

ANSI/ASSP Z490.2-2019

Accepted Practices for E-Learning in
Safety, Health and Environmental Training



AMERICAN SOCIETY OF
SAFETY PROFESSIONALS



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American National Standard

**Accepted Practices for E-Learning in
Safety, Health and Environmental Training**

Secretariat

American Society of Safety Professionals
520 N. Northwest Highway
Park Ridge, Illinois 60068

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Foreword (This Foreword is not a part of American National Standard Z490.2 – 2019.)

Training is an important element of an effective overall safety, health and environmental program. The Z490 standard grew out of the recognized need for improvement in safety, health and environmental training. Effective, quality training is required to ensure that workers and safety, health and environmental professionals have the knowledge, skills and attitudes necessary to protect themselves and others in the workplace.

The ANSI/ASSP Z490.1, *Criteria for Accepted Practices in Safety, Health and Environmental Training*, was first approved in July 2001, with revisions approved in May 2009 and December 2015. The standard covers core facets of training, including training analysis, design, development, delivery, evaluation and management of training and training programs. During the 2015 revision process, the Z490 committee recognized the increasing use of electronic learning (e-learning) for delivering, evaluating and managing training. Given the unique considerations of electronic learning, the Z490.2 subcommittee was formed to develop criteria specific to e-learning. Thus, the ANSI/ASSP Z490.2 standard supports the concepts of ANSI/ASSP Z490.1 and is arranged to complement and enhance the concepts discussed in that standard.

The benefits of e-learning can include cost savings, time savings, increased outreach potential, training in multiple locations from a central location, consistency in messaging and more. However, in order to develop a conducive environment for effective adult learning in this digital age and to capitalize on digital technologies, instructional designers, trainers, facilitators and learners must be aware of the unique challenges and limitations that must be taken into account in the design of instruction, the mode of delivery and dissemination, and instructional and teaching practices employed in electronic learning.

The user should recognize that not all information presented in an electronic format is training. Training, as used in this standard, is any activity designed with learning objectives and methods to engage and involve participants in an interactive process in gaining, improving or retaining specified knowledge, skills and/or attitudes.

Industry employers may use this standard to assess the services of external e-learning providers or to audit or improve their own corporate e-learning programs. Training providers may use the standard to assess and improve their e-learning services. This standard may also be used as a basis for development and management of electronic training and training programs, with the annexes and references providing additional information and detail.

Governmental regulations specify mandatory requirements for various safety, health and environmental training. Likewise, the training program may be embedded in a larger safety, human resources or other organizational structure. As a broad-based voluntary consensus standard, this document applies to both the regulations and public and private organizational policies. However, compliance with this standard does not ensure compliance with governmental regulations or organizational policies, or vice versa.

Normative Requirements: This standard uses the single column format common to many international standards. The normative requirements appear aligned to the left margin. To meet the requirements of this standard, machinery, equipment and process suppliers and users must conform to these normative requirements. These requirements typically use the verb “shall.”

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AMERICAN NATIONAL STANDARD Z490.2 ACCEPTED PRACTICES FOR E-LEARNING IN SAFETY, HEALTH AND ENVIRONMENTAL TRAINING

1. Scope, Purpose and Application

1.1 Scope

This standard establishes criteria for electronic learning (hereafter referred to as e-learning) as part of safety, health and environmental training programs, including program management, development, delivery, evaluation and documentation.

This standard is intended to complement ANSI/ASSP Z490.1, *Criteria for Accepted Practices in Safety, Health and Environmental Training*. As such, all criteria in ANSI/ASSP Z490.1 apply. Only criteria unique to or particularly relevant to e-learning are presented in this standard.

1.2 Purpose

The purpose of this standard is to provide accepted practices for e-learning in safety, health and environmental training programs.

1.3 Application

This standard is recommended for providers, designers, users and auditors of safety, health and environmental training with e-learning components.

1.3.1 If any of the provisions of this standard are not applicable, the other requirements of the standard shall still apply.

1.3.2 This standard applies to all electronic safety, health or environmental training, whether separate or a part of other training.

2. Definitions

Definitions included in ANSI/ASSP Z490.1 apply. This section provides definitions relevant to this standard on e-learning.

NOTE: See Annex B for discussion and definitions of education terms. See Annex C for discussion and definitions of e-learning approaches and methods.

Bandwidth. Amount of data that can be transmitted in a fixed amount of time.

Blended Learning Solution. A combination of multiple training delivery methods (e.g., face-to-face training, e-learning, etc.).

Electronic Learning (e-learning). A method of delivering training on a computer or other electronic device using the internet or a local computer network (intranet). E-learning typically involves a delivery platform and training content. E-learning is also referred to as computer-based training (CBT), online training or virtual training.

NOTES: Different forms of e-learning can include web pages, live or recorded webinars, e-learning courses and others. See Annex C for description of various e-learning approaches and methods for learner engagement.

Devices can include desktop computers, laptop computers, tablets, phablets, phones, smart watches and other wearables and other devices.

E-learning Component. A part or portion of a course that is delivered via computer or other electronic device.

E-learning Course. A training course or class that is delivered via computer or other electronic device.

E-learning Program. Training program that includes delivery of training via computer or other electronic device. All or a portion of the training may be delivered via e-learning.

E-learning Standard. An agreed-upon set of specifications for how an e-learning course is created so that it can be imported into, be read by, and communicate with a learning management system (LMS) and/or, in some cases, a learning record store (LRS).

NOTE: Creating e-learning courses and LMSs that comply with and/or support one or more of these e-learning standards makes it easier for courses to be used in LMSs (or similar software systems) made by various software creators. See Annex D for more details about e-learning standards.

Facilitator. The leader of an e-learning course (similar to instructor, trainer or teacher).

NOTE: See Annex B for discussion and definitions of education terms.

Instructional Designer. The person(s) who designs and develops the training. The instructional designer also integrates educational technologies to promote effective teaching strategies.

NOTE: This is the currently favored term for the person who develops electronic training (as opposed to course or content developer). See Annex B for discussion and definitions of education terms.

Learner. The receiver of the training for whom it was designed and delivered (sometimes called trainee or student).

NOTE: See Annex B for discussion and definitions of education terminology.

Learning Management System (LMS). The software application used to store, create, assign, deliver, access, track and/or report on training and/or educational materials.

NOTE: See Annex E for further information on LMSs.

May. Denotes a permissive statement.

Shall. Indicates a mandatory requirement.

Should. Indicates a recommendation which is advised but not required.

3. Training Program Administration and Management

Follow all guidelines for management of safety, health and environmental training covered in ANSI/ASSP Z490.1. This section provides additional criteria for training programs that include e-learning.

3.1 Responsibility and Accountability

3.1.1 Responsibility and accountability for e-learning shall be clearly defined.

NOTES: Examples of responsibilities related to e-learning include software licensing and updates, system maintenance, provision of information technology (IT) support to learners, provision of tools for online sharing opportunities, expectations for learners, etc.

Responsibilities should be defined to create a sense of online community and shared expectation between instructional designers, facilitators, learners, administrative personnel, IT staff and others. For example, minimum technology requirements, technology use instructions and etiquette expectations for online discussions, email and other forms of communication should be included.

3.1.2 The level and rigor of program accountability and responsibility shall be proportionate with the requirements, if any, of the accrediting body or provider's organization.

3.2 Minimum Training Program Requirements

3.2.1 Maintaining quality of e-learning shall be a priority.

NOTES: Trainers and training providers should strive for quality improvements to their training courses, training delivery and the overall program.

Both third-party and in-house improvement processes (for e-learning) can be of value. Self-assessments, peer review, audits, etc. with other trainers could be conducted.

3.2.2 Accreditation of the training program should be considered.

NOTES: Accreditation can be helpful for a training provider's quality and validation, especially if providing continuing education maintenance to learners via e-learning outside of the program.

One example of a training accreditation program is the International Association for Continuing Education and Training (IACET) (see <https://www.iacet.org/>). Some e-learning programs meet CEU/CME/CNE, etc. requirements for license/professional organizations. When used, they should be transparent and follow the required criteria. For example, Continuing Medical Education (CME) is granted by various organizations like American College of Occupational and Environmental Medicine (ACOEM) or Centers for Disease Control and Prevention (CDC).

3.2.3 Compliance with the Americans with Disabilities Act (ADA) shall be incorporated in the training program.

NOTE: ADA compliance may involve issues related to sight; hearing; the ability to physically interact with a screen, mouse and/or keyboard; and more. The Web Content Accessibility Guidelines (WCAG) provide a single shared standard for web content accessibility that meets the needs of individuals, organizations and governments internationally (see <https://www.w3.org/WAI/standards-guidelines/wcag/glance/> for guidance).

3.3 Resource Management and Administration

Planning and implementing an effective e-learning program should include, but not be limited to, the following:

3.3.1 Personnel are assigned and supported to ensure adequate program administration and management specifically to meet on-demand assistance to learners.

NOTE: Additional staff may be needed to monitor discussion boards, chat rooms, etc. to facilitate engagement.

3.3.2 Expertise includes IT and e-learning development technical support for platform and delivery system, in addition to content expertise.

NOTE: Staff may need to attend training on new authoring and interactive tools. See <https://elearningindustry.com/top-10-instructional-designer-skills> for skills sets for instructional design staff.

3.3.3 Course technologies' effectiveness and usefulness is current and readily available.

NOTE: Best practices for e-learning navigation, learner accessibility and multimedia facilitation should be implemented.

3.3.4 Expertise in e-learning andragogy is considered.

NOTE: Training and updated resources for instructors should be considered, for example, in topics such as successful strategies for e-learning teaching techniques and strategies that increase instructor visibility.

3.3.5 Technology infrastructure planning, hardware and software are reviewed periodically.

NOTE: New tools should be incorporated that emphasize engagement, interaction and presence for the e-learning community.

3.3.6 Resources required for e-learning are assessed and provided to learners.

NOTE: Resources required for e-learning include, but are not limited to, budget for and availability of:

- *instructional and e-learning designers and training facilitators with expertise in IT;*
- *learner access to appropriate devices, software and internet connection; and*
- *personnel to support learners and maintain devices and software.*

3.4 Program Evaluation

3.4.1 The e-learning program should be evaluated to assure:

- program requirements of an accrediting body and/or user organization are being met (if applicable);
- continued improvement is a strong consideration relative to the e-learning program, process and platform;
- resources to support the inclusion of electronic components are available; and
- the e-learning components are evaluated across applicable factors, are up to date and readily available.

3.4.2 Evaluation of the e-learning program should include:

- instructor and student criteria for engagement and interaction;
- operation of the LMS;
- methods for delivery of content in the e-learning environment; and
- cost of the e-learning, including cost of designing and developing the course, delivery, managing it, reusability, etc.

3.4.3 Evaluation of e-learning program elements shall take place on an established schedule, or as changes dictate the need.

NOTE: For example, instructors should review student evaluations, update content, and add new technology tools as recommended.

3.5 Software Integrations

Where feasible, training delivery software, such as an LMS, should be integrated with other software systems at a workplace.

NOTES: Integration with human resource software systems can help automate safety, health and environmental training assignments based on job role.

Integration with safety and health management software can help facilitate safety training based on safety observations and incidents.

A single sign-on integration can allow learners to access e-learning by simply clicking a link without having to login with a username and password.

4. E-learning Development

Follow all guidelines for the development of environmental, health and safety training covered in ANSI/ASSP Z490.1. This section provides additional criteria for training that is specific to e-learning.

NOTE: See Annex F, E-learning Development Checklist.

4.1 Needs Assessment

During the initial or subsequent needs assessment(s), it shall be decided whether e-learning is an appropriate method or intervention to the given organizational training need.

This assessment shall take into consideration, when relevant:

- availability of quality producers, instructional designers, facilitators and administrators of e-learning;
- electronic technologies, internet connectivity and/or other methods of training delivery and distribution;
- internet service available to learners;
- minimum learner literacy and computer skills necessary;
- preferences of learners, including their attitudes and cultural acceptability of e-learning;
- ability to deliver e-learning materials in languages appropriate to learners; and
- special accommodations required by learners to complete e-learning.

NOTE: Reasons to consider e-learning for a given training need include but aren't limited to:

- *whether the learner population is centrally located or dispersed;*
- *learner population works multiple shifts and/or is otherwise unavailable to meet in common for other forms of safety training;*
- *the e-learning allows a safe environment for learners to practice skills without creating negative, real-world consequences;*
- *learners prefer e-learning; and/or*
- *other efficiencies or valid reasons.*

4.2 Learning Objectives

The chosen e-learning method shall be suitable for:

- delivering training that will help the learners develop the knowledge, skills and attitudes required to satisfy the learning objectives;
- allowing the learners the opportunity to practice those knowledge, skills and attitudes in a limited-risk environment; and
- assessing the learners' ability to satisfy the learning objectives when the training is complete.

4.3 Selecting E-learning Delivery Methods/Media

4.3.1 An appropriate delivery method/media shall be selected based on the learning objective, training need and/or available resources.

NOTE: E-learning may be created and delivered in a number of different media or delivery methods (see Annex C for discussion of various e-learning methods).

4.3.2 When selecting training methods, blended learning solutions should be considered.