

Online Learning Environments for Southwestern Vermont:  
A Framework Supporting Planning and Initial Endeavors

Abstract

Individuals working as educators in K-12 institutions have the responsibility to continue to develop their professional skills and knowledge. In rural regions, accessing professional development can be a problem for educators. In this paper, the educational community in a rural region of Vermont is described and the potential for using online learning environments to deliver professional development to educators in that community is explored. The resources and practices existing in that region are described, and recommendations for successfully integrating online learning environments into the professional development options for teachers working in that rural community are explored and explicated.

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## Introduction

Modern educators are working in increasingly complex situations. Recent discoveries in the science known as brain research suggest new pedagogical practices (Bransford, Brown, & Cocking, 1999; Erlauer, 2003; Sprenger, 1999). Increasingly complex technology is available for use in classrooms (Ansell & Park, 2003). Changes in the political landscape bring new priorities to the attention of educators (United States Department of Education, n.d.). In this milieu of ideas and practices, educators face the need for continuous professional development.

For educators working in rural regions, accessing professional development activities can be problematic, yet rural educators face a variety of challenges that make professional development an important aspect of school improvement efforts (Karges-Bone, Collins, & Maness, 2002). Distance learning methodologies, including online learning environments, are a venue through which professional development can be delivered to educators working in rural regions (Bonk, Ehman, Hixon & Yamagata-Lynch, 2002; Knapczyk, Chapman, Rodes, and Chung, 2001; Richardson, 2001).

In this paper, the educational communities of a rural region of Vermont are described, and the possibility of using online learning environments to serve the educators in those communities is explored. The populations of the schools in the region are characterized and the extant technology capacity and system capacity are described. Essential planning issues are identified and emerging practices in the design and implementation of online learning environments are reviewed. The purpose of the paper is to provide a framework for those who seek to initiate and sustain online learning environments for professional educators in the region, as well as indicate some of the

options that are available for managing, organizing, and delivering online professional development for educators in the region.

### Statement of the Problem

Southwestern Vermont (defined as Bennington and Rutland Counties) is a rural region of the state that has 49 public K-12 schools. Providing the region's educators with professional development is a recognized need in the area of technology planning (Ackerman, 2000) and, in recent years, a number of organizations have collaborated with the schools to provide professional development in the area of educational technology. Despite the existence of systems to support distance learning in the region and a population of educators characteristic of those that engage in distance learning, few formal efforts to develop distance learning programs have been attempted. The purpose of this paper is understand the emerging practices of online distance learning and the connections between the implementation of these models and the resources available in the region and the demographics of the educators in the region.

### The Schools of Southwestern Vermont

Southwestern Vermont is a largely rural region of the state, and there is a diverse community within the region. The schools in the region are organized into twelve supervisory unions and school districts (three of those supervisory unions have only one school that falls within Bennington or Rutland County), and each supervisory union and school district has significant autonomy in making decisions about all aspects of school planning. Professional development for the region's educators is provided by various

institutions, including some that utilize distance learning technologies.

### Characteristics of the Schools in the Region

The towns of Bennington and Rutland Counties govern schools in a great variety of ways. Some towns have joined supervisory unions to provide secondary schools for the students of many towns, while each town maintains somewhat independent local elementary schools. Some towns do not even maintain schools, choosing to pay tuition to allow all students to attend any public school. Some towns pay tuition for students to attend quasi-private secondary schools (those schools are private, but are obligated to enroll any student who resides within defined towns). The only city in the region maintains separate elementary, middle and high schools, but also enrolls students in grades 9-12 from nearby towns that have no high schools.

Size of schools, enrollment, educators. Almost 15,500 students enrolled in the 49 public K-12 schools located in Bennington and Rutland Counties of Vermont. The range of enrollments in the schools is 28 to 1,231 with a mean enrollment just over 315 and a median enrollment of 255. As the difference between the mean and median suggests, the schools in the region tend to be small. Most of the school are elementary schools, enrolling grades K-6 or K-8; only nine schools in the region enroll only secondary students (grades 7-12). The schools in the region employ over 1,342 full time equivalent teachers (see figure 1). No comprehensive data is available to describe the professional characteristics of the educators in the region. In Vermont, individual educator's professional development is guided by local standards boards that will recommend educators be relicensed by the state department of education as long as the educator has met relicensing requirements, which include attending professional

development activities that align with school improvement plans (Vermont Department of Education, n.d.).

Connectivity. Data regarding Internet connectivity in the region's schools are somewhat dubious. Although data regarding Internet connectivity were requested during the most recent school reports, many individuals submitting data for those reports did not report the level of connectivity in schools. Many schools for which there was no report of connectivity are likely to have broadband Internet access, however. The cable company that serves the region has offered to provide free cable modems and free cable access to the Internet to each K-12 school in the region, and the only schools known to not have accepted the offer are those that sit on a road where cable service is not available (Franz, 2002).

Technology Planning. Ackerman (2000) made a number of observations of the technology planning and implementation by the schools in the region. In general, the schools were found to have adequate computer hardware, software, and Internet connectivity, but the lack of access to sufficient technical support was identified as inhibiting the effective use of that technology capacity. Professional development, in both the operation and use of computer technology and the effective use of technology in teaching was identified as a need in the region, but few schools had formal plans for providing that professional development. Technology planning as a specialized function of strategic planning for schools was done inconsistently throughout the region. Active leadership, either from a building administrator or a teacher leader, was found to influence technology planning and technology implementation in the region's schools. Those schools with an active leader tended to demonstrate more progress in developing

and implementing technology plans that address all aspects of technology use.

### Existing Distance Learning Organizations in the Region

In southwestern Vermont, there exist a number of organizations that provide professional development for educators. The list includes institutions of higher education, independent organizations, and consortia of school districts and supervisory unions, as well as individual schools and school districts. Several institutions in the region do provide access to professional development activities for teachers using distance-learning technologies.

Vermont Interactive Learning Network. The Vermont Interactive Learning Network (ILN) provides video conferencing facilities within high schools across the entire state. Begun in 2000, the goal of the project is to provide video conferencing capabilities in all Vermont high schools by 2006. Currently, ten schools in southwestern Vermont are connected to ILN. Events transmitted over ILN include a number of professional development workshops for teachers, as well as courses and workshops for high school students, and events for other public service organizations (Vermont Interactive Learning Network, n.d.).

Vermont Interactive Television. Vermont Interactive Television (VIT) provides video conferencing capabilities from a number of sites throughout the state. Each VIT site has document cameras and computer and audio/ visual transmission capabilities. Three VIT sites are located within the southwestern region of the state, and the system is capable of providing videoconferencing to sites around the world. VIT does not create programs to be delivered over the VIT system; VIT only provides the

infrastructure for other organizations or individuals to use. Educational organizations seeking to use VIT are charged a fee, but the rates are less than the rates for businesses and some other users (Vermont Interactive Television, n.d.)

University of Vermont. The University of Vermont maintains a satellite campus in Rutland County. At that site, there is a Distance Learning Network (DLN) studio (University of Vermont, n.d.). The Rutland DLN studio is capable of videoconferencing over a number of networks within the region, the state, and the world. Because the DLN studio provides videoconferencing to certain corporate sites in manufacturing and health care as part of formal programs offered through UVM, the DLN site in Rutland County is more used by professionals from those industries, and educators typically enroll in UVM courses that use World Wide Web Course Tools (WebCT) for online delivery and Vermont Interactive Television for videoconferencing (University of Vermont, n.d.).

The Schools Library Media Sequence (University of Vermont, 2003) is an example of a program offered by UVM that makes extensive use of distance learning capabilities. All courses in this six-course series are offered through a hybrid of in-person and distance learning methodologies. The typical course begins and ends with in-person sessions and the remainder of the coursework is completed through either WebCT or Vermont Interactive Television.

### Existing Professional Development Organizations in the Region

As part of school building Strategic Action Plans (Vermont Department of Education, 1998), local education leaders plan for and provide professional development

for teachers; these plans include graduate-level courses, extended workshops, single workshops, mentoring programs, and other activities available both at the school and at other sites. Much of this professional development is provided at no expense to the participating educators. In addition, many schools provide tuition reimbursement as a benefit negotiated in collective bargaining agreements with teachers' unions. In addition to the professional development provided by local schools and school districts, there are a number of organizations supporting individual teachers seeking professional development and schools supporting those teachers.

Teacher Quality Network. Vermont is divided into five regions for the purposes of the Teacher Quality Networks (TQN). Through support systems administered through and provided by TQN, educators can receive instruction and mentoring to enhance their classroom practice. The ultimate goal of TQN's work is to build and sustain system capacity and leadership capacity within a school to allow for continuing support of learners. TQN is intended to support individuals new to the teaching profession and to provide continuing professional education at sites removed from the higher education campuses (Teacher Quality Network, 2003).

Rutland Region Education Alliance. Begun in 1997, the Rutland Region Education Alliance (RREA), a consortium of supervisory unions and districts in Rutland County and part of Bennington County, promotes the use of student-centered practices in the region's schools. Under the guidance of the Capstone Leadership Team, which has representatives from the member school districts, the RREA has sponsored week-long summer institutes for teachers, demonstration days for the public, and other activities to promote classroom practices that address emerging standards and the principles of

student-centered instruction that are the focus of local and state initiatives (Vermont School to Work, n.d). Current plans call for developing an online learning environment to deliver professional development focusing on Capstone practice (Moeckel, 2002).

Vermont Institutes. The Vermont Institutes (VI) is a collaborative effort among a number of organizations that provide professional development for teachers. Although VI has no regulatory authority, the organization does facilitate the implementation of Vermont Department of Education policy. The primary focus of VI efforts is providing professional development that helps teachers align their practice with state and national standards. Historically, the VI have focused on math and science education, as well as technology integrations (Vermont Institutes, 2003).

Southwest Superintendent's Curriculum Collaborative. This collaborative is an association of five supervisory unions in the region. The purpose of this association is to combine efforts to provide and publicize professional development for teachers. To date, the collaborative has shared professional development plans made for local schools and open programs to teachers from other schools and supervisory unions. After seeing common goals and initiatives resulting in neighboring supervisory unions providing similar professional development, the collaborative sought grants to develop and implement a regional professional development plan that addresses the common needs emerging from state and national initiatives.

### Potential for Online Learning Environments

The educational communities in southwestern Vermont are well-prepared to make wider use of distance learning methods, including online learning environments to

provide professional development for teachers in public K-12 schools. The schools in the region have sufficient existing technology capacity and Internet connectivity to provide access to web-based online learning environments similar to that used to successfully provide professional development to other educators in other rural regions (Rodes, Knapczyk, & Chapman, 2000; Sologuk, Stammen, & Vetter, 2001). In addition, the schools have access to a variety of systems for providing videoconferencing within the region and beyond the region. The organizations that provide the videoconferencing have support systems in place so that the systems are available to all regardless of their technical expertise.

In addition to the existing infrastructure, there exists an active professional development culture in this region. The professional development activities sponsored by the organizations and institutions active in the region focus on connections to local, state, and national initiatives, and such connections promoted participation in and engagement in professional development for teachers (Dutro, Fisk & Koch, 2002). By converting the existing professional development initiatives to be delivered through online learning environments, educational leaders in the region can make necessary experiences available to more educators.

### Critical Planning Issues

Given the observation that online learning environments have potential for delivering professional development to educators working in the region, and given the minimal attention that the region's education leaders have paid to technology planning (Ackerman, 2000), it is necessary to specify and explicate the critical planning issues that

will ensure the success of professional development initiatives that utilize online learning environments. Compora (2003) defined the Distance Learning Administrative Operational Model which identified twelve areas that must be addressed to successfully design and implement distance learning initiatives in institutions of higher education. Other than the first area of importance, defining a clear mission for the distance learning program, the areas defined by Compora can be categorized into the broad areas of critical planning explicated below. Because professional development activities delivered through online learning environments to the educators in southwestern Vermont are likely to be offered through existing organizations and to be offered to well-known populations, those areas focusing on student demographics and marketing are ignored in this paper.

### Defining the Mission

The successful implementation of distance learning endeavors has been shown to depend on a clear connection between the mission of the organization and the goals of the distance learning endeavors. Establishing this connection and overcoming the institutional inertia that can inhibit the implementation of new initiatives, such as distance learning, can pose significant challenges to the top leaders in an organizations that seek to affect changes (Ellsworth & Iorizzo, 2001; Howard, 2001). Berge (2001) suggested the more enthusiastic the support for distance learning initiatives form the top leaders, the more successful the initiative is likely to be.

Similar observations have been made about technology-rich professional development for teachers. Activities clearly connected with other school initiatives are more successful (Sandholtz, Ringstaff, & Dwyer, 1997), and the endeavors actively

supported of principals and central office administrators are more successful (Hunt & Loakhardt, 1998). Despite the central role of direct and clear leadership in the successful implementation of online learning environments and other distance learning in some organization, educational leaders are in the precarious position of having to satisfy numerous constituents who may have contradictory goals (Fullan, 1998). Kohn (1999) argued effective leadership in educational organizations should take on a collaborative and supportive tone; too direct leadership from the highest leaders in an organization is perceived as coercive by educators and can actually inhibit educators from meaningful participation in new initiatives.

### Necessary Infrastructure

Access to technology sufficient for participation in all aspects of the online learning environments is essential if teachers are to participate in online professional development. Accessibility is defined as both having the necessary hardware, software, and connectivity available when the individual has the time to participate in the online activities and as having the efficacious operation of the hardware and software within the capabilities of the individual. Cho and Berge (2001) identified a lack of confidence with technology as an obstacle to participation in technology-rich distance learning and teachers are a group whose members traditionally are not facile with technology (Lanahan, 2002). The implications of delivering instruction to educators using a technology-rich medium is considered below in the section “Knowing the Students.”

A key factor determining the level of technology necessary to deliver online learning is the level of interaction among participants. In general, synchronous and

directed interactions require more and more complex technology (Adams & Freeman, 2003). Interaction in which one participant, either student or instructor, makes information available to the group to use at any time (for example a web page or a user profile page) requires minimal technology; a web browser familiar to most modern computer users would be sufficient.

Synchronous interaction, such as videoconferencing, requires more complex technology; including functioning cameras at each site and high speed network connection between all sites (Pacific Bell, 2003). In southwestern Vermont, organizations are in place to provide videoconferencing services. The use of such services would make that complex technology accessible to individuals with limited technical expertise or confidence, but because the organizations offering videoconferencing are somewhat centralized, those services may not be accessible to all.

### Knowing the Students

When designing online learning environments, planners must not only attend to the principles of good online learning environment design, but must also address any unique features of the intended audience that may influence how the students drawn from that population will experience the activity. When designing online learning environments for teachers, planners must ensure the experiences will provide skills and information the participants perceive as necessary and the delivery systems must be within the technical skills of the participants. A key feature of meaningful professional development for teachers is a connection to that teacher's current teaching responsibilities (Feist, 2003). Especially meaningful is professional development that allows teachers to

explore the complexities of classroom practice in other complex tasks and projects (Baron & McKay, 2001); tasks that require teachers to analyze and synthesize new theories and practices are more meaningful than simply demonstrating awareness of new theories and practices.

Sandholtz et al (1997) identified access to necessary technology, receiving assistance with technical questions, and time as obstacles to teachers being trained in technology-rich situations. Although those factors are not unique to teachers, those are issues that planners must address when planning for teachers' professional development. Teachers who are initially drawn to online educational experiences tend to be those who already have significant technology skills and who are perceived as leaders in the field (Blocher, deMontes, Willis, & Tucker, 2002); such individuals have been effective leaders in professional development efforts in other aspects of educational technology (Sandholtz et al, 1997). If online learning environments are to be a venue through which all teachers, not just those who have technology savvy, receive professional development, then planners must address the traditionally weak technology skills of teachers (Lanahan, 2002). To ensure participants can overcome technical problems that arise why participating in online learning environments, sponsoring institutions are advised to establish technical support systems (Cho & Berge, 2001; Compora, 2003).

### Effective Instruction

Central to the success of any educational endeavor is providing instruction that allows for meaningful learning to occur. For teachers, the primary focus of professional development activities should be classroom practice and educational theory.

Planners of online learning environments must design instruction that allows for meaningful learning while using accessible technology (Chapman & Nicolet, 2003). By creating easy to use interfaces that rely on accessible technology, planners and program developers can create online learning environments in which learners focus on the ideas and resources rather than on the obstacles posed by obfuscating design and other technical problems (Kuper, 2002).

Professional development that is designed and delivered according to the principles of Constructivist learning theory has emerged as essential in supporting educators who are initiating new endeavors in schools (Brooks & Brooks; 1993; Aaronsohn, 1996). Such professional development places emphasis on modeling effective instruction and engaging participants in experiences that encourage interaction and ownership of new ideas. Murphy (2003) described the successful design and implementation of a web-based course for teachers that is aligned with these theories.

### Managing the Programs

Any online learning environments initiated in the southwestern region of Vermont are likely to be associated with any of the existing professional development organizations described above. Planners of online learning environments can rely on the resources of those existing administrative structures, including the administrative systems of the individual schools and central offices, to address the general administrative needs of those organizing the online learning environment, and to address important tasks such as student matriculation and marketing (Compora, 2003). Even with this necessary support, important management issues, specifically program development and funding,

remain for planners of online learning environments to address.

Program development, including initial needs assessment, faculty selection, and program assessment are all management issues that planners of online learning environments must address (Lee & Dziuban, 2002). Because the school and school districts in the region have existing professional development plans and initiatives, needs assessment is likely to have been completed, but selecting skilled staff and assessing the initial experiences delivered via online systems will be essential. The transition from traditional delivery methods to online delivery methods can be troublesome for planners as well; programs delivered without sufficient planning and preparation are frequently unsuccessful (Gandanidis & Rich, 2003). An adequate budget is an essential feature of program development (Cho & Berge, 2003).

### Emerging Practices

When designing online learning environments, planners have a number of practices to define and develop. A number of practices have emerged as successful in developing and delivering learning through online systems. Those practices will provide a framework within which planners for the specific community under consideration here can work. In order for the programs to provide an environment which allows participants to engage in meaningful learning, the practices must be designed such that the system allows participant input, supports participants when they encounter trouble, allows participants to modify the system (especially as the participant grows within the system) and allows collaboration (Fischer & Scharff, 1998)

### Models of Organization

The participants in professional development delivered through online learning environments can be organized in a number of ways, depending on the nature of the course and the goals of the instruction. Courses can have definite start and stop dates, or courses can be open for enrollment at any time. Individuals can enroll together and work through the activities as a cohort, or enrollment can be open to all individuals (Penn State, n.d). Because the individuals in the target audience for the online learning environments under consideration in this paper are likely to be available at similar times (summers and after school hours) and to have similar interests (interests defined by the initiatives in local schools), they are likely to find a cohort organization to provide a more meaningful experience (Schott, Chernish, Dooley, & Linder, 2003)

### Media and Tools

The nature of the media, technology, and infrastructure that will be necessary to deliver an online learning environment depends in large part on the nature of the experiences and interactions included in the instructional design. A broad range of media are available to planners of online learning environments including traditional media such as print and compact disks (Barron, 1999), online course tools, interactive television or other videoconferencing (Schott et al, 2003). When deciding which of the available technologies and media to use for distributing information, planners of online learning environments must decide which will be appropriate for the stated goals of the instruction and at the same time provide the necessary interaction while minimizing the potential need for technical support (Pen State, n.d.). Miller, Rainer, and Corley (2003)

reported an important predictor for engagement in and participation in distance learning activities was the perceived ease of use of the technology used to deliver the course, as well as the perceived usefulness of the course content. This observation suggests that instruction should be delivered using familiar interfaces and instruction in the use of the technology is an important part of the technical planning and practices for the projects using online learning environments.

Even those with minimal experience using Internet resources are likely to have sufficient skill to use a number of tools that have been used to deliver instruction in online learning environments. LISTSERVS, which provide subscribers with a method of sending email to all members of a group through one address and using typical email protocols, have been used to facilitate communication among participants in online courses, and the use of the LISTSERV was credited with increasing the interactions among the course participants (Strickland, 2003). Streaming media, which allows users to view video or hear audio through a traditional web browser has been useful for delivering content in online situations where simple text and graphics are not sufficient to convey the idea, or to users who benefit from using more than one sense when learning (Michilich, 2002).

New software technologies are emerging that allow participants to share information and collaborate on projects. Blogging, the term used to describe web publishing using web-based tools (Pyra Labs, 2003), is a method of web publishing that makes it relatively easy for instructors or other participants with little web authoring experience to publish on the web (Baggaley, 2003). Groupware allows individuals access to shared resources in effective ways for instruction, but preparing groupware interfaces

to facilitate meaningful instruction can require a significant amount of work (Wang & Bonk, 2001). Toolkits, in which individuals have access to a common set of templates and other guidelines for designing projects have provided users a framework for defining practical solutions to problems from current classroom practice (Conole & Oliver, 2002)

### Interaction

A range of activities can be classified as online courses. Mason (1998) identified models for online courses that vary according to the quantity of collaboration among participants and in the nature of the collaboration among participants. The model in which the most collaboration occurs is the Integrated Model. Courses aligned with this model include much online discussion and group work, and the Integrated Model includes practices most aligned with student-centered practices or Constructivist practices defined above. Mason suggested that such courses are more valuable than traditional courses for adults seeking new learning in professional areas and attributes the value to the interaction promoted by the model. Pringle (2002) found web-based interactions are generally perceived as a positive component of online learning experiences for the participants, and the interactions increase participant's engagement in the coursework.

In a study of participants in online courses designed with components to promote interaction and components to be completed independently, Picciano (2002) found the level of interaction influenced performance in a positive manner. Participants in online learning environments who demonstrated high levels of activity in discussion boards, reported high levels of presence (the perception that an individual is a member of a community) and that those reporting high levels of presence participated in interactive

components online learning environments. Those who reported low levels of presence participated in interactive components less as well. On tasks requiring participants to demonstrate awareness of new ideas and practices, performance was the same for those who were highly interactive in the course and those who were not highly interactive in the course. On more complex task that required analysis and synthesis of ideas and practices, those who were highly interactive performed better. This higher performance was directly attributed to the participants level of interaction in the coursework.

### Conclusions and Recommendations

The educational communities of southwestern Vermont seem well-suited to utilize online learning environments to provide professional development for teachers and other educators. Schools in the region have access to organizations that can support initial endeavors, the schools have adequate technology to allow connection, and there is an existing culture that supports important professional development activities. Given observation that schools in the region have not made technology planning and training a priority and the observation that top school leaders have not been effective leaders of technology initiatives, important planning must occur if online learning environments are to become a viable option for delivering professional development in the region. In this section, a number of issues that will influence the successful initiation of and sustained implementation of online learning environments for educators in the southwest region of Vermont are considered.

Strong Leaders Must Emerge.

The schools in the region have had little vision and leadership in technology-rich endeavors in the past. Given this history and the importance of leadership to the success of online learning environments, finding effective leaders is vital to the success of initial endeavors. Those individuals providing the leadership must be strong advocates for the endeavors and give strong encouragement to educators to participate, but educators should not feel coerced by the leadership or the tactics. If those currently holding leadership positions in the region are not willing or able to assume the role of one advocating for online initiatives, then planners should seek leaders from other sources who are empowered by school administrators to provide the necessary leadership. Teachers can assume such leadership roles (Crowther, Kaagan, Ferguson, & Hann, 2002) or individuals associated with other organizations (such as the Vermont Institutes or the Teacher Quality Network) can provide this leadership. Leadership is necessary to both initiate and sustain online learning programs in the region.

Accessible Technology Needs to be Identified.

A clear understanding of the technology currently available to educators in the schools of southwestern Vermont is not yet available. Several issues related to the accessibility of technology are not currently well-understood. First, although there are indications that adequate hardware, software, and Internet connectivity is available in most schools, this is not well documented. If teachers are to access the materials delivered via the online programs while at school, then adequate technology is necessary. Second, little is known about the technology that teachers have available at home, or other sites

from which they will participate in online learning activities. Presumably those educators who participate in these online experiences will connect to the learning environments from home or from some site other than school. It is unreasonable to design a learning environment to comply with the technology accessible to the least equipped participants, but it is reasonable for planners to document the system and announce those system requirements so that all can find or arrange for adequate technology at a convenient location.

Third, there is little known about the existing technology skills of those who will participate in the online learning environments. Just as it is unreasonable to design an online learning environment for the individual with the least technology available, it is unreasonable to design online learning environments that are for the most neophyte computer user. It is reasonable, however, to understand the skills characteristic of individual in the target audience prior to designing an online system, and use that as a guideline for designing (find the paradigm term) to ensure the system is generally accessible to potential participants. It is further reasonable and necessary that online learning environment planners include support for those with inadequate skills into the system.

A final unknown about the accessibility of technology is the availability of videoconferencing. Although there are extant videoconferencing systems distributed throughout the region, those systems are in specific locations with some location hosting multiple systems. Although travel to the distributed locations for videoconferencing may make such capabilities more accessible, travel may still inhibit the availability to users from isolated areas of the region.

These uncertain aspects of technology accessibility are areas that will continue to influence the successful implementation of online learning for educators in the region. Once accessible technology is understood for initial projects and instruction is delivered within the limits of accessible technology, planners must assess the efficacy of the delivery so that effective uses of technology are maintained and ineffective are replaced. Ensuring continued use of only accessible technology is vital to sustained professional development programs using online learning environments.

#### Design Online Learning Environments According to Modern Learning Theory.

The goals of the instruction delivered to educators through online learning environments will be to enable teachers to come to deep understanding of pedagogical theory and practice. Such understanding comes when professional development requires and supports the synthesis of ideas, an analysis of practices, and evaluation of the practice once implemented. Such high order understanding of the theory and practice of teaching is facilitated in Constructivist learning environments.

#### Identify Existing Professional Development Programs that can be Converted to Online Delivery.

Schools, school districts, and other organizations in the region are currently offering professional development for teachers based on strategic plans and other state and national initiatives. Because professional development delivered through online systems should continue to address those needs, planners should seek programs that can be converted to online delivery. Criteria for selecting programs to convert should include:

applicability to the broader educational community and expected lifetime of the need. If a number of schools in the region have a need for professional development in a particular area, then those schools can combine resources to develop meaningful online experiences and enroll larger groups of teachers in the programs. By sharing resources in such a way, planners can provide situations in which the expenses can be shared by a larger population; instructors can work with larger a group, decreasing the redundancy of administrative and other tasks necessary to deliver any instruction; and there are more opportunities for collaboration among participants.

Schools seek to address a variety of issues through professional development. Some needs are ongoing, such as the need to train new teachers in the use of local technology, and the need to support teachers as they develop new knowledge in their teaching areas. Other needs are ephemeral. Schools that notice decreasing performance in math (for example) may choose to offer professional development to help teachers become better math teachers, and as the practices become more embedded and math performance improves, the professional development is curtailed in that area. Planners of online learning environments should understand such life cycles and decide which current endeavors are worth the expense of developing into an online system. Planners should seek to convert those programs that will be useful for the longest time to allow maximum return on the funds spent on program development.

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Figure 1. The schools of southwestern Vermont, from Center for Rural Studies (2003)

<u>School ID</u>	<u>Supervisory Union ID</u>	<u>Grades</u>	<u>Enrollment</u>	<u>Student: Computer</u>	<u>Internet Access</u>	<u>Access Type</u>	<u>Teachers</u>
PS284	49	K-8	90	3.7	Yes	Direct Link	7.5
PS029	05	K-6	259	3.8	Yes	Cable Modem	17
PS062	05	K-6	336	DNR	DNR	DNR	25.3
PS175	06	K-8	491	4.8	Yes	Direct Link	38.61
PS085	06	K-8	196	4.9	Yes	DNR	18.05
PA002	00	9-12	510	DNR	DNR	DNR	DNR
PS392	06	K-6	177	5.7	Yes	Direct Link	19.4
PS240	49	K-8	89	5.8	Yes	Direct Link	7.8
PS196	05	9-12	1231	14	Yes	Direct Link	77.3
PS262	05	K-6	239	3.4	Yes	Direct Link	16.8
PS231	05	K-6	308	2.8	Yes	DNR	21
PS293	06	K-6	78	3.1	Yes	Direct Link	7.92
PS197	05	7-8	631	4.9	Yes	Direct Link	48
PS192	05	K-6	136	3.8	Yes	DNR	8.7
PS213	05	K-6	153	9.8	Yes	DNR	13.4
PS188	05	K-6	339	6.8	Yes	DNR	24
PS011	60	7-12	250	DNR	DNR	DNR	29.45
PS354	05	K-6	28	4.5	Yes	Direct Link	63.7
PS109	60	K-6	189	2.4	Yes	DNR	23.2
PS182	38	K-6	55	2.5	Yes	Direct Link	6.64
PS061	04	K-8	531	5.3	Yes	Dial-Up	46
PS256	40	K-2	299	13.7	Yes	Dial-Up	20
PS317	33	K-6	161	4.5	Yes	DNR	23
PS290	36	K-6	38	10.5	Yes	Dial-Up	3.7
PS269	33	K-6	98	5	Yes	Direct Link	14
PS267	51	PK-6	90	7.9	Yes	Direct Link	11.9
PS103	04	K-8	406	3	Yes	Direct Link	36.4
PS230	38	7-12	365	DNR	DNR	Dial-Up	34.83
PS365	40	7-8	388	5.4	Yes	Dial-Up	36.41
PS328	38	K-6	92	5.1	Yes	Direct Link	9
PS300	38	K-6	63	2.8	Yes	Dial-Up	5.07
PS382	40	3-6	752	9.4	Yes	Dial-Up	43.1
PS021	36	K-8	273	4.8	Yes	Direct Link	24
PS031	04	K-8	137	4.6	DNR	Dial-Up	13.3
PS165	36	K-6	255	6.7	Yes	Direct Link	22
PS071	33	K-6	237	9	Yes	Dial-Up	27
PS331	37	K-12	405	5.1	Yes	DNR	40.3
PS183	33	7-12	737	7.1	Yes	DNR	66
PS232	37	K-6	180	4	Yes	Dial-Up	17.3
PS104	04	9-12	580	DNR	DNR	Direct Link	53.2
PS219	36	7-12	744	DNR	DNR	Dial-Up	63.8
PS233	37	7-12	185	3.1	Yes	Direct Link	23.4
PS229	38	K-6	260	8.4	Yes	DNR	22.6
PS198	39	K-6	85	DNR	DNR	Dial-Up	12.3
PS200	36	K-6	396	5.9	Yes	Direct Link	27.3
PS258	37	K-8	437	10.6	Yes	Dial-Up	38.4
PS079	06	K-6	106	3.5	Yes	DNR	14.42
PS253	40	9-12	1066	9.2	Yes	Dial-Up	99.29
PS255	40	K-2	<u>262</u>	DNR	DNR	Dial-Up	<u>20.25</u>
TOTAL ENROLLMENT:			15413	TOTAL TEACHERS:			1342.04

