Moving Mountains To Ensure Equal Access To High Quality Learning

Colorado Online Learning

Findings and Recommendations of the Colorado E-Learning Task Force

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Table of Contents

Table of Contents **2**

1. Executive Summary **4**

2. Introduction **6**
2.1. The growth of online education 7
2.2. The E-Learning Task Force and Colorado Online Learning (*COL*) 7

3. Existing Online Educational Providers **8**
3.1. Models of online education programs 8
3.2. Statewide programs in other states 9
3.3. K-12 programs in Colorado 10
3.4. Commercial providers 11

4. Demand for Educational Services in Colorado **12**
4.1. Unmet educational needs 12
4.2. Meeting unmet demand 13

***5. Colorado Online Learning*—A Statewide Online Learning Organization** **13**
5.1. Organization design and principles 14
1. The statewide organization should support schools. 14
2. The statewide organization should collaborate with other online learning programs. 14
3. The statewide organization should meet a broad range of educational needs. 15
4. The statewide organization should support a broad range of learners. 15
5.2. Organization goals 16
5.3. Target audience 16
5.4. Collaboration among in-state online programs 17

6. Stakeholder Benefits **18**
6.1. Learners 18
6.2. Teachers 19
6.3. Schools and districts 19
6.4. State 19

7. Leadership, Governance, and Staffing **20**
7.1. Governing board and bylaws 20
7.2. Staffing 21
7.2.1. Core staff 22
7.2.2. Contract purchased services 23
7.2.3. Local school staffing 23
7.3. Fiscal agent 23

8. Implementation and Operation 23
8.1. Recommendations for start-up. 24
8.1.1. Identity 24
8.1.2. Preparation 24
8.1.3. Governance and staffing 24
8.1.4. Curriculum and support services 25
8.2. Determining course offerings 26
8.3. Course development and delivery 26
8.4. Quality assurance standards and procedures 26
8.5. Ongoing support for learning 27
8.5.1. Learner support 28
8.5.2. Pace of learning and course completion 28
8.5.3. Instructional design and teacher-student interaction 29
8.5.4. Teaching and learning communities 29
8.5.5. Technical support 30
8.6. Teacher recruitment, preparation, and support 30
8.7. Marketing 30
8.8. Platform 31

9. Financial Model 31
9.1. Funding of programs in other states 32
9.2. Setting enrollment fees 33
9.3. Revenue and cost projections 34

10. Accountability: Evaluation of Program Goals 34
10.1. Goals and objectives 34
10.2. Key metrics 34
10.3. Independent evaluation 35

11. Conclusion: A (Narrow) Window of Opportunity 35

Appendix A: References 36
Appendix B: Proposed Timeline for Implementation of *Colorado Online Learning* 37
Appendix C: Projected *COSC/COL* Course Offerings for 2002-03 38
Appendix D: List of E-Learning Task Force Members 3/21/02 39
Appendix E: Selected List of K-12 Online Programs 42
Online programs in Colorado (incomplete list) 42
Statewide programs outside of Colorado (incomplete list) 42
Virtual schools run by public school districts outside of Colorado 42
Consortia operating online programs 43
Appendix F: Proposed *COL* Enabling Legislation 44
Appendix G: Virtual High School, Inc. 46
Appendix H: Commercial Providers 47
Course management system providers 47
Course content providers 48

1. Executive Summary

Online learning[1] is rapidly becoming an important mode of educational activity in Colorado. Putting courses online offers a promising strategy for meeting the educational needs of students in isolated districts or schools, students in small high schools with limited teaching staffs, students whose schedules exclude them from important learning opportunities, alternative students, home-schooled students, and expelled students. The increasingly common use of online learning in this state reflects a nationwide trend. An estimated 40-50,000 K-12 students across the country took online courses in the 2001-02 school year.

In order to understand the impact of this phenomenon and determine what course the state should set, the Colorado Department of Education formed an E-Learning Task Force (ELTF) in fall 2001. The task force, whose forty members represent a rough geographic and programmatic cross-section of the state's educators, has recommended that a consortium-based statewide organization (*COL—Colorado Online Learning*) be created to sponsor online learning for K-12 students and educators. The task force members concluded that a statewide organization could provide equity of opportunity for all Colorado learners, assure that online courses available throughout the state meet rigorous standards of quality, and take advantage of economies of scale through the use of common technology, content, and resources.

The proposed statewide organization would not be a "virtual school", granting diplomas and drawing per-pupil (PPOR) funding, nor would it be a regulatory unit of the state government. Instead it would function through the collaboration of school districts and online learning programs[2] in the state, and it would serve and support existing schools and other educational programs. Four basic principles set the foundation for the statewide organization:

1. The statewide organization would complement and supplement other educational programs. Colorado students would earn diplomas through physical schools or "cyberschools"[3], not the statewide organization. Students would enroll in *COL* courses through local physical schools or cyberschools; while taking *COL* courses, students would get support such as mentoring, tutoring, and access to computers and Internet connectivity through local physical schools or cyberschools.
2. The statewide organization would collaborate with other in-state online learning programs.
3. The statewide organization would meet a broad range of educational needs, including advanced as well as remedial work in core subjects or skills, test preparation, applied technology, and career exploration.
4. The statewide organization would support a broad range of learning styles and abilities.

[1] "Online learning", in this document, means instruction and content delivered primarily via the Internet. Online learning is a form of distance learning, which is interactive instruction in which the teacher and students are separated by time and/or space.
[2] "Online learning program", in this document, means an educational organization that develops and offers online instruction and content. An online learning program may be a cyberschool, or it may provide supplementary learning opportunities for students enrolled in physical schools or cyberschools.
[3] "Cyberschool", in this document, means an educational organization that enrolls students in online courses, awards students diploma-earning credit based on successful completion of those courses, and awards diplomas based on students' completion of the school's prescribed (usually online) curriculum.

COL would serve numerous types of learners who are often not fully served by physical schools. Course offerings would include:

- Core and remedial courses that students may need to complete scholastic requirements or basic educational needs but may not be able to obtain in their local schools;
- Advanced Placement, honors courses, and other advanced academic courses for students attending schools that do not offer these courses or whose schedules prohibit them from taking these courses;
- General high school curricula for learners who otherwise would not be able to obtain them, including (1) students who are homebound due to prolonged illness, disability, or other factors; (2) home-schooled students; and (3) adult adolescent learners[4] who are acquiring basic skills or working towards a high school degree.

In addition, the organization would offer professional development courses for teachers, and could extend offerings to middle schools, adult learners, and other populations.

Focusing on equity and high-quality education, *Colorado Online Learning* would provide benefits to a significant range of stakeholders within the state. Specific beneficiaries include:

- K-12 learners, through access to a broader array of courses, greater flexibility of course scheduling, and consistently high-quality content;
- Teachers, through professional development opportunities and dissemination of high-quality models for curricula, instructional design, and teaching strategies;
- Schools and districts, through expansion of their educational mission without the high start-up and operational costs of developing independent online programs;
- The state of Colorado, through an increase in educational attainment and closing the learning gap between high- and low-achieving students.

Operations of *Colorado Online Learning* would be handled by a combination of a small full-time core staff, contract staff (especially teachers), support from local schools, and commercial vendors (who would provide course management technology and possibly content). A Board of Directors, representing a broad range of constituencies, would set policies and by-laws.

The experience of other states indicates that a well-funded statewide online organization in Colorado would cost approximately two million dollars per year in the initial stages of development—about $2.50 per public school student in the state—with the largest portion of that money going to course development and delivery, teacher preparation, and quality assurance. *COL* would charge course fees, which would be paid by schools or districts (*not* students). But the fees would be minimal in order to ensure that low-income students and districts have equitable access. This strategy would necessitate external funding for the organization, especially in the first several years of operation. *COL* would seek funding via legislative appropriation as well as grant support.

[4] "Adult adolescent learners" are people sixteen years of age or older who are not enrolled in school and seek educational services.

2. Introduction

Online learning[5] is rapidly becoming an important mode of educational activity for K-12 students in Colorado. More than 20 schools and districts in the state offer online courses in some form, a four-fold increase in four years. Three districts operate "cyberschools"[6], recruiting students throughout the state; and two charter cyberschools have been created. The Colorado Online School Consortium (*COSC*) delivers core and elective courses to students in 60% of the state's school districts.

The Colorado activity reflects a nationwide trend, fueled by advances in computer technology and expanded use of the Internet. The National Telecommunications and Information Administration (NTIA, 2002) reports that 90% of American children and teenagers use the Internet, and that all Americans' use of the Internet and computers is growing substantially, regardless of income, education, race, or other factors.

The growth of online learning is widely hailed. The Web-based Education Commission to the President and Congress of the United States (WEC, 2000), for example, says that "Although web-based education is in its earliest phase, it holds extraordinary promise." Similarly, the National Association of State Boards of Education (NASBE, 2001) observes, "Evidence to date convincingly demonstrates that, when used appropriately, …e-learning can improve how students learn, can improve what students learn, and can deliver high-quality learning opportunities to all [students]." Commentators generally agree that online learning can:

- Make high-quality standards-based courses available to learners regardless of where they live, work, or go to school;
- Provide courses to students that their schools cannot offer because of limited resources;
- Assure equitable access to learning opportunities for students who have barriers to being physically present in a classroom;
- Fit into non-traditional schedules;
- Accommodate learners who might have difficulty in conventional classroom environments (e.g., shy students who may feel more comfortable participating online, "energetic" students who can participate without being disruptive to others, or independent learners who prefer setting their own pace);
- Promote student responsibility for learning by adapting to individual student preferences (e.g., offering a range of course or assignment completion schedules);
- Foster increased on-task student-to-student and student-to-teacher communications; and
- Teach valuable technology skills through the instruction and interactions that take place.

[5] "Online learning", in this document, means instruction and content delivered primarily via the Internet. Online learning is a form of distance learning, which is interactive instruction in which the teacher and students are separated by time and/or space.

[6] "Cyberschool", in this document, means an educational organization that enrolls students in online courses, awards students diploma-earning credit based on successful completion of those courses, and awards diplomas based on students' completion of the school's prescribed (usually online) curriculum.

Despite the growing enthusiasm, educators also realize that online education is not a panacea; nor would it be easily developed and implemented. The WEC (2000) noted, for example, that "The power of the Internet to transform the education experience is awe-inspiring, but it is also fraught with risk." And NASBE observed that the "rapidly moving trends" in online learning present educational policymakers with an immediate and daunting challenge: "In the absence of firm policy guidance, the nation is rushing pell-mell toward an ad hoc system of education that exacerbates existing disparities and cannot assure a high standard of education across new models of instruction." (NASBE 2001, p. 4).

Colorado has the opportunity to exercise the firm policy guidance called for in the NASBE report, encouraging the use of online learning and innovations in that area of K-12 education while establishing safeguards to assure that the learning obtained online meets rigorous standards of quality, equity, and accountability.

2.1. The growth of online education

As of early 2002, the Distance Learning Resources Network estimated that more than 85 K-12 online learning programs[7] existed across the United State, and Clark (2001) estimated that between 40-50,000 K-12 students took online courses in the 2001-02 school year. Given the number of Colorado programs (more than 14) and students (more than 1,000) in spring 2002, both estimates seem conservative. *Education Week* (2002) reports that twelve states have established statewide online high school programs, and 25 states allow for the creation of charter cyberschools. At least 32 states have some online learning initiative in the works. Virtual schools have been developed by state education departments, local education agencies, individual school districts and district consortia, universities, and private institutions. The oldest of these programs have been in existence for as long as eight years.

The movement in K-12 toward online education mirrors trends in postsecondary education and corporate training. Almost 75% of postsecondary schools have selected a single system for managing all courses, and an estimated 20% of on-campus postsecondary courses have web-based components, according to the Campus Computing Project (CCP, 2001). The growing demand for online content and delivery systems has prompted numerous start-up and established companies to offer course management software, digital content to pre-load into courses, and the infrastructure for operating online courses, programs, and schools.

2.2. The E-Learning Task Force and Colorado Online Learning (*COL*)

In order to understand the impact of the online learning phenomenon and to determine what course the state should set regarding online education, the Colorado Department of Education formed the E-Learning Task Force (ELTF) in fall 2001. The task force, whose forty members represent a rough geographic and programmatic cross-section of the state's educators, has recommended that a statewide organization (*Colorado Online Learning—COL*) be created to sponsor online learning for K-12 students and educators. Four primary reasons underlie the creation of a statewide organization in Colorado:

[7] "Online learning program", in this document, means an educational organization that develops and offers online instruction and content. An online learning program may be a cyberschool, or it may provide supplementary learning opportunities for students enrolled in physical schools or cyberschools.

1. to provide equity of educational opportunity throughout the state;
2. to support existing physical schools and online programs in the state;
3. to assure that online courses available statewide meet rigorous standards of quality; and
4. to take advantage of economies of scale through the use of common technology, content, and resources.

The proposed statewide organization would not be a "virtual school", granting diplomas and drawing per-pupil (PPOR) funding. Instead it would serve and support existing schools and other educational programs. *Colorado Online Learning* would supplement the curricular offerings of school districts and in-state online programs. By coordinating planning, course content, administrative functions, staffing, and resources at the state level, *Colorado Online Learning* would ensure the equitable availability of high-quality offerings at the lowest possible cost. (For details about *COL*, see Sections 5, 7, 8, and 9.)

3. Existing Online Educational Providers

The following sections describe online learning programs in Colorado and across the country, as well as commercial providers of technology and course content.

3.1. Models of online education programs

Clark (2001) has identified five models used by online learning programs:

- **State level:** At least 12 states have created statewide programs. Examples include Florida Virtual School and Kentucky Virtual High School. In this model, initial funding typically comes from the state independent of standard state per-pupil expenditures, and the virtual school attempts to recoup some or all operating costs by charging schools or students for online enrollments. Often the school seeks a pro-rated percentage of the per-pupil funding that the state provides to school districts. See section 3.2 for a more detailed description of statewide programs.
- **University based:** Several postsecondary institutions have made their introductory level courses available online to high school students, and in some cases have developed larger virtual high school programs. A prominent example is the University of Nebraska Independent High School, which operates online courses and has spun off an independent for-profit company, Class.com. Other examples include the University of Texas High School, and the University of California College Prep Initiative. Funding for these programs comes from a variety of sources, including foundation grants, state appropriations, and charging fees to students or schools.
- **Consortial and regionally based:** VHS, Inc., formerly Concord Virtual High School, is the most prominent example of a consortium model. VHS charges each school a consortium membership fee, which pays for training one of the member-school's teachers in online pedagogy and pays a school staff member to provide local support. The member school provides an online course, and for each such course taught the school may enroll

twenty students per semester in other VHS courses at a low fee. (See Section 3.2 and Appendix G for details about the program.)

- **Local education agency-based:** School districts often create virtual programs to meet needs that individual schools cannot, such as offering Advanced Placement courses. Examples include both rural districts, such as the Monte Vista On-line Academy (in south-central Colorado), and those in urban areas, such as Houston Independent School District's Virtual School.
- **Charter and private schools:** Numerous online schools have been created as charter schools, in order to take advantage of the regulatory freedom allowed to charter schools. A smaller number of private online schools have also been established.

A partial list of online programs run by states, school districts, and consortia is provided in Appendix E.

3.2. Statewide programs in other states

Most statewide online learning programs are in the early stages of development, and the oldest of these programs have been in existence for only about 5 years. Prominent examples include:

- **Florida Virtual School** (FLVS), the first statewide virtual school funded by state appropriations (Clark, 2000), served 8,200 enrollments in 62 courses in 2001-02. FLVS was started in the1997-98 school year and has grown steadily, with total funding over the past five years of approximately $23 million, and funding for the 2001-02 fiscal year at roughly $5.7 million. Because of the high level of state funding to date, courses are offered free of tuition to in-state students, and demand at FLVS far exceeds the supply of course seats. (In 2001-02 FLVS maintained a waiting list, but stopped adding names to it when the list reached 1,000 students.) To address equity issues while demand exceeds supply, FLVS gives registration priority to students from low-performing schools and rural schools which do not have courses such as honors and AP. FLVS also allows students from out of state to take its courses, charging $500 per course per semester, and also licenses courses to other online programs. FLVS has a small administrative staff based in Orlando, and employs full-time teachers to teach the courses. By fall 2003 FLVS hopes to add middle school and adult education courses. FLVS uses the Jones E-education course management system, and has developed its own courses.
- **Kentucky Virtual High School** (KVHS), which has approximately 40 courses and 750 students annually, was developed in 1999 as a program within the state's Department of Education. Like FLVS, KVHS is funded by state appropriations, currently at a level of $750,000 per year. KVHS works closely with Kentucky's Commonwealth Virtual University, sharing some services in order to keep costs down. KVHS uses the eCollege platform, and originally used some courses developed by Class.com, although it now develops most of its own courses.
- **Michigan Virtual High School** (MVHS) is another example of a state-funded statewide online program. MVHS was funded at $15 million for start-up in FY 2001 and $1.5 million ongoing in FY 2002-03, and has a current annual course enrollment of approximately 1,000. Michigan charges students $335 per course per semester, and also

has a district membership option, in which districts purchase 60 seats in any class at a group rate based on the size of the district. Similar to Kentucky, MVHS is closely tied to a virtual postsecondary institution, in this case the Michigan Virtual University. Unlike the Florida and Kentucky programs, MVHS does not present itself as a cyberschool. It does not grant diplomas, nor prescribe a diploma-earning curriculum.

Although not a statewide program, the **Virtual High School** (VHS) consortium, formerly the Concord Consortium and now VHS, Inc., is nationally the most prominent online program that uses a consortium model. In spring 2002 VHS offered 132 courses to 2,000 students. The program, which was created by the Hudson (MA) Public Schools, received start-up funding in the form of a 5-year, $7.5-million federal Technology Innovation Challenge grant. VHS uses a quasi-barter system in which each member school pays an annual membership fee of $6000 and provides a course that any VHS member's students may take; in return each school receives up to 40 course seats, 20 in each semester. Additional course enrollments cost the participant school $4000. Schools also pay a $5000 set-up fee, which includes a 26-week online course for a teacher and training for a site coordinator ($3500 for the teacher and $1500 for the site coordinator). See Appendix G for more information on the Virtual High School.

3.3. K-12 programs in Colorado

Colorado, like other states, has experienced explosive growth in the number of schools and districts that offer online courses. A partial list of these programs is provided in Appendix E and posted at http://www.cde.state.co.us/cdetech/et_distance-colorado.htm. This section provides an overview of these online programs..

The Colorado Online School Consortium (*COSC*) is the only consortium-based online learning program in the state. *COSC* serves students who need one or a small number of courses, such as students seeking a course not offered at their physical school, students who need to re-take a course for graduation credit, homebound or home-schooled students, and others who need to supplement the learning available at their home physical schools or cyberschools. *COSC* has two core principles: (1) to supplement existing Colorado school programs, not compete with them, and (2) to be responsive to and representative of its constituencies throughout the state. *COSC* was created in October 1998 with a membership of fourteen school districts and has since grown to a membership of more than 70 districts. *COSC* began offering courses in 1999-2000; that year it had fewer than 100 enrollments in its eighteen courses. In 2001-02 *COSC* offered twenty courses, with a total of 320 enrollments in spring 2002; and the program plans to offer 30 courses in school year 2002-03.

COSC courses were developed through a $330,000 grant from the Colorado Department of Education. *COSC* obtained an additional $724,000 from CDE through the federal Technology Literacy Challenge Fund (TLCF) in June of 2001. *COSC* currently charges fees to member districts of either $200 for three semester seats or $500 for six semester seats, based on the size of the member district. Additional semester seats cost $100. Originally *COSC* envisioned using a barter model similar to that used by the Virtual High School, Inc., in Massachusetts. But with the receipt of the TLCF grant, *COSC* decided that a lower and more direct fee structure would be more appropriate.

Most of the other online programs in Colorado differ from *COSC* in that they provide a curriculum of core courses sufficient for students to acquire graduation or advancement credit. In doing so, these programs position themselves as alternatives to physical schooling.

JeffcoNet, for example, has been developed by Jefferson County School District to meet the needs of students who want "credit recovery" (making up credits for courses previously failed), "schedule completion" (taking courses not available in the students' physical schools), and educational opportunity (for expelled students). *Jeffco*Net primarily serves students who need a supplementary curriculum for a limited time. The students may enroll full-time or part-time, or enroll at a physical school and take a course through the online program.

Monte Vista, Vilas, and Branson school districts operate diploma-granting programs that can fully replace physical schooling but also provide supplementary courses to students otherwise enrolled in a physical school. Monte Vista, which completed its eighth year in 2001-02, has approximately 150 students in grades 7 through 12, most of whom are funded through PPOR[8]. Vilas, which completed its second year in 2001-02, has approximately 85 students. Vilas is entirely funded through PPOR. It uses courses developed by Florida Virtual School, on the Jones Knowledge E-education platform. Branson, which claims to be the oldest online public school in Colorado, has just over 100 students in grades K through 12, all funded through PPOR. It uses NCS Learn for its K-8 curriculum and has considered the NovaNet courses for its high school curriculum.

Two online charter schools also exist. Lester B. Arnold Virtual High School, in the Adams 14 School District, enrolled 40 full-time students, and 28 part-time students (who take an online course while attending a physical school) in 2001-02. Half of these students come from within the district. The program is largely self-funded through PPOR, although some part-time students pay $295 per class. Lester B. Arnold uses courses developed by Class.com, which it offers on the Blackboard platform. The Colorado Virtual Academy, in Adams 12 school district, provides self-paced, home-based courses. Its enrollment in 2001-02 was approximately 350 students in kindergarten through second grade; the school plans to extend its program through the 12th grade. Its curriculum is entirely provided by K12.Com.

3.4. Commercial providers

Most K-12 online programs obtain their technology or course content from one or more commercial providers. There are three areas in which *COL* may choose to use commercial providers. These are:

- **Course management system (CMS):** the technology platform through which online courses are offered, which includes creation and editing of course content, communication tools, assessment tools, and other features;
- **"Portal" website:** the website surrounding the online courses, which serves as a brochure for the online program, provides course listings and/or schedules, and allows for registration and other student services;

[8] PPOR (Per-Pupil Operating Revenue) is allocated by the state government to each school in the state, based on the number of students enrolled in the school. The base PPOR amount is $5,434 per full-time student.

- **Course content:** the actual course material, which may be purchased from a commercial vendor, often because commercially-generated material can incorporate graphics, animations, audio/video, and other features that most teachers and district-based instructional designers are not able to easily create.

It is most likely that *COL* would use a commercial CMS, instead of absorbing the high cost of developing similar tools. In most cases, the CMS company would offer a portal website as well, although *COL* could build its own portal (or share a portal developed by another educational organization, e.g., Colorado Community College Online). It is even possible, though unlikely, that *COL* would use a CMS from one commercial vendor and a portal from a different company.

Course content purchases (actually licensing or leasing arrangements) are generally made separately from both the CMS and the portal, although sometimes the course content is offered in either a proprietary course management system or within a subset of the commercial provider's systems. Although online learning programs typically prefer to offer "home-grown" courses, leasing or licensing from commercial vendors enables an online program to cover a broad range of curricular offerings without having to create them all at one time. Usually the commercially developed courses can be adapted to state standards without substantial difficulty (similar to the adaptation of textbooks); and although the quality of commercially developed courses varies substantially, high-quality courses can almost always be obtained in core subjects. In their first years of operation, most online programs—including most statewide programs—purchase more courses than they create; as online programs mature, they create more of their own.

For more detail on commercial course management and content providers, see Appendix H.

4. Demand for Educational Services in Colorado

4.1. Unmet educational needs

Colorado educators are looking for cost-effective ways to meet the educational needs of students. Concerns include students in isolated districts or schools, or schools with limited teaching staffs, students whose schedules exclude them from important learning opportunities, alternative students, home-schooled students, and expelled students. The gaps between educational demand and available opportunities that online learning can address include:

- A rural or inner city school that cannot find a calculus teacher;
- Students in alternative learning environments who need adult basic skills or adult secondary learning;
- Students in a large school who cannot take AP Literature because it is offered at the same time as band or a course required for graduation;
- Students in small schools who want to take a similar course that their schools do not offer (e.g., economics, a second language, or computer-aided design);
- Students from isolated communities who fail college courses because they were not sufficiently challenged in high school.

4.2. Meeting unmet demand

A survey of high school principals commissioned by *COSC* (Taylor, 2002) indicated a substantial demand in Colorado for better access to online courses. The survey showed that 98% of students have "computer/online access," 33% of schools have students enrolled in an online course, and 81% of principals see "an expanded role in the future" for online courses. The leading reasons given by the survey respondents for wanting to offer online courses were expanding course offerings, addressing scheduling conflicts, and providing remedial courses. More than 75% of respondents also reported that they have an "interest in access to web-based professional development." The survey also identified respondents' concerns regarding online courses, including cost, alignment to standards, and technical support. A statewide online program would serve numerous types of learners who may not be fully served by physical schools, while also alleviating the concerns identified by Taylor. Course offerings could include:

- Core and remedial courses that complete scholastic requirements or basic educational needs but which students may not be able to obtain in their local schools;
- Advanced Placement (AP), honors, and other advanced academic courses for students attending schools that do not offer these courses or whose schedules prohibit the students from taking these courses;
- General high school curricula for learners who otherwise would not be able to obtain them, including (1) students who are homebound due to prolonged illness, disability, or other factors; (2) home-schooled students; and (3) adult adolescent learners[9] who are acquiring basic skills or working towards a high school degree.

In addition, the organization could offer professional development courses for teachers, and over time could extend offerings to middle schools, adult learners, and other populations.

5. *Colorado Online Learning*—A Statewide Online Learning Organization

In order to achieve the potential of online education, while minimizing risk, the E-Learning Task Force (ELTF) has recommended that a statewide organization, *Colorado Online Learning*, be formed to sponsor online learning for K-12 students and educators. The task force members concluded that a statewide organization would be the best approach to maximizing the benefits of online education, while ensuring equity of opportunity and taking advantage of economies of scale in technology, content, and resources.

This section discusses the basic design of the statewide organization, such as its principles, goals, target audience, and collaborative approach. Section 6 outlines the benefits a statewide online learning organization could provide. Sections 7 through 10 present more specific organizational details, including governance, staffing, implementation, funding, and evaluation.

[9] "Adult adolescent learners" are people sixteen years of age or older who are not enrolled in school and seek educational services.

5.1. Organization design and principles

Four basic principles underlie the ELTF's recommendations regarding *Colorado Online Learning*:

1. The statewide online learning organization should support schools, not become a school.
2. The statewide organization should collaborate with other online learning programs.
3. The statewide organization should meet a broad range of educational needs.
4. The statewide organization should support a broad range of learners.

1. The statewide organization should support schools.

Colorado Online Learning would not be an autonomous school that replaces physical schools. It would extend the learning opportunities available to students and educators in those schools but keep the locus of learning in the building. Four components of *Colorado Online Learning* incorporate this intention:

- Students taking online courses through the statewide organization would obtain diplomas through local physical schools or cyberschools upon completion of those schools' graduation requirements.
- Revenue for the statewide online organization would come through state appropriations and course fees. The organization would not take per-pupil funding away from physical schools or cyberschools.
- Students would enroll in statewide online courses through local physical schools or cyberschools, obtaining registration and counseling support through those schools.
- While taking statewide online courses, students would get support—e.g., mentoring, tutoring, and access to computers and Internet connectivity—through local physical schools or cyberschools.

These components of the proposed statewide organization reflect the principle that online learning should complement, not compete with, physical schools. If successful, online learning will contribute enormously to changing the way education occurs in this country. But the statewide online learning organization should not be designed to take students out of school; instead, it should bring more learning to students in school.

2. The statewide organization should collaborate with other online learning programs.

Online programs in Colorado have developed in a piecemeal and often competitive fashion. If this trend continues, quantity and profit, rather than quality and service, may dominate the online learning "marketplace." Disparities in learners' financial resources and schools' technological capabilities will widen traditional gaps between the have's and have-not's. For a typical high school course, vendors charge from $300 to $795. If Colorado online programs continue to operate independently and somewhat competitively, they can only meet the needs of a limited number of students.

Colorado Online Learning would replace competitive anarchy with a cooperative network. The statewide organization would coordinate the efforts of the various online programs within the

state, offering courses developed by existing programs under a statewide umbrella. Through its "brokering" role, the statewide organization would ensure that courses meet high standards of quality. (For instance, all statewide courses would be based on the Colorado Model Content Standards, and their design would be reviewed by content and instructional experts.) The originating organizations may draw a proportion of the course fees and/or other revenue sources, or "trade" courses and other learning services with the statewide organization. Through this system the collaborating programs would provide many of the online courses, and the statewide organization would create or purchase/lease courses to fill needs not met through collaboration.

This approach achieves the advantages of an educational marketplace while avoiding its pitfalls. The continued existence of numerous online programs will encourage the enterprise of the various organizations. Statewide brokering would ensure quality, equity, and more efficient use of resources.

3. The statewide organization should meet a broad range of educational needs.
Online programs often focus on the core of the high school curriculum or on niche courses (e.g., AP) sought by the most ambitious students. Such courses are easier to fill and to teach, but online learning could serve a much more vital mission. Providing equity of educational opportunity doesn't just mean that a student in a mountain town can take the same Latin course that's available to the student in the suburbs. It means that all students should have access to the educational opportunities they need—whether Latin or English as a Second Language, AP Calculus or Consumer Math. *Colorado Online Learning* could provide not only core and advanced courses but also learning experiences that go beyond the mainstream of schooling, reaching students who are not generally well served by existing online programs and who may not be well served in local physical schools. Such courses could include remedial work in core subjects or skills, test preparation (including GED), applied technology, career exploration, and life skills development.

As this list implies, educational experiences needn't be confined to one-semester courses. An online program can offer a variety of learning modules—perhaps a unit or a single lesson, a guided tour, an online tutor, or a job aid. Students could collaborate online, perhaps on a habitat observation project or the school newspaper. Teachers could meet online to write curricula. In both cases the virtual teams could get feedback from online coaches who work with several teams engaged in independent projects. Such just-in-time, on-demand learning can provide all learners with the information and skills they need when they need them. Making such "coursework" available is one of the ways in which online learning can transform schooling.

4. The statewide organization should support a broad range of learners.
Online programs often target students who are self-motivated, self-disciplined, and college-bound. These "high-end" students are more likely to seize the online opportunities and more likely to complete the courses. Given the low completion rate that prevails in online learning (a national average generally reported to be around 50 percent), targeting "successful" students seems sensible.

If, however, online learning is going to provide a meaningful extension of educational experience, it must serve a broad student population—"average" students, or those who have limited English proficiency or physical or emotional disabilities, who are on alternative learning

paths or have left school altogether. Otherwise, online learning is just another Gifted and Talented add-on, not a strategy for providing a meaningful extension of educational experience.

5.2. Organization goals

A statewide organization would help to provide access to educational resources and meet the needs of all learners in Colorado while ensuring high standards of quality, reducing costs, and conserving resources. The following goals are essential to establishing *Colorado Online Learning*:

- Provide equity of access and opportunity for all Colorado learners and teachers;
- Serve specific needs identified by Colorado educators, learners, and members of the larger community;
- Maximize the effective use of valuable educational resources, reducing duplicative and conflicting deployment of the teachers and technology required for online learning, and reducing costs through aggregated purchasing power;
- Assure high-quality learning experiences for all learners, by setting standards for instructional design, course delivery, and student services;
- Establish governance that reflects numerous, diverse constituencies;
- Achieve collaboration among all parties involved in online learning by providing a common organization in which all parties can flourish.

C*olorado Online Learning* could provide learners throughout Colorado with the opportunity to participate in excellent, interactive, standards-based courses. Teachers could participate in high-quality professional development programs at a distance. Through well-conceived curriculum, learner support, and instructional design, the statewide organization would serve all learners, whether they attend physical schools or cyberschools, or are home-schooled, whether they take one course or all of their courses online, whether they are technophiles and independent learners or computer-phobic and need clear external structure.

5.3. Target audience

The ELTF has identified three groups of learners as the primary focus for *COL*:

1. Students who need/desire one or a small number of courses, with the curriculum to include core, remedial, and specialized courses;
2. Educators who need/desire professional development courses;
3. Students who need alternative education (e.g., at-risk students or adult adolescent learners).

The descending order of the list above reflects prioritization of learning services to be offered by *COL*, given limitations on available resources. The ELTF recognizes that *COL* should do fewer things well rather than many things poorly. The priority list reflects a compromise between the ELTF's interest in assuring equity of learning opportunity and, given resource scarcity, needing to start with audiences that can be served with fewer resources and a higher probability of

academic success. Several factors make the learning needs of alternative students more difficult to serve. These factors include:

- Absence of a physical school as a "home base" for enrollment, advising, and mentoring;
- Lack of a predictable pattern of timing for course entry;
- Need for "courses" (such as remedial work, applied tech, and vocational support) different from those typically available through online providers;
- Need for more individualized, face-to-face support than is typically required for conventional students.

Meeting the needs of alternative students, however, would not only underscore the broad learning value of a statewide online organization, it would represent a substantial step toward expanding the online organization's role beyond conventional schooling. For example, the Center for At-Risk Education (CARE) in the Colorado Department of Education, has determined that there are up to 10,000 adult adolescent learners in Colorado seeking access to courses that are unavailable because the Adult Education Centers that are supposed to provide them lack the necessary physical resources. CARE believes that online courses would be a viable strategy for responding to this unmet demand. Such courses would include:

- English as a Second Language;
- Adult Basic Education (e.g., reading, writing, math—up to 9th grade levels);
- Adult Secondary Learning (including both GED preparation and courses leading to a high school equivalency diploma);
- Family-based learning/Family Literacy (including academic classes for both adults and children, parenting classes, and literacy classes shared by parents and children).

5.4. Collaboration among in-state online programs

At least 20 online programs already exist in Colorado. There are several ways that *Colorado Online Learning* should work with these programs, as well as others that are created in the future. These collaborative mechanisms include:

- Supplement the curricular offerings of other online programs. In this case students in those online programs would be treated the same as students coming from physical schools, and the same enrollment fees would apply.
- Coordinate the implementation of quality assurance standards. (For more detail on this point, see Section 8.4.)
- Provide a clearinghouse of information on, and links to, other programs. *COL* might, for example, maintain a searchable database of all courses offered by other programs.
- Contract with existing programs for statewide purchase or licensure of their courses, as well as new course development. As *COL* adds courses, it would look first to other online programs in Colorado to provide these courses, especially when these programs have already developed the courses.

- Become the lead agent in negotiating "state buy" agreements in which other in-state online programs would participate. *COL* could thereby secure volume discounts and reduce paperwork for smaller online programs that might be disadvantaged in dealing with vendors.
- Work with both online programs and physical schools to strengthen the support mechanisms that help learners succeed in online education.

Colorado Online Learning would provide a valuable service to all districts in the state. Districts that prefer to build their own online programs would be free to do so and would not be required to send online students to *COL*. Because online learning is evolving so quickly, it is likely that additional local and regional online programs will be created and developed in the coming years. While it is not possible to predict all the possible areas of interaction that may develop between *COL* and other online programs in Colorado, *COL* would be open about its future plans for development, including plans for new courses and new target audiences. This openness would encourage other online programs to fill gaps and to collaborate both with *COL* and each other.

6. Stakeholder Benefits

Because of its focus on equity and high-quality education, *Colorado Online Learning* would provide benefits to numerous stakeholders within the state. These benefits fall into two categories: (1) general benefits of online learning that would now be available to more students, schools, and districts because of the added capacity of a statewide organization, and (2) specific benefits of a statewide organization, such as lower cost, consistency of the learning environment, and equity of educational opportunity.

6.1. Learners

Learners would be the primary beneficiaries of *COL*. Their benefits would include:

- Access to courses previously unavailable to students in small rural or urban schools that do not offer the same breadth and depth of courses as larger, wealthier schools and districts, including vocational, second language, elective, remedial, and Advanced Placement courses;
- Greater flexibility in scheduling required courses, because of the ability to take a course online if the same course offered within the student's home school conflicts with another desired course or educational activity;
- A greater number and variety of learning opportunities for students who are homebound due to disability, illness, or other reasons;
- A source of curricula for home-schooled students and parents, particularly for courses such as advanced science courses which require specialized knowledge;
- Increased access to high-quality electronic databases and research tools;
- Consistent quality and expectations within the online course environment;
- Assurance of high-quality learning experiences.

6.2. Teachers

Benefits to teachers from *Colorado Online Learning* would include:

- Access to more professional development opportunities (not just for teachers conducting online courses);
- Dissemination of models of excellent standards-based curricula and teaching strategies;
- Options that improve teachers' ability to individualize learning opportunities for their students.

6.3. Schools and districts

Schools and districts would reap the benefits of an online program without incurring the high costs of creating one on their own. Because *COL* would work collaboratively with in-state education groups, *COL* would help schools and districts serve their students with a larger variety of courses that respond to a broader range of educational needs. Schools and districts would also be able to use online courses to meet the needs of students who may simply feel better equipped to learn certain subjects in an online environment instead of in a classroom.

Small schools and districts, as well as those in rural areas, would especially benefit from *COL* because they are less likely than larger and/or more urban schools to be able to offer a broader range of classes. A school in a large metropolitan school district, for example, might simply add an advanced economics course if it finds demand for that course, because it has enough students to fill the course and enough resources to add a teacher. The same option may not be available to a school in a small district on the Western Slope, either because of lack of resources or demand. (If there were only three students in the school who would take the course, offering it would be uneconomical.) A *COL* course would fill this gap for the Western Slope school.

Schools and districts would also find it easier to make plans and manage budgets. The availability of a large menu of online courses would enable schools and districts to predict staffing and curricular needs more reliably, yet still adapt to individual students' learning needs as they arise. This is especially important because staffing is generally determined in April or May of each school year, several months before particular student needs may be known.

6.4. State

The state of Colorado would benefit because *Colorado Online Learning* would increase equity of educational opportunity throughout the state. Specific benefits would include:

- Increasing educational attainment (i.e., more learners would go further in school);
- Increasing the quality of the state's workforce (especially to the extent that *COL* reaches learners who might otherwise leave school);
- Closing the learning gap between the most and least successful students.

7. Leadership, Governance, and Staffing

The statewide organization proposed by the ELTF will serve two quite different and uniquely important priorities: Not only will it provide Colorado physical schools and cyberschools with a large variety of high-quality standards-based courses designed to meet student and teacher needs, but it will also coordinate the collaborative efforts of the state's various online learning programs. This dual responsibility, combined with the desirability of establishing a relatively autonomous entity that does not carry state-level jurisdiction, means that the structural components of the organization need particular attention. These components must balance flexibility with stability, collaborative values with efficiency and centralized vision. The recommendations discussed in this section address these structural issues.

A Board of Directors would provide broad governance and oversight for the statewide organization. A small core staff, led by an Executive Director, would carry out the primary administrative and educational development work of the organization, guiding and supervising a larger part-time or contracted staff—including teachers who would deliver the online courses, teams of course developers who would create and revise course content, technical and information support staff, online learning coordinators and mentors at physical schools, and vendors providing technology, technical support, or course content. A school district or board of cooperative educational services (BOCES) would serve as the organization's fiscal agent. An organizational chart is shown on the next page.

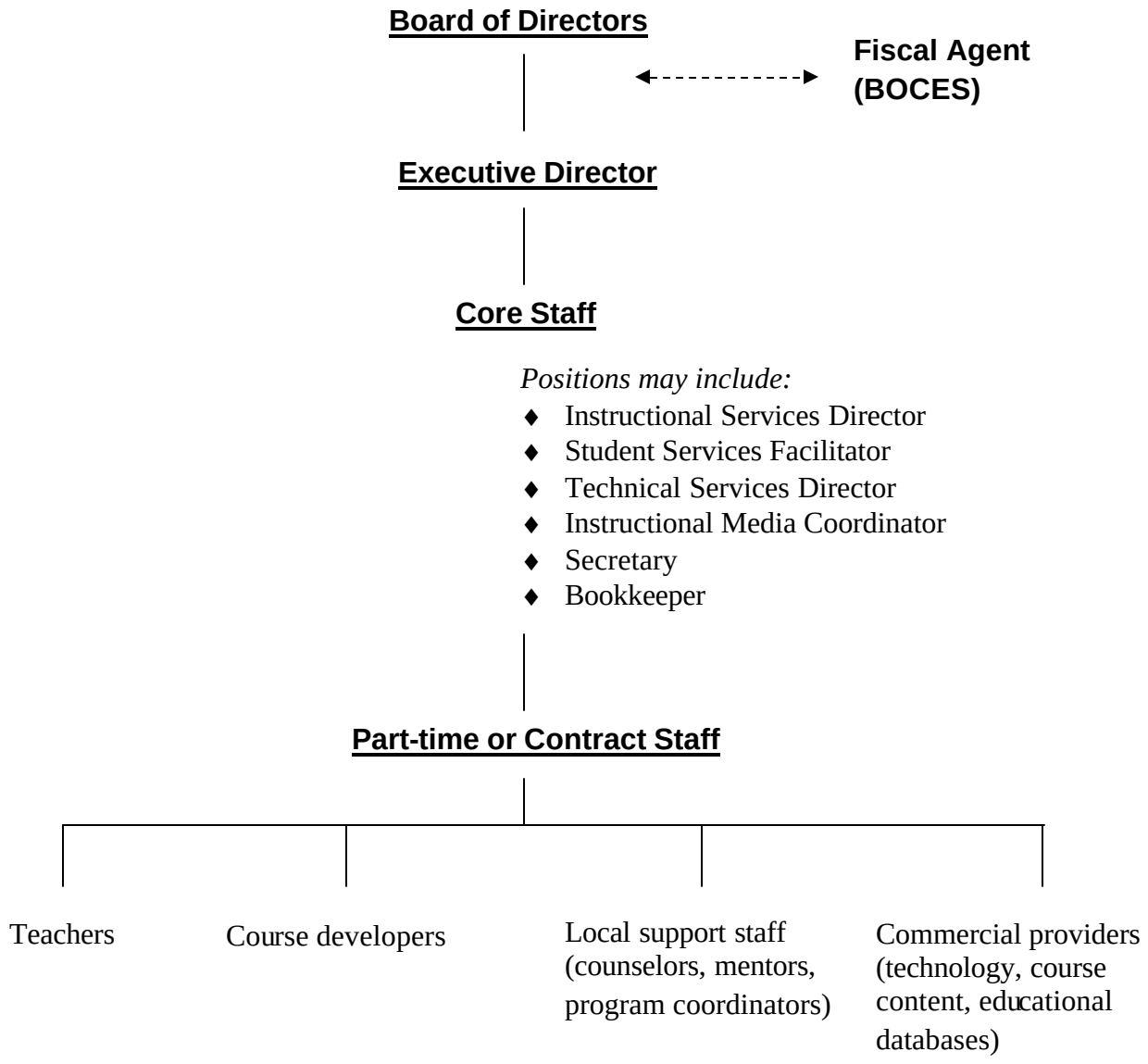
7.1. Governing board and bylaws

The Board of Directors would include representatives from school districts, other online programs, and postsecondary education institutions. Board duties would include:

- Hire and provide oversight to the Executive Director;
- Approve personnel policies and decisions of the Executive Director;
- Approve policies and procedures for the operation of *Colorado Online Learning*;
- Approve the operational budget and expenditures;
- Approve and provide oversight to the organization's fiscal agent;
- Approve the process through which the statewide organization determines which courses to license and which courses to purchase or develop;
- Monitor and promote the collaborative activities of Colorado's online learning programs;
- Promote a vision of online learning opportunities.

A set of bylaws would provide high-level operational guidance for the Board of Directors.

Organizational Chart for *Colorado Online Learning*



7.2. Staffing

COL services would be provided by a combination of core, probably full-time, staff and part-time or contracted staff (including vendors). Core staff could be co-located in a single office or distributed across the state and connected electronically. Some staff could continue to teach in their "home" schools part-time to meet local needs and to retain daily contact with local students.

7.2.1. Core staff

Primary activities of the *COL* core staff would be to:

- Manage and/or conduct curriculum development;
- Supervise teaching staff;
- Coordinate professional development for teaching staff;
- Provide assistance to schools and districts in carrying out their activities;
- Coordinate student services;
- Manage and/or provide academic support services (e.g., online student records and online library and research databases for use by teachers and students);
- Manage and/or conduct research and evaluation related to courses and teachers;
- Coordinate statewide marketing and public information.

The number and nature of core staff jobs would depend on the size of the organization, its budgetary constraints, and planning/policy decisions. Potential staff positions (and hypothetical responsibilities) include the following:

- **Executive Director:** Responsible for marketing, outreach, overall management and operation of the organization. Work with Board of Directors; provide liaison with Colorado Department of Education and other government organizations; develop and maintain partnerships with other educational organizations; supervise all personnel.
- **Instructional Services Director:** Responsible for curriculum development. Broker agreements with existing programs or vendors regarding course licensing and quality standards; conduct course and program evaluation; maintain quality assurance standards; supervise instructional staff; coordinate staff professional development.
- **Instructional Media Coordinator:** Responsible for information and media support for instructors, students, administrators, and collaborative partners. Develop online resources (e.g., research and information databases) that support courses and student work; support course developers in obtaining and using resources to support instructional content; help instructors obtain and use resources to augment developed or brokered courses; assist instructors, mentors, and students to obtain and use appropriate materials to support student work; teach information literacy skills; support integration of information literacy skills into all online curricula.
- **Student Services Facilitator:** Responsible for all direct and online student services. Manage registration; provide information about the program and curricula; coordinate site personnel (e.g., online coordinators, counselors and mentors); oversee development and implementation of student support systems (e.g., orientation and mentoring).
- **Technical Services Director:** Responsible for management of communication and courseware systems (including online communications, educational databases, digital records, and online information services for staff). Establish and maintain the online learning delivery platform (or coordinate platform services with CMS vendor); provide technical support for users of all systems; maintain the organizational website.

- **Bookkeeper (part-time):** Responsible for handling finances. Make financial arrangements with vendors and brokering organizations; pay bills; supervise expenses; maintain financial records. May be employed by fiscal agent.
- **Secretary (part-time):** Responsible for office management and administration.

7.2.2. Contract purchased services

In addition to the core staff, *COL* would contract with educators for the following services:

- Teaching courses;
- Course content development;
- Course evaluations;
- Revision of courses as necessary;
- Program evaluation (to be conducted by an evaluator from outside of *COL*).

7.2.3. Local school staffing

Local physical schools or cyberschools using *COL* courses would need to provide services that support online learners. These services would be "contractual" in the sense that the physical schools or cyberschools would be obliged to provide these services in exchange for access to the online courses. The primary activities of the local school staff would be:

- Provide and supervise on-site mentors for students;
- Provide and supervise counseling support for students;
- Register and place students enrolling in online courses;
- Maintain records of students enrolled through the local school;
- Provide face-to-face student orientation for online learning;
- Grant credit to students for successful completion of coursework;
- Provide feedback to *COL* on effectiveness of courses and program.

7.3. Fiscal agent

Because *Colorado Online Learning* would not be constituted as either a local education agency (LEA—a school district or BOCES) or a state education agency, the organization would not have legal authority. In order to receive grant funds and enter into enforceable contracts, therefore, *COL* would need a fiscal agency agreement with an LEA. The fiscal agent would receive and distribute funds, maintain the organization's books, be the official signatory for employment and other contracts, and file accounting reports with government agencies and grant providers.

8. Implementation and Operation

The implementation and operation of *Colorado Online Learning* would involve numerous complex issues such as content development, choice of course delivery technology, teacher recruitment and preparation, and quality assurance. While decisions on these issues would be

made by *COL* staff, in conjunction with the governing board, these sections provide background and suggestions, including specific recommendations of the ELTF.

8.1. Recommendations for start-up

ELTF members have concluded that it is essential to make *COL* operational by fall 2002—partly to preserve and build on the momentum established through the seven-month task force process and partly to preclude a proliferation of independent in-state online programs that may harm the evolution of online learning in Colorado. Creating the *COL* organization on such a short timeline necessitates an efficient transition requiring statewide collaboration on the development of a successful proposal for using federal grant money available through CDE. That transition will be guided through an online learning grant Request for Proposal (RFP) published by the Educational Telecommunications Unit of CDE (for grant funds available through Title II, Part D, of the Elementary and Secondary Education Act [ESEA] of 2001). The RFP will specify conditions that applicants must fulfill in order to support the creation of *COL* while affording applicants flexibility in how to shape various components of the statewide online organization. The specified conditions are described in the sub-sections that follow.

8.1.1. Identity

1. *COL* will be officially constituted by October 2002.
2. The organization that receives the online learning grant available from CDE through ESEA funds will be identified as *COL*.
3. A publicity campaign will be conducted by CDE and the online learning grant recipient to inform educators, parents, students, and other Colorado residents of the plans for creating *COL*. Information distribution will include presentations at conferences and meetings, publicity in various media, course catalogs, and website postings.

8.1.2. Preparation

1. All applicants for the online learning grant program will recruit broadly in an effort to obtain a statewide coalition that collaborates in the preparation of the grant proposal and the creation of *COL*.
2. The grant proposal will reflect as much as possible the transitional intentions and decisions outlined in the Findings and Recommendations of the E-Learning Task Force.
3. Institutional memory residing within existing online organizations will be preserved—through archives, input to the E-Learning Task Force, recommendations to CDE in the formulation of the online learning grant RFP, joint meetings between the outgoing board of the Colorado Online School Consortium and the incoming *COL* board, and other viable mechanisms.

8.1.3. Governance and staffing

1. A *COL* governing board will be officially constituted in October 2002. Specific provisions relating to composition and operation of the governing board will be determined through the online learning grant application process and subsequent negotiations between CDE and the program that receives online learning grant funds. General principles for guiding these provisions are:

a. Board members will be elected in a staggered rotation of terms.
b. Input into the governing process of *COL* will be diverse. This may be accomplished through representation on the governing board, advisory committees, and/or other input mechanisms.
c. The governing board will include representation from the group that writes the e-learning grant proposal.
d. The governing board will include representation from in-state online programs.
e. Input from postsecondary education and CDE will be explicitly provided for in some manner.

2. A chief executive officer will be appointed by the governing board. Employment of other staff will be determined by the chief executive officer working with the governing board.

8.1.4. Curriculum and support services

1. In October 2002 *COL* will take over operation of the online learning services provided by *COSC* (*The Colorado Online School Consortium*).[10]
2. For the 2002-03 school year *COL* will fulfill all appropriate and reasonable commitments made by *COSC* related to online learning services.
3. *COSC* courses will be offered by *COL* through the end of the 2002-03 school year. While *COSC* courses will form the core of *COL* offerings during that time, *COL* course offerings may also include courses selected from other online organizations and educational providers through agreements with those entities as well as courses developed by *COL* staff or subcontractors.
4. *COL* fees for the 2002-03 school year for courses previously offered by *COSC* will preserve commitments made by *COSC*.
5. *COL* will conduct a statewide survey to determine learning needs. Using the findings from the statewide survey, *COL* will collaborate with other online organizations in the state to determine course offerings for spring and fall 2003.
6. *COL* will develop and implement a process for selection of courses and assuring the quality of its offerings.
7. *COL* will establish and maintain contact with online education organizations both within and outside of Colorado for the purpose of continually improving online education.

[10] The rationale for building the *COL* organization on the foundation of *COSC* is important. Initiated in 1998 through a grant administered by CDE, *COSC* has many similarities to *COL*, including a collaborative structure, the mission of providing online courses that supplement physical schools and other in-state online programs, and a target audience of students who need/desire one or a small number of courses in a curriculum that includes core, remedial, alternative, and specialized courses. (For more information on *COSC*, see Section 3.3.) *COSC* has also developed extensive quality assurance procedures and instruments, along with an effective course development process, that can inform *COL* efforts in those areas. Building on *COSC* would assure continuation of the educational services provided by that program, greatly reduce the amount of time and funding necessary to put a statewide online organization in place, and infuse the new statewide organization with valuable knowledge obtained through *COSC*'s four-year developmental experience.

8.2. Determining course offerings

There are a variety of options for determining educational demand for courses:

- Core staff of the statewide organization conducts a survey of various constituencies (e.g., principals, teachers, students, parents, guidance counselors, school board members, superintendents) to identify needs and interests in a range of secondary education options (e.g., core courses, vocational education, adult adolescent education, elective/special education courses, AP courses, and remedial courses). Based on survey results, develop curricular offerings, then field test these offerings to determine actual demand.
- Core staff of the statewide organization, working with collaborative partners (other Colorado online organizations) determines courses to be offered.
- Core staff of the statewide organization, using canvass of representative educational groups and working with collaborative partners, determines courses to be offered.

Course offerings will likely be determined by a process that includes a survey and also builds on the experience and knowledge of the ELTF and *COL* staff.

8.3. Course development and delivery

Colorado Online Learning would have three basic methods for acquiring courses: (1) brokering courses created by other in-state online programs, (2) purchasing courses from commercial providers, and (3) developing its own. Since *COSC* courses would form the core of *COL* offerings in at least the initial year of the statewide organization's existence (see Section 8.1.4), *COL* will begin with a set of courses that are almost entirely developed in-house. In the main, however, *COL* would probably "outsource" most of its course creation in the early years of operation. Brokering—selecting courses from in-state online programs for purchase or license by *COL*—would be the preferred mechanism because it would encourage collaboration, efficient use of resources, and quality assurance among all in-state online programs. Courses that are brokered or licensed from other companies or organizations could be customized by *Colorado Online Learning* teachers or instructional designers to meet state standards and/or specific learner needs. Courses that are developed by *COL* would either be created by in-house design and development teams in conjunction with Colorado teachers, or contracted through teachers, postsecondary instructional design departments, or other sources.

8.4. Quality assurance standards and procedures

COL would implement a rigorous process that assures that the learning experiences offered through the statewide organization meet high standards of quality. The purposes of a quality assurance program are both to determine that the courses provided through the statewide organization are excellent and to make that fact clear to any thoughtful reviewer. All courses available through the statewide organization—whether developed by *COL* staff, brokered through other online programs, or acquired from commercial vendors—must align to state content standards (including reasonable expectations regarding the breadth and depth of content), meet the quality assurance criteria established by *COL*, and comply with the Americans with Disabilities Act.

Essential components of quality include:

- Excellent instructional design of courses that meet or exceed Colorado content standards and utilize the best online teaching practices (e.g., community-building components, interactivity among students and instructors, and active learning experiences);
- Incorporation of information literacy skills and habits into the curriculum;
- Continuous improvement of courses based on external review as well as student and teacher reflection;
- Extensive use of digital resources (e.g., online research databases) to support and extend student learning and teacher preparation;
- An effective structure and process for enhancing student learning in the online environment and maximizing opportunities for students to succeed;
- Strategic professional development for online teachers and student support personnel;
- Meaningful data available to teachers concerning course quality and student learning.

Quality assurance is a continuous process. Courses would be evaluated prior to their use by *COL*, and approved or upgraded based on that review. Courses would also be evaluated and improved during and after use by students, based on the experiential information provided by conducting each course. *COL* could use Quality Assurance Teams, consisting of the online teacher, a content specialist, and a specialist in online pedagogy, to achieve and maintain excellence. The teams would identify strengths in course content or delivery as well as elements that need improvement, then work on enhancing the strengths and implementing the improvements. The evaluations and modifications would draw on multiple sets of data, including team members' observations, formal and informal student reviews, student work portfolios, and student performance on standards-based exams.

The COL *quality assurance process would apply only to courses that are prepared or recommended for inclusion in the statewide organization's curricular offerings.* COL *would not become a regulatory agency, supervising the curriculum and operation of other online programs.* It is anticipated, however, that the quality standards set by *COL*, as well as its review process, would contribute to improving the quality of all online offerings in the state.

8.5. Ongoing support for learning

People who are unfamiliar with online learning tend to think of it as textbooks or correspondence courses on the Web. The material is available for the self-motivated learner to come and get it. Experienced practitioners, however, know that successful online learning requires substantial individualized support—for both the teacher and the learner. Support needs range from counseling in enrollment and the selection of courses to technical assistance for students and educators in navigating the online environment to mechanisms and processes that enhance the learning and teaching environment. Such support must occur face-to-face as well as online, through both the local school and the online learning organization.

8.5.1. Learner support

Students need help in building the new habits that are essential for success in online learning—especially if the student population is diverse and the program takes seriously a commitment to equity. Student support is also a central ingredient to quality assurance.

Types of support:

- Orientation of students through an online tutorial and/or a face-to-face meeting with instructors or local mentors;
- Social connection within the online learning process, through, for instance, online discussions, study groups, online mentors, tutoring, project groups, competitions, and exchanges with distant classes, experts, or researchers;
- Technical support for students and teachers, available 24x7 so that students and teachers may work at any time.

The best support is usually local—another reason to enroll students in online learning through physical schools and an increasingly common requirement in statewide online learning programs. But who is responsible for the local support—the local physical school or the statewide online learning organization? And what are the standards for support? The more rigorous the support practice, the more likely the support will make a difference. Programs need to take a close look at pre-course counseling and orientation, timing and nature of check-ins, ease of access to local support, and using a variety of support strategies and communication media. As a minimum, the ELTF recommends that each local school must provide an online learning coordinator to manage counseling, enrollment, pre-course assessments, placement, and credit reporting, plus the individualized network that supports each student's success. The coordinator should work with local school staff and students to create the success networks, through mentorships, tutoring, structured study time, group support, and other mechanisms that make the online experience more accessible to more diverse learners.

8.5.2. Pace of learning and course completion

The opportunity to set one's own pace for learning is one of the most appealing features of online learning. But encouraging student success requires a balance between the desire to maximize individual choice with the need for boundaries, and an online program must also consider the manageability of its course structure. Potential pacing options include:

- One timetable, with a set beginning and end date;
- Completely self-paced;
- Instructor makes a recommendation after a specified trial period and invites/assigns students to join the appropriate timetable for completing coursework;
- Student picks a timetable after a specified trial period, with perhaps one switch within a prescribed time period.

The experience of existing online programs indicates that the self-paced option should be used only in very rare cases, if at all. For example, after experimenting with the completely self-paced option, Florida VHS has moved to offering three timetables for students to follow (accelerated, standard, and extended). Both instructional planning and student support become more difficult

if courses are self-paced, because students are at different points in the course, and have different levels of comfort with both the content and technology. Pacing also influences a teacher's capacity to facilitate interaction among the students. Not surprisingly, online learning programs report higher rates of failure or non-completions in completely self-paced settings.

8.5.3. Instructional design and teacher-student interaction

Instructional design oriented to the specific needs and opportunities of online learning plays a key role in the development of courses. Online learning provides opportunities to reach students with different learning styles, in some cases more efficiently than classroom teaching. Online teaching, however, often requires skills that differ from those which work best in the classroom. Well-written online courses incorporate effective teaching strategies—developing the content through sequencing, guided interactions with course materials, exercises and review, the nature and timing of assessments, along with other instructional strategies. Effective content development mixes not only learning experiences but also media (including text, animations, interactive applications, and physical resources [e.g., lab kits, math manipulatives, and books]).

Content development, however, is like writing a textbook; no matter how well crafted, at best it merely sets a foundation on which the skilled teacher builds. The teacher-student process—including, for example, feedback on assignments, discussions, and various kinds of individualized student support—ultimately matters more to whether students master the content. One *COSC* teacher has commented that teaching a course online is like preparing twenty individualized lesson plans. Teachers guide students through leadership in discussions, responses to individual questions, comments on assignments, and assessments throughout the course, using these strategies to focus and motivate the students. Internet-based tools (e.g., e-mail, chatrooms, white boards, and message boards) allow extensive synchronous and asynchronous communication between teachers and students, as well as among the students. Despite the Internet-based tools, the telephone may serve as the primary mode of contact. (*COSC* teachers all have phone cards to make such contact easier.) Whatever the medium, the online program should require that teachers respond to students' notes or work promptly (at least within 24 hours). The program may also require the students to contact their teachers frequently (at least three times a week), by either e-mail or telephone. An extensive quality assurance program (see section 8.4) should incorporate guidelines for these teacher-student interaction practices as well as for instructional design.

8.5.4. Teaching and learning communities

Online technology enables the development of teaching and learning communities that can be used by both teachers and students to enhance their educational experience. Shared resources, including online library and research databases, listservs, discussion boards, and synchronous communication tools, help teachers who are geographically dispersed to strengthen their curricula and teaching practices—in professional collaborations to develop and review courses as well as in the process of guiding students through the courses themselves. Students can use the online resources to build their own learning communities with mentors or other students. Although enthusiastically supported in theory by online educators, however, such communities are rarely extended in practice beyond the threaded discussions embedded in many courses. Their potential warrants further exploration.

8.5.5. Technical support

The goal of technical support should be more than just solving immediate problems; it should ensure that both students and teachers are well prepared for navigating and participating in the courses before they begin, and are able to obtain help promptly if they have problems. Support can be provided through initial orientation tutorials, e-mail and telephone consultations, and context-sensitive automated Web assistance within a course management system. The exact nature of technical support depends in part on the CMS provider, because companies offer technical support at differing levels (phone or e-mail, phone available during business hours only or 24x7, or other combinations). The technology should augment the learning experience, not detract from it. Technical support requirements can be overwhelming for the staff of an online learning program; consequently, tech support is one of the primary reasons that most online programs use commercially provided platforms.

8.6. Teacher recruitment, preparation, and support

According to Clark (2001), most online teachers come from three groups: K-12 teachers working in physical schools who teach online courses as part of or in addition to their assigned workloads; content-area specialists (often retired teachers) who contract for part-time teaching; or the full-time staff of an online learning program.

COL would seek teachers who are qualified in their content areas as well as enthusiastic and knowledgeable about teaching in the online environment. The particular demands of online instruction suggest a need to emphasize qualifications that are oriented to this type of education—i.e., teachers who are skilled in online pedagogical theory and application.

Regardless of prior experience and licensure, all online instructors would obtain professional instruction in the design and delivery of effective online learning, especially as these are practiced by *COL*. Professional development would be a prerequisite to teaching any course as well as a continuing requirement for online instructors. Portfolios and other exhibitions of mastery could substitute for required professional development.

8.7. Marketing

Colorado Online Learning would market to school administrators, teachers, counselors, parents, and students in order to increase awareness of the statewide organization and the opportunities presented by online learning. While the end goal is to attract students, most of them would learn about *COL* through their teachers, counselors, and schools. In order to reach students who are not currently part of the educational system, *COL* would also market to other support agencies. Marketing efforts would include: presentations at conferences and meetings; announcements on, and links from, other Colorado educational websites; flyers in schools and social services agencies; bulletins posted to listservs for educators; networking among educators and social services agents; and press releases and other news coverage.

The *Colorado Online Learning* website would be a marketing tool in addition to the organization's "campus". The website would include a description of the organization, course listings and descriptions, registration information, and an online "brochure" for the organization. (More details about the website and platform are provided in Section 8.8.)

8.8. Platform

Essential elements of an online learning platform include:

- A "portal" website that provides listings and descriptions of courses, supports registration and online student guidance, serves as a brochure site for the online learning program, and offers other similar marketing and logistical features;
- A single point of entry for all parts of the website, controlled by a user ID and password and differentiated levels of secured access;
- A course authoring and editing system;
- Support for posting, storing, and retrieving various types of digital files (e.g., text, audio, video, PowerPoint slides, and PDF documents);
- Support for both synchronous and asynchronous communication tools (e.g., chat, white boards, and threaded discussions);
- An online library and research databases to support and extend learning;
- Online assessment/exam tools, including digital portfolios;
- An online gradebook with controlled access and authorized reporting to students, counselors, or adult guardians of online students.

Colorado Online Learning would use a single platform for courses and student services, assuming that arrangement is feasible. While existing in-state online programs use a variety of commercial platforms, a statewide organization needs to use a single platform in order to simplify technical support and reduce the amount of learning required (for instructors, students, and local support staff) that is extraneous to the real learning task. Features of the delivery platform could be learned in orientation classes for online students, mentors, and teachers. *COL* staff would choose a course management system (CMS) provider based on comparisons of tools, features, cost, and other elements. A key question to be determined by *COL* staff would be whether to choose a "full solution" CMS, such as those offered by eCollege or Jones Knowledge, which would include course hosting, registration, website, and other services, or a stand-alone CMS, which would require *COL* staff to maintain a website, registration, and other student service elements. WebCT and Blackboard, for instance, provide a CMS that can be used on a server owned and operated by the client. (See section 3.4 for a more complete description of commercial technology providers.)

9. Financial Model

Clark (2000) identifies three types of funding mechanisms used by statewide online programs:

- Funding from state agencies or legislative appropriation;
- Per-student enrollment fees ("tuition");
- A barter system in which each participating school or district provides resources (e.g., a teacher) in exchange for course seats to be used by the participant's students.

Clark notes that "alternative funding sources are not readily apparent," and that sustainability is a key concern of many statewide programs. In a survey of all online programs (not just statewide programs), Clark reported that 73% of the programs charge student enrollment fees. The same study showed that online programs receive an average of roughly $1,000,000 in non-tuition funding (typically state or federal funds) per fiscal year.

Funding from state agencies allows online programs to charge lower (or no) enrollment fees, increasing equity of opportunity for poorer students or districts. Of course, greater reliance on state appropriations or grant funding creates political and financial uncertainties and makes the online program more susceptible to budgetary pressures. Setting fees at a level lower than the marginal cost of adding a student to the online program means that increased appropriations are necessary as the program grows. The barter system allows for schools and districts to supply teachers and other resources in place of higher fees, but such a system is logistically more difficult to administer and creates inequities based on schools' expertise or resources.

9.1. Funding of programs in other states

No statewide K-12 online programs have been developed without state or federal funding, and it is clear that *Colorado Online Learning* would require substantial start-up monies from state and/or federal sources. The budget that *Colorado Online Learning* uses in its first few years of operation would likely be driven by the availability of funding from government sources.

Of the funding mechanisms described by Clark, the combination of funding from state agencies together with enrollment fees is most common among statewide online programs similar to *Colorado Online Learning*. Illinois Virtual High School (IVHS), for example, was planned and created through a series of state and federal grants totaling roughly $800,000 between late 1999 and 2001. This sum does not include significant separate funding provided to Illinois colleges and universities that went, in part, to create courses for the online program. IVHS now typically charges $300 per student per course, and has formal agreements with member districts whose students take IVHS classes. IVHS leaders acknowledge that the $300 fee is higher than some districts can easily afford, and in some cases districts apply for grant money or other funds to pay IVHS student fees. But IVHS leaders argue that the best revenue model for ensuring sustainability is to charge a fee that covers operating costs (in this case, technology and support fees to a vendor as well as teacher pay).

Michigan Virtual High School has a similar financial model. Operating costs are covered by enrollment fees, which are paid by schools in one of two ways. Districts may pay a fee for a single course, which is $335 per student per course. Alternatively, they may become "members" by paying a fee that is determined by the size of the school, up to a maximum of $5,000 plus $.50 per student for the largest schools in the state, which entitles the member district to 60 course seats.

Florida Virtual School (FLVS) has taken a different approach to funding its virtual school, with the state providing all the money so that there are no enrollment charges. Total appropriations over the past five years have been approximately $23 million, with funding for the fiscal year 2001-02 at $5.7 million. Florida Virtual School is currently a line item in the state budget, operating on annual appropriations. Partially because of the free tuition, demand at *FLVS* far

exceeds the supply of course seats. In the 2001-02 school year Florida Virtual had 62 courses and 8,200 students, with additional demand of at least 1,000 students. (Florida Virtual maintained a waiting list but stopped adding names to it when the list reached 1,000 students.) Demand for FLVS' 2002-03 school year (including the 2002 summer school) has already reached 20,000 enrollments. To address equity issues while demand exceeds supply, FLVS gives registration priority to students from low-performing schools and rural schools without courses such as honors and AP.

9.2. Setting enrollment fees

In addition to state and federal funds, *Colorado Online Learning* would have to decide whether to charge enrollment fees, and if so, how much. Two options for fee levels bound the reasonable alternatives.

- Allow all students to take courses at no charge, ensuring access without regard to students' or districts' abilities to pay. This model assures equity and is more consistent with the philosophy of public K-12 schooling. Demand would be higher, and *Colorado Online Learning* would have to determine a mechanism for allocating courses among students when demand exceeds supply.
- Charge the full enrollment fee necessary to cover all costs of operating the online program, so that no state funds would be required. Demand would be lower, and participation would be limited to more affluent students, schools, or districts that could afford to pay high fees, or those that could secure additional funds to pay the fees.

Alternatives include:

- Charge a fee in the neighborhood of $330 per student per course—which Clark (2001) identified as the mean tuition charge for statewide programs—for all students, regardless of a student's home school and district.
- Charge a $330 enrollment fee but allow schools or districts in low-income areas to pay a lower fee. The fee structure would be determined through some sort of means testing, possibly based on the number of students receiving free or reduced lunch (to avoid the additional administrative costs of establishing a means testing procedure specific to *Colorado Online Learning*).
- Charge a lower fee, possibly $100, which would offset some operating costs but allow participation by almost all students, schools, and districts.
- Charge a district membership fee, which would essentially be a bulk purchase of seats in *COL*. This fee could be an either/or option for districts, which could choose the membership fee or pay for individual seats. In either case, member districts would have the ability to purchase additional seats above the number provided by the membership.

If *Colorado Online Learning* charges enrollment fees to schools or districts, the dollars would essentially come from PPOR-based funding. Because PPOR is paid on a zero-sum basis, this arrangement potentially presents the most direct and significant challenge to physical schools. If enrollment fees are kept low, however, the bulk of the PPOR would be retained by the local school, which would register the student and provide other support services.

The E-Learning Task Force recommended that *COL* course fees should be set at a level low enough to allow all districts in the state to offer the courses to their students. The task force recommended an individual course fee should not exceed $100.

9.3. Revenue and cost projections

The experience of other states suggests that an adequately funded statewide online program in Colorado would cost approximately two million dollars per year (about $2.50 for each student in Colorado public schools) in the initial stages of development—with the largest portion of that money going to course development and delivery, teacher preparation, and quality assurance. *COL* would charge enrollment fees, as discussed in Section 9.2, but would keep the fees low in order to ensure that low-income students and districts have equitable access. This would necessitate external funding for the program, especially in the first several years of operation.

A rough calculation demonstrates the need for revenue support beyond enrollment fees.

- Revenue for a single one-semester course = $2,000 (assuming 20 students in each section of a course, each paying $100).
- Annual enrollment fee revenue = $120,000 (30 courses per semester)
- Estimated annual cost of the online program = $2,000,000
- Estimated revenue need beyond enrollment fees = $1,880,000

10. Accountability: Evaluation of Program Goals

Program evaluation extends beyond evaluation of individual courses or teachers. A statewide organization must demonstrate that the concept of online learning itself yields significant educational and social value to the state. Evaluation must therefore be built into the program from the outset; and it must look not just at how well the program does what it intends to do but also at the impact those activities have on Colorado.

10.1. Goals and objectives

The Executive Director of *COL*, in conjunction with the Board of Directors, would develop a set of programmatic objectives for *Colorado Online Learning*. These would include key metrics for determining achievement of program goals, which would be married to the educational benefits of the program. The Executive Director would also set a timeline for analysis in order to ensure that metrics are measured and reported on a regular and timely basis.

10.2. Key metrics

While specific metrics would be determined by the Executive Director, it is expected that the measures may include the following:

10.2.1. Program utilization

- Number of online course enrollments;
- Number of students served;
- Number of students served for whom comparable courses were otherwise unavailable or available only at great cost or effort;
- Course completion rates;
- Course/teacher evaluations by students.

10.2.2. Educational benefits

- Changes in CSAP and other test scores of students who take online courses;
- Changes in educational attainment of students who take online courses;
- Changes in academic achievement of students who take online courses;
- Changes in educator practices in design and delivery of instruction;
- Changes in educator practices in uses of technology.

10.2.3. Financial benefits

- Benefits per dollar spent on the program;
- Impact on state and local educational budgets.

10.3. Independent evaluation

In order to ensure impartial analysis of key measures of success, *Colorado Online Learning* would hire a contractor to conduct an independent evaluation of the success of its program. This project evaluator would survey students, principals, and other stakeholders, collect and analyze data, and report to the *Colorado Online Learning* Board of Directors, the Colorado Department of Education, the Colorado Legislature, and the Governor.

11. Conclusion: A (Narrow) Window of Opportunity

In its fall 2001 report (p. 4), the National Association of State Boards of Education urged that "State education policymakers should seize the opportunity to take the lead and move decisively to assure that e-learning spreads rapidly and equitably, is used well, and strengthens the public education system." In Colorado the principles and organizational strategies recommended by the E-Learning Task Force can contribute to the development of coherent policies that support high-quality learning experiences for any person in any place on any path.

Appendix A: References

In addition to the written sources cited here, this report is based on the meetings and online discussions of the E-Learning Task Force, extensive discussions between the report's primary author, John Watson, and many members of the ELTF, phone interviews with staff of online programs in Colorado and other states, and documents provided by several commercial content and technology vendors.

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Appendix B: Proposed Timeline for Implementation of *Colorado Online Learning*

May 2002	Preliminary recommendations made by ELTF regarding creation of *COL*.
May 2002	Students registered by *COSC* for fall 2002; these students form the core clientele for *COL* in the 2002-03 school year.
August 2002	Final findings and recommendation of ELTF published.
September 2002	Federal ESEA grant funding awarded to *COL*.
September 2002	Promotional documents, presentations, etc., created to announce *COL*.
September 2002	*COSC* fall semester courses begin; converted to *COL* identity during semester.
October 2002	*COL* officially constituted; Board of Directors and Chief Executive Officer selected; website launched.
November 2002	First-year *COL* core staff assembled.
November 2002	Online learning needs survey initiated by *COL*.
December 2002	*COL* and collaborating online programs determine course offerings for spring 2003.
January 2003	*COL* spring semester courses begin.
February 2003	*COL* and collaborating online programs determine course offerings for fall 2003.
May 2003	Legislative support provided for *COL* organization.

Appendix C: Projected *COSC/COL* Course Offerings for 2002-03

Language Arts:	English I, English II, Intro to Composition*, Readers/Writers Workshop, Contemporary Issues, AP English Literature and Composition
Mathematics:	Algebra I, Geometry, Algebra II, AP Calculus, Fundamental Math*
Science:	Biology, AP Physics, Issues in Biotechnology*, Geology*, Astronomy*, Health*
Social Studies:	American Government, U.S. History, World Geography*, World History
Foreign Languages:	German, Latin I-IV, Spanish I-IV
Technology:	Web Page Development*, C++ Programming/ Java Programming
Other:	Career Exploration*

(*denotes semester length)

Appendix D: List of E-Learning Task Force Members 3/21/02

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Appendix E: Selected List of K-12 Online Programs

More complete list of online programs available at the Distance Learning Resource Network
http://www.dlrn.org

Online programs in Colorado (incomplete list)

1. Branson Online Academy (Branson Schools, CO) (http://www.bransonschoolonline.com)
2. Colorado Online School Consortium (Leadville, CO) (http://www.cosc.k12.co.us/)
3. Colorado Virtual Academy (Adams-12 School District) (http://www.covcs.org/)
4. *Jeffco*Net Academy (Jefferson County Public Schools, Golden, CO) (http://jeffcoweb.jeffco.k12.co.us/access/academy/index.html)
5. Lester B. Arnold (Adams 14 School District) (http://www.acsd14.k12.co.us/schools/lahs/vhs_general.html)
6. Littleton Schools (Littleton, CO) (http://www.govhs.org)
7. Monte Vista On-line Academy (Monte Vista Schools, CO) (http://monte.k12.co.us/ola/index.htm)
8. VILAS (Vilas Interactive Long Distance Alternative School) (http://www.vilas.k12.co.us/vilas/vilas.htm)
9. Western State College (Gunnison, CO) (http://www.western.edu/pseo/#k12)

Statewide programs outside of Colorado (incomplete list)

1. Alabama Online High School (http://altair.pacers.org/AOHS.htm)
2. Arkansas Virtual High School (http://arkansashigh.k12.ar.us/avhs_main.htm)
3. Florida Virtual School (http://www.flvs.net/)
4. Hawaii E-School (http://www.eschool.k12.hi.us/)
5. Illinois Virtual High School (http://www.eschool.k12.hi.us/)
6. Kentucky Virtual High School (http://www.kvhs.org/)
7. Louisiana Virtual Classroom (http://www.lcet.doe.state.la.us/distance)
8. Michigan Virtual High School (http://www.mivhs.org/)
9. New Mexico Virtual School (http://www.nmvs.org/)
10. North Dakota Division of Independent Study (http://www.dis.dpi.state.nd.us/ISC/classes/OLCourses.html)
11. Utah Electronic High School (http://www.ehs.uen.org/)
12. West Virginia Virtual School (http://access.k12.wv.us/vschool)

Virtual schools run by public school districts outside of Colorado

1. Babbage Net School (Eastern Suffolk BOCES, Port Jefferson, NY) (http://www.babbagenetschool.com/)
2. Birdville Virtual School (Birdville ISD, TX) (http://www.birdville.k12.tx.us/cf/Virtual/VirtSchl.htm)
3. CAL Online (Clovis Unified Schools, Clovis, CA) (http://www.clovisusd.k12.ca.us/learn/virtual/default.htm)
4. CCS Web Academy (Cumberland County Schools, Fayetteville, NC) (http://www.ccswebacademy.net/)

5. Clintondale Virtual High School (Clinton Township, MI) (http://www.clintondalevhs.org/)
6. Cyberschool (Lane County Schools, Eugene, OR) (http://www.cyberschool.4j.lane.edu/)
7. eSchool (Plano ISD, TX) (http://www.planoisdeschool.net/)
8. Evergreen Internet Academy, Evergreen HS (Vancouver, WA) (http://www.egreen.wednet.edu/)
9. Gwinnett County Online Campus (Gwinnett County Schools, Lawrenceville, GA) (http://gwinnettk12online.net/)
10. HISD Virtual School (Houston ISD, Texas) (http://hs.houstonisd.org/virtualschool)
11. Internet Academy (Federal Way, WA) (http://www.iacademy.org/)
12. Juneau Cyber School (Juneau Public Schools, AK) (http://jcs.jsd.k12.ak.us/)
13. Mindquest (Bloomington Public Schools, MN) (http://www.mindquest.org/index.html)
14. NetSchool (Hillsboro Schools, OR) (http://netschool.hsd.k12.or.us/)
15. Oakland Virtual Connection (OV Connect, Oakland Public Schools, MI) (http://www.oakland.k12.mi.us/ovconnect)
16. Rock Hill School District #3 Virtual High School (http://www.rock-ill.k12.sc.us/departments/vhs)
17. SeeUonline (Matanuska-Susitna Schools, Palmer, AK) (http://www.seeuonline.org/)
18. SK Online (Salem-Keizer Public Schools, Oregon) (http://skonline.org/)
19. Southern Oregon Online School (http://www.jacksonesd.k12.or.us/soos)
20. Virtual School @ Liverpool (Liverpool Central Schools, NY) (http://www.liverpool.k12.ny.us/virtual.html)
21. Virtual High School @ PWCS (Prince William County Schools, Manassas, VA) (http://www.pwcs.edu/pwcsvirtualhs/)

Consortia operating online programs

1. AP Nexus (SREB, States of Georgia, South Carolina, and Tennessee, funded via APIP) (http://www.apnexus.sreb.org/)
2. ECO 2000 Cyberschool Project (Aroostook County, Washburn, ME) (http://www.eco2000.org/consortium)
3. Francis Virtual School (New York) (http://www.francisvirtualschool.org/)
4. Lancaster-Lebanon Intermediate Unit 13 (Apex courses only; Lancaster, PA) (http://www.iu13.k12.pa.us/tech/Apex.html)
5. Minnesota Distance Learning Academy (SW/WC Service Cooperatives) (http://www.swsc.org/mdla)
6. Texas Virtual School (ESC 4) (http://www.texasvirtualschool.org/)
7. Virtual Greenbush (Southeast Kansas Education Service Center, Girard, KS) (http://www.virtualgreenbush.org/)
8. Virtual High School (Hudson Public Schools, Concord Consortium, Hudson, MA) (http://vhs.concord.org/website.nsf)
9. Western Consortium for Accelerated Learning Opportunities (WICHE states, Denver, CO) (http://www.wiche.edu/proSvcs.htm)

Appendix F: Proposed *COL* Enabling Legislation

Proposed Legislation Concerning the Creation of a *Colorado Online Learning* Organization (Created by the Public Policy Subcommittee of the E-Learning Task Force)

Article 86
Colorado Online Learning
22-86-101 to 22-86-109

22-86-101. Short Title. This article shall be known and may be cited as the "Colorado Online Learning Act."

22-86-102. Legislative declaration. (1) The general assembly hereby finds, determines, and declares that:

(a) The use of Internet technology has achieved such a high level of pervasiveness in society that any person who is unfamiliar with or lacks knowledge in the use of Internet technology is at a distinct disadvantage both economically and in terms of available career opportunities;
(b) Internet technology can be used to deliver high-quality online coursework to Colorado students whose schools may not be able to offer specialized coursework due to limited funding and/or teacher shortages;
(c) Internet technology can be used to deliver high-quality online coursework to Colorado students who experience scheduling conflicts in local schools due to limited flexibility in course schedules;
(d) Internet technology can be used to deliver high-quality online coursework to Colorado students who may be home-bound for medical or other reasons;
(e) Online coursework can increase equitable access to academic subject areas for all Colorado students, regardless of geographic location or other circumstances of local schools;
(f) Greater integration of online coursework in schools will help combat the growing digital divide and learning gap between categories of students and provide Internet technology access for students who do not have access to such technology in their homes;
(g) A growing number of Colorado schools are using local and state revenues to develop online schools;
(h) A growing number of Colorado schools are collecting state school finance act revenues for teaching out-of-district students via online formats;
(i) Many Colorado schools do not have the resources of money and personnel to develop their own online courses;
(j) Colorado students in schools without access to online education may not have the same opportunity for coursework as students from schools with access to online education;
(k) A statewide online learning organization can conserve state finance act dollars by collaborating with existing online schools to offer online learning services to all Colorado schools;
(l) It is therefore appropriate and in the best interest of students and schools in Colorado to create a *Colorado Online Learning* organization.

22-86-103. Definitions. As used in this article, unless the context otherwise requires:
(1) "Online education" means any course of study delivered via Internet technology.
(2) "State board" means the state board of education created pursuant to section 1 of article IX of the state constitution.

22-86-104. *Colorado Online Learning* created. There is hereby created the Colorado Online Learning organization. It is the intent of the general assembly that:

(a) The *Colorado Online Learning* organization will, with available revenues, develop and offer high-quality, Colorado-standards-based coursework in an online format to students from any school that chooses to use *Colorado Online Learning* courses.

(b) The *Colorado Online Learning* organization will offer online coursework to schools for a fee and will not compete with Colorado schools for per-pupil school finance act revenues.

(c) The *Colorado Online Learning* organization may create professional and paraprofessional staff development coursework, courses for adult basic education and any other coursework needed for training school stakeholders.

22-86-105. Organization. All Colorado school districts are members of the Colorado Online Learning organization.

22-86-106. Governing board. The governing board of the *Colorado Online Learning* organization shall consist of five representatives from school districts, one representative from higher education, and one representative from business. Representatives shall serve terms of three years; however, two representatives from school districts shall serve initial terms of one year, and two representatives from school districts shall serve initial terms of two years. Representatives are limited to two terms; except in the case of those representatives serving initial terms of one or two years; they may, if elected, serve two three-year terms succeeding their initial terms.
(1) The representatives of school districts shall initially be appointed by the state board. Thereafter, representatives of school districts shall be elected at an annual meeting. Each Colorado school district is entitled to designate one elector for the purpose of electing *Colorado Online Learning* governing board members. Any school district may nominate a candidate for the governing board. A nominating committee shall be appointed by the governing board president to prepare the slate of candidates. At least two governing board members must represent districts with less than 1,500 high school students. At least two governing board members must represent districts with more than 1,500 high school students.
(2) The representative from higher education shall be appointed by the governing body of the community colleges system.
(3) The representative from business shall be appointed by the governor's office.

22-86-107. Corporate status. *Colorado Online Learning* is hereby declared to be a body corporate and in its name may hold title to personal property for any purpose authorized by law, sue, and be a party to contracts for any purpose authorized by law.

22-86-108. Eligibility for funds. *Colorado Online Learning* shall be entitled to such state moneys as may be available upon receiving approval by the general assembly or state board.

22.86-109. Rules and regulations. The state board shall adopt rules and regulations relating to the establishment, governance, and operation of the *Colorado Online Learning* organization.

Appendix G: Virtual High School, Inc.

VHS, Inc. (http://www.govhs.org) is the leading nationwide high school online education consortium. VHS member schools typically provide a teacher and a course to the VHS course catalog, and in exchange may enroll a set number of their students in VHS courses. The school also pays an annual fee to VHS. The advantage to this model is that the school can offer a much larger range of courses than most programs could develop on their own. The disadvantage is that the cost, including both the fees and the release time for a teacher and site coordinator, is relatively high. Because of the breadth of VHS course offerings, *COL* may choose to become a member of the consortium. While this arrangement would be different from the typical VHS agreement (because VHS member schools are typically physical schools), VHS has indicated a willingness to explore different options with *COL*.

VHS was originally part of the Concord Consortium, a nonprofit educational research and development organization based in Concord, MA, but recently has spun out as a separate nonprofit organization focused on the operations of the Virtual High School. Original funding came from a five-year, $7.5 million federal Technology Innovation Challenge grant. In spring 2002, VHS offered 132 courses to 2,000 students.

VHS charges two types of fees to member schools: annual membership fees and teacher/site coordinator training fees. These fees cover central administration, registration, server management, and all the other operational aspects of VHS. The membership fee is $6000 per year for schools offering one course, with additional courses charged $4000 per year. Each course offered by a school entitles that school to 20 student seats in both the fall and spring semesters. Training fees are $3500 for the teacher, and $1500 for the site coordinator. Consequently, the direct per-student cost of a VHS course is $150 per semester, but this cost does not include the training fees for the teacher and site coordinator. In addition to membership and training fees, the school must provide release time to the teacher to teach the course, and to the site coordinator to act as the local support person for the school's students. Schools that wish to participate in VHS as student-only schools can enroll ten students per semester on a trial basis for one year only at a cost of $8,000 for the year.

Littleton High School, which has participated in the Virtual High School program for three years, is the only school in Colorado that is part of the consortium. In Fall 2001, nine Littleton students were enrolled in VHS courses. In spring 2002 all 20 seats available to Littleton were filled, plus an additional ten seats offered by VHS. Chris Taylor, VHS Site Coordinator at Littleton High School, reports that VHS offers excellent value because of the number and breadth of courses available. Among the roughly 150 courses available, Littleton enrollments include Mythology, Visual Basic, and Integrated Mechanical Physics with Logical Reasoning. Taylor feels that this offering of courses is far larger than what Littleton could offer by developing its own online program, and also larger than the *COSC* course listing. He identifies four types of students who are taking VHS courses: (1) students with a scheduling conflict and unable to find a suitable class fitting their schedule, (2) students trying to "catch up" in a certain area, (3) students seeking a class not offered at Littleton, and (4) homebound students.

Appendix H: Commercial Providers

As noted in Section 3.4, most K-12 online programs obtain their technology or course content from one or more commercial providers. The brief overview of commercial vendors in this appendix provides a sense of the choices available.

There are three areas in which commercial providers operate. These are:

- **Course management system (CMS):** the technology platform through which online courses are offered, including creation and editing of course content, communication tools, assessment tools, and other features;
- **"Portal" website:** the website surrounding the online courses, which serves as a brochure for the online program, provides course listings and/or schedules, and allows for registration and other student services;
- **Course content:** the actual course material, which may be purchased from a commercial vendor, often because commercially-generated material can incorporate graphics, animations, audio/video, and other features that most teachers and district-based instructional designers are not able to easily create.

It is most likely that *COL* would use a commercial CMS, instead of absorbing the high cost of developing similar tools. In most cases, the CMS company would offer a portal site as well, or *COL* could use just the CMS and build its own portal. It is even possible, though unlikely, that *COL* would use a CMS from one commercial vendor and a portal from a different company. Course content is generally separate from both the CMS and the portal, although sometimes the course content is offered in either a proprietary course management system or within a subset of the commercial provider's systems.

Course management system providers

The most well-established course management systems have been developed primarily for postsecondary education, and now are being offered to, and in some cases adapted for, K-12. These systems tend to have fairly similar features and toolsets. (See section 8.7 for a basic list of common features that *COL* would probably seek in a CMS.)

There are two basic models for a CMS. In the first model the client purchases software, owns and controls the server, and administers the CMS with technical assistance from the vendor. In the second model the vendor serves as an Application Service Provider (ASP) and hosts the software, and may provide extensive technical support as well. In the first model the vendor typically charges much less, but the client must employ a larger technology staff to maintain the server and CMS. Distinctions between these two models are being blurred, as some companies move to offer a range of options and other companies provide hosting services for off-the-shelf software products.

The two leading low-cost platform providers are Blackboard and WebCT. Blackboard, located in Washington, D.C., is by most common measures (e.g., combination of installed base and revenues) the largest CMS provider. (This includes postsecondary institutions.) While

Blackboard, along with most CMS companies, initially focused on postsecondary education, the company's product is now in use in many K-12 schools. Blackboard was originally created as an off-the-shelf stand-alone CMS, but has expanded its product line to include a host for student services and a portal, among other features.

WebCT, originally created at the University of British Columbia and now located in Massachusetts, has an installed base comparable in size to that of Blackboard, although generating much less revenue. WebCT has made less of an effort to penetrate the K-12 market, and is not nearly as prominent in K-12 as it is in postsecondary education. WebCT is also now expanding its product line to include a portal and similar services.

The two leading ASP-model companies are Jones Knowledge and eCollege. Both offer full-service hosting, portal, and extensive services such as registration, technical support, instructional design, and instructional support. The services offered by these companies tend to be more expensive, but both contend that the total cost of ownership of their online programs is lower than with an off-the-shelf product. Both Jones and eCollege are located in the Denver area. Jones, however, has indicated that it will no longer offer CMS services.

In the survey conducted by Clark (2001), Blackboard and eCollege were most frequently cited as the CMS technology being used by K-12 programs. Jones is quite prominent because of its use by Florida High School (FLVS)—especially now that FLVS has been licensing courses to other programs.

Because both Blackboard and WebCT began as off-the-shelf products with few services, and because of the variety of options available to educational institutions, several consulting companies have formed to service multiple CMS technologies. The leading example is Eduprise, a North Carolina-based company that has partnership agreements with numerous CMS companies to offer hosting, training, and other services built around the other companies' CMS platforms.

Course content providers

Online programs often turn to external content providers, just as physical schools use textbooks, because the externally developed content may seem more reliable or complete, and because the external content provider can invest more in sophisticated instructional development. Effective online courses rely not only on the information, learning activities, and assessments, but also on how these materials are engaged by the student. As online learning matures, text presentations on a screen ("textbooks online") give way to multiple media and more complex modes of learning.

Commercial content providers typically create courses that utilize text, audio, and video files, with animations and other graphics, and in some cases interactive exercises. The multimedia elements contained in these courses, such as interactive animations, generally exceed the design and technical capabilities of school- or district-based developers. This does not necessarily mean, however, that the courses are demonstrably better at achieving desired student outcomes.

While there are numerous providers of course content, according to the survey by Clark (2001), the most commonly cited commercial content providers are APEX Learning and Class.com, and the most common non-commercial source is the Florida Virtual School. Other sources of course

content that were cited by more than one school in Clark's study are Academic Systems, Intelligent Education, NovaNet, eHarcourt Child U, and Boxer Math.

APEX, which was started by Microsoft co-founder Paul Allen in 1997, claims to have been among the first companies to offer online high school courses. Their course list includes courses for high school students in general studies, Advanced Placement, foreign languages, and technology. The company offers its content in its own proprietary system, and has also teamed with Blackboard to offer courses on the Blackboard platform. APEX also has at least one customer that combines its content with the eCollege system, an arrangement that is slightly less user-friendly because the content and course management system are not as well integrated. Similar arrangements could be made with WebCT or Jones. APEX charges $250 per course per student per semester, for the course content (assuming that the client provides the teacher). APEX can also provide instruction for an additional charge, as well as a variety of other services including professional development courses. During the 2000-01 academic year, APEX online enrollments totaled approximately 45,000, but 89% of these enrollments (about 40,000) were in APEX's online Exam Review course.

Class.com, another leading content company, was created as an offshoot of the University of Nebraska Independent High School. A for-profit company, Class.com has created over 40 online courses, which it manages on the Blackboard system.

Florida Virtual School (FLVS) is also licensing its courses to other providers, with the goal of creating substantial revenues to replace state funding. FLVS charges an initial fee of $500 per course, plus roughly $90-$95 per student based on the total number of students using FLVS courses. FLVS uses the Jones CMS, so the content is in the Jones E-education platform. While the content can be moved to another system, this would entail additional expense, likely in the range of $2,000-$3,000 per course.