

Defining Sustainability via ISO 14001

By

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Abstract: The issue of sustainability is becoming more critical as finite resources become depleted and pollution increasingly is destroying our habitat. This presentation explores sustainability as it relates to the fundamental concepts around ISO 14001, an international standard that encourages pollution prevention. ISO 14001 provides a framework for organizations to develop an environmental management system (EMS). An EMS is a managerial construct that creates a systemic methodology to support pollution preventions. This module will initially define sustainability and how ISO 14001 can help corporations support sustainability while realizing corporate profits; it will also examine the underlying standards within ISO 14001, audits, EMS, compliance, and certification. Of central importance is the realization that ISO 14001 is not a guarantee of sustainability but can provide the initial impetus for sustainability. This module will provide students and educators with the basic concepts that are at the core of an effective EMS such as audits, product take-back, and continuous improvement to name a few. Finally, this module will explore some of the myths and misconception around ISO 14001 as well as the number of ISO 14001 certifications in the United States compared to other developing nations.

Module Objective: To sensitize students to the issue of sustainability and to introduce them to the ISO 14001 standard.

Student Learning Objectives: After reviewing this PowerPoint slide discussion the student will be able to:

- Outline the fundamental ideas surrounding ISO 14001.
- Explain the purpose of an EMS.
- Define sustainability.
- Examine the problems with ISO 14001 certification.
- Present arguments for or against ISO 14001 regarding environmental sustainability.
- Outline some of the basic savings that business can realize by implementing ISO 14001.
- Discuss the number of ISO 14001 certifications in the United States vs. other developed countries and explain the implications on a local and global basis.

MatEd Core Competencies Covered:

4.E Recognize where a global perspective should be used in the workplace

19.A Demonstrate processes to promote quality management practices

19.B apply statistical, cost, life cycle and related management principles to manufacturing processes and management

Type of Module/Mode of Presentation: Classroom PowerPoint presentation.

Duration: Approximately 45 minutes

Key Words: sustainability, ISO 14001, certification, environmental management systems (EMS)

Prerequisite Knowledge: none

Grade Level Intended:

Comprehensive High School – 11 & 12

Project Lead the Way

Engineering by Design

Technical High School – freshman exploratory through 12

College – freshman – non-majors and majors

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Equipment and Supplies: PowerPoint projector

Curriculum Overview and Notes for Instructor:

The major objective of this demonstration is to explore the underlying concepts and ideas around the international standard for pollution prevention – ISO 14001. This module explores the major ideas that form the framework of ISO 14001 and what companies need to do in general to obtain certification. There are many advantages as well as disadvantages associated with trying to obtain ISO 14001 certification that will be highlighted. Finally, a brief review of companies that are currently certified in the United State vs. other developed nations will be reviewed.

These PowerPoint slides are designed as a general overview that examine if the international standard for pollution prevention, ISO 14001, supports sustainability. This Power Point presentation can be altered to provide either more or less detail when exploring this topic various concepts. The small number of companies getting ISO 14001 certification in the United States is unfortunate. The focus of ISO 14001 on pollution prevention does not bode well for sustainability but at least can provide the context for other sustainable initiatives such as:

ABCD

Triple bottom line

Life Cycle Assessment

Cradle-to-cradle

Natural Step

Natural Capitalism

Precautionary principle

Zero Waste

Factor X

Eco-footprint

Exploring local recycling policies and reclamation sites (dumps) can also be helpful for out of class activities. The emerging use of substitute materials such as pressboard for plastics food containers is a typical. The idea behind these pressboard products is that they are biodegradable and therefore disposable. An important question is, does providing for disposable product help or hurt recycling efforts? Do these products encourage a mentality that encourages littering, since the rationale is that they will decompose? This is an interesting paradox to explore with students.

Newly designed water bottles of lighter weight have been developed and a comparative analysis can be done based on weight.

Pre- class review:

The faculty should ask their students to consider: what are some of the problems when trying to dispose of common consumer products? Can some of these existing products be reused? Another important concept to analyze is how much of a product's cost is the result of materials vs. labor. Students should be asked to reflect on the everyday consumer products that are already designed for reuse such as ink jet cartridges. Another possible assignment is to ask students to bring in one "simple" consumer product and try to determine how it might be redesigned to be more easily reused or one that it is already available for reuse.

Homework Assignments:

Have the students consider developing a definition of sustainability. Another option is to have students review the various web sites related to environmental sustainability (an annotated list is provided). It would be helpful if each class of students could add to this list along with their own annotations. Another option is to have students do a wiki and collectively explore key issues around sustainability and ISO 14001.

To evaluate student understanding assign a homework that requires them to select an item and discuss reuse and recycling. Questions can be added to quizzes to determine if the students can successfully meet the student learning outcomes listed above.

Guiding Questions:

Is ISO 14001 an adequate standard to prevent pollutions? Why or why not?

Does ISO 14001 ensure environmental sustainability? Why or why not?

Is pollution prevention considered sustainability?

This module is intended to help educators explore an international standard and its ability to provide business personnel with an adequate framework for pollution prevention and to support sustainability. Pollution prevention and sustainability are not mutually exclusive.

Module Procedure:

Review the attached PowerPoint slides with the class, followed by discussion.

Other Curriculum Sources Please visit the MatEd website at: www.materialseducation.org

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Evaluation Packet

Student evaluation questions (discussion or quiz):

1. Is ISO 14001 an adequate standard to prevent pollutions? Why or why not?
2. Does ISO 14001 ensure environmental sustainability? Why or why not?
3. Is pollution prevention considered sustainability?
4. If you viewed this module on the internet, please also answer these questions
 - Did the PowerPoint load properly?
 - Were you able to follow the PowerPoint over the web?

Instructor evaluation questions:

1. At what grade level was this module used?
2. Was the level and rigor of the module what you expected? If not, how can it be improved?
3. Did the PowerPoint work as presented? Did they add to student learning? Please note any problems or suggestions.
4. Was the background material on ISO 14001 sufficient for your background? Sufficient for your discussion with the students? Comments?
5. Did the module generate interest among the students? Explain.
6. Please provide your input on how this module can be improved, including comments or suggestions concerning the approach, focus and effectiveness of this activity in your context.

Course evaluation questions (for the students)

1. Was the PowerPoint clear and understandable?
2. Was the instructor's explanation comprehensive and thorough?
3. Was the instructor interested in your questions?
4. Was the instructor able to answer your questions?
5. Was the importance of materials testing made clear?
6. What was the most interesting thing that you learned?