NATIONAL, STATE, AND PROVINCIAL PERSPECTIVES ON DISTANCE EDUCATION IN OPERATOR CERTIFICATION

Margaret Doss, President
Association of Boards of Certification
208 Fifth Street
Ames, IA 50010

Columbia County Water Utility
P.O. Box 204660
Martinez, GA 30917
mdoss@columbiacountyga.gov

ABSTRACT

This paper discusses various national, state, and provincial perspectives on distance education as it pertains to treatment plant operator certification and continuing education. The Association of Boards of Certification, the United States Environmental Protection Agency, the Water Environment Federation, the American Water Works Association, and the Association of State Drinking Water Administrators provided their perspectives from a national level. State and provincial perspectives were obtained from certification program officials from 39 programs. The national organizations contacted advocate operator education utilizing all means deemed appropriate by individual certification programs to meet the diverse needs of today's operators, including online distance education courses. They mentioned several advantages to online programs but cautioned potential users to consider the disadvantages as well. Of the 33 certification programs surveyed that require an operator to complete a certain training course or courses prior to becoming certified, 85 percent have approved traditional written correspondence courses for the initial training, but only 58 percent have approved online distance education courses. Eight-six percent of the programs requiring continuing education have approved both traditional and online courses for that purpose. Even though these programs are allowing their operators to utilize online distance education courses, they cited evaluating the plethora of courses now available as their biggest challenge. These programs also listed several advantages and disadvantages of online distance education courses to themselves and the operators. Because most programs surveyed accept distance education courses for initial training and continuing education, one can deduce that the advantages to the programs and the operators outweigh the challenges and disadvantages.

KEYWORDS

Online Learning, Distance Education, Operator Certification, Training, Continuing Education, Computer-Assisted Learning, Association of Boards of Certification, Certification Programs

INTRODUCTION

What is distance education? At its most elemental level, distance education is a planned learning experience in which the education provider is in a different geographical location than the

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student. The main purpose of this paper is to discuss various national, state, and provincial perspectives on distance education as it pertains to water and wastewater treatment plant operator certification and continuing education. National organizations that provided input into this study about distance education include the Association of Boards of Certification (ABC), the United States Environmental Protection Agency (USEPA), the Water Environment Federation (WEF), the American Water Works Association (AWWA), and the Association of State Drinking Water Administrators (ASDWA). State and provincial perspectives were obtained from certification program officials from 39 programs.

Historically, most distance education was accomplished through written correspondence courses. The education provider sent the student material to read. After reading the required material, the student would complete a written assessment and mail it to the education provider. The education provider then scored the assessment and determined whether or not the student passed the course. This type of traditional correspondence course is still being used by operators today. One well-known traditional correspondence course provider in the water and wastewater treatment industry is the Office of Water Programs at the California State University, Sacramento (aka "the Ken Kerri manuals").

In recent years, distance education has expanded beyond traditional written correspondence courses to include audio tapes, video tapes, DVDs, audio/video conferencing, computer-based training, webcasts, asynchronous online courses, and combinations of those formats. There are training modules available for water and wastewater operators utilizing most of the previously-mentioned formats.

One rapidly expanding category of training is online distance education. There are several platforms for online distance education, but one seems to be the most prevalent in regards to operator certification training and continuing education: computer-assisted learning (CAL). In this format, the computer essentially acts as the instructor. When students log on to the website, they receive information from the computer via print, audio, and/or video. In some courses, students receive credit for each page read, audio file heard, and/or video watched. The computer keeps track of time spent in the program and/or components viewed and awards a certificate of completion when the required amount of material has been accessed or the required amount of time has been spent in the course. Some course providers have coupled computer-assisted assessment with the CAL material. In these courses the student is not awarded credit for the course until he or she successfully completes a computer-generated assessment covering the material. For the remainder of this paper, online distance education refers to CAL courses.

THE ABC PERSPECTIVE

The Association of Boards of Certification (ABC) is an association of regulatory and volunteer environmental certification programs located primarily throughout North America, but includes a few non-North American programs. Since its inception in 1972, ABC has been a strong proponent of operator education, believing that high quality training, regardless of format, has a positive impact on the operators, thereby enabling them to protect the public health and the environment more effectively.

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Several years ago, the ABC Board of Directors realized that distance education was an emerging format for educating operators, but that there were no criteria available for evaluating distance education courses. At that time a collaborative effort by ABC, AWWA, and WEF led to the development of a distance education evaluation criteria document that became available to certification programs. This document, *Guidance for the Evaluation and Accreditation of Distance Education*, recommends major elements a certification program should consider when reviewing and evaluating traditional or online distance education courses. This document, which is on ABC's website at http://www.abccert.org/disted.html, is available to all certification programs.

Even though the ABC/AWWA/WEF distance education guidance document is available, ABC is aware that additional challenges exist in the approval of online distance education courses. Some are the same challenges a program faces in evaluating traditional classroom training: the quality of the training course; the relevance of the material; the effectiveness and qualifications of the instructor; etc. Additional challenges are specific to online training: lack of adequate beta testing by course providers; the massive amount of time required to review the substantial number of courses that have been developed; and the wide variety of formats and course designs being presented.

Beyond the challenge of properly evaluating online distance education courses, ABC recognizes that there are advantages and disadvantages to operators and certification programs in relation to these courses. The two main advantages to operators are convenience and variety: convenience because an operator can take a course at any time from any location that has a computer with Internet access; and variety due to the vast array of available training topics. For programs responsible for providing operator training and those with continuing education requirements, the advantage of the online courses is the fact that there is training available. Disadvantages to the operator include the lack of interaction with an instructor, no opportunity for asking questions, the absence of a hands-on component, and the potential for receiving poor quality training. The disadvantages to the programs include the challenges previously mentioned plus the difficulty of verifying that the operator receiving credit for the course is actually the operator who took the course and the program's lack of familiarity with a national provider as opposed to a local classroom instructor.

To summarize ABC's perspective concerning online distance education, the Association strongly advocates operator education opportunities—both classroom and distance—that effectively transfer relevant knowledge to the operators. Online training can be a viable means of training operators when it meets the needs of the operator and the requirements of individual certification programs. Although online distance education courses may be advantageous to both the operators and the certification programs, there are some disadvantages to consider. Also, there are some significant challenges being faced by certification programs in evaluating online distance education courses.

ADDITIONAL NATIONAL PERSPECTIVES

In addition to ABC, several other organizations with a stake in operator education were asked for their perspectives on distance education. Those providing significant input include the United

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States Environmental Protection Agency (USEPA), the Water Environment Federation (WEF), the American Water Works Association (AWWA), and the Association of State Drinking Water Administrators (ASDWA).

Officials from both the drinking water and wastewater offices at the USEPA were contacted concerning the Agency's perspective on distance education. USEPA input was sought because the 1996 Amendments to the Safe Drinking Water Act (SDWA) specifically address operator certification, and many in the industry believe similar requirements may be added to the Clean Water Act the next time it is revisited. EPA staff with responsibility for overseeing operator certification programs under the SDWA noted that the Drinking Water Program does not have an official policy on distance education. The Agency's position is that it will support whatever training each state feels is appropriate for its operators. Like the Drinking Water Program, the Office of Wastewater Management does not have an official policy on operator education courses because all of the wastewater certification programs are managed by the states, and each state develops its own requirements for operator education. EPA staff did express their belief that properly designed distance education courses may be a legitimate means of educating operators, but cautioned operators and programs to consider both the advantages and disadvantages of such courses. Advantages mentioned were flexible scheduling of classes for operators and potential cost savings for employers. Disadvantages included the difficulty programs may have verifying who actually took the course, the inability of the operator to ask questions of the instructor, and the potential problem of determining what the operator actually learned.

Both WEF and AWWA have a significant number of operators as members. These organizations are heavily involved in operator training and share some distinct similarities: 1-both offer distance education courses, signifying that they both believe in the viability of distance education as a means for educating operators; 2-both participated in the development of the *Guidance for the Evaluation and Accreditation of Distance Education* document described earlier; and 3-both believe that distance education courses need to be designed properly in order to be beneficial to the operators that want to utilize them.

Stacy Passaro, WEF Senior Environmental Engineer and Training Program Manager, cited the need for a wide spectrum of high quality training opportunities due to the diverse types of situations in which operators find themselves. WEF currently offers several types of training, including traditional classroom, CAL, conferences, and webcasts. Passaro asserted that online distance education is a viable tool for operators when the courses are properly designed. One potential problem with online distance education courses is the disparity between the number of hours projected for an operator to complete a course and the number of hours an operator actually spends in the course. WEF is currently in the process of revamping its method of assigning credit to its distance education and computer-based training modules to insure that the CEUs given for those types of courses are realistic and equivalent to the CEUs granted for similar classroom training.

AWWA, like WEF, is a strong proponent of utilizing all available platforms for operator continuing education. AWWA offers classroom training, conferences, written correspondence courses, conferences, webcasts, and online courses. Rick Harmon, Technical and Educational Programs Manager for AWWA, believes the greatest benefit of online distance education

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courses is flexibility of scheduling for the operator. Even when classroom training is available, many operators have a difficult time making it to a class. Harmon feels that the scheduling variability offered by online courses will allow operators more opportunities for training. He cautioned operators and programs that approve online courses to be certain the courses they choose to utilize are high quality courses.

The Association of State Drinking Water Administrators (ASDWA) was contacted because it represents state drinking water programs, many of whom administer operator certification programs for drinking water systems. ASDWA does not have an official written policy on distance education, but Bridget O'Grady, Policy and Legislative Affairs Manager, stated that ASDWA endorses the principle of continuing education for operators through all appropriate types of training that meet the diverse needs of the operators including traditional classroom, distance education, hands-on workshops, etc. Like the USEPA, ASDWA does not approve specific training courses, so O'Grady stressed that each state certification program must decide for itself which courses and types of training will benefit its operators.

STATE AND PROVINCIAL PROGRAM PERSPECTIVES—INTRODUCTION

To gain the perspectives of state, provincial, and other regulatory programs, an open-ended survey was developed and emailed to each water or wastewater certification program contact in the ABC 2006 Directory. The brief survey consisted of ten questions:

1. Does your certification program approve any traditional correspondence courses for initial operator training?

2. Does your certification program approve any online distance education courses for initial operator training?

3. Does your certification program approve any traditional correspondence courses for operator continuing education for license renewal?

4. Does your certification program approve any online distance education courses for operator continuing education for license renewal?

5. What challenges has your program faced in the approval of online distance education courses?

6. What advantages do online distance education courses provide to OPERATORS?

7. What advantages do online distance education courses provide to YOUR PROGRAM?

8. What disadvantages do online distance education courses provide to OPERATORS?

9. What disadvantages do online distance education courses provide to YOUR PROGRAM?

10. Do you have any other comments about online distance education courses?

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There were 86 surveys emailed, and 39 were completed and returned. Of the 39 responses, 31 were from state operator certification programs, six were from provincial programs, and two came from jurisdictions outside of the United States and Canada. Raw data from questions one through nine is tabulated in the next section of this paper, and a discussion of the results follows the data tables.

STATE AND PROVINCIAL PROGRAM SURVEY RESULTS

1. Does your certification program approve any traditional correspondence courses for initial operator training?

Answer	**Number of Programs with Answer**	**Percent of programs requiring initial training accepting traditional correspondence courses**
Yes	28	85
No	5	15
Do not require initial training	6	n/a

2. Does your certification program approve any online distance education courses for initial operator training?

Answer	**Number of Programs with Answer**	**Percent of programs requiring initial training accepting online distance education courses**
Yes	19	58
No	14	42
Do not require initial training	6	n/a

3. Does your certification program approve any traditional correspondence courses for operator continuing education for license renewal?

Answer	**Number of Programs with Answer**	**Percent of programs requiring continuing education accepting traditional correspondence courses**
Yes	30	86
No	5	14
Do not require continuing education	4	n/a

4. Does your certification program approve any online distance education courses for operator continuing education for license renewal?

Answer	**# Programs with Answer**	**Percent of programs requiring continuing education accepting online distance education courses**
Yes	30	86
No	5	14

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Do not require continuing education	4	n/a

5. What challenges has your program faced in the approval of online distance education courses?

Answer	**# Programs with Answer**
Massive amount of time it takes to evaluate a course and lack of staff to evaluate properly	10
Determining if training meets educational and content quality standards	9
Sheer number of courses requesting approval	8
Determining the appropriate number of CEU's/training hours to award	8
Obtaining necessary information from course provider	5
Having to draft a policy on how to evaluate the courses	4
Lack of established guidelines for evaluated courses	3
Verifying credentials of course developer and provider	3
Determining relevancy of course	3
Technical problems reviewing courses	2
Wide variety of designs of courses to evaluate	2
Determining what information was needed to adequately evaluate courses	1

6. What advantages do online distance education courses provide to OPERATORS?

Answer	**# Programs with Answer**
Operator does not have to travel	20
Training schedule is flexible	20
More subject matter choices are available	19
Class can be taken at any location with Internet access	7
Training is self-paced	7
Training costs less	6
Supervisor can oversee and monitor progress	2

7. What advantages do online distance education courses provide to YOUR PROGRAM?

Answer	**# Programs with Answer**
Continuing education is available for the operators	16
No advantages to my program	11
Operators can get training on short notice	6
Operators can remain on site while training	3
Each course that is approved is consistent	1

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8. What disadvantages do online distance education courses provide to OPERATORS?

Answer	# Programs with Answer
No instructor interaction/question and answer time	16
No peer networking	11
Operator must have computer access and be computer literate	6
Less certainty of knowledge transfer	5
Operator must be self-disciplined	4
Fewer opportunities to meet regulators	3
Fewer opportunities to connect with operator organizations	3
Proof of training hard to get	2
Need Internet connection	2
Registration process sometimes cumbersome	1
Course may be too repetitive	1

9. What disadvantages do online distance education courses provide to YOUR PROGRAM?

Answer	# Programs with Answer
Difficult to verify who actually took the course (too easy to cheat the system)	12
Hard to get rosters from course providers	6
Time spent in course by operator not tracked or not provable	6
Not certain CEU's awarded are equivalent to same CEU's in classroom training	3
Too many course provider coming and going (fly-by-night)	2
Difficult to get course updates	1
Operators become isolated	1
Have to spend time walking providers through approval process	1

STATE AND PROVINCIAL PROGRAM PERSPECTIVES—DISCUSSION

Of the 33 respondents that require an operator to complete a certain training course or courses prior to becoming certified, 85 percent have approved traditional written correspondence courses for the initial training, but only 58 percent have approved online distance education courses. Eighty-six percent of the programs requiring continuing education have approved both traditional written correspondence courses and online distance education courses for that purpose. These results indicate that programs are more willing to allow already certified operators to engage in online distance education than those seeking initial certification.

When analyzing the answers to the questions regarding the challenges programs have faced in approving online distance education courses, it is evident that the biggest challenge is the evaluating of these courses. All but one of the responses given relate to evaluation of the courses. The most four common responses were: 1-the time/staff needed to evaluate the courses; 2-determining if the course meets quality standards; 3-the sheer volume of courses requesting approval, and 4-discerning the appropriate number of training hours/CEU's to award. Other

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answers included drafting an online course evaluation policy, lack of established guidelines, obtaining appropriate information from the course provider, and verifying the credentials of the course developer and the course provider. These responses indicate that work is needed in the area of evaluating online distance education courses.

As mentioned earlier, ABC, WEF, and AWWA developed a guidance document for evaluating distance education courses. There are some programs already utilizing this guidance, but there are a few programs that did not know of its existence and others that are not utilizing it. When some of those not using it were asked why, the most common answer was that they did not have sufficient staff to review the recommended information. Several program officials mentioned the desire for a central organization that could evaluate distance education courses and provide the results of that evaluation to interested programs. Others expressed a need for some sort of standardized set of requirements and definitions for online courses.

The replies to the query about the advantages of online distance education courses for the operators cited three major ones: 1-operators do not have to travel; 2-the training schedule is flexible; and 3-more subject matter choices are available. Half of the programs responding to the survey mentioned all three of these advantages. Even though the programs recognize the advantages, and 86 percent allow the use of online courses to meet continuing education requirements, they also realize that there are disadvantages to online distance education courses. The two most commonly mentioned disadvantages both relate to the absence of interacting with people: 1-there is no instructor interaction for questions and answers; and 2-there is no peer networking. Other frequently brought up operator disadvantages are that the operator must be computer literate, have access to a computer, and be self-disciplined.

There was a pair of questions on the survey relating to the advantages and disadvantages of online distance education courses to the programs. The most frequently cited advantages to programs were the fact that there are continuing education courses available for the operators to be able to fulfill the programs' continuing education requirements and that the courses are available on short notice. Interestingly, eleven programs stated that online distance education courses offered no advantages for them. Disadvantages mentioned, besides the enormous challenge of evaluating the courses, were the inability of the course provider to verify who was actually sitting at the terminal, difficulty in obtaining rosters from some course providers, and the fact that actual time spent in the course was either not tracked or not provable. Just because a particular operator was logged in to the course, the provider could not guarantee that the particular operator was actually sitting at the computer working in the course.

The last question on the survey offered the opportunity for respondents to submit additional comments they had about distance education. Several programs stated that they had not accepted many or were not accepting any online distance education courses for continuing education credit because there was no demand for it by operators in their jurisdictions. In contrast, other programs expressed the opposite view—the availability of online distance education was invaluable to their operators because parts of their jurisdictions were rural, and classroom training opportunities were rare.

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Of the programs that are accepting online distance education courses, a few are only evaluating ones from IACET Authorized Providers. IACET, which stands for International Association for Continuing Education and Training, "…is a non-profit association dedicated to quality continuing education and training programs. IACET authorizes education providers that meet strict continuing education guidelines created in 1968." IACET guidelines are specific about procedures required to develop courses but are not designed to evaluate the technical content of courses, so programs requiring IACET approval still have to evaluate courses for technical merit.

Another sentiment expressed by programs is that it may be more difficult to produce high-quality training courses in the online format than in a traditional classroom setting, but, when done correctly, an online course can be very effective. Officials in states where the operators are utilizing online courses articulated their desire to encourage development of high quality online distance education courses. Some programs with funding to develop online courses are in danger of losing that funding because the online courses are not being utilized by the operators.

The availability of online distance education courses is causing a paradigm shift amongst many operator certification programs. Some answered the survey three ways: 1-what we've done in the past; 2-what we are doing now; and 3-what we plan to be doing in the future (answers relating to the present were used in tabulating survey results). Some are in the process of using the *Guidance for the Evaluation and Accreditation of Distance Education* as a foundation for developing their own policies and procedures for evaluating and accepting online distance education courses while others are developing policies from scratch. A few are instituting rules to require continuing education when they had not done so in the past because there were not enough training opportunities available for their operators.

Lastly, the programs realize that the approval process, as difficult as it is for the programs, is even more difficult for the course providers. They have to satisfy the requirements of each state, provincial, and national operator certification program, and no two governmental entities have the same requirements.

CONCLUSIONS

All national, state, and provincial agencies surveyed believe that operator education is important, and most consider distance education a legitimate means of operator education. ABC, the USEPA, and ASDWA advocate operator education utilizing all means deemed appropriate by individual certification programs to meet the diverse needs of today's operators. All three organizations recognize that online distance education courses have a role to play, but there are advantages and disadvantages to consider.

WEF and AWWA, national operator organizations that provide operator training, use a variety of platforms, including online distance education. Staff from both organizations emphasized that online distance education courses need to be properly designed and of the highest quality in order to be beneficial to operators. Both also believe that this type of course fulfills a need within the operator community for training with flexible schedules and in remote locations.

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A slight majority, 58 percent, of certification programs responding to the distance education survey allow operators to utilize online distance education courses to satisfy initial operator training requirements while a significant majority, 86 percent, permits certified operators to use these types of courses to comply with continuing education requirements. The biggest challenge for the certifying authorities in approving distance education courses is properly evaluating the courses. The four major aspects of evaluating the courses with which the programs are struggling are: 1-the large amount of time/lack of staff needed to evaluate the courses; 2-the decision of whether or not the course meets quality standards; 3-the sheer volume of courses requesting approval; and 4-the determination of the appropriate number of training hours/CEU's to award. Additional disadvantages to the programs include the inability of the course provider to verify who was actually sitting at the terminal, difficulty in obtaining rosters from some course providers, and the fact that actual time spent in the course was either not tracked or not provable. Advantages to distance education as seen by the programs are the availability of continuing education courses for the operators to be able to fulfill their continuing education requirements and that the courses can be taken with little to no notice.

When asked if online distance education courses held advantages for operators, program officials overwhelmingly responded with three key advantages: 1-operators do not have to travel; 2- the training schedule is flexible; and 3-more subject matter choices are available. The lack of interaction with other people was the common thread between the two most frequently cited disadvantages to online distance education courses—no instructor interaction/opportunity for questions and answers and no peer networking.

Because most programs surveyed accept distance education courses for initial training and continuing education, one can deduce that the advantages to the programs and the operators outweigh the challenges and disadvantages. Individuals contemplating utilizing distance education courses, and programs considering accepting them, would be wise to take into account the advantages and disadvantages before making a final determination.

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Colorado Water and Wastewater Facility Operators Certification Board
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