Teacher Education Programs and Online Learning Tools:

Innovations in Teacher Preparation

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Chapter 4
Virtually Unprepared:
Examining the Preparation of K–12 Online Teachers

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ABSTRACT

At present, there are very few examples of the preparation of teachers for the online environment in teacher education. Even more unfortunate is that less than 40% of all online teachers in the United States reported receiving any professional development before they began teaching online. While some virtual schools provide some training to their own teachers, in most instances, no such training is provided to the school-based personnel. This is unfortunate, as K-12 student success in online learning environments require support from both the online teacher and the local school-based teacher. Clearly, there is a need for teacher education programs to equip all teachers with initial training in how to design, deliver, and – in particular – support K-12 online learning. This chapter begins with an examination of the act of teaching online and how that differs from teaching in a face-to-face environment. Next, the chapter describes existing teacher education initiatives targeted to pre-service teachers (i.e., undergraduate students) and then in-service teachers (i.e., graduate students). This is followed by an evaluation of current state-based initiatives to formalize online teaching as an endorsement area. Finally, a summary of the unique aspects of teaching online and how some initiatives have attempted to address these unique skills, before outlining a course of action that all teacher education programs should consider adopting.

INTRODUCTION

In the United States, the first K-12 school to begin using online learning was the private Laurel Springs School in California around 1994. This was followed by the Utah eSchool in 1994-95, which primarily used a correspondence model, but did offer some online courses (Barbour, 2009). In 1996-97, the Florida Virtual School (FLVS) and Virtual High School Global Consortium, which were created using state or federal grants, came into being (Clark, 2007). At the turn of the millennia, Clark (2001) estimated that there were between 40,000 and 50,000 virtual school enrolments. Almost a decade later, Picciano and Seaman (2009) indicated that there were over 1,000,000 students enrolled in online courses, while Watson, Murin, Vashaw, Gemin, & Rapp (2010) reported significant online learning activity in 48 states, and the District of Columbia. In 2006, Michigan became the first state in the US to require that all students complete an online learning experience in order to graduate from high school (a move that has been followed by other states, such as New Mexico, Alabama and Florida). Finally, some have gone so far to predict that the majority of K-12 education will be delivered using online learning by the year 2020 (Christensen, Horn & Johnson, 2008).

Wood (2005) stated there was a "persistent opinion that people who have never taught in this medium [i.e., online] can jump in and teach a class, [however], a good classroom teacher is not necessarily a good online teacher" (p. 36). Roblyer and McKenzie (2000) indicated that many of the factors that make a successful online teacher, such as good communication and classroom organization skills, were similar to those for any successful teacher, yet Davis, Roblyer, Charania, Ferdig, Harms, Compton and Cho (2007) discovered "effective virtual teachers have qualities and skills that often set them apart from traditional teachers" (p. 28). Some of the skills necessary for teaching in an online environment are consistent with those provided by traditional teacher education programs, but there are other necessary skills that are largely absent (Davis & Roblyer, 2005).

At present, there are very few examples of the preparation of teachers for the online environment in teacher education. Even more unfortunate is that Rice and Dawley (2007) found that less than 40% of all online teachers in the United States reported to receiving any professional development before they began teaching online. While some virtual schools provide some training to their own teachers, in most instances no such training is provided to the school-based personnel. This is unfortunate, as Aronson and Timms (2003) indicated that K-12 student success in online learning environment required support from both the online teacher and the local school-based teacher. Clearly there is a need for teacher education programs to equip all teachers with initial training in how to design, deliver, and – in particular – support K-12 online learning.

This chapter begins with an examination of the act of teaching online and how that differs from teaching in a face-to-face environment. Next, we describe existing teacher education initiatives targeted to pre-service teachers (i.e., undergraduate students), and then in-service teachers (i.e., graduate students). This is followed by an evaluation of current state-based initiatives to formalize online teaching as an endorsement area. Finally, we summarize the unique aspects of teaching online and how some initiatives have attempted to address these unique skills, before outlining a course of action that all teacher education programs should consider adopting.

EXAMINING ONLINE TEACHING

Many of us can think of instances where we thought poorly of our professor's ability to teach. Perhaps it was due to poor preparation, a lack of content knowledge, or an inability to explain complex

concepts in terms a novice could understand. In other instances, we have all had excellent teachers who motivated us to do our best and helped us get through a class that we never thought we could. Currently, more and more people are able to say the same thing about their online teachers. Some of us have had excellent online instructors and some of us have had horrible online instructors.

Students enrolled in online courses encounter a variety of formats for delivery of instruction (Kaseman & Kaseman, 2000), and thus the skills required of teachers will vary. In the independent model of instruction, students are primarily self-taught, progressing through the content at their own pace and completing much of the work offline or through database-driven online systems. Students will take assessments throughout the course, but there is little in the way of feedback from the instructor. In this delivery model the teacher has little interaction with the student, and therefore does not need much in the way of communication skills. In this case, unless the course is prepackaged, the teacher needs to be skilled in the technical aspects of delivery and the organization of the course.

In an asynchronous course, students work through the content when it is convenient for them. Asynchronous courses have little to no live or real-time interaction with an instructor. However, that does not mean that there is no communication between the teacher, student, and classmates (Zucker & Kozma, 2003). Teachers need to provide feedback on assignments, and students must often interact with one another via discussion boards or group assignments (Friend & Johnston, 2005). However, unless the student is taking an asynchronous course with classmates in a brick-and-mortar school, the potential for student isolation is still present. Therefore, online instructors in an asynchronous environment must be able to provide opportunities for interaction when convenient for the student, provide authentic feedback without ever coming in direct contact with the student, and be able to monitor students

who are becoming isolated from the rest of the class.

In a synchronous course, students interact with the teacher and other students in real time; they are separated by distance but come together during regularly scheduled periods. One could consider the courses to simply be traditional courses mediated by technology (Barbour, 2011). Synchronous courses are the most similar to traditional face-to-face courses, although the course may have both synchronous and asynchronous elements. Instructors must have the capabilities to effortlessly work with the new communication technology and be able to integrate synchronous activities with any asynchronous events or discussions that occur when the class is working offline.

On the surface, it would appear that the skills required for teaching online are quite similar to those for teaching in a traditional format. Teachers in both environments must carry out procedural duties (e.g., grading and attendance), provide students with feedback, manage behavior, and cater to the needs of both low-achieving and high-achieving students. Davis and Niederhauser (2007) discussed several similarities between the skill sets of online and face-to-face teachers, among them the ability to stay organized and to communicate effectively with students. In fact, Davis and Rose (2007) found that most online teachers teach in the way that they were once taught, and they transferred their teaching style to the online realm. However, to simply say that the skill sets are exactly the same would be incorrect.

Several problems exist with defining the skill set necessary for successful online teaching. The first problem is obviously identifying those skills. Easton (2003) stated that online instructors needed advanced skills in the management of instructional activities and assessments, as well as stronger engagement skills. In a traditional classroom, all of the students are in one area and can interact with one another based on proximity. In an online environment, the experiences must be engineered so that students separated by both space and time

can have engaging interactions with one another. Morris (2003) believed that online instructors needed to be tech-savvy and have a genuine excitement for teaching in the online environment. Instructors also needed to be very familiar with the curriculum. The technical acumen and excitement could be helpful in overcoming technical problems with a content management system and the loss of enthusiasm that could arise when the problems are frequent.

The second problem is validating through research whether such skills are truly unique to online instruction. The aforementioned skills are based primarily on anecdotal evidence, and much of the research that has been done on essential skills has been narrow in scope (Harms, Niederhauser, Davis, Roblyer & Gilbert, 2006). Clearly more research is needed in this area to validate which skills are essential to teaching online. Without strong empirical research backing principles of online instruction, teacher preparation programs may do more harm than good by teaching pre-service teachers faulty methods for teaching courses online.

The third problem is translating this knowledge into training for pre-service and in-service teachers, as it appears that online instruction will be an inevitable part of teachers' duties in the future. Smith, Clark, and Blomeyer (2005) found that only about one percent of K-12 teachers have been trained to teach online. Barbour (2011) stated that most online teacher training is gained through professional development, and this professional development is mainly focused on the technical aspects of a content management system rather than pedagogy.

The training for online teachers is only one aspect of the success of online learners, since more than one person is often responsible for all of the different aspects of delivering online curriculum. The instructor may not have designed the course, and thus online course designers must be able to create quality online courses rather than simply digitize materials from a traditional

course. Collis (1999) and Barbour (2007) provide design principles for online courses. In addition to the instructor, another adult is often involved in the monitoring the student (Davis & Niederhauser, 2007). This facilitator is often located at the student's physical school. Research involving the role of the on-site support teachers (Roblyer, Freeman, Stabler & Schneidmiller, 2007) showed that based on surveys of online teachers, the most frequently reported problems concerned the facilitator's ability to monitor student progress. Because of the importance of these facilitators to the success of students, the skills necessary to be a successful facilitator need to be researched and distilled into teacher education programs. In the following two sections, we will look at attempts to prepare teachers on the skills necessary to design online learning, teach online or support students learning online.

EXISTING PRE-SERVICE TEACHER EDUCATION INITIATIVES

Existing pre-service teacher education initiatives for future teachers that attempt to support K-12 online learning are faced with a variety of challenges such as a lack of research and few models to guide their development. Other critical barriers to effective pre-service K-12 online learning teacher education arise from constrictive geographic regulations around the teacher certification process that vary from state to state. Such policies and procedures are more suited to traditional brick and mortar environments and complicate the reach of K-12 online learning's broad development. It is generally agreed that teacher education is currently unprepared for the burgeoning demand for K-12 online learning (Kennedy & Archambault, 2011). Given such consensus, how has pre-service teacher education prepared teachers for K-12 online learning? In this section, we will examine how a small number of universities have attempted to prepare their students for K-12 online learning

their pre-service teacher education initiatives. This discussion is not exhaustive, but is fairly representative of the initiatives underway (and is pretty close to an exhaustive listing).

Teacher Education Goes into Virtual Schools (Iowa State University)

Iowa State University, in collaboration with the University of Florida, the University of Virginia, Graceland University and Iowa Learning Online, developed the Teacher Education Goes Into Virtual Schools (TEGIVS) project; the first comprehensive attempt at designing a national model for pre-service teacher education with an emphasis on K-12 online learning. The TEGIVS project sought to identify and develop online teaching competences that would be valuable for all K-12 teachers to support K-12 online learning in the traditional setting, to develop tools that permitted engagement with K-12 online learning practices from multiple perspectives (e.g., the online student, the online teacher, the online course developer, and local school site facilitator), and, ultimately, to build a national community of K-12 online learning practice amongst peers who might constructively critique and challenge the model (Davis et al, 2007).

The Iowa State University model for implementing the actual K-12 online learning training took on various formats within four pre-service teacher education degree programs in four different states (i.e., Iowa, Florida, Virginia and Missouri):

- Secondary lab & lecture (4 hours of training)
- Elementary lab & lecture (4 hours of training)
- Theme within course on distance education (45 hours of training)
- Unit in instructional design course (12 hours of training)

- Theme within a regular methods course (12 hours of training)
- Field experience in a K-12 online learning program (5-24 hours of training) (Davis, 2007)

The variation that occurred in the way each of the pre-service teacher education programs integrated the K-12 online learning curriculum was welcomed by design as researchers sought to gather data on the effectiveness of these varying models.

Field experience in an actual classroom is a foundation in pre-service teacher education programs in North America.

"The field experience in Iowa matched two pre-service teachers with one virtual school teacher. The pre-service teachers were enrolled in a one-credit course that allowed them to work with the virtual school teacher via guided observation and with the online K-12 students via virtual interactions. Pre-service teachers used reflection journals, discussion forums, and interviews to reflect on their practicum experience. Through the study and their involvement in the virtual school field experience, the pre-service teachers experienced a growth of understanding about virtual schooling and formed new personal theories regarding K-12 online learning." (Kennedy & Archambault, 2011)

The Iowa State University model attempted to offer an authentic field experience in a K-12 online learning environment to provide these pre-service teachers the opportunity to be mentored by a teacher comfortable with facilitating learning in this new environment.

While federal funding for the TEGIVS project spanned from 2004-2007, TEGIVS's K-12 online learning lab tools still serve to encourage pre-service and existing teachers to reflect on these topics even as technological tools advance and public policy changes (see http://ctlt.iastate.

edu/~tegivs/TEGIVS/homepage.html). These TEGIVS tools allow pre-service teacher to explore archived scenarios around issues of Internet safety, cheating, and assisting students who cannot take a class due to an illness or even their location are addressed; use a tour tool for observations, and offer a discursive portfolio tool for supervision and mentoring. Likely the greatest impact of TEGIVS is the continued availability of these curriculum materials that can be used as a model for future initiatives. However, as others use these materials, Demiraslan-Cevik (2008) advised them "to help yourself to our resources and adapt them to the ecology of your program, while also forming partnerships with Virtual Schools that parallel those you have with traditional schools" (p. 11).

Student Teaching Partnerships (Florida Virtual School)

Long before K-12 online learning's mass appeal as an educational delivery option, FLVS was providing online opportunities for students in Florida. The success of FLVS's K-12 online learning activities placed the organization in a prominent place to affect change in teacher education programs in that state. Unlike TEGVIS and other universities who struggle with the challenge of identifying K-12 online learning environments to have authentic experiences for their pre-service teachers, this partnership involves pre-service teachers directly with online instruction. In the Fall 2008 the University of Central Florida (UCF) formed a partnership with FLVS to establish a pre-service student teaching internship that aligned to the Florida Educator Accomplished Practices (i.e., state teacher benchmarks for teacher education), National Council for Accreditation of Teacher Education's Unit Standards, and International Association for K-12 Online Learning's National Standards for Quality Online Teaching. UCF's virtual teaching internship – and more recently the University of South Florida since 2010 – provides

an option to education majors to complete their student teaching in this innovative environment.

According to Beth Miller, Outreach/Partnerships manager with FLVS, the virtual pre-service interns are paired with lead or cooperating teachers (i.e., certified teachers employed by FLVS) and share in the responsibility of teaching high school students who are enrolled in FLVS courses. The experience parallels the traditional brick-and-mortar internship, with the main difference being that instruction occurs online and not in the traditional school setting. Pre-service interns plan lessons, communicate with students, and assist with assessment of learning, supervised by a university professor and the FLVS lead teacher. Pre-service interns are required to report to a computer lab at their university for observations by their university professors. Additionally, FVLS uses technology to monitor student teachers' work in much the same way that student teachers mentor the work of their FLVS students' work. Finally, feedback is ongoing between the FLVS administration, the lead teacher and pre-service intern in a variety of ways. The program is designed to meet accountability concerns, so at any time the university or FLVS can demonstrate quality assurance through artifacts and data around the activities that the student teacher has undertaken. Given a structured approach to curriculum planning, lead teachers know exactly what to do each week and student teachers are required to create products (e.g., slide presentations, reflective journals, etc.) to demonstrate their time on task.

The focus of the virtual teaching internship experience is for pre-service teachers to develop transferable skills, pedagogical strategies and perspective to their future teaching career – in either online or the traditional classroom environments. Talking with parents, providing feedback on graded assignments, deep content knowledge for effective multi-student differentiation, technology skills, and time management are practical transferable skills essential for either setting. We

can assume that the desire to have a separate online student teaching experience is based on Davis et al.'s (2007) premise that "effective virtual teachers have qualities and skills that often set them apart from traditional teachers" (p. 28). This would be further supported by Davis and Roblyer's (2005) assertion that some of the skills necessary for teaching in an online environment are largely absent from traditional teacher education programs.

Online Teaching Course and Practicum (Queen's University)

In addition to the growth K-12 online learning has experienced in the United States, K-12 online learning is also used in similar ways and at comparable levels in Canada (Barbour, 2010). For the past 25 years, Queen's University has had at least one elective course on using computers or information and communications technology (ICT) in teaching and learning. In early 2006, Dr. Geoffrey Roulet – in response to increased web-based instruction by some teachers and school boards as well as the development of online courses by the Ministry of Education – submitted a proposal to create a new elective course entitled "Teaching and Learning Online," described in Table 1.

This course had two goals:

1. Using online tools and resources to enhance classroom based education
2. Teaching online

The purpose of the course was to address the interests and needs of pre-service teachers who desired employment as developers and teachers of online courses and those who aspired to employ online activities in combination with classroom based instruction. The course was approved and taught for the first time during the 2006-07 academic year; however, enrollment was restricted to pre-service teachers in the intermediate-senior (i.e., grades 9-12) program.

According to Roulet's course outline (syllabus) for 2009-10, the course:

"aimed to critically examine present and proposed uses of the Internet/Web in teaching and learning; to collaboratively construct images of what effective online learning could be; and to increase understanding and skills related to the development, presentation, and delivery of online content and learning resources."

Beyond the formal course content, students also participated in an online teaching practicum. During these practicums, many of the participating online teachers were themselves in the initial stages of online teaching careers, and welcomed assistance from these Queen's University students with the design of web-based learning environments and online interaction with their own students.

Teaching and Learning Online was a half credit course, meaning that the course ran throughout the full academic year (i.e., September to April). Additionally, there was a three-week practicum requirement. Dr. Roulet indicated that enrollment in Teaching and Learning Online was generally low, but sufficient to make the course viable from the 2006-07 academic year to the 2009-10 aca-

Table 1. Course description for Teaching and Learning Online

FOCI 291: Teaching and Learning Online
Candidates explore the organization of curriculum and course content for online presentation, construction of learning objects, leading and moderating online discussions and the development of course websites. Course sessions involve classroom meetings and synchronous and asynchronous online interaction. During alternative practicum placements, candidates work with teachers designing and leading online courses or with classroom teachers building learning objects and course websites. http://www.queensu.ca/calendars/education/Program_Focus__FOCI_.html

demic year. However, in the 2010-11 academic year the course was dropped from the schedule due to low enrollment. The course will again not be run in 2011-12, and with Dr. Roulet's impending retirement it is likely that the course may not be offered in the immediate future. When asked why student interest in the Teaching and Learning Online course began to wane, Roulet attributed it to:

"[a] general attitude towards ICT…students have considerable experience with ICT, but largely in the social domain. They have not generally used ICT for intellectual activities other than possibly looking for information on the Web. Thus, students see limited potential for ICT use within education and feel that they have sufficient skills to employ the Web in the ways they imagine using it in a class."

Roulet's assessment is consistent with the sentiments expressed by Davis and Rose (2007), who believed that most online teachers teach in the way that they were once taught, simply transferring their teaching style to the online environment.

Defunct Diploma in Rural and Telelearning (Memorial University of Newfoundland)

Prior to Dr. Roulet's course, the Centre for Tele-Learning and Rural Education acted as a catalyst in the Faculty of Education at Memorial University of Newfoundland for research and development with a special focus on small schools in rural and remote communities in the Canadian province of Newfoundland and Labrador. In the mid- to late-1990s, there was considerable interest in rural schools and solutions to teaching in rural multi-grade classrooms as the majority of schools in the province of Newfoundland and Labrador are rural. Then Chair and Managing Director of the Centre, Dr. Ken Stevens and Mr. Wilbert Boone, initiated the program for Telelearning and Rural Education (Brown, 2000). According to Dr. Jean

Brown, a Professor of Education at Memorial involved in the Centre:

"The first thought was that we would develop a graduate program. However, the Associate Dean of Graduate Studies at the time did not support it. Without her support, it was felt we would not be successful in getting the program through Faculty Council and the Academic Council of Graduate Studies within the university. Reluctantly, we decided to develop an after-degree undergraduate diploma. The Associate Dean (Undergraduate Studies), although not a strong supporter, did not oppose it. Mr. Boone had been successful in obtaining external funding for the development of this Diploma, so we moved ahead with it. In hindsight, that was a mistake. Teacher Certification would permit this diploma to count towards a fifth teaching grade, but to obtain a sixth or seventh teaching grade, a Master's Degree was required. Many teachers already had a fifth teaching grade as they held two undergraduate degrees (a B.A. or B.Sc. plus a B.A. (Ed) or B.Ed). That being the case, there was no real incentive for them to do the Diploma. Rather, if continuing their education, they would be wiser to complete a Master's degree."

However, in 1999 the Diploma in Telelearning and Rural School Teaching program was officially launched for teachers already holding a Bachelor of Education degree to better prepare them for teaching in small rural or remote schools in Newfoundland, as well as other jurisdictions.

The program ran from around 2000-01 until at least 2003-04. The diploma comprised of 10 courses (i.e., 6 core courses and 4 electives from a list of 11 possible courses). Of the electives that students could take, there were options for them to participate in a three week, six week, or nine week field-based experience in a rural school environment that may or may not have included as distance education or telelearning component (See Table 2).

Table 2. Diploma in telelearning and rural school teaching program

Core Courses
ED4900: TeleLearning in a Rural School Intranet
ED4901: Effective Teaching Strategies for Multi-grade/Multi-age Classrooms
ED4902: Special Needs in the Context of Rural Schools
ED4903: Leadership Perspectives in Rural Schools
ED4904: Contemporary Educational Issues in Rural Schools
ED4905: Resource-based Learning in the Context of Rural Schools
Elective Courses
ED4906: Career Development in the Context of Rural Schools
ED4907: Curriculum Connections in Multi-grade/Multi-age Classrooms
ED4908: Rural Schools and Community Relationships
ED4909: Rural Schools as Community Learning Centres
ED4910: Curriculum Implementation in All-grade Rural Schools
ED4911: TeleTeaching in a Virtual Classroom
ED4912: Student Assessment in the Context of Rural Schools
ED4916: General Classroom Music
ED4920-4930: Special Topics in TeleLearning and Rural School Teaching
ED4920: Literacy in Small Rural Schools
ED4921: The teaching of Art in Small Rural Schools
Field-Based Experience
ED4913: Field-based Experience in a Rural School (TeleLearning) – 3 weeks
ED4914: Field-based Experience in a Rural School (TeleTeaching) – 6 weeks
ED4915: Field-based Experience in a Rural School (Multi-grade/Multi-age Classroom) – 9 weeks (Memorial University of Newfoundland, 1999)

All of the courses were web-based and supported through CD-ROM for those with limited Internet access.

Regrettably, very little promotion of the program occurred within the province, and no attempt to promote the program outside the province started the demise of the diploma program. Initially 21 potential teachers expressed interest, but only 11 of them actually registered. Further, after the Dean at the time moved to another university, support for the diploma was limited among senior administration. Even within the faculty, some believed the program was not needed because there was a lack of research to support it, while others argued that K-12 distance learning should be integrated in the existing courses currently offered. Upon reflection, this example served to underscore the belief that existing pre-service teacher education initiatives for future teachers and educational leaders require wide-spread support within a faculty if implementation is to be successful – particularly when such programs are ahead of their times, such as this Diploma in Rural and Telelearning was in 1999.

Summary of Pre-Service Teacher Education Initiatives

Partnerships between K-12 online learning programs and universities are essential to the development of effective pre-service teacher education programming. Driven by public demand – and

necessity in some instances – pre-service teacher education initiatives that support K-12 online learning are being given increased attention by universities and state Departments of Education. While the duration, quality and availability of these programs vary, the pioneering efforts of the universities discussed in this section have succeeded in beginning an ongoing process of informing and reforming pre-service teacher education initiatives for the demands of this relatively new method of educational delivery.

We believe that K-12 online learning must not simply be an instructional add-on to existing pre-service teacher education programs. The time has come for pre-service teacher education programs to ensure that K-12 online learning is pervasive throughout the undergraduate experience to allow for each teacher to be prepared to fill the roles of online course designer, online teacher and local site facilitator. Regrettably, advances or developments in pre-service teacher education emphasizing K-12 online learning as a course or field experience, such as those described in this section, have been largely reactionary. Clearly more work is needed

EXISTING IN-SERVICE TEACHER EDUCATION INITIATIVES

In much the same way that there are few examples of pre-service teacher education initiatives related to K-12 online learning, the number of examples of in-service teacher education programs are also quite small. The existing initiatives that are targeted to in-service teachers tend to focus on universities that offer graduate level certificates in online teaching with some kind of K-12 focus and/or universities that offer in-service teachers the opportunity to gain an endorsement to their existing teacher certification. The graduate certificates that are offered to educators who would like to learn more about how to teach in an online environment range from certificates that are part of a graduate curriculum and, in some instances,

can be used towards a Master's degree to certificates offered by continuing education divisions to certificates offered by K-12 online learning programs that have partnered with universities. We begin this section with a brief look at each of these kinds of certificates, along with what classes and experiences are included in each.

Graduate Certificates in Online Teaching

There are a number of universities that offer certificates to educators for online learning. Generally, the certificates are not limited to K-12 educators, rather these certificates are offered to trainers in industry and higher education instructors who find themselves in a situation that requires online teaching. To date, those universities that offer training that is part of a graduate curriculum include: Arizona State University, Boise State University, University of Central Florida, University of Florida, University of Wisconsin-Stout, and Wayne State University. The certificates generally follow a similar pattern: the in-service teacher must take three to five courses, generally the courses must be taken in sequence, there may or may not be elective courses, and the certificate may or may not have some form of field experience (see Table 3 and Table 4 for the variations in the different programs).

Most of the courses in these graduate certificates can be used towards a Master's degree in educational or instructional technology. The exception is the University of Central Florida, where students in the Master's Degree in Instructional Design and Technology can choose between an educational technology track, an instructional systems track or an e-learning track.

In addition to the variety in the length and nature of these certificates, there is also a great deal of variety in their course offerings. For example, almost all the aforementioned graduate certificate programs offer a course in online teaching methodology and most also offer a course in online course

Table 3. Summary of graduate certificate programs

University	Number of Courses	Nature of Program	Nature of Courses	Field Experience	Other
ASU	5	3 core courses 1 of 4 electives practicum	K-12 focus	Yes	
BSU	3	3 core courses 1 of 4 electives	K-12 track	No	
UCF	9	5 common courses 4 specialized courses	K-12 content	Optional	Leads to M.A.
UF	3	3 of 4 courses	K-12 content	Optional	Currently on hold
UWS	5	4 core courses practicum	K-12 content	Yes	Meets state's online PD requirement
WSU	5	2 core courses 2 of 6 electives practicum	K-12 track	Yes	

Table 4. Summary of course offerings in graduate certificate programs

University	Required	Elective	Field Experience
ASU	1. Principles & Issues in K-12 Online Learning 2. Methods of Online Teaching 3. Online Course Design	One of: 1. Technology Integration Methods 2. Using the Internet in Education 3. Emerging Technologies 4. Technologies as Mindtools	Practicum
BSU	1. Online Teaching in the K-12 Environment 2. **Advanced Online Teaching Methods**	One of: 1. The Internet for Educators 2. Online Course Design 3. Teaching & Learning In Virtual Worlds 4. Educational Games & Simulations	
UCF	1. Current Trends in Instructional Technology 2. Research in Instructional Technology 3. Measurement & Evaluation OR Statistics for Educational Data 4. Fundamentals of Graduate Research in Education 5. Instructional System Design	All of: 1. Multimedia for Education & Training 2. Distance Education 3. Interactive Online & Virtual Teaching Environments 4. Virtual Teaching & the Digital Educator	
UF	1. Instructional Design 2. Distance Online Teaching & Learning	1. Design & Development of Online Content 2. Virtual Schools Philosophy & Pedagogy	
UWS	1. E-Learning for Educators 2. Assessment in E-Learning 3. Instructional Design for E-Learning 4. Creating Collaborative Communities in E-Learning		E-Learning practicum
WSU	1. Facilitation of Online & Face-To-Face Learning 2. **Foundations of Distance Education**	Two of: 1. Designing Web Tools for the Classroom 2. Internet in the Classroom 3. Web-Based Courseware Development 4. Multimedia for Instruction 5. Advanced Multimedia for Instruction 6. Learning Management Systems	Practicum in Instructional Technology

design. The majority of these graduate certificates include a course in either the foundations or trends in distance education and/or in online learning. Several of these certificates also include a course in instructional design.

While there is some consistency in the nature of core courses offered in these graduate certificates, there are few similarities in the elective courses. Those certificates that offer students some choice range from courses in multimedia to emerging tools such as gaming and virtual worlds to learning management systems to courses that are part of the core requirements of some of the certificates (e.g., online teaching and online course design) to a wide range of courses typically found in a graduate program in educational or instructional technology.

Beyond a certificate approved by the School of Graduate Studies at each of these institutions and the ability to apply some or all of the credits towards a Master's or Educational Specialists, in some instances these programs also lead to additional credentials. For example, the three courses in the certificate at Boise State University can be used towards the seven-course online teaching endorsement program that was only announced by the university in August 2011. Similarly, the three of the five courses in the certificate at Wayne State University can be used towards the six-course endorsement in Educational Technology offered by the State of Michigan. In Wisconsin, as of July 1, 2010, "no person may teach an online course in a public school, including charter school, unless he or she has completed at least 30 hours of professional development designed to prepare a teacher for online learning." (State of Wisconsin, 2010). The graduate certificate at the University of Wisconsin-Stout allows teachers to meet this requirement.

Continuing Education Certificates in Online Teaching

In addition to graduate certificates offered by academic departments, there are a couple of examples of graduate certificate programs that are offered by Continuing Education or Extension divisions within the university environment. There are two examples that have a K-12 focus: California State University, East Bay and University of California-Irvine. While both of these universities have a K-12 focus, they also invite instructors from many different backgrounds (e.g., K-12 teachers, military and corporate trainers, community college faculty, continuing education or in-service facilitators, and educators interested in educational technology).

Both certificates include four courses, although these are not identical (see Table 5).

Similar to the graduate certificates offered by academic departments, both of these certificates offer courses in the foundations or trends in online or virtual learning and in online teaching, and one of them offer a course in online course design. Interestingly, the University of California-Irvine

Table 5. Summary of continued education graduate certificates

University	Courses	Field Experience
CSU	1. Introduction to Online Teaching and Learning 2. Teaching Models for Online Instruction 3. Technology Tools for Online Instruction 4. Designing Curriculum for Online Instruction	No
UCI	1. Foundations of Virtual Instruction 2. Advanced Instructional Strategies 3. Performance Assessment in the Virtual Classroom 4. Virtual Teacher Practicum	No

includes a course in assessment (and the University of Wisconsin-Stout is the only other university to include such a course).

The courses included in these certificates are not traditional fifteen week, semester long courses that one would expect to find at a typical university. The courses offered by California State University, East Bay are six weeks in length, while the courses offered by the University of California-Irvine are twelve weeks in length. The certificate courses at the University of California-Irvine do not naturally lead to graduate credits at the university or other universities. This is not to say that other universities will not accept these courses, but that the University of California-Irvine's Extension Division has yet to establish any articulation agreements with other institutions. It is up to the individual university to which the student may be interested in transferring as to whether they will accept the credits. However, the certificate courses from California State University, East Bay are designed to provide a grounding for students who wish to pursue a Master of Science in Teaching program with an option in online teaching (MS-OTL).

Virtual High School Global Consortium Certificate

In much the same way that the FLVS has partnered with universities to better prepare teachers for K-12 online learning, the Virtual High School Global Consortium (VHS) also has long standing relationships with several universities. Since its inception, VHS has offered its own six-week professional development courses as a part of its 21st Century Teaching Best Practices series:

- 21st Century Teaching and Learning explores the tools to teach using technology
- Web-enhanced Classroom explores ways traditional teachers can enhance their practice using web-based tools

- Online Extended Teaching shows teachers how to promote independent study using web tools
- Web 2.0 Collaborative Instruction shows teachers how to use Web 2.0 tools to enhance the learning experience for students
- Becoming an Online Teacher is a practicum experience for teachers to partner with and experienced online teacher

For most of that history, VHS has had partnerships with various universities to allow teachers who complete these professional development courses to obtain graduate credit. These universities include Endicott College (Beverly, MA), Plymouth State University (Plymouth, NH), Framingham State College (Framingham, MA), Northwest Nazarene University (Nampa, ID), Salem State College (Salem, MA), and North Dakota State University (Fargo, ND). Essentially, teachers can pay an additional fee to the participating institution and receive two to four graduate level credit hours depending on the course. Additionally, the VHS has partnered with the Van Loan School of Graduate and Professional Studies at Endicott College and the College of Graduate Studies at Plymouth State University to allow teachers who have completed all five of the VHS courses to achieve a Graduate Certificate in Online Teaching and Learning.

Summary of In-Service Teacher Education Initiatives

At present there are many opportunities for K-12 educators to increase their knowledge, skills, and practice when it comes to classroom instruction. However, this does not hold for their opportunity to increase their ability to design, deliver and support online instruction. Certificates for online teaching often encompass not only K-12, but also the larger field of online learning (including higher

education, corporate, and military environments). While some of these certificate programs may be applied for graduate credit towards a Master's of Educational technology degree, in most states there is no standard or endorsement for online teaching.

This lack of standardization has led to a great deal of inconsistency between programs. Of the existing programs, some are three courses, some are four courses and some are five courses. Some provide a field experience in a K-12 online learning program, others simply provide a field experience in any online learning environment, while some have no field experience at all. Most certificate programs do offer courses to provide insights on methodology and trends in the field of online learning, along with courses in online pedagogy and course design. Most also offer instructional design principles as part of the course offerings.

Beyond the graduate certificate programs, there are also certificates that have been created by the extension departments of some universities. In states where there is no teacher certification endorsement for online teaching, these extension programs offer little more than a glorified professional development experience. In fact, at least one K-12 online learning program has taken it upon itself to elevate its own professional development offerings by partnering with several universities. These professional development courses are similar in nature to the professional development provided by numerous other K-12 online learning programs, and the partnerships to receive graduate credit hours from a variety of universities and even a graduate certificate from some university does not equate to the rigor one would expect to find in a traditional semester-long graduate level university course. Simply put, the opportunities for in-service teachers to become better acquainted with the design, delivery and support of K-12 online learning may be greater than they are for pre-service teachers. However, those opportunities vary considerably in the nature of the experience an in-service teacher will receive.

ONLINE TEACHING ENDORSEMENT INITIATIVES

A number of states have brought the practice of online teaching and learning in the K-12 arena to the attention of the legislature. Beyond the 2010 Wisconsin bill in 2010 that required teachers to have a minimum amount of professional development in order to teach online, several states have introduced some form of endorsement to their teaching certification for online teaching. The earliest adopter of this endorsement was Michigan, followed by Georgia and then Idaho. The purpose of these endorsement initiatives has been to ensure that teachers who teach via distance have prepared for and understand the online environment (Michigan Department of Education, 2008). There are a few universities around the country that offer programs that lead to these endorsements, which we will examine in this section, followed by a discussion as to whether there is specific a need to have endorsements for online teaching.

Michigan: Educational Technology (NP) Endorsement

Michigan's educational technology endorsement initiative began in 2000 by a group of professional educators. After review by various groups and school districts, the State Board of Education (SBE) made the recommendation that "all educators and administrators will be prepared to use information-age tools and learning techniques and processes" (Michigan Department of Education, 2008, p. 5). In addition, it was believed that, in order to denote those teachers who had greater skill and study in the area of the use of technological expertise should be given some sort of recognition that they indeed are highly qualified in this area. The original educational technology endorsement was based on 15 standards in three thematic areas that were measured by 93 performance indicators. However, by 2006 the legislature passed a bill

that required students to have an online learning experience in order to graduate from high school. This necessitated an update to the educational technology standards.

The revised educational technology standards included 19 new standards measured by 84 performance indicators under an additional three thematic areas.

- **Online Technology Experience and Skills:** Program will prepare Candidates to participate in an online learning experience and demonstrate knowledge and use of an online learning management system(s), adapt online tools to support effective online instruction, understand internet safety issues as well as knowledge of social, ethical, legal, and human issues surrounding the use of educational technology in online teaching and learning, and be able to apply to principles and practice as they relate to technology experiences and skills.
- **Online Course Design:** Professional studies in online course design prepare Candidates to demonstrate knowledge and understanding of pedagogical issues related to teaching and learning in an online environment, and develop and implement curriculum plans aligned with State content standards that include methods and strategies for applying educational technology to maximize learning in an online environment. Professional studies in online course design prepare Candidates who are certified experts in the content subject area being taught, to demonstrate their knowledge and understanding of how to develop, design, and implement strategies that encourage active learning, interaction, participation, and collaboration in the online environment. Professional studies in online course design prepare candidates to demonstrate knowledge about effective online course design with knowledge and understanding of issues related to accessibility and adaptive technologies. Finally, professional studies in online course design prepare candidates to demonstrate knowledge of social, ethical, legal, and human issues surrounding the use of educational technology teaching and learning as it applies to online course design.
- **Online Course Delivery:** Professional studies culminating in the educational technology endorsement prepare candidates to demonstrate knowledge and understanding of: best practices for online delivery of instruction, effective online course technology management, appropriate online assessment and measurement techniques and tools, modeling, moderation and facilitation skills for appropriate online communication with timely feedback, and thoughtful accommodation of student's special needs in an online environment. Professional studies culminating in the educational technology endorsement prepare candidates to facilitate collaboration and incorporate teaming activities in the online environment informed by knowledge of social, ethical, legal, and human issues surrounding the use of educational technology and can apply to principles and practices in teaching and learning as it relates to online course delivery. (Michigan Department of Education, 2008, pp. 21, 24, 30)

At present there are 12 universities throughout the state that offer programs leading to the educational technology endorsement, and in most instances students can use those courses towards a Master's degree or Educational Specialists Certificate in educational or instructional technology.

Georgia: Online Teaching Endorsement

Georgia was the first state in the United States to have a specific endorsement in online teaching. The criteria for this endorsement are that the teacher must already hold certification in qualifying areas, and that the teacher must have an online practicum before being awarded the endorsement. In addition, the awarding institution must follow guidelines that include the following three thematic areas:

1. Content Knowledge, Skills, and Concepts for Instructional Technology
2. Online Teaching and Learning Methodology, Management, Knowledge, Skills, and Dispositions
3. Effective Online Assessment of Teachers, Students and Course Content

Within these three thematic areas there are 10 different standards and 57 competencies.

At present, three universities in Georgia offer programs that lead to this endorsement: Georgia Southern University, Georgia State University and Valdosta State University (see Table 6 for program descriptions)

Note that the Georgia State program is one course longer than the Georgia Southern and Valdosta programs. Also, based on the course descriptions it is not apparent where the required field experience is contained in the Georgia State program, where it occurs in the Field Experience in Online Teaching and Learning course at Georgia Southern and the Design and Delivery of Instruction for E-Learning course at Valdosta. Because the participants in these online only certification processes are already certified teachers, the emphasis is not as much on educational strategies and pedagogy as it is on the incorporation e-learning strategies into the teacher's own teaching style.

Idaho: Online Teacher Endorsement

In Idaho, an initiative to create an endorsement for teaching certification to reflect the study of online teaching and learning has recently passed the state legislature (i.e., November 2011). The endorsement is comprised of ten standards, which are further divided into 53 different knowledge, disposition and performance indicators.

1. **Knowledge of Online Education:** The online teacher understands the central concepts, tools of inquiry, and structures in online instruction and creates learning experiences that take advantage of the transformative potential in online learning environments.
2. **Knowledge of Human Development and Learning:** The online teacher understands

Table 6. Summary of Georgia endorsement programs

University	Courses
GA Southern	1. Theories and Models of Instructional Design 2. Pedagogy of Online Learning 3. Field Experience in Online Teaching and Learning
GA State	1. Integrating Technology into School-Based Environments 2. Evaluation and Assessment for Online Learning 3. The Internet for Educators 4. E-Learning Environments
Valdosta	1. Course Management Systems for E-Learning 2. Resources and Strategies for E-Learning 3. Design and Delivery of Instruction for E-Learning

how students learn and develop, and provides opportunities that support their intellectual, social, and personal development.

3. **Modifying Instruction for Individual Needs:** The online teacher understands how students differ in their approaches to learning and creates instructional opportunities that are adapted to learners with diverse needs.

4. **Multiple Instructional Strategies:** The online teacher understands and uses a variety of instructional strategies to develop students' critical thinking, problem solving, and performance skills.

5. **Classroom Motivation and Management Skills:** The online teacher understands individual and group motivation and behavior and creates a learning environment that encourages positive social interaction, active engagement in learning, and self-motivation.

6. **Communication Skills, Networking, and Community Building:** The online teacher uses a variety of communication techniques including verbal, nonverbal, and media to foster inquiry, collaboration, and supportive interaction in and beyond the classroom.

7. **Instructional Planning Skills:** The online teacher plans and prepares instruction based upon knowledge of subject matter, students, the community, and curriculum goals.

8. **Assessment of Student Learning:** The online teacher understands, uses, and interprets formal and informal assessment strategies to evaluate and advance student performance and to determine program effectiveness.

9. **Professional Commitment and Responsibility:** The online teacher is a reflective practitioner who demonstrates a commitment to professional standards and is continuously engaged in purposeful mastery of the art and science of online teaching.

10. **Partnerships:** The online teacher interacts in a professional, effective manner with colleagues, parents, and other members of the community to support students' learning and well-being.

The requirements for this endorsement state that the teacher must already be certified in his or her field of study. The teacher must take 20 credit hours of courses in the study of online teaching and learning. As well, the teacher must either take an eight-week online teaching internship or have at least one year of experience as an online teacher and be able to document that experience.

With an announcement in August 2010, Boise State University indicated that it was building upon its Graduate Certificate in Online Teaching to provide in-service teachers three options to take advantage of this new online teaching endorsement (see Table 7).

Under the competency-based options, students have to illustrate that they have met all of the performance indicators in the Idaho K-12 Online Teaching Endorsement Matrix (see https://sites.google.com/a/boisestate.edu/idaho-online-endorsement/idaho-k-12-online-teaching-endorsement-matrix).

Ontario: Qualification for Teaching and Learning through e-Learning

Outside of the United States, the Canadian province of Ontario is the only jurisdiction where there is any kind of recognition for online teaching. The Ontario College of Teachers is responsible for the accreditation of teacher education programs in the province. Recently, the Ontario College of Teachers created an "Additional Qualification Course Guideline Teaching and Learning through E-Learning," a thirteen page document that is much more extensive than the online teaching endorsements in the United States and is intended to provide a comprehensive capture of the important aspects of the professional development

Table 7. Boise State endorsement options

Population	Paths
BSU Students	Complete the following courses: 1. Internet for Educators (3 credits) 2. Theoretical Foundations of Educational Technology (3 credits) 3. Online Course Design (3 credits) 4. Teaching Online in the K-12 Environment (3 credits) 5. Advanced Online Teaching (3 credits) 6. Social Network Learning (3 credits) 7. Internship (2 credits or evidence of one year of online teaching experience)
BSU Students	The endorsement is intended to be competency-based, which means that students can demonstrate their competency in meeting the recommended proficiencies through a combination of course completion and other PD experiences. In this instance, the submission of an e-Portfolio (i.e., EDTECH597: Endorsement Portfolio) is required to demonstrate that the proficiencies have been met.
In-service Teachers	This option would apply to teachers who have been teaching in the K-12 online environment for several years, who have participated in PD training through their employer or in PD workshops, and who have perhaps completed some graduate courses related to online teaching and learning. The submission of an e-Portfolio **(i.e., EDTECH597: Endorsement Portfolio)** is required to demonstrate that the proficiencies have been met.

for teachers interested in teaching in an online environment. The qualifications cover ethics, multiculturalism, pedagogy, instructional design components, assessment, and also has references for further reading. Upon successful completion of the program, candidates receive a certificate of completion. It is not clear from the document whether certification is mandatory to teach online or which Ontario universities offer programs that lead to this qualification.

Are Online Teaching Endorsements Necessary?

With all the push toward online teaching and learning, perhaps teachers who wish to provide these services need to be trained to utilize the unique environment of the web. It is a changing presence and becoming ubiquitous in education today. Teachers who teach online must be able to create engaging online learning in an environment where the student is physically (and, in some instances, psychologically) distant from him or her. In terms of communication alone, teaching and learning online is very different than traditional

classrooms. But is this really the domain of teachers who teach exclusively online?

It is predicted that by 2019 half of all high school classes will be taught online (Christensen, Horn, & Johnson, 2008). Recently, the market analyst Ambient Insight (2011) estimated that the current level of participation in K-12 online and blended learning was four million students. There is a need to be prepared for the online environment, but not just for a few self-selected teachers. Since it has been shown that most online teachers have previously been teaching in traditional classrooms for many years (Archambeault & Crippen, 2009), the question should be how will all teachers be prepared to utilize these pedagogies in their practice?

Online students can find themselves in a variety of course models. In these models the teacher has differing levels of engagement and responsibility. In the independent model, the course is primarily self-taught and the teacher mainly provides technical skills so that the student can complete the course. In the asynchronous model, the teacher must provide feedback on assignments, moderate student discussion boards, and generally support and guide the student. In these instances,

the teacher must be able to communicate well in situations where communication may never be direct (i.e., by phone, chat, or in person). The teacher must monitor the students to make sure they do not feel or become isolated, and if this does occur the teacher must have the tools to help the student overcome this learning challenge. Finally, in the synchronous model the teacher and students interact directly in a real-time setting; most often during a prearranged online meeting time. In these instances, the teacher must be able to implement many of the same skills they would use in a real-time classroom environment, only with those interactions being mediated by technology.

In some ways, the online environment has its own issues—the teacher has to be both tech-savvy and be able to guide students. The teacher or facilitator at the school may not have access to the student's progress or success, so the online teacher must be vigilant in keeping the student engaged. Online teachers may not have designed the course they teach, even though they understand and teach the content. They need advanced skills in the management of instructional activities and strong engagement skills. They need a genuine excitement for the course content, and familiarity with the curriculum. These teachers will also need to be able to select engaging content, rich multimedia for instruction, nontraditional content delivery methods, sound teaching philosophy, an understanding of the use of the Internet to teach and learn, and innovative teaching strategies.

However, it can be argued that these skills are not exclusively the domain of the teacher who delivers instruction via distance. Is it only the domain of online teaching and learning to understand how to use the Internet or select rich multimedia for instruction? These skills provide a richer experience for students regardless of the instructional delivery method. Teacher should be genuinely engaged with the course content and enthusiastically encourages students will bring energy and success to the course, whether the course is delivered via distance or not. As well, teachers need technology skills for instruction, whether it is delivered face-to-face or online. Successful teachers use non-traditional teaching methods. Communication skills are a necessary part of the instructional process. These skills are necessary for every teacher in service today. The profession needs to have these aspects of what is now considered the domain of online instructional practice incorporated into the traditional teacher preparation curriculum of all teacher education programs. We are doing a disservice to all our students and teachers if we do not demand this. In much the same way that all teachers should be able to integrate technology into their teaching (which means that endorsements to technology integration are redundant at best, demeaning to a professional at worst), all teachers should be able to design, deliver and support instruction in an online as well as a face-to-face environment.

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KEY TERMS AND DEFINITIONS

Asynchronous: Not in real time. For example, a discussion forum is an asynchronous technology where one student posts a message and at a later time another student can read and respond to that message. A non-technical example would be like a community bulletin board where one person posts a for sale poster and at a later time another person may walk by and see that sign.

Cyber School: A full-time K-12 online learning program where students do not attend a traditional or brick-and-mortar school.

K-12 Online Learning: A generic term to encompass all forms of distance education at the K-12 level delivered over the Internet. This includes full-time cyber schooling and supplemental virtual schooling.

Synchronous: In real time. For example, a telephone conversation occurs in real time or is said to be synchronous.

Virtual School: A supplemental K-12 online learning program where students attend a traditional or brick-and-mortar school, but may also be enrolled in one or more online courses.