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Commentary

Online Learning in Secondary Education: A New Frontier

Simone Conceição and Sarah B. Drummond

Introduction

Distance education is not a new concept in the educational arena. In 1892, it was established in the United States with correspondence study at the University of Chicago through the home study department of the Division of Extension.[1,2] As such, distance education was first aimed at nontraditional adult learners who did not have access to higher education.[3] Later, between the end of World War I and the start of World War II, the U.S. government provided radio broadcast licenses to 202 schools, and in the 1950s educational television broadcasts were introduced in schools.[4] More recently, online learning, made possible by the World Wide Web and virtual realities, has entered the realm of distance education as a result of the development of high performance computing and communications.[5] With these new technologies, learning has become available any time, anywhere.

Online learning, also referred to as distance education in this article, involves a variety of approaches, such as making resources available electronically and creating rich, interactive online experiences with class activities using Web tools like chat and discussion groups. Online courses offer flexibility as they may not require learners to be at a specific location for class participation. Students may work with course materials at their own convenience, or they may work collaboratively with other students in a Web environment. Today distance education serves not only adult learners, but also secondary education students.[6] Educational organizations serving high schools are rapidly distributing online education via the Internet due to the competitive market. However, rapid changes in the field may not necessarily mean higher quality programs. To insure high quality online offerings, institutions of secondary education need to have in place organizational strategies to plan and implement distance education.[7] This article is designed to assist secondary schools/districts to make informed, research-based decisions in that process. We begin with a review of related literature on the status of online learning in high schools. Next we describe the study's methodology and present the results. The article closes with conclusions and recommendations for those considering the plunge into online education at the secondary level.

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Review of Related Literature

Little research-based literature is available on the current status of online learning in high schools. The paucity of information about what high schools are doing to provide online learning to their students is perhaps not surprising considering the relative novelty of the phenomenon. However, Websites exist that give detailed examples of the ways in which high schools are making online learning possible.[8] Many who have administered the beginning phases of online learning programs have written articles offering guidance to others, but, in general, not a great deal of information exists regarding the overall status of online learning in secondary education.

One exception is Clark's 2001 study that reviewed online learning programs in 33 high schools for the purpose of "provid[ing] insights into activities and trends of K-12 virtual schools in the United States."[9] This study included survey results, virtual school profiles, and a review of contextual issues. This study does have some limitations because in a rapidly expanding field a study even a few years old may be out-of-date. Since its publication, literally hundreds of online programs have emerged. Furthermore, the survey polled online program administrators but did not triangulate data by first-hand analysis of online high school Websites.

Although little research has taken place related to the overall status of online learning in high schools, there has been a great deal of activity that merits attention. Just a cursory glance at the news media from Wisconsin, for example, reveals both curiosity about online learning and anxiety about the policy issues it presents. In 2003, three news stories in the *Milwaukee Journal Sentinel* offered a window into the current debate over online learning. One described two new online high schools that were competing with one another for students[10] while another described a district's debate over whether to create a virtual charter school.[11] A third described angry protests over students being allowed through the state's open enrollment law to attend online high schools at the expense of taxpayers.[12]

Online learning for high school students is both making headlines and addressing previously unmet needs. Rural Missouri schools that have had trouble attracting mathematics and science teachers have begun to offer mathematics courses online through a partnership with Southwest Missouri State University.[13] Administrators from Florida Virtual High School, one of the largest and oldest programs providing online learning, have written about their experiences and lessons learned from creating that state-wide entity.[14] In perhaps the most comprehensive report on the advent of a program providing online learning, Zucker and Kozma wrote a full-length book on the process behind beginning Virtual High School, an online learning consortium in New York.[15] More specifically, Vrasidas and Chamberlain, who oversaw the creation of an online course for students, detailed the steps that were necessary for implementing the course.[16] Steps included assembling a team comprised of teachers, instructional designers, a graphic artist, a Web developer, and a database programmer. Designing the program required leaders to communicate with major stakeholders (the superintendent, for example), select students, develop content, and train teachers. They concluded with the assertion that working with an outside vendor would likely have been more time-efficient than designing an in-house program.

Because of the number of steps and stakeholders involved in offering any new form of instruction, online learning included, authors, such as Lawton and Bonhomme and Moore and Kearsley, have stressed the importance of a systems approach to online

learning program development.[17,18] Still, practically speaking, the systems approach suggests only a mode of leadership, not nuts-and-bolts information related to how an online program comes to be. Some guidance is available for addressing the more technical and practical aspects of online programs. In a 2001 special issue of *The School Administrator* devoted to online learning, Hirsh addressed the question, "How do we choose a vendor?"[19] while Reents explored the advantages of creating "homegrown" programs rather than partnering with a vendor.[20] Guidance for creation of online learning in high schools can also be found at the state level in Kalman's "Principles for Creating a Statewide Online Learning Organization: The Process and Decisions Underlying the Creation of Colorado Online Learning."[21] Here the state of Colorado outlined its hopes for the future of online learning in the state, asserting that it would support schools that wished to branch out into this area, but did not create a statewide school. In Wisconsin, Sanders, writing for the Wisconsin Department of Public Instruction, published a similar report titled, "Virtual Education: New Opportunities, New Challenges," outlining the qualities a school should seek out when determining if an online program was suitable for its students.[22] Guidance and guidelines are available in some areas of the country around certain questions related to online education for high school students. A comprehensive picture, however, is difficult to find. Those who provide advice generally do so from a shallow basis of experience, and guidelines do not provide schools with assistance for discovering options, only assessing them.

Another theme in the current literature about online learning relates to policy issues, some of which are divisive and controversial. These fall into two broad categories: (1) fiscal barriers to participation in online learning; and (2) general resistance to online education as a form of instruction.

Some online learning programs were created specifically to address equity issues in education. For example, some states provide access to Advanced Placement courses to students who live in rural or economically disadvantaged via online programs.[23,24] However, according to Weisman and Birtolo, in spite of policymakers' good intentions, online programs for financially disadvantaged school districts can be problematic because they may not have the technology necessary for students to access them.[25] Overall, without public or private assistance, school districts face major new expenditures to provide online learning opportunities.[26,27] For example, Reents estimated the annual cost of a "home-grown" or district-developed program at $300,000 annually[28] while Clark estimated the annual estimated cost per pupil of working with a vendor to be $300.[29]

The third fiscal issue raised by online learning— open enrollment laws—leads into the topic of resistance to online learning as a concept. In some parts of the United States, when a student leaves a brick-and-mortar school to enroll in an online high school in another school district, taxpayer money follows, creating a loss of revenue for the student's school district of residence.[30,31] If the cyberschool receives the same or similar amount of funding as a school district which must support a physical plant with the same amount of funding, questions arise as to the fairness of the funding formula. In addition, equivalent funding, in the eyes of the public, makes a symbolic statement that the state considers online learning and face-to-face instruction equally effective. This is a pedagogical concern for some taxpayers and a source of anxiety for school districts who must maintain brick-and-mortar schools no matter how many students depart for online settings.[32] In Florida, Weisman and Birtolo found that program designers for the state-sponsored online learning program were caught off-guard by the level of acrimony toward online learning.[33] Reeves pointed out that it was not only the general public who questioned the merit of online learning.[34] Superintendents perceived online schools not only as a drain on funding for public education but also a mode of instruction that benefited private vendors while hurting students. Furthermore, every one of the charter school proponents she interviewed considered online high schools to be a step in the wrong direction for the charter movement in particular, and for education in general.[35] Interestingly, Clark found in a survey that even fewer individuals approved of online education than home schooling. While 41% of the general public expressed approval for home schooling, the approval rate for online education was only 30%.[36]

If a substantial percentage of the public disapproves of online high schools, and superintendents suspect them, what about teachers? Perhaps this quotation from a news story about teachers protesting the creation of a virtual charter school in Wisconsin sums up their concerns:

> "We have very, very serious concerns and questions about this approach to education. It's attacking the very core of what we do," said [a] high school teacher [and] chief negotiator for the Fredonia Education Association. "As a professional, I just don't like the idea that a CD-ROM would replace me."[37]

As a remedy for teacher resistance, Lawton and Bonhomme wrote that teachers must be included in the implementation of an online program, asserting that those who are not consulted often show not only resistance to such programs but low performance in supporting students involved in them.[38] However, no research was found to support the efficacy of this approach.

In sum, administrators, faculty, and parents alike have expressed a number of concerns about online learning for high school students. For example, Kalman found that they believe that programs are often geared toward brighter students who are then removed from learning environments where they can be of most benefit to other students.[39] In addition, Weisman and Birtolo concluded that these groups perceived that schools and independent online programs do not work together for the benefit of students, but rather function separately and without communication.[40] Overall, little information is available to high school administrators who wish to understand the options available to them as they consider whether online learning is right for their students. With only anecdotal evidence on ideas that have worked in some locations, school administrators may find themselves vulnerable to the sales pitches of persuasive vendors wishing to sell their products[41] or influenced by the objections of community members and teachers who may lack information about the positive aspects of online learning.

Research Methods

This study came about as a result of one high school deciding it wanted as much information as possible before deciding to venture into online learning. In the interest of making an informed decision about online learning, Shorewood High School, a suburban school located in northern Milwaukee County in Wisconsin, convened a committee of local stakeholders and experts in online education called the Shorewood High School Distance Learning Committee. It

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was through participation in this committee that we were asked to find "what is out there" and to submit a research report to help the committee to make decisions.

Unlike the online high school with a motto taken from Victor Hugo, "You cannot stop an idea whose time has come,"[42] Shorewood High School resisted jumping on the online learning bandwagon by informing itself. High school leaders did not want to allow market forces or pedagogical fads to overtake their mission; rather they sought to integrate online learning into that mission. The resulting research was designed to assist the Shorewood High School Distance Learning Committee to move forward in a knowledgeable fashion, understanding what it needs to consider as it ponders next steps toward online learning.

The study used a combination of quantitative and qualitative approaches. Quantitative methods included an online survey questionnaire distributed to email addresses of online learning providers, which was developed based upon the review of related literature. (See the Appendix for a copy of the survey instrument.) The development of the survey questionnaire rested in large part on the typology we developed as a result of the review of related literature. (See Table 1.) Qualitative methods included Website analysis and interviews with school administrators who lead distance learning initiatives and vendors. An Internet search of organizations that provide some type of distance learning opportunity to students in secondary education was conducted. Ninety-four Websites that provide some type of distance learning opportunity for secondary education were found. Interviews were conducted using semi-structured, open-ended questions via telephone (N=4) and email (N=8) with 12 administrators who volunteered through the survey to provide further information. The purpose of the interviews was to triangulate the data and further clarify survey responses.

Results of Study

The results of this study were limited by the three factors: (1) Website access; (2) survey response rate; and (3) the interview process. Many of the Websites were proprietary, requiring a password to view any content beyond the advertisement section. The survey response rate was admittedly low at 20.5%; that is, of the 112 surveys distributed, only 23 responses were received. Of the 112 email addresses, 80 were found through institutional Websites, and 32 were provided by a vendor of e-learning solutions. Many of the respondents worked with the vendor who provided a list of names and email addresses, further limiting the generalizability of the results.[43] However, respondents included a wide variety of professionals in online education: deans of curriculum and instruction; program leaders; program assistant directors; directors of curriculum development; principals; executive project directors; e-learning distance education specialists; and coordinators of digital content. Although the original research plan was to use telephone interviews, many of the respondents requested an email interview due to time constraints.

According to data collected, the online high school in existence the longest started its program in 1995. At the time of this study, school enrollments varied from 20 students to 3,116. Over 70% of respondents worked with a vendor, e.g., Class.com, JonesKnowledge, Blackboard, eCollege, Compass, APEX learning, SchoolFirst, University of Texas, ComputerPrep, Community College courses. Respondents were asked which of five types of online high schools they considered themselves. The types and percentages were as follows: (1) state sponsored (9.1%); (2) district-sponsored or district-chartered (36.4%); (3) university-based (9.1%); (4) vendor-based (13.6%); and (5) other (36.4%). Responses to the category of "other" included: non-profit collaboration with other states and foreign countries; private school/individualized instruction; consortium of education service centers; grant-initiated; and private.

Online learning program models in secondary education are determined by the type of partnership between the school and partners/vendors. Three types of partnerships between schools and vendors were found: (1) "home-grown" programs, where schools developed online courses with no vendor involvement; (2) hybrid programs, where schools created some online courses in-house and then chose

Table 1
Typology for Describing Online Learning in Secondary Education

Types of Online High Schools	*Program Models*	*Course Offerings*	*Students Program Aims to Serve*	*Student/Program Relationship*
State sponsored	"Home-grown" programs	AP courses	Recovering credit	Students register with Online High School directly, graduate with diploma from online program
District sponored	Hybrid programs	Languages	Home-schooling	
District charter	Vendor programs	Technology	Advanced courses	
University-based		Unusual electives	High school diploma	Students register with Online High School via school principal or guidance counselor
Vendor		Home-school curriculum	Early graduation	
		Comprehensive diploma program	Schedule conflicts	Hybrid model between the two
			Students with special circumstances	

vendor courses as needed; and (3) vendor programs, where schools, consortia, or districts contracted with a vendor and formed a partnership with that course provider. Within these three categories were found different rationales as to why schools chose to work with vendors or not. For example, some home-grown programs branched into online learning before vendors were creating content; so they had no choice but to create their own programs. Those with fully in-house programs stated that they enjoy the flexibility and freedom this provides them. Those with partnerships with vendors appreciated knowing that content has been prescreened for meeting state standards and had been created by professional online instructors. Respondents with vendor partnerships enjoyed the convenience of not having to "reinvent the wheel," saving staff time and resources. In situations where teachers had no experience teaching online, working with a vendor was perceived as less taxing than training teachers. In one particular case, a school received a grant in order to offer online courses and needed to act quickly. It did not have time to learn the necessary skills to create an online curriculum; so it contracted with a vendor.

Respondents were queried as to they types of online courses they offered. These included: basic graduation requirements, such as English and Algebra; unusual electives, like Native American History); test preparation, such as SAT and ACT examination practice; Advanced Placement (AP) courses and AP examination preparation; languages; and technology courses. Fifty percent of survey respondents responded that the most popular courses offered through online high schools were AP, languages, and technology. In a few cases, a comprehensive diploma program was offered. Respondents commented that offering courses online made it possible for schools to offer unusual electives and a more widely varied curriculum. Some schools in rural areas reported offering courses online in order to add courses without having to hire new teachers.

Also, respondents were asked to select from the following reasons students took online courses: recovering credit; advanced courses; early graduation; home bound due to disability or long-term illness; work-related travel; home schooling; online high school diploma; and schedule conflicts. The aim of most high school online programs was to serve students who required alternative avenues of access to school, such as making up credit (90.9%); schedule conflicts (81.8%); early graduation (68.2%); advanced courses (63.6 percent%); home-schooling (59.1%); online high school diploma (40.9%); and students with special circumstances (40.9%). Special circumstances included:

- Courses not be offered by the school;
- Student withdrawals, expulsions, incarcerations;
- Student choice to accelerate/decelerate course pace;
- Students studying abroad for a semester;
- Student preference to work independently;
- Student transfer;
- District desire to expand curriculum

High schools that made online learning opportunities available to their students chose to do so in order to meet a variety of different goals. Only one program reported a long-standing tradition of distance education programs, where online learning had picked up where correspondence courses had left off. All other online high schools reported having begun to offer online learning relatively recently in order to expand course offerings and meet the needs of students. The majority of participants in this study administered programs through which students took only one or two of their courses online. In most programs, students used online courses to supplement face-to-face instruction at a school. Some of the participants in the study, however, managed fully online programs where students graduated from an online high school.

The relationship between the student and the online learning program was linked both to enrollment policies and procedures of schools and to the level of support students receive before they start online courses and during the delivery of the online course. In some cases, students enrolled directly in an online high school and even received diplomas from those schools. At the other end of the spectrum, some online courses were offered to students within the school building with onsite mentors helping and overseeing students. Between these two extremes, high schools found a variety of delivery approaches.

The type of support students received before and during their journey into online learning determined the type of relationship between the organization and the student. Only a few online schools had the capacity to prescreen students for preparedness before enrollment. One charter school administrator stated that she could not turn a student away due to state open enrollment laws. Another online administrator maintained that although he was allowed under law to prescreen students, he received pressure from high-level administrators to admit students who did not function well in a traditional classroom.

Implications of Results

Online programs in secondary education are still emerging. Educational organizations that have included online learning in their strategic planning may learn from others who have used it. Our study raised several questions for administrators to consider relating to the practices that current online programs in secondary education have in place:

- What standards is your organization employing for curriculum/course design?
- Does your organization have guidelines for program/course completion?
- What is the average cost for a student to participate in an online program?
- What strategies does your organization use to assess student learning and evaluate program effectiveness?

Standards for Curriculum/Course Design

Standards for curriculum/course design may be applied from different perspectives. One is from the perspective of designing the curriculum (content) to meet state and national standards. The other perspective is related to course design. Both home-grown and vendor-provided courses must meet state and national standards. Due to the federal *No Child Left Behind* legislation and the differences in state standards, curriculum alignment is a concern for online high school administrators. One vendor interviewed in this study recently found a computer program that automatically screens curricula for state standards. The time-consuming task of aligning curriculum with state and national standards served as sufficient justification for some schools to choose to work with a vendor. From a course design perspective, schools reported that online courses were updated frequently either by vendors or by in-house instructors, depending on

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the course's origin. Some reported updates as frequent as once per week while others stated that each course was carefully reviewed before each new semester.

Guidelines for Program/Course Completion

Online programs often cited as a benefit the fact that students can work at their own pace through online high school programs. The online programs investigated in this study, however, largely had distinct time periods during which students had to complete courses. Some online high schools required that students take courses in school computer labs under the supervision of teachers. All of the programs had at the very least guidelines with regard to the amount of student time needed to complete online courses.

Programs reported course completion rates ranged from 72% to 100%. The criteria programs used to determine whether a student had completed a course varied as well. In some cases, students were said to have completed a course if they fulfilled all course requirements. In other cases, students were required to complete a certain percentage of lessons or course assignments in order to be assigned a grade. Many online programs have a two to three-week trial period at the beginning of the term to gives student the chance to learn what online courses are like and decide whether online learning is for them. The trial period gives students time to drop courses without penalty if they found that online learning was not for them. Some respondents commented that students were often surprised at how much work was involved with online courses, having expected the online environment to be less challenging than face-to-face instruction. Existing online programs tended to give students guidelines for how much time they should spend working on courses, such as a common suggestion of one hour per course per day. One program where nearly all students completed their entire degree online required two hours of in-person, mentored instruction every day. Many programs required that students complete courses within the time frame of one semester, or around 18 weeks. The programs with strict time limits tended to offer accommodations to students with special circumstances such as illness or special learning needs.

Average Cost per Students

The average cost of a one-semester online course at the time of this study was approximately $300 per student, not including expenses such as textbooks, supplies, and administrative fees. The way in which this cost was covered varied from program to program. At one end of the continuum, students' families covered the full cost of online courses. In contrast, some school districts covered all costs. Under a third alternative, schools joined consortia or contracted with vendors so that as more students signed up for courses, the per-student cost went down. However, some vendors charged a fee per student per course, and/or they charged schools for the cost of on-site mentors they deemed crucial to the success of their product. For example, one online vendor charged a flat fee of $300 per student in a course while another charged $195 per seat in its semester-long courses and required high schools to hire onsite mentors at $25 per hour for four hours per week.

Strategies to Assess Student Learning and Evaluate Program Effectiveness

Online programs utilized student assessment tools that are not dissimilar to those administered face-to-face. One vendor used self-assessment quizzes, journals, and unit tests for students in the online environment, with a mentor or teacher proctoring all of the exams. One online program relied much more heavily on portfolios, activities, and participation in online chats with classmates than testing. All program administrators surveyed engaged in practices designed to assure academic honesty.

Online high schools measured school effectiveness and student satisfaction in a variety of ways. Many surveyed students at the end of courses and solicited feedback from on-site mentors. Others offered functions on their Websites through which students could send comments. For the most part, schools with vendor contracts allowed the vendor to manage feedback and comments. Vendors surveyed also explicitly sought input from online teachers regarding program quality.

Interview participants, when asked how students do when transitioning out of online courses and back into a regular classroom, found this question difficult to answer. Most programs the study included are relatively new and have not yet been able to measure student success over a period of time. Some online high schools do not offer sequenced courses (such as Algebra I or Algebra II) online, but rather offer only electives, in which case transition back into the classroom is difficult to measure.

Conclusions and Recommendations

Understanding how online high schools function can be beneficial to high school administrators, district personnel, and state departments of education. A wide array of options is available to schools interested in providing online learning opportunities to students; however, selecting the appropriate action requires a certain level of familiarity and comfort with the different programs currently in use. This study can have practical applicability for those interested in understanding the options they face in choosing among providers and program design components.

Online courses provide alternatives to schools and to students that were, up until very recently, not available. Still, creating an online program for a high school is a massive undertaking not to be entered into lightly. Distance education has pedagogical, political, and logistical implications that must be taken into consideration in view of the school as a complete system. Therefore, we recommend the following steps for a school considering making online learning opportunities available to its students:

1. *Assess goals.* Why does the school wish to try to offer online courses to students? What need would be met by an online program that cannot be met otherwise?
2. *Consider resources.* What does the school possess by way of resources (e.g., funding, teachers interested in teaching online, technology infrastructure), and to what outside support could it gain access (e.g., grants, vendors)?
3. *Seek out partners, collaborators, financial supporters.* In this time of rapid proliferation of online programs, many high schools are considering branching out in this area. Joint efforts may offer cost-savings and work-sharing.
4. *Experiment.* Create a pilot program involving vendor courses, or home-grown courses, or a few of each. Build into the pilot program an ongoing evaluation mechanism in order to make the pilot project a true learning experience.

In closing, as online learning in secondary education continues to expand as an option for offering educational opportunities to

students, it is imperative that research be conducted in the following areas: student success and retention over time; teacher satisfaction and success online; impact of students transitioning out of an online program; and sources of resistance for implementing online programs. Through this study, we found that online learning provides more course options to students *and* course options to more students. Through carefully investigating available options, high schools have the opportunity to tailor an online education program to their overall learning philosophy and goals.

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[43] For the purposes of this study, "vendor" was defined as a for-profit or nonprofit course-providing entity that develops online courses and charges a fee to individuals or schools for access to them.

APPENDIX

Survey Instrument

Online High School Information

1. What is the name and Web address of your Online High School (OHS)?

2. What is your role in the organization?

3. What year did your program start?

4. How many students are currently enrolled?

5. Please indicate which of the following terms best describe your OHS (Check all that apply):
__ State-based __ School district-based __ University partnership __ Vendor __ Other, please specify: _____

6. Does your OHS serve students outside your geographical region? __ Yes __ No

What courses does your OHS provide or support? (Check all that apply)
__ Basic graduation requirements (e.g., Algebra, English, U.S. History, etc.)
__ Advanced Placement[T] courses
__ Test preparation (e.g., SAT, ACT, AP)
__ Languages
__ Unusual electives for credit, please specify: _____
__ Technology courses
__ Other, please specify: _____

7. What are the reasons students participate in distance learning? (Check all that apply)
__ Recovering credit __ Home-schooling __ Advanced courses __ OHS diploma __ Early graduation
__ Schedule conflicts __ Home-bound (e.g., disability, long-term illness, etc.)
__ Unusual personal circumstances (e.g., pregnancy)
__ Work-related travel (e.g., parents in military, student in entertainment business, athletes, etc.)
__ Other, please specify: _____

8. Do you provide accommodation for students with special needs? __ Yes __ No

9. How do students register for courses with your online high school? (Check all that apply)
__ Parent/student registers directly with OHS
__ Parent/student registers; High School provides permission
__ Student registers via High School Guidance Counselor
__ High School registers students
__ Other, please specify: _____

Program Delivery

11. How is content delivered? (Check all that apply)
__ Via in-house online course management system
__ Via videoconferencing (e.g., satellite, ITV, IP, ISDN)
__ Via streaming video
__ Via video cassette
__ Via vendor online course management system
__ Other, please specify: _____

12. Do you work with a vendor in online course delivery? __ Yes, please specify vendor: _____ __ No

13. Who creates the online content of the courses you offer through your OHS? (Check all that apply)
__ Teachers licensed in state/district __ Qualified teachers, unlicensed __ Course-providing vendor
__ University instructors __ Other, please specify: _____

Program Evaluation

14. How do you evaluate program effectiveness? (Check all that apply)
__ Student evaluation of instructor
__ Student evaluation of program
__ District/state-wide standardized program review
__ National/regional standardized student assessment
__ Other, please specify: _____

15. What is the completion rate of students who begin courses in your OHS?
__ 0-25 percent __ 26-50 percent __ 51-75 percent __ 76-100 percent