DISTANCE EDUCATION: WHERE IT STARTED AND WHERE IT STANDS FOR

GIFTED CHILDREN AND THEIR EDUCATORS

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Today it seems that almost anything can be done remotely—most often electronically. Today, from shopping and banking to conducting research and taking courses, people use the Internet and other electronic media as resources and as means of completing a multitude of tasks both simple and complex. Educational institutions have long embraced the concept of distance learning as a means of serving students, and with recent advancements in technology many institutions have moved their programs online, offering new, sophisticated learning opportunities for students of all ages. Distance education, and more specifically online learning, is growing in popularity because it offers instruction at any time and across geographic boundaries, extending educational opportunities nationally and internationally (Timpson & Jones, 1989).

Brief History of Distance Education

Forms of distance education began in the early 1700's when prospective clergymen were trained through correspondence (Adams & Olszewski-Kubilius, 2007). By the 1800s women were being encouraged to get an education through home study. In 1873 Anna Ticknor established the Society to Encourage Studies at Home. This program provided correspondence instruction in over 20 subjects. In the late 1800s and early 1900s, colleges and universities began to offer college courses via correspondence, with

University of Chicago leading the charge in 1892 by allowing students living off campus to use the United States Postal Service to exchange lessons and submit assignments. In 1906, the Calvert School of Baltimore became the first elementary school to offer correspondence courses to students (Adams & Olszewski-Kubilius, 2007), and as technology improved and became more accessible, distance learning continued to flourish, making use of radio broadcasts and television once broadcasting became available in the 1950s. With the advent of the computer in the 1970's came electronic bulletin boards, then email correspondence and the Internet, and, eventually, all of the electronic forums we have today.

Distance education has a long history, but its popularity and use have risen exponentially as more advanced technology has become available (Watson & Ryan, 2007). As of 2008, online learning programs at the k-12 level were available in 44 states and several others were in the planning stages (Watson, Gemin & Ryan, 2008). And, the Sloan Consortium reported that in 2004, 2.5 million students enrolled in higher education and took at least one online class, representing approximately 11% of all students in accredited, four year, degree-granting institutions (NACOL, 2006). Enrollment in online higher education programs has increased steadily at the rate of about 400,000 students annually.

The Delivery of Distance Education

Correspondence via the postal service was the main delivery venue for distance education for over 200 years. With the advent of technologies such as radio, television and telephone, new delivery options became available. These options included lectures given in real time via television broadcasts. Universities used these broadcasts primarily

to reach students at distant campuses (Adams & Olszewski-Kubilius, 2007). While initially only one-way transmissions, with advancing technologies, these remote classrooms eventually involved two-way transmission, allowing for interactions between students and instructor. More recently, videotapes, computer assisted learning programs, and CD-ROMs allowed students the freedom of learning on their own schedule while in their homes.

Today, with broadband technologies and e-mail, most distance education courses are delivered through the Internet. Some courses are run as an independent study, where each student progresses through the material on his or her own and works individually with the instructor. Other courses and programs use a cohort model in which students proceed at the same pace and work together online through virtual class meetings. Some courses involve a hybrid of the two models with required virtual class meetings interspersed within an otherwise independent study. Other hybrid models are possible including occasional face-to-face meetings combined with online work, or a combination of virtual classes and real time face-to-face class meetings, etc. In a recent survey, researchers found that out of 77 online programs surveyed, 65% use asynchronous course primarily or entirely while 31% use a mix of real time and asynchronous courses, and only 4% use synchronous courses exclusively (Watson & Ryan, 2007). Thirty-nine percent of online programs had courses with set start and end dates, 25% had courses that were self-paced, and 36% of programs included both types of courses (Watson & Ryan, 2007).

<div align="center">Recent Growth of Distance Education</div>

With the rapid advancement of technology, distance education opportunities, particularly online learning options, have expanded significantly. Distance education is available widely now, and many programs are experiencing rapid enrollment growth. The phenomenal growth of distance learning is documented in several recent reports and publications:

- A recent book aimed at helping high school students find an online high school lists 113 such programs (Kiernan, 2005).

- 44 states have significant online learning programs to supplement school programs or significant full-time programs (complete cyber schools) or both (Watson, 2008).

- In a recent U.S. Department of Education survey (2008) the number of K-12 distance learning course enrollments grew from 317,000 to 507,000 between 2003 and 2005.

- In a recent survey of providers, 40% of online programs reported annual growth of 25% in the 2006-07 school year and in half of those programs the growth was 50% or more (Watson, 2008).

- In a 2007 survey of 10,000 public schools nationwide, 75% had one or more students enrolled in a full online or partially online course, an increase of 10% since 2005-2006, and 66% of responding schools expected this figure to increase in future years (Picciano and Seaman, 2009)

<div align="center">Advantages of Distance Education</div>

There is demand for distance education from consumers, but what are the advantages of distance learning venues? One advantage is access to an expansive college

preparatory curriculum. Distance learning programs provide access to a wide range of advanced courses that would otherwise be unavailable, particularly to students in rural and low-income communities whose schools have limited offerings, and to students who might now have the prerequisites to take advanced or AP classes in their home school. Being able to offer courses not available in one's school, particularly advanced and AP courses, and meeting the needs of specific groups of learners including gifted learners were the two most important reasons cited by school district administrators for offering online courses (Picciano and Seaman, 2009).

Another advantage of distance education is that it develops skills necessary for success in the 21st century (NACOL, 2006). The state of Michigan has gone so far as to require that every high school student complete an online course before graduation, believing that online instruction will be a fact of life for students in the future and high school should prepare them for it. According to NACOL, 21st century technology skills include:

- Global awareness, which includes understanding of world cultures and an ability to relate to individuals from diverse backgrounds;

- Self-directed learning;

- Information and communications technology literacy;

- Problem-solving skills;

- Team-oriented and group-focused problem solving;

- And time management and personal responsibility (NACOL, 2006).

Another often cited advantage of distance education is the individualization possible in terms of content and instruction. Teachers report that they can respond more

easily to the needs, abilities and previous experiences of students in their online courses compared to brick and mortar classes (Education Week, 2009). Distance education classes often involve a more personal relationship between teacher and students, one that is more akin to a mentor-mentee relationship as a result of the one-on-one communication that occurs around assignments and course activities as well as the tailoring of course content and instruction to individual students (Dykman & Davis, .

Who Is Being Served Through Distance Education?

Historically, correspondence courses emerged to serve adult students in rural areas who were not geographically close enough to an institution of higher education to physically attend classes. More recently, distance education programs for pre-college students were designed to serve students who were not succeeding in a traditional school setting or were unable to attend a regular school (Olszewski-Kubilius & Limburg-Weber, 2002; Timpson & Jones, 1989) for a variety of reasons including illness or because they had special talents that required full time training during the day (e.g. elite tennis players). The reasons for participation are now more varied and a significant segment of the pre-college distance education population consists of students who are taking courses for credit recovery, particularly enrollments in state supported virtual high schools. However, growing segments of the distance education market are students who want or need to supplement their school programs with additional advanced courses, students who want to take advanced courses earlier than typically allowed, and home-schooled students (Roblyer, 2006). All of these groups likely include academically gifted students.

Current forms of distance education transcend the constraints of time and space and enable educators and learners to "interact" but not necessarily in face-to-face

situations ("Accessing Distance Learning," 1995; Hofmeister, 1994; Washington, 1997). Distance education programs may never replace traditional classrooms and schools, but increasingly they are a means of compensating for educational deficits, such as a lack of advanced courses or teachers to teach advanced courses; to supplement existing curricula with additional courses; or to meet the needs of special groups of students including gifted, at-risk, elite athletes and performers, dropouts, migrant youth, pregnant or incarcerated, and home bound or home-schooled students (Adams & Cross, 1999/2000; Picciano & Seaman, 2009; Ravaglia & Sommer, 2000; Washington, 1997; Watson, 2007; Wilson, Litle, Coleman, & Gallagher, 1997/1998).

<div align="center">Need for Distance Education Programs for Gifted Students</div>

Gifted educators appear interested in distance education as a means to increase their ability to serve gifted learners, especially those with limited access to advanced courses (Adams & Cross, 1999/2000; Olszewski-Kubilius & Limburg-Weber, 2002). Distance education programs may be a good option for gifted students in a wide variety of circumstances, including situations where students attend schools with few advanced courses and gifted programs (Picciano & Seaman, 2009), cannot obtain early access to advanced courses, want to take additional advanced courses but cannot fit them into their school schedules, or are not thriving in a typical school setting (Goodrich, 1994; Lewis, 1989; Lewis & Talbert, 1990; McBride, 1991b; McBride & Lewis, 1993; Ravaglia & Sommer, 2000; Savage & Werner, 1994; Wilson et al., 1997/1998), and homebound or home schooled gifted learners (Ravaglia & Sommer, 2000).

A tremendous area of need seems to be for rural schools. A recent survey of 10,000 school districts nationwide by the Sloane Consortium concluded:

In the original study and in this study, the loudest and clearest voices were those of respondents representing small rural school districts. In these places, online learning is not simply an attractive alternative to face-to-face instruction but increasingly is becoming a lifeline to basic quality education. Shortages of teachers in high-demand secondary school subject areas such as science, mathematics, and foreign languages, as well as modest property tax bases and the lowest per pupil expenditures compared to urban and suburban districts have forced rural school districts to use their financial resources as wisely and effectively as possible. Online learning provides these districts with a cost beneficial method of providing courses that otherwise would require hiring teachers, many of whom would be uncertified in their subject areas and who would not have enough students to justify their salaries. This would be true not only for electives and enrichment subjects but increasingly for required courses as well. Several of these issues were presented earlier in this report. Below the voices of respondents to our survey state well their concerns and needs:

One of the significant advantages of distance education for schools is the ability to provide appropriate courses for gifted students without having to separate them from their chronological peers or regular school environment, thus avoiding transportation costs and problems associated with placing younger students in classes with older students (Ravaglia & Sommer, 2000).

A sample of middle and high school (grades 6 through 12) gifted students enrolled in a distance education program through the Center for Talent Development at Northwestern University, most of whom (83%) were enrolled full time in public schools, revealed that students' interest in specific subjects, a desire to enrich or add to their local school curriculum, a desire to accelerate or move faster through the curriculum, and the unavailability of the courses in their home schools were the major reasons for enrolling in the distance education program (Olszewski-Kubilius & Lee, 2004a). Less salient (reported by less than 10% of students) were reasons such as a desire to accumulate another AP credit for college or to take a course offered in their schools but unavailable to their age group. The reasons for taking a distance education courses were different for younger students; Parents who enrolled their fourth through sixth graders in enrichment

classes in a distance education program did so primarily because they desired academic challenge for their children and because of their children's interest in the subject matter. Other less significant reasons for these younger students were the lack of courses in their school and a desire by parents that their children spend more time on academic pursuits (Dershewitz, Lee, & Johnson, 2006).

Number of Gifted Students Enrolled in Distance Learning Programs

A national study of four talent search centers serving academically gifted students through distance education programs found that 34,644 students in grades 3 through 12 had participated in distance education courses since the inception of these programs in the 1990s and 7,468 participated in 2003-2004 (Lee, Matthews, & Olszewski-Kubilius, in press). For the year 2003-2004, males (53.9%) surpassed females (45.9%) in their participation in these courses. More than half (54.2%) of the students were seventh through ninth graders, 43.1% were third through sixth graders, and 2.8% were tenth through twelfth graders. Many other gifted students may be participating in distance education programs through state supported virtual high schools or other institutions or organizations. While the overwhelming majority of these other programs are not geared specifically towards gifted learners, they may offer courses that appeal to or are appropriate for these students.

Effective Teaching and Learning in Distance Education Programs

Effective distance education programs, like all educational endeavors, build on knowledge of best practice. The most effective programs are ones that focus on learner-centered instruction, the learners' motivation, and an environment that allows participants to engage and interact (Dooley, Lindner & Dooley, 2005). Distance education is often

thought of as a lonely or a solitary type of experience, but this is not necessarily the case with current technologies. By posting discussions or participating in real-time class discussions online, students can actively engage with others. And, contrary to many people's beliefs that distance education is passive, distance education programs are based on the premise that students are active participants and collaborators (McLoughlin, 1999) who construct their own knowledge (Hull, Bull, Montgomery, May, & Overton, 2000), reflecting a student-centered learning approach in which the learner takes responsibility for her learning. Teachers assist learners by serving as an "educational resource" and encouraging students to engage in learning activities (Wilson et al., 1997/1998).

Effective use of technologies makes distance education programs active and engaging learning experiences for students (Glennan & Melmed, 1996). The technologies enable students to have a variety of learning experiences including virtual field trips to cultural institutions and historical sites that allow students to have broader exposure to the arts. Technologies can also afford students the opportunity to communicate and collaborate with a more diverse group of students thereby cultivating an understanding of multicultural perspectives via interactions across classrooms, countries, and continents (Cifuentes, Murphy, & Davis, 1998).

As distance-learning programs continue to thrive, institutions such as the National Education Association (NEA) and International Association for K-12 Online Learning (iNACOL) are providing guidance to educators and administrators on the design of effective programs. The NEA has now published teaching guidelines that offer the following course design standards:

- Courses should be instructor-led;

- Courses should be student-centered;

- Learning should be collaborative in nature;

- Coursework should maximize participation flexibility while providing a framework for student pacing;

- Courses should foster information, communication, and technology skills necessary for success in this century, such as 21st Century and ICT;

- Course format, expectations and instructions should be clear and concise;

- Activities and assessments should account for different learning styles;

- Courses should use the latest best practices (NEA, 2006, p. 6-7).

With appropriate attention to the design and implementation of distance learning programs they effectively meet the needs of a wide range of learners.

Distance Education Programs Specifically Designed for Gifted Students

Some university-based gifted centers have distance education programs designed specifically for gifted students of pre-college age. The Center for Talented Youth (CTY) at Johns Hopkins University offers computer-based multimedia courses in mathematics, computer science, language arts and writing, science, foreign language and Advanced Placement (AP®) for students in elementary through high school. Students interact with their instructors using email, telephone, or by means of an interactive, Internet-based whiteboard. Students can earn high school credit for high school level classes.

Duke University's Talent Identification Program (Duke TIP) offers distance education courses through their E-Studies program to gifted students in grades 8-12. Courses are web-based, and students interact with their instructors and peers through online discussions, virtual lectures, and real-time collaborations. Examples of course

offerings include Anatomy and Physiology, Mathematical Problem-Solving, Academic Writing, and Abnormal Psychology. Duke TIP does not grant credit for completion of E-Studies courses, but students may seek credit from their local schools on their own.

The Center for Talent Development (CTD) at Northwestern University has offered a distance education program, Gifted LearningLinks, for gifted students in grades 4 through 12 for more than 20 years. Gifted LearningLinks offers more than 150 enrichment classes (e.g., The Wonders of Ancient Egypt, Classic American Novels, Writing Workshops, Latin, Topics in Math) at the elementary and middle school level, over 40 high school honors level classes (e.g., Creative Writing, Literary Analysis, Economics, U.S. History, Biology, Chemistry), and approximately 14 different AP classes. Courses are taught by an instructor and are web-based, utilizing the Blackboard online course management system. Students engage with instructors and other students through discussion boards, virtual meetings, chat rooms, and e-mail. Some college level classes are also available and students earn credit for high school level classes.

The Wisconsin Center for Academically Talented Youth (WCATY) provides programs and services for gifted students in the state of Wisconsin and has developed its own distance education model for students in grades 5 through 8. The program, called the District Cooperative Online Program, is a hybrid model, combining both online learning and face-to-face interactions. It allows students from a school district or spread across a geographical region to take classes together. Co-op courses are taught by a WCATY instructor and include students from several area schools or school districts. Courses are typically nine weeks in length (one school quarter) and designed to replace curriculum (e.g., language arts or reading) in the home school. Students access the online portion of

the course via the Internet and approximately three times per quarter the students and the instructor meet at a central location for face-to-face activities. WCATY works with the schools to design the courses and enroll students.

The Education Program for Gifted Youth (EPGY) at Stanford University offers multimedia, computer-based distance education courses in mathematics (kindergarten through advanced undergraduate classes), English (grade two through AP), physics (secondary through advanced undergraduate level), and computer science (secondary level). Students receive Stanford University credit for successful completion of undergraduate level courses.

Stanford recently began a comprehensive online high school with a three-year curriculum. The curriculum consists of the self-paced courses described above as well as some courses unique to the online high school that consist of lectures that student view over the web and synchronous, required, weekly discussion sections. Science courses use virtual laboratories. The online school is supplemented with a summer program on the Stanford University campus to allow students to meet and engage face-to-face and online extra-curricular activities such as a math team, a literary journal, a student newspaper and a club devoted to culinary arts.

<div align="center">Success of Distance Education Programs</div>

Success in distance education programs depends on both program and participant characteristics. Studies of distance education programs have begun to reveal several characteristics of high-quality programs. In general, these characteristics include preparation, training, and ongoing support for both students and instructors (Roblyer, 2006). Characteristics of students who are most often successful in distance learning

programs often include motivation and independence. Wilson et al. (1997/1998) suggest

that there are four characteristics that contribute to success in a distance education course:

1) ability to work independently, 2) desire to take the course, 3) motivation to persist, and

4) prerequisite background knowledge. Still, empirical research about the success of

distance education programs, in terms of completion rates, achievement, and skill

development remains sparse, specifically regarding gifted students.

Completion rates nationally for distance education courses are about 30 to 40%

(Roblyer, 2006), but some programs that are open to all learners have much higher rates

and attribute this to curriculum that is systemically designed and interactive in nature,

assessment and monitoring of students progress and specific training for teachers in

online instruction. Little data is available on completion rates for distance education

programs designed specifically for gifted learners, although one program reports

completion rates around 66 to 80 percent (lower for AP classes, higher for enrichment

classes), and grades of A or B for over 95% of students (L. Dershewitz, personal

communication, January 25, 2006; Olszewski-Kubilius & Lee, 2004a). Olszewski-

Kubilius and Lee found that students who took AP classes via a distance education

program specifically designed for gifted students reported that the classes prepared them

well for their AP examinations (64% of students followed through with the AP exam and

63% earned a 4 or 5 on the exam).

Despite limited data on how successful gifted students actually are in distance

education courses, researchers have documented evidence about the positive effects of

distance education programs on gifted and talented students academically and socially,

primarily through self-reports from students on questionnaires and surveys after the program. Effects found include:

- Greater independence on the part of students regarding their learning and the development of close relationships with peers for rural gifted students who took advanced high school mathematics courses in a ele-learning program (Lewis, 1989);

- Enhanced independent study and thinking skills, new means of communication, academic challenge and growth, and a more realistic assessment of how one's abilities compared to others among high school aged students from multiple schools who participated in a distance education program through a state supported residential school (Wilson et al., 1997/1998);

- Increases in students' collaboration skills and higher-order thinking skills such as logical explanation, critical inquiry, interpretation, and reflection as a result of participation in a program that augmented teaching with audiographic conference technology for secondary students (McLoughlin, 1999);

- Increases in students' problem-solving abilities, logical thinking skills, and collaborative learning skills, motivation, task commitment, leadership ability, and responsibility for learning in a program that connected elementary and secondary gifted students from multiple schools (Ewing, Dowling, & Coutts, 1997); and

- Higher interest in the subject studied, increased confidence in one's academic abilities, and improved study and organizational skills for fourth through sixth graders who took enrichment classes via a distance education program (Dershewitz, Lee, & Johnson, 2006).

Clearly, research on distance education has not kept up with the proliferation of programs. Most programs do not track enrollments and completion rates in detail, such as disaggregating data by racial/ethnic groups or SES. As a result, we do not know who enrolls and who successfully completes distance education programs. We do not know if success varies by features of the course, such as whether is it self-paced and asynchronous versus synchronous or a hybrid, or by demographic characteristics of the student. It is clear that knowledge of what leads to success in distance education programs, cyber schools, and online courses, including features of the courses themselves, aspects of the instruction, and characteristics of the students, is needed in order to better craft courses that will enable all students to be successful.

<div align="center">Challenges and Pitfalls to Avoid</div>

Despite evidence of positive learning experiences and outcomes, there continues to be concern about distance education on the part of both educators and students. School administrators chief concerns center around course quality, costs, losing state funding based on student attendance and teacher training (Picciano and Seaman, 2009).

Olszewski-Kubilius and Lee (2004a) found that among gifted students who took either honors or AP courses through a distance education program, the lack of interactions with teachers was a source of dissatisfaction for some students and that most students wanted to use computer technologies that enabled them to have easy communication with teachers, other students, and course information, but still desired to have traditional textbooks and written course materials as part of the learning tools. Thus, students need to know and understand their learning styles and preferences in order to find those distance education classes appropriate for them.

Other concerns include the inability to use students' body language as an indication of student engagement and understanding (Gallagher, 2001), technological problems (Lewis & Talbert, 1990), and insufficient contact with and therefore support from other students and the teacher (University of Plymouth, 2006). Also, distance education programs suffer from some of the same articulation issues as summer and other out-of-school programs. Olszewski-Kubilius and Lee (2004a) found that 20% of students who took a distance education course and wanted credit did not get it from their high schools, but only 6% of those who asked for placement in the next course in sequence were denied. However, almost half of the students could not skip ahead to the next course because none was available.

Another challenge for online science courses is the use of virtual laboratories and simulated laboratories and whether these are adequate to teach or demonstrate key concepts and achieve learning concepts. Some distance education programs require students to find a situation where labs can be conducted, perhaps in a local school.

A concern for students enrolled in cyberschools full time is isolation and socialization (Watson, 2007). Some cyberschools provide extra-curricular activities such as clubs and field trips that are a mix of online and face-to-face. Technologies such as web-conferencing tools that integrate voice, web cam and whiteboard can be used to facilitate online group projects and facilitate student interaction thus promoting socialization.

Watson (2007) identified some other issues unique to online learning programs including assessment of students' learning and particularly giving tests to assess mastery. Many programs enlist the assistance of another adult—a teacher or learning coach in the

student's local environment—to proctor assessments, while other programs rely on web-based quizzes and tests or other types of assessment like papers or projects.

Professional development for online teachers is critical, especially for school administrators using distance education courses to fill in gaps in their curricula (Picciano and Seaman, 2009). Online courses involve the use of multimedia more than face-to-face teaching and teachers have to acquire comfort and agility with using these technologies. Program administrators need to provide technological training and support to teachers and also to enrolled students. A particular challenge for online teachers is time management since students and teachers can be online at any time. Thus, online courses can become very time-consuming and demanding for teachers, encroaching into their leisure and family time if guidance and firm boundaries are not set for students. Online teachers must also be particularly adept at written, as opposed to oral communication skills (Watson, 2007) so as to give constructive and useful feedback to students.

Despite the increase in the number of cyberschools and distance education, there is still concern about access for some students. Not all students have a computer at home nor do they have fast, reliable Internet access. Currently, there is very little data regarding who is accessing and who is not accessing distance education options among K-12 students, but it is likely that the same groups that are disenfranchised with respect to other educational options, i.e. low income students, are closed out of distance education programs as well, especially those requiring tuition.

<div align="center">Summary</div>

Distance learning has been and continues to be a significant source of educational opportunity, particularly for gifted students. The proliferation of programs and the

continual advancement of technology offer students the chance to learn content never before available to them and in ways that can meet their individual needs. But popularity and increased options do not equal effectiveness and success. There is still much to be learned about distance education for all learners. It is important to keep focused on the fact that data collection and research on effective program models, teaching strategies, and outcomes is imperative as are standards and program evaluation.

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