design should be.

This section examines each of the components of an online education program. It describes the differences among the available designs and provides cost estimates for each.

I. Curriculum/Content

Online curriculum has changed in the last decade. The earliest online curricula were simple and easy to design. Students were given textbooks, and the online portion of the class was little more than a syllabus. Some classes still follow that model, but this model is only effective with completely self-directed learners who can learn without instruction. The next phase of instructional development did little more than take textbooks and recreate them online. Many online curricula being used today still follow these two patterns. Classes are cheap and easy to create.

Modern online curricula attempt to marry the best practices in classroom instruction with the advantages inherent in the online system. At the same time, it de-emphasizes the attributes of classroom instruction that do not work well in an online setting. These classes demand student/teacher interaction and student/student interaction. They use project-based learning and other hands-on activities. They make use of the latest software advances, including multi-media, to engage students and make them active participants in the educational process.

In a classroom, the primary educational process is created anew by the instructor every day as he or she interacts with students. In online education, that process must be created fully in advance. This means that an online school must have the nearly the entire instructional process in place when classes begin. Choosing a curriculum is one of an online school's most important decisions and expenses.

Curriculum Sources

- **Self-created:** According to the Clark (2001) study, most online schools create at least a portion of their curriculum. For many, this turns out to be a much more challenging task than they anticipated. Unless they devote a significant amount of startup time and expense to this process, they will need to supplement this with other sources in their earliest years. Programs that create their own curriculum indicate that they usually start with a basic-text based curriculum with little multi-media or interactive features that promote engagement. Established schools indicate that economies are achieved over

time because their curriculum writers can work much faster with experience and because they have a strong base of established courses. In time, curriculum costs become negligible. It is also possible to lease or purchase components of courses from commercial vendors like BigChalk, RiverDeep, and SAS in Schools. Another factor with self-created curriculum is the use of textbooks, which may or may not be needed, depending upon course design.

Cost of Self-created curriculum: Cost estimates vary. Of all schools surveyed, the lowest cost found was \$1,500 per semester course for highly experienced teachers working with established templates. In Colorado, the Colorado Online School Consortium (now Colorado Online Learning) paid \$4,750 for each semester course and JeffcoNet Academy paid approximately \$3,000 per semester course. Both programs felt that the results were classes that still needed work to be at the level they wanted. Florida Virtual School, working with extensive state grants, estimates that 80% of its original budget went to course development, and that each course cost between \$50,000 and \$100,000. Commercial vendors such as ApexLearning have course development estimates approaching \$500,000. If textbooks are to accompany courses, they must be figured into the costs. Because of this range, and because only a fully established school can rely upon self-created curriculum exclusively, it is difficult to estimate the true cost of self-created curriculum.

- **Leased Curriculum:** Several vendors, including established schools like Florida High School, provide curriculum on a per student basis. Under this system, schools contract with the vendor under a system that counts the number of students who log into the vendor's web site. Some systems charge for a specified number of simultaneous users. The advantage of this is that a school can get by with fewer licenses than it has students, since not all will be online simultaneously. The disadvantage is that the school must still purchase more licenses than it needs, since it must anticipate peak needs. Others charge on a strict per-pupil basis. The advantage is that the school only pays for the students who use the curriculum; the disadvantage is that schools with a transient population will routinely pay full prices for students who are only briefly with the program. In all cases of leased curriculum, the major problem is the challenge of finding curriculum that matches state standards and best practices in instruction. In his keynote address to the CiTE conference in Denver in 2002, John Bailey, Director of the Office of Educational Technology in the U.S Department of Education noted a disconnect between what is available and what we know about effective instructional practice.

Cost of Leased Curriculum: Commercial vendors contract with each school differently, often requesting confidentiality as to the details of the contract. For example, one vendor provides a Colorado program with access to all courses in its curriculum for \$190 per student per course, but it offered another Colorado program unlimited access to ten courses for \$100,000, not mentioning the other school's deal as an option. In some cases, leasing the curriculum also leases the platform for the program, so those costs are included. For this report, a good estimate for leased curriculum is \$200 per student per semester course, or \$2,000-\$2,400 per student on an FTE basis.

- **Purchased Curriculum:** Purchasing curriculum is a new concept, and few vendors offer this option. It has the disadvantage of requiring a large initial investment. Its advantages are that the school can manipulate the content to match content standards and best practices in instruction, and in the following years curriculum costs decrease. When a school owns a fully developed online curriculum, its curriculum costs are negligible.

Cost of Purchased curriculum: Current estimates from the few vendors supplying this option range from \$5,000-\$20,000 per course. With purchased curriculum, costs diminish or are nearly eliminated during the life of the program.

- **Outsourced Curriculum:** Some vendors supply full service. They provide the platform, the curriculum, and the instruction. In these cases, it is difficult to separate the cost of the curriculum from the entire package.

Cost of Outsourced Curriculum: Prices range from \$375-\$500 per student per semester class. Costs are constant throughout the life of the program.

Summary: Fully self-created curriculum and fully purchased curriculum require large investments up front, followed by significant savings. They also allow for total customization. Leased and outsourced curricula require no up front costs, but costs remain constant and the school must accept the curriculum as it is, even if it is not totally suitable to district needs. Most established schools estimate curriculum costs at \$2,000-\$2,400 per FTE.

II. Instruction

Instruction is by far the greatest expense for programs fitting this report profile. According to the *TCM Casebook* (Boeke 2001) all other costs pale in comparison to personnel costs. If instruction is provided by teachers licensed as required in traditional schools with student/teacher ratios similar to regular schools, then schools should expect to pay approximately the same for online instruction as for traditional instruction.

The use of adjunct faculty lowers that expectation, however. Adjunct faculty are normally paid less than traditional faculty. Although adjunct faculty are paid with different systems in different schools, \$3,000 per semester class (secondary) can be considered a representative salary. On an FTE basis, this is equivalent to \$30,000 per year, which is well below the state average teacher salary, especially since adjunct faculty do not receive benefits. Most schools surveyed indicated that they use a blend of full time and adjunct faculty.

On the other hand, actual student/teacher ratios used raise the expectation. An informal survey of established cyberschools presenting at the CiTE conference in Denver in 2002 indicated that all believed that online teachers using an interactive curriculum could not handle as many students as a traditional teacher. The most common responses indicated a belief that the most important factor was the total number of students being served, and they felt that, at the secondary level, a teacher could not be effective with more than 100 total students. This is about 50% fewer than a typical maximum load for traditional students.

There are also economies of scale to be considered. A school with few total students will of necessity have a large number of low enrollment classes. Low enrollment classes drive up the cost of instruction as much as 300%. Illinois Virtual High School estimates instructional costs at

\$130 per student per semester class for classes that have maximum enrollment (25 students), but a class with minimum enrollment (5 students) costs \$400 per student per class. According to Illinois' projections, a student with five full classes will cost anywhere from \$1,300 to \$4,000, but the extremes of this range would be extremely rare.

Summary: Accepting an average of all factors, a cyberschool should expect to pay \$2,000 to \$2,500 per FTE for licensed instruction at a student/teacher ratio consistent with traditional instruction and demonstrated best practice in online education.

III. Platform/Internet Service.

An online school must have some form of Internet service, and although it is possible to do without one, almost all use a platform of some kind. A platform is a software package that maintains the class. It allows the student to access materials, take quizzes, hand in assignments, participate in discussions, and view grades. Schools have several choices for Internet service and platform. The following profiles show the most typical variations in platform and Internet service.

- **Full in-house:** Some schools maintain an Internet server and create classes without a platform, using templates and a web page editing program. This is the least expensive option, but it requires extensive training, and it is difficult to include all the features of a prepared platform. In our survey, we found no Colorado schools doing this, and only two outside of Colorado. One of these (SK Online) reported that it was in the process of choosing a platform because it cannot duplicate the services a good platform offers. Annual costs for this are minimal, especially if the district is using its Internet server for other purposes anyway.
- **In-house with basic platform service:** In this system, the school provides its own Internet service, maintains its own servers, and provides its own technical support. Usually the school will have this infrastructure in place for other purposes, so the additional costs are not great. The school purchases an annual license for a platform that will provide the essential instructional needs. A typical license for the platform is \$5,000 per year for unlimited users. Costs associated with maintaining the server and providing support range from \$15,000-\$20,000 per year. However, some of these expenses are duplications of expenses that are being paid anyway. For example, an online program operating out of a building may benefit from the Internet services that would be provided to that building without their existence.
- **In-house with advanced platform service:** Some platform providers offer advanced programs that make the administration of a large instructional program much more efficient. These programs can integrate with student information systems and allow for other administrative advantages. These programs are generally priced for a range of student users. One such company offers an advanced package for up to 2,000 users for \$10,000 and another even more advanced package for \$22,000. In these cases, the school's cost of ownership of the hardware would remain. There could be savings in personnel costs related to increased efficiency of operation.

- Full service platform:** Some companies provide a full service package that eliminates the need for the district to maintain the Internet service or the platform. Since students log into the vendor's server, prices usually include a base fee plus a per student charge. The advantages to the district depend upon the package purchased from the vendor. These may include a higher quality platform than is generally available in basic packages, all the features of the advanced platforms above, complete 24/7 server maintenance and tech support, and even support for course creation (curriculum design specialists, multi-media creation, etc.). This is also an advantage to school districts that do not already have their own Internet service in that the total cost of ownership could be comparable to what they would have to pay to operate their own system. For schools that already maintain their own Internet service, much of the cost of this service duplicates what they already have in place. Costs of a total service platform vary depending upon the amount of service provided under contract. Estimates from schools using full service platforms range from \$50-\$120 per student. No Colorado schools are currently using resources at the upper end of this range. These services are more common outside of Colorado.
- Platform included with curriculum:** Some curriculum vendors include a platform with their curriculum package. Although this service varies, students generally log into the vendor's web site to access all materials and the platform. Instruction from the school's teacher is done separately. In some cases, the school finds it must maintain its own platform and then send the student in a particular class to another site, where the student encounters the curriculum vendor's platform. Costs for the platform cannot be separated from the costs for the curriculum.
- Fully outsourced platform, curriculum, and instruction:** Some companies supply the complete instructional package. The student goes to the vendor's web site and accesses the platform, the curriculum, and the instruction. An example of this in the public sector is Colorado Online Learning (COL). COL's classes are \$100 per student per class this semester because of the requirements of its grant, but the price will increase. The lowest known price for a private vendor at this time is \$375 per student per semester class, but that company is in its venture phase of existence and plans to increase prices. More established companies charge \$450-\$500 per semester enrollment. In all these cases, it is difficult to determine how much of the cost is directly related to the platform.

Summary: Platform/Internet service costs can be either fixed costs that do not depend upon enrollment (in-house services) or variable expenses that are directly related to enrollment (full service or outsourced service). As fixed expenses, they can be as little as \$15,00-\$20,000 total. As variable expenses, they can run from \$50-\$120 per student. At the highest part of that range, platform/Internet expenses can bring about savings in other components.

IV. Student Support

Studies of online completion rates indicate that student success increases sharply when schools provide systematic and systemic mechanisms for support. One kind of support is technical: students in poverty need to have computers with Internet access in their homes. They also need assistance when their technology does not work or they do not understand it. The most important support, though, is academic. According to Virtual High School (formerly Concorde Virtual High School), the primary reason for their excellent success rate is the emphasis they put

on the use of trained and paid site coordinators in every building to facilitate student success. Unfortunately, this mode of student support is not applicable to a true online program, since the students are not in a building with a site coordinator. Online schools must find an effective way to replace this missing element.

This is especially true when special education students and other at-risk students become involved with a program. The Virtual High School model has an advantage in that its students are primarily housed within a high school and are accessing special interest classes not otherwise offered at the school. They tend therefore to be more self-directed students than those who are fully online. Many of the students who are fully online have chosen this medium of education only after having been unsuccessful in a traditional school.

Many early online programs attempted to screen out students who were not likely to succeed in online education without support, but those efforts were largely unsuccessful. Research done on students in the SK Online program showed that it is difficult to identify such students. At this time, there are few models of effective student support available. Most successful programs rely upon low student/teacher ratios that allow for a high degree of student/teacher interaction. To support at-risk and poverty students, online schools may also have to provide both the required technologies (especially computers) and Internet service.

Research at Florida State University (Boeke 2001) indicates that student achievement, even for college students, increases significantly with the use of a Mentoring program. Other forms of student support include centers tutoring labs, homebound support for disabled students, social workers, guidance counseling, and other processes that monitor student participation and automatically intervene.

Costs rise appreciably when special education students become involved. Schools may have to invest in screen reading and writing software. They may have to find a way to provide academic assistance to students with IEP's, which can be tricky when students live far from the program site. Social workers may be necessary, especially for students who entered the program because social anxieties made them unsuccessful in a traditional school.

Summary: Students need support in both technical and in academic/affective areas. Online education programs are still learning the degree to which this is true and do not have enough consistent models to create a meaningful cost analysis. This report uses \$600 per FTE as a figure, but that is a theoretical number based on preliminary and incomplete data.

V. School Administration/secretarial support

Like all schools, cyberschools need building level administration and secretarial support to manage the program, supervise instruction, handle scheduling, report grades, and perform all the other normal main office functions. In small programs, these functions are usually absorbed by staff with other duties. Larger programs need dedicated staff. These are otherwise fixed costs that are highly dependent upon total enrollment figures to be determined on an FTE basis. This report assumes an average program will spend \$400-800 per FTE.

VI. District Administration/Housing/Record Keeping/Assessment

As with all students, online students use the district's administrative functions. These include directing the program itself, record keeping, transcripts, ACT testing, CSAP testing. Graduates attend graduation ceremonies. The buildings in which the staff works must be maintained. All school districts need to direct a certain amount of funding to district and school administration.

Summary: The needs of online students in this area are at least the same as traditional students. (See *geographic dispersion* and *at-risk* factors below.) A typical school spends \$300-400 per student.

VI. Factors affecting per pupil costs

A. Geographic Dispersion

Programs that work with a local population (such as JeffcoNet Academy) are less expensive than programs whose students are located throughout the state. It costs more to serve just a few students in remote areas of the state because of long distance phone bills, shipping costs, providing technical support (visiting the home when the computer's not working), providing academic and affective support, setting up CSAP testing sites, arranging social activities, and other needs.

B. Scale

The more students in a school, the lower the per pupil costs for fixed expenses. Fixed expenses include administrative costs, costs for self-created or purchased curriculum, and most platform/Internet service systems. For a school with 100 students, these expenses are 500% higher than a school with 500 students. Variable expenses (instructional salaries) are also affected because of the typically small size of cyberschools. With small total enrollment, it is difficult to fill high school classes. Illinois Virtual High School estimates that the cost per pupil of a class with minimum enrollment is more than 300% higher than a class with maximum enrollment. These issues are the same as for traditional schools with low enrollment. In online education, a small cyberschool operating in a large district has the same problems of scale as a small traditional district.

C. Experience/Curriculum

The longer a cyberschool has been in existence, the greater its efficiency. This is especially true for schools that purchase or create their curriculum. Once a school has total control of its curriculum, those costs become minimal. Florida Virtual School's per FTE costs were 71.5% higher in 2000-2001 than their projected cost for the coming year. That is partly because their enrollment will have doubled since then, but according to Director Julie Young, the primary reason is that they have nearly finished all curriculum development. In fact, because they have started to sell that curriculum, it has become an asset rather than a debit.

D. At-Risk

Although students enroll as full time online students for a variety of reasons, many (especially at the secondary level) have chosen to be online because they were not successful in a traditional school. Others have been expelled or are too ill or injured to attend school. JeffcoNet Academy estimates that 97% of its students fit into those

three categories. This increases the need for student support and Administrative support.

Summary of FTE Expenses for Online Education

Because of the factors noted above, it is very difficult to create a base total with any accuracy. Online schools follow many different models, and each model has an effect upon the cost of each component. If a school’s model puts them at the low end of the cost range for a particular component, it will likely have to be at the top of the cost range for another. The following table summarizes all component costs.

The estimated costs are based upon the profile identified in the introduction:

- **A curriculum that requires student/teacher interaction and makes full use of the instructional benefits associated with computer assisted instruction.**
- **A student/teacher ratio at least similar to the traditional classroom.**
- **Licensed Instruction in all classes.**
- **Systemic student support, including special education when appropriate.**

Component	Estimated Cost per FTE	Comments
Curriculum	\$2,000-\$2,400	Depends upon source. Can be an up front purchase or an annual lease. With purchased/created curriculum, costs would be much higher than this in the first years, but costs then diminish over the life of the program.
Instruction	\$2,000-\$2,500	Depends upon student/teacher ratios
Platform/Internet	\$20-\$120	Depends upon the system. Higher costs can lead to savings in other areas. Higher priced systems assist in curriculum development/acquisition.
Student Support	\$600	Earliest programs provided little support. There is no clear cost history.
School Administration	\$400-\$800	Fixed costs; depends upon enrollment
District Administration	\$300-\$400	Fixed cost; depends upon enrollment
Typical Total Cost Range	\$6,000-\$6,400	Excludes factors affecting per pupil costs.

The likely cost range is consistent with findings from cyberschools outside of Colorado. Four of the schools surveyed said costs were the same or slightly higher than the costs of traditional schools. Florida High School reported FTE costs significantly higher than traditional schools when it was still designing curriculum, and it reports lower costs now that curriculum is completed. CSS Web School in North Carolina also reports costs that are less than traditional schools, and that can be attributed to the fact that they have completed all work on more than 100

courses, and thus have almost no curriculum costs. In Oregon, SK Online has also lowered costs by completing curriculum development.

Strategies that lower costs

The total above is for schools that fit into the report model profile. Schools departing from this profile can have much lower costs. The following areas can be reduced as described, and most cyberschools use some of these measures to some extent to lower costs.

- **Curriculum:** Without the necessary resources to purchase or create quality curriculum, schools would purchase or create curriculum that is the easiest to produce. Such curriculum essentially places a textbook online and leaves the student to “read and repeat” content in a way shown to be ineffective. It does not make use of the interactive benefits of computer assisted instruction.
- **Instruction:** Schools can increase the student/teacher ratio by decreasing the amount of teacher/student and student/student interaction in the course design. Schools can use non-interactive curriculum that leaves a student alone in the learning process without regular contact with a teacher. This would allow a school to have a single teacher “teach” a large number of students and sections, even in areas for which the teacher is not licensed. One curriculum vendor approached Jefferson County Schools with the contention that a single teacher with any license could “teach” more than 400 high school students in a variety of subject areas. This assumes that the students are capable of getting all learning from the course materials without expert assistance, even for classes like Algebra II or Chemistry. At the most extreme level, this could lower instructional costs by 75%.

Costs can also be substantially reduced by relying nearly exclusively on adjunct faculty. These are lower priced than regularly licensed teachers, and they do not receive benefits. Established schools report that full time instructors are essential to the delivery of a consistent educational product of high quality.

- **Student Support:** Effective schools use Mentors and other programs to help students succeed. Students in poverty who need the use of computers and Internet service might not be served. In the earliest online programs, student support was almost non-existent. Online schools are still learning how to provide effective support to students, and schools could save substantial money by not investing in this area. Most schools have only begun to invest in this area, and some spend little here now.

Summary and Recommendation

For schools adhering to the model program profile identified for this report, online education costs are comparable in total to costs associated with traditional education. Although there are areas in which its costs are significantly less, there are also areas in which costs are significantly higher.

Factors that influence the cost, such the number of students in the program and the number of at-risk students involved, are also similar to traditional school and have the same impact.

Online programs can make substantial savings by departing from the model program profile, but all of these savings depart from best practice for instruction and student achievement.

Colorado should fund online schools at the same level as regular schools, provided that the program design in the schools conforms to accepted best practice, especially in the use of licensed teachers consistent with traditional schools.

Sources Consulted

- Abdal-Haqq, I. ed. (2002). *Virtual realities: a school leader's guide to online education*. National School Board Association.
- Bailey, J. (2002). Keynote address to CiTE conference in Denver, Colorado.
- Boeke, M. ed. (2001). *Technology costing methodology casebook*. Western Cooperative for Educational Telecommunications (WCET) and Western Interstate Commission for Higher Education (WICHE). <http://www.wcet.info/projects/tcm/projects.htm#Casebook>.
- Clark, T. (October 2001). *Virtual Schools: Trends and Issues*. WestEd. <http://www.wested.org/cs/wew/view/rs/610>.
- Jones, D. (2001). *Technology costing methodology handbook*. Western Cooperative for Educational Telecommunications (WCET) and Western Interstate Commission for Higher Education (WICHE). <http://www.wcet.info/projects/tcm/projects.htm#Casebook>.
- National School Boards Foundation (2002) "Are We There Yet? Research and guidelines on schools' use of the Internet." <http://www.nsb.org/theyet/index.htm>.
- North Central Regional Educational Laboratory. (2002). *The E-Learning knowledge base*. <http://www.ncrel.org/tech/elearn/index.html>.
- Virtual High School. (2000). <http://www.govhs.org/website.nsf>. Presentation at National School Board Association Conference. Denver.