



Understanding the Significance of Integrating Codes and Standards into the Learning Environment

Prof. Virginia Charter P.E., Oklahoma State University

Virginia Charter has her BS in Fire Protection & Safety Engineering Technology from Oklahoma State University and MS in Fire Protection Engineering from Worcester Polytechnic Institute. She is currently pursuing a PhD in Educational Leadership and Policy Studies at OSU.

Ms. Charter is the Program Coordinator and an Assistant Professor at OSU's Fire Protection and Safety Engineering Technology program where she teaches Fire Protection Hydraulics and Water Supply Analysis as well as Design and Analysis of Sprinkler Systems. Her research interests include fire protection systems, codes and standards, as well as educational effectiveness and women in STEM. She serves as the advisor to the OSU SFPE Student Chapter and is an active member in the Oklahoma Chapter of SFPE. She is a licensed Fire Protection Engineer in Nevada, California and Oklahoma.

Prior to returning to OSU, Ms. Charter was a Senior Consultant for the Las Vegas office of Rolf Jensen & Associates, Inc. Ms. Charter has been heavily involved in large mixed-use properties egress design. She has developed performance specifications and conceptual drawings for fire alarm and automatic sprinkler systems, as well as construction design documents including fire protection reports, code equivalencies, and general code consulting for many projects across the nation and abroad. Additionally, she has valuable technical knowledge in smoke control analysis including the commissioning of smoke control systems.

Dr. Bryan Lawrence Hoskins, Oklahoma State University

Dr. Hoskins is an Assistant Professor of Fire Protection & Safety at Oklahoma State University. He earned his BS and MS degrees in Fire Protection Engineering from the University of Maryland and his PhD degree in Mechanical Engineering from the University of Maryland in 2011 with an emphasis on building egress. He has primarily taught classes related to codes and standards and has worked on grants related to effectively teaching codes and standards. Dr. Hoskins serves on technical committees for NFPA 101 and NFPA 72 as well as being the chair of the working group that has developed the SFPE Research Roadmap. His research interests are in evacuation, tenability, emergency messaging, and other issues related to human behavior in fire.

Samuel B. Montgomery, Oklahoma State University

Understanding the Significance of Integrating Codes and Standards into the Learning Environment

Oklahoma State University

Abstract

Short video models as a learning resource can easily be integrated into existing undergraduate, graduate, and professional development courses. This project includes the development of video modules to educate students about the role of codes and standards in engineering and technology disciplines, particularly fire protection engineering and related fields. The objective of the videos is to help students and other viewers understand the standard development process and the applications of codes and standards. The standards to be addressed in the videos are product standards (e.g. ones from Underwriters Laboratories and Factory Mutual), installation and maintenance standards (e.g. standards related to systems from the National Fire Protection Association), and model codes (e.g. ones from the International Code Council and the National Fire Protection Association). This paper addresses the need for the videos, the development process, and testing the first module prepared for the effectiveness. The module was tested on a freshmen level undergraduate course.

Introduction

Many professionals in engineering and technology fields do not have a solid background in codes and standards. They feel that the codes and standards organizations are acting independent of the rest of society; they do not understand the consensus process and the role that they can play in changing codes and standards. There is also a general lack of knowledge related to the different types of codes and standards. For example, some people are only aware of product standards while others are only aware of model codes. All types of standards are necessary. Poor understanding of codes and standards can have a significant economic impact. Professionals not understanding all of the different standards can have projects cancelled or delayed during construction to fix problems that could have been avoided if the standards were followed from the onset of the project.

The videos will explain the different types of codes and standards, how they are created, and how the application in the field relates to fire protection engineering. Additionally, they will be freely available for other institutions to use. There is no known comparable resource available for people interested in learning about codes and standards. Organizations like Underwriters Laboratories (UL), the International Code Council (ICC), and National Fire Protection Association (NFPA) all support this proposed educational tool.

It should be noted that this is not the first effort to educate those about codes and standards. The various code and standard organizations detailed above all have information publicly available on their individual websites. Additionally, NFPA, which this paper addresses through the video development and implementation, also has various case studies on the importance of Standard Development Organizations [1]. The important difference of these

efforts of the codes and standards organizations and those of this project, is putting the information in a user-friendly format that is also classroom ready.

The choice to develop videos was based on three key points. First, the visual representation of the material will allow the viewer to have a better appreciation for the importance of the standard. Students who have difficulty with the material can review the video repeatedly. Second, it can be easily shared with a wider audience. Videos will be able to be used in workplaces and classrooms throughout the country to teach about codes and standards. Third, it is more cost effective to have a video that can be shown every year than it is to recreate new materials each year. The effectiveness of the videos will be tested within undergraduate classrooms prior to wider mass dissemination. Ultimately, these videos will enable the different viewers to learn about codes and standards and their applicability within engineering and technology and the built environment.

Video Development

Seven video modules will serve as learning resources in undergraduate, graduate, and professional development courses to educate students about the role of standards in various fields of fire protection. The video modules include an introductory module, American National Standards Institute process module, product standard module, installation and maintenance standards module, ICC module, NFPA module, and concluding module. In speaking with NFPA, one of the subjects addressed was how many professionals in fire protection do not have a solid background in codes or standards. The purpose of the videos is to present the modules in an efficient way for traditional or online classroom settings. To those means, the videos will range in length from 10 to 30 minute periods, making them easily viewable in a single class period.

Koumi [2] believed videos, that when appropriately designed, should improve the learning experience. To develop the various modules, the process will flow from outlines of the different organizations and/or processes through to filming of each module. Each module will have both graphics and important notes within the film. There will be voice over graphics to discuss the details related to the development of the standards and codes. This is consistent with what Koumi [2] has encouraged in the power of visuals coupled with sound. Video content will include the processes in place, the people involved, and the resulting product. Other important items addressed will be the incorporation of codes and standards into the design world as well as the multiple applications that are used between codes and standards. Each module will then be filmed. After filming, sample-screening studies will begin and feedback from the screening groups will be evaluated. Adjustment to the modules will be made with the feedback in mind.

The module chosen to complete first is associated with NFPA. The NFPA module covers code creation, ratification, and implementation by the committees that serve NFPA [1]. NFPA utilizes consensus committees on the various codes and standards. Additionally, NFPA is a common organization that develops codes and standards utilized within the design industry. This paper will report how well the initial module was received within an undergraduate course, such that the future modules can be improved upon.

Utilizing Videos as a Supplement to Lecture

The video format will be helpful for various learning environments. Undergraduate or graduate students being introduced to codes and standards will be able to review the video(s) multiple times. Field professionals interested in only a particular module will be able to select which video to watch based upon their need. Online tutorials have been found to help students' master key points or skills. For example, it was found that undergraduate chemistry students had a better understanding of the concepts taught when utilizing the tutorial videos [3]. The study found that students performed better on examination questions after the online tutorials were introduced [3]. Choi and Johnson [4] also found a significant difference in learners' motivation when comparing video-based instruction and traditional text-based instruction. Learners in this study reported the video-based instruction to be more memorable compared to the text-based instruction [4].

This project, funded by the National Institute of Standards and Technology, aims to provide online videos to either supplement existing courses that utilize codes or standards or introduce individuals to codes and standards and the overall development process. Similar to the online chemistry tutorials comparisons He, Swenson, and Lents [3] conducted, this project will also evaluate the effectiveness of the NFPA module within a classroom setting. This comparison will utilize a pretest and posttest format detailed below as well as a survey of the students' perception of their learning gains.

The videos and modules will be applicable across the United States, and are intended to help students understand the standard development process and applications once published. Each module begins with a research period to fully understand the most current information on the subject content. Currently, the first module over NFPA standards has been screened in a traditional university setting. The purpose of our NFPA content module is to familiarize the audience with the NFPA revision process, and how to properly navigate the various codes and standards available for industry. The content explains the various stages of revision, where they are implemented, how to properly read the codes and standards, and makes note of commonly used publications.

Instructional videos can be used to increase learning of difficult subjects when used as a supplemental resource [3]. The purpose of the videos is to create such a resource for those within the fire protection and safety industry and fields affiliated with their respective standards and codes. In a professional setting, these can be used to brief employees on how to read the standards that directly correlate with the job task. A higher rate of success is expected when it comes to understanding and familiarization with codes and standards.

Method

The video related to the NFPA codes and standards was developed and then filmed. The content for the video covered the role of NFPA, how they develop codes and standards, how codes and standards are adopted, and how the NFPA codes and standards are organized.

The filming was done on campus by the Institute of Teaching and Learning Excellence, which specializes in developing content to be used in instruction. Two professors were filmed teaching about the different concepts while wearing Sennheiser EW 112-p wireless clip-on microphones. The filming was done using Canon EOS C100 digital video cameras mounted on lightweight Manfrotto tripods. The video was edited using the latest version of Adobe Premiere Pro. The final video was approximately 30 minutes in length.

The intent of the videos is to have them used by classes that study areas related to codes and standards. In order to evaluate the effectiveness of the videos, they need to be shown to the target audience and compared with other means of instruction.

A freshman level course that has content related to multiple NFPA codes and standards was selected to evaluate the video. This course is one of the first courses that students have that relates to codes and standards. The students typically have had some exposure to NFPA codes and standards before they enter the course and in some of the earlier lectures in the course.

This course is also ideal for testing because there are two different lab sections. The two lab sections are equivalent with no known differences a priori; both sections had no restrictions on enrollment and students were free to choose which section they wanted during registration.

The instruction took place during a laboratory session of the class. These sessions are scheduled for three hours, which allowed enough time to complete all of the tasks for the study. In previous semesters, this session of the class consisted of a lecture related to codes and standards followed by an exercise where students used the codes to find answers to questions using codes.

In order to serve as a baseline measurement and to confirm that the two sections were equivalent, a pretest was distributed to all students. The pretest asked basic questions related to the key objectives of the content in the video. The intent of this pretest was to establish how much the students knew in advance of the instruction. A copy of the pretest can be found in Appendix A.

After taking the pretest, the two sections then received instruction. The first section first watched the video while the second section first had a traditional lecture. The lecture covered the same basic material as was covered in the video. The lecture was similar to the one that has been given in this course in previous semesters. After receiving this instruction, the students then took a post-test.

The posttest covered the same questions as the pretest. The intent of the posttest was to determine how much knowledge was gained by students watching the video compared to how much they gained when receiving a traditional lecture.

After completing the posttest, the students were given a survey. This survey used the Student Assessment of Learning Gains instrument to allow the students to quantitatively rank how effective they found the means of instruction. A copy of the SALG instrument can be found in Appendices B (video) and C (traditional lecture).

After taking the posttest and the survey, the two sections received the other instructional method. After the second round of instruction, the students were given a final survey, a copy of which can be found in Appendix D. The survey asked the student open-ended questions about what they found to be most beneficial about the video and for recommendations of how the video could be more effective at conveying the information related to the codes and standards.

Student Assessment of Learning Gains Instrument

The Student Assessment of Learning Gains (SALG) instrument was developed in 1997. In 2007, Stephen Carroll, Elaine Seymour, and Tim Weston refined the instrument to broaden it beyond chemistry, which it was initially created for [5]. The SALG has respondents self report their own learning [5]. The instrument includes five overarching questions and sub-questions or items that are customized. The five SALG questions are as follows:

1. How much did the following aspects of the course help you in your learning? (Examples might include class and lab activities, assessments, particular learning methods, and resources.)
2. As a result of your work in this class, what gains did you make in your understanding of each of the following? (Instructors insert those concepts that they consider most important.)
3. As a result of your work in this class, what gains did you make in the following skills? (A sample of skills includes the ability to make quantitative estimates, finding trends in data, or writing technical texts.)
4. As a result of your work in this class, what gains did you make in the following? (The sub-items address attitudinal issues such as enthusiasm for the course or subject area.)
5. As a result of your work in this class, what gains did you make in integrating the following? (The sub-items address how the students integrated information.) [5]

These overarching questions within the SALG will provide a basis for determining how well a student who received the information as a video as compared to a student who received the information within a traditional lecture within the class.

Results

For the section that received the video instruction first, 15 students took the pretest and 16 were provided with the posttest, the SALG (only 15 completed it), and open-ended survey (one student arrived late). For the section that received the lecture first, 13 students responded to the pretest and 16 students participated in the posttest, SALG, and open-ended survey (three students arrived late). The overall demographics of the two sections were similar with two females and three international students in the video first section and one female and four

international students in the lecture first section. There are no known differences between the two sections.

The pretest consisted of five questions related to the learning objectives of the material to be presented. Because the students had previous exposure to some of these topics, the average score on the pretests for both sections was 2.7. On the posttest, covering the same five questions, the students that had watched the video correctly answered 4.1 questions correctly while the students that had received the lecture correctly answered 4.2 questions correctly. The number of questions answered correctly on the pretest and posttest are shown in Figure 1. A copy of the pretest and posttest can be found in Appendix A.

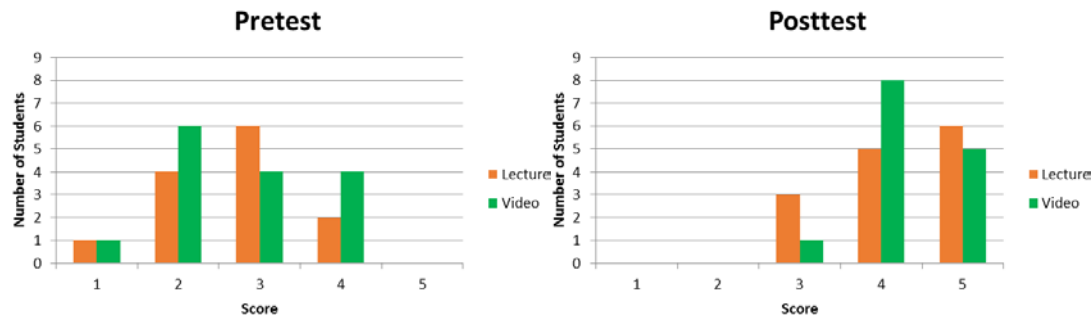


Figure 1: Pretest and Posttest Scores

Across the different elements in the SALG, there were 27 different questions where the students were asked to rank their learning gains on a scale of 1-5 with five being the best. The two sections scored issues related to the overall material and integration of issues similarly (typically around 4). For the questions related to gains from the instruction and the class activity, the section that saw the video typically scored gains at 3.5 to 4.0 while the section that received the lecture scored gains at a 4.0 to 4.5 with approximately the same difference between the two sections across all of these questions.

After receiving both means of instruction, the students were asked which method of instruction helped them better understand the material and if it would be beneficial to have access to the video outside of class. The results are shown in Figure 2.

For the section that received the video first, eight said that the lecture was more effective; three said that the video was more effective, and five gave an answer that did not indicate a preference between the two. For the lecture first section, twelve said that the lecture was more effective; one said that that video was more effective, and three gave an answer that did not indicate a preference. In terms of having access to the video outside of class, fourteen students that saw the video first and fifteen students that saw the lecture first thought that having the video available would be beneficial, one student in each section gave an answer that did not indicate a preference, and one student that saw the video first stated that people would not watch the video outside of class.

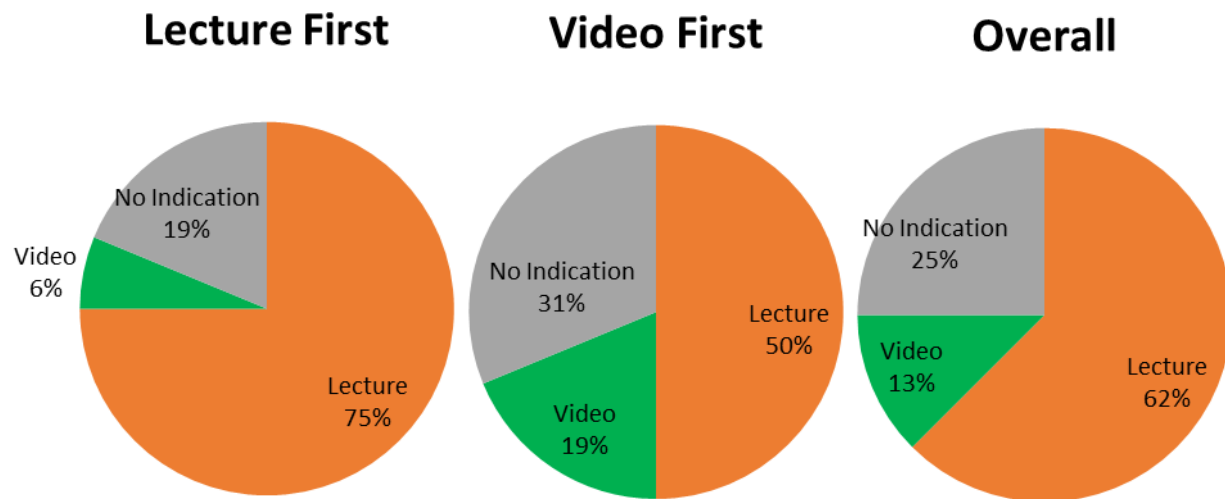


Figure 2: Student Preferences on Instructional Method

Discussion

The student responses to the surveys indicate several key issues related to the effectiveness of using video instruction. First, the students in both sections showed similar gains in learning on the posttest. Second, the students that received the video first evaluated their own gains to be lower. Third, both sections preferred the live lecture rather than the recorded one. Fourth, there was a very strong preference by the students to have the videos available outside of class.

Based on the pretests and posttests, the students in both sections saw nearly identical improvement in terms of understanding of the main concepts. Thus, using the videos rather than a live lecture as a teaching tool can lead to equivalent outcomes in terms of students' abilities to master the material. In situations where it is not possible to have a quality live lecture (e.g. faculty not being subject area experts or limited class time for all the material that needs to be covered), using the videos as a way of teaching the students will still result in similar learning outcomes.

While the measured outcomes might be the same, the students rated their gains as being lower when they watched the video. Because measures about the overall class were the same, this is likely not due entirely to one section simply having a different baseline for what scores they should give. This perception is important to address as students move through the curriculum. If students do not feel like they are sufficiently learning the material, they may lose motivation and/or choose an alternate means of education. This initial study has provided valuable information on the development of future video modules. The biggest takeaway is that several students indicated that examples within the videos would be helpful to fully understand the content. Appropriate examples will be provided in future videos to enable students to further their learning on the content.

The difference in perception is also evident in the response of both sections that they preferred the lecture. While the section that received the lecture first had a much stronger

preference in this regard, that can be potentially explained by the fact that the second method of instruction was likely viewed as redundant by the students and thus not as beneficial. Thus, it is more meaningful that both sections came to the same conclusion. This, combined with the previous discussion on the SALG results, indicates that the students view live lectures far more positively than recorded videos. During the live lecture, students are able to interact with faculty and ask for broader clarification; in both sections, students asked questions that went beyond the material originally in the module.

While students preferred the lecture, nearly all of them desired to have access to the video outside of the class. The methodology employed here did not test the gains that a student could receive from being able to watch the video multiple times at their own pace and it appears that the students would appreciate the ability to have that added resource. This allows the students to be able to take notes and re-watch certain concepts in the video that they struggled with the first time.

Overall, the two sections saw similar gains from both means of instruction. While the students strongly preferred the lecture over the video, this was in large part due to their ability to interact with the instructor and ask questions. For this class, they had a subject matter expert teaching the course; had that not been an option, the video would have potentially scored better. Despite the overall preference for the lectures, the students still preferred having access to the video as a way to reinforce the material covered in the lecture. This effect was not captured in the study. Based on the results of this study, students appear to prefer a mixture of learning options. They want to be able to have the live lecture in order to interact with the faculty and gain a deeper understanding of the topic, but they also find value in having the video resource available for use outside of class.

References

- [1] NFPA (2018). *Regulations and policies for NFPA's standards development process*. Retrieved 2018, from National Fire Protection Association: <https://www.nfpa.org/Codes-and-Standards>
- [2] Koumi, Jack (2016). *Designing video and multimedia*. New Your, NY: Routledge.
- [3] Y. He, S. Swenson and N. Lents (2012). Online Video Tutorials Increase Learning of Difficult Concepts in an Undergraduate Analytical Chemistry Course. *Journal of Chemical Education*. 89(9), 1128-1132.
- [4] Hee Jun Choi & Scott D. Johnson (2010). The Effect of Context-Based Video Instruction on Learning and Motivation in Online Courses. *American Journal of Distance Education*. 19(4), 215-227, DOI: 10.1207/s15389286ajde1904_3
- [5] SALG (2017). *About SALG*. Retrieved 2017, from Student Assessment of their Learning Gains: <http://www.salgsite.org/about>

Appendix A

NFPA Module Pretest/Posttest

Name:

1. Which is not true of NFPA?
 - A) Government organization that develops regulations related to fire protection
 - B) Helps save lives and limit economic loss due to fire and related hazards
 - C) Leading information and knowledge source on fire, electrical, and related hazards
 - D) Publishes more than 300 codes and standards
2. Which is not part of the NFPA code and standard development process?
 - A) Public provides input
 - B) Motions made at NFPA convention to modify proposed changes to the code or standard
 - C) Other standards development organizations coordinate content
 - D) Technical committees vote on proposed changes
3. Which is true about how NFPA codes and standards are adopted?
 - A) All NFPA codes and standards must be used together
 - B) Each jurisdiction can pass local amendments to change what is law in their jurisdiction
 - C) The newest editions are adopted every code cycle
 - D) They automatically become law
4. Which of these is the correct order of the first four chapters of most NFPA codes and standards?
 - A) Administration, definitions, referenced publications, general requirements
 - B) Administration, general requirements, referenced publications, definitions
 - C) Administration, referenced publications, definitions, general requirements
 - D) General requirements, definitions, referenced publications, administration
5. What symbol is used by the NFPA codes and standards to identify sections that have additional information in the Annex?
 - A) *
 - B) Δ
 - C) •
 - D) |

Appendix B
SALG Instrument – Video

Number	Question
	Your understanding of class content
	As a result of your work in this class, what GAINS DID YOU MAKE in your UNDERSTANDING of each of the following?
1	
1.1	The main concepts explored in this class
1.2	The relationships between the main concepts
1.3	The following concepts that have been explored in this class
1.3.1	What is NFPA?
1.3.2	How NFPA Codes and Standards are Developed
1.3.3	How NFPA Codes and Standards are Adopted
1.3.4	How NFPA Codes and Standards are Organized
1.4	How ideas from this class relate to ideas encountered in other classes within this subject area
1.5	Please comment on HOW YOUR UNDERSTANDING OF THE SUBJECT HAS CHANGED as a result of this class.
	Increases in your skills
	As a result of your work in this class, what GAINS DID YOU MAKE in the following SKILLS?
2	
2.1	Using NFPA Codes and Standards
2.2	Please comment on what SKILLS you have gained as a result of this class.
	Class impact on your attitudes
	As a result of your work in this class, what GAINS DID YOU MAKE in the following?
3	
3.1	Enthusiasm for the subject
3.2	Confidence that you understand the material
3.3	Your comfort level in working with complex ideas
3.4	Your willingness to seek help from others (teacher, peers, TA) when working on academic problems
3.5	Please comment on how has this class CHANGED YOUR ATTITUDES toward this subject.
	Integration of your learning
	As a result of your work in this class, what GAINS DID YOU MAKE in INTEGRATING the following?
4	
4.1	Connecting key class ideas with other knowledge
4.2	Applying what I learned in this class in other situations
4.3	Using systematic reasoning in my approach to problems
4.4	Using a critical approach to information and arguments I encounter in daily life

4.5 What will you CARRY WITH YOU into other classes or other aspects of your life?

The Class Overall

5 HOW MUCH did the following aspects of the class HELP YOUR LEARNING?

5.1 The instructional approach taken in this class

5.2 How the class topics, activities, reading and assignments fit together

5.3 The pace of the class

5.4 Please comment on how the INSTRUCTIONAL APPROACH to this class helped your learning.

Class Activities

6 HOW MUCH did each of the following aspects of the class HELP YOUR LEARNING?

6.1 Participating in discussions during class

6.2 Specific Class Activities

6.2.1 Video presentation on NFPA

6.3 Please comment on how the CLASS ACTIVITIES helped your learning.

Assignments, graded activities and tests

7 HOW MUCH did each of the following aspects of the class HELP YOUR LEARNING?

7.1 Graded assignments (overall) in this class

7.2 Please comment on how the GRADED ACTIVITIES AND TESTS helped your learning.

Class Resources

8 HOW MUCH did each of the following aspects of the class HELP YOUR LEARNING?

8.1 The textbook

8.2 Online notes or presentations posted by instructor

8.3 Please comment on how the RESOURCES in this class helped your learning.

The information you were given

9 HOW MUCH did each of the following aspects of the class HELP YOUR LEARNING?

9.1 Explanation of how the class topics, activities, reading and assignments related to each other

9.2 Explanation given by instructor of how to learn or study the materials

9.3 Please comment on HOW the INFORMATION YOU RECEIVED about the class helped your learning.

Support for you as an individual learner

10 HOW MUCH did each of the following aspects of the class HELP YOUR LEARNING?

10.1 Interacting with the instructor during class

10.2 Please comment on how the SUPPORT YOU RECEIVED FROM OTHERS helped your learning in this class.

Appendix C

SALG Instrument – Traditional Lecture

Number	Question
	Your understanding of class content
	As a result of your work in this class, what GAINS DID YOU MAKE in your UNDERSTANDING of each of the following?
1	
1.1	The main concepts explored in this class
1.2	The relationships between the main concepts
1.3	The following concepts that have been explored in this class
1.3.1	What is NFPA?
1.3.2	How NFPA Codes and Standards are Developed
1.3.3	How NFPA Codes and Standards are Adopted
1.3.4	How NFPA Codes and Standards are Organized
1.4	How ideas from this class relate to ideas encountered in other classes within this subject area
1.5	Please comment on HOW YOUR UNDERSTANDING OF THE SUBJECT HAS CHANGED as a result of this class.
	Increases in your skills
	As a result of your work in this class, what GAINS DID YOU MAKE in the following SKILLS?
2	
2.1	Using NFPA Codes and Standards
2.2	Please comment on what SKILLS you have gained as a result of this class.
	Class impact on your attitudes
	As a result of your work in this class, what GAINS DID YOU MAKE in the following?
3	
3.1	Enthusiasm for the subject
3.2	Confidence that you understand the material
3.3	Your comfort level in working with complex ideas
3.4	Your willingness to seek help from others (teacher, peers, TA) when working on academic problems
3.5	Please comment on how has this class CHANGED YOUR ATTITUDES toward this subject.
	Integration of your learning
	As a result of your work in this class, what GAINS DID YOU MAKE in INTEGRATING the following?
4	
4.1	Connecting key class ideas with other knowledge
4.2	Applying what I learned in this class in other situations
4.3	Using systematic reasoning in my approach to problems
4.4	Using a critical approach to information and arguments I encounter in daily life

4.5 What will you CARRY WITH YOU into other classes or other aspects of your life?

The Class Overall

5 HOW MUCH did the following aspects of the class HELP YOUR LEARNING?

5.1 The instructional approach taken in this class

5.2 How the class topics, activities, reading and assignments fit together

5.3 The pace of the class

5.4 Please comment on how the INSTRUCTIONAL APPROACH to this class helped your learning.

Class Activities

6 HOW MUCH did each of the following aspects of the class HELP YOUR LEARNING?

6.1 Participating in discussions during class

6.2 Specific Class Activities

6.2.1 Lecture presentation on NFPA

6.3 Please comment on how the CLASS ACTIVITIES helped your learning.

Assignments, graded activities and tests

7 HOW MUCH did each of the following aspects of the class HELP YOUR LEARNING?

7.1 Graded assignments (overall) in this class

7.2 Please comment on how the GRADED ACTIVITIES AND TESTS helped your learning.

Class Resources

8 HOW MUCH did each of the following aspects of the class HELP YOUR LEARNING?

8.1 The textbook

8.2 Online notes or presentations posted by instructor

8.3 Please comment on how the RESOURCES in this class helped your learning.

The information you were given

9 HOW MUCH did each of the following aspects of the class HELP YOUR LEARNING?

9.1 Explanation of how the class topics, activities, reading and assignments related to each other

9.2 Explanation given by instructor of how to learn or study the materials

9.3 Please comment on HOW the INFORMATION YOU RECEIVED about the class helped your learning.

Support for you as an individual learner

10 HOW MUCH did each of the following aspects of the class HELP YOUR LEARNING?

10.1 Interacting with the instructor during class

10.2 Please comment on how the SUPPORT YOU RECEIVED FROM OTHERS helped your learning in this class.

Appendix D

Final Survey

1. Did the video or lecture help you better understand the material?
2. Which of the learning objectives was best conveyed by the video?
3. Which learning objective was least effectively explained?
4. How could the video be improved?
5. Would having access to the video outside of class time be beneficial?
6. What other suggestions do you have?