

Impact of Materials on Society

Module 10 –Writing Materials - Outline of Instruction for Faculty

The ways that we store and distribute information are not neutral, but have social, cultural, and political implications for the societies in which these materials operate. This module examines the wide variety of materials that have been used for information storage and dissemination, and uses lessons learned to predict the potential and pitfalls of new magnetic storage materials. The degradation of different materials for information storage can have a profound impact upon political, cultural, and economic development of any society, since it affects access to crucial information and influences what information is recorded, shared, and preserved.

Module Objectives

Students will:

- identify the properties of different writing materials, including stone, papyrus, parchment, and paper
- identify the properties of magnetic materials
- discover the uses and applications of writing materials both historically and in modern times
- examine the political dimensions of information storage
- discover how different technologies for information storage shape how we use and access information, as well as how we manipulate new writing materials

Student Reading Assignment before Day 1

Read excerpt (pp. 134-146) from

Sass, Stephen L. (1998/2011) *The Substance of Civilization*. New York: Arcade Publishing.

Day 1 Class - Material Science & Engineering Lecture on Writing Materials

(View Module 10 Day 1 Lecture PowerPoint slides: Writing Materials)

Materials Science Professor gives an overview of writing materials:

Materials Science Lessons

The goal from a materials science and engineering standpoint of this module is to discuss the history of various writing media from clay through paper. This includes the processing that was required to convert the media from raw material to a final useful product. The chemistry of processing of paper including the chemistry and separation of cellulose from lignin is discussed. Finally the concept of magnetic storage is presented.

Day 1 Lecture Development Resources:

- a. **Lecture:** [Writing Materials](#) PPT slides
- b. **Video:** [HowStuffWorks Show: Episode 3: Paper Pulp](#) (2.56)

- c. **Sample Lecture Video:** [Writing Materials](#) (15:54) ([Transcript](#))
Excerpts from Kevin Jones' lecture
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Student Reading Assignment before Day 2

Read: [Writing Materials: The Politics and Preservation of Knowledge](#) By Bonnie Effros

Abstract: Just as we cannot communicate to those around us without gestures or spoken language, it is difficult to convey thoughts and desires in a more lasting manner (or to those at a distance) without either the written word or pictorial representation. We will identify the properties of different writing materials, including stone, papyrus, parchment, and paper, and discusses the implications of the transition from manual to mechanical and digital printing. This lesson will examine the cultural and political dimensions of communication through writing and how different technologies for the storage of knowledge shape how we use, access, and share information.

Day 2 Class - Lecture on the Politics of Knowledge

Guest Professor presents The Politics and Preservation of Knowledge.

The lecture identifies the properties of different writing materials, including stone, papyrus, parchment, and paper, and discusses the implications of the transition from manual to mechanical and digital printing. It will examine the cultural and political dimensions of communication through writing and how different technologies for the storage of knowledge shape how we use, access, and share information.

Societal Lesson:

Innovations in materials often change the lives of communities in anticipated and unanticipated fashions.

Day 2 Lecture Development Resources:

1. **Lecture:** [Writing Materials](#) (PPT) slides by Prof. Bonnie Effros (UF)

Student Video and Homework Assignments before Day 3

Video: [Information Storage Systems](#) (11:33) ([Transcript](#))

As you watch the video, consider answers to the following questions:

Module 10: Writing Materials

- How have cell phones met a variety of needs in our day-to-day lives? What makes it possible to use this relatively small appliance to replace so many of the things we used to carry in our backpacks like maps, cameras, and music devices?
- How is a data stored on a magnetic hard drive? What elements are used in creating a hard drive? In what situations is this not an effective form of storage?
- How else can data be stored? And how is flash storage different from that of the magnetic hard drive?
- What are some of the shortcomings of both of these forms data storage? Why should we be concerned?
- How might we look back on this period of rapid technological change in the distant future?

Day 2 Individual Assignment:

Assignment: [Module 3 — Individual Homework Assignment](#) (Word)
Information Storage Systems Homework due start of class Day 3

Please answer your questions in either bullet points or full sentences. Your responses will probably take ½ to 1 page. Assignment will be graded out of 2 points on effort, use of the lecture, video, and reading materials, and thoughtful reflection. Be sure your name is on the paper. A cover page is not necessary. We'll build on your responses with the in-class group activity on Day 3.

Day 3 Class: Flipped Classroom Activity on Writing Materials

Day 3 Classroom Activity: Information Storage.

Part 1. Information exchange has always been a driving force behind changes in writing media. We seem to have an insatiable need for more information storage. Why? What might be a driving force behind future needs in improving data storage?

Part 2. How might this new magnetic storage technology affect how we make and use knowledge? (E.g., who has access to knowledge, how is knowledge exchanged, who is responsible for its storage, who owns the knowledge and finally are we getting smarter with all this memory storage?)

Part 3. What is Cloud data storage in one sentence? What are the two technologies that dominate cloud storage and what are the strengths of each? Do you use the cloud and why or why not i.e. what are the advantages and disadvantages to you?

Part 4. In what instances might future magnetic storage materials replace other materials for information storage (like paper etc.)? In what instances might they co-exist? Why does a new material for information storage not replace other materials immediately, or at all?

- Refer to [Day 3 In-Class Activity: Information Storage](#) worksheet for specific instructions.

- Refer to the rubric for grading criteria.

Day 3 Lecture Development Resources:

1. **In-Class Activity:** [Information Storage handout](#)

Complete Impact Paradigm Assignment:

Thinking about the material that we covered in this week's unit, add another question to the impact paradigm.

- **Assignment:** [Module 10—Impact Paradigm Individual Homework Assignment](#) (Word)

Additional Resources:

Online Course Module

- a. View the online Module 2 in [Word](#) or [PDF](#) format
- b. Available soon: The full online course to upload to your Learning Management System. Contact Kevin Jones at kjones@eng.ufl.edu or Pamela Hupp at hupp@mrs.org for more information.

Articles and Books:

- a. Chartier, Roger "Representations of the Written Word". In *Forms and Meanings: Texts, Performances, and Audiences from Codex to Computer*. Philadelphia: University of Pennsylvania Press (1995) 6-24.
- b. Loveday, Helen "Papermaking in the Islamic World" *Islamic Paper: A Study of the Ancient Craft*. Archetype Publications (2001) 17-28.
- c. Rothenberg, Jeff "[Ensuring the Longevity of Digital Information](#)". (1999)

Online Images:

- a. [Papyrus Scroll \(Egyptian Antiquity\)](#) *Book of the Dead of the Goldworker of Amun, Sobekmose*. Saqqara, Egypt. New Kingdom, Dynasty 18, prob. reign of Thutmose III to reign of Amunhotep II (circa 1479–1400 B.C.E.), Brooklyn Museum of Art, New York.
- b. [Paper Scroll \(China, Tang Dynasty\)](#) *Sutra on the Buddha's Liberation, Mahaparinirvana*, Book 4, Chapter 7-8. Undyed paper, Sinkiang, China, ca. 625-650 CE. Schoyen Collection MS 2152 – Oslo and London.
- c. [Handwritten Parchment Codex](#) (Medieval Europe) *Prayer Book of Claude de France* (c. 1517), Queen of France. Pierpont Morgan Library, MS M.1166, New York.
- d. [Paper Printed Book \(Early Modern Europe\)](#) – *Biblia Latina*, Mainz: Johann Gutenberg & Johann Fust, ca. 1455. Pierpont Morgan Library ms. 12, New York.

Videos:

- a. Yihong Wu. [Materials for Information Technology: Magnetic Materials](#) (24:12) video