AHE 233 Introduction to Health Informatics
Lesson Plan - Week One

Major Theories & Healthcare Informatics Literacy

Note: I have set up the entire curriculum for this class with weekly lesson plans. This will allow the Instructor to determine how to incorporate the information into lesson plans whether it is a daily class, a twice weekly class, a three times a week class, or even a one class per week calendar.

Healthcare Informatics
Definition

Health Informatics - Health informatics or medical informatics is the intersection of information science, medicine and health care. It deals with the resources, devices and methods required to optimize the acquisition, storage, retrieval and use of information in health and biomedicine. Health informatics tools include not only computers but also clinical guidelines, formal medical terminologies, and information and communication systems.

Medical Informatics

Clinical Informatics - Clinical Informatics is a sub-field of medical informatics. It focuses on computer applications that address medical data (collection, analysis, representation). Clinical informatics is a combination of information science, computer science, and clinical science designed to assist in the management and processing of data, information and knowledge to support the practice and delivery of clinical care (Shortliffe and Perreault, Medical Informatics: Computing applications in health care and biomedicine).

Biomedical Informatics - Biomedical informatics is a discipline related to bioinformatics and has roots in medical informatics or healthcare informatics. It studies the use of information technology and advanced research computing in the practice of biomedical sciences and medicine.

Nursing Informatics - Nursing Informatics is a specialty of Health care informatics which deals with the support of nursing by information systems in delivery, documentation, administration and evaluation of patient care and prevention of diseases.

Various definitions of Nursing Informatics have been proposed, perhaps the most widely currently accepted definition comes from the International Medical Informatics Association - Nursing Informatics Special Interest Group adopted August 1998, Seoul, Korea: Nursing informatics is the integration of nursing, its information, and information management with information processing and communication technology, to support the health of people world wide.[1]

A more recent definition of Nursing Informatics comes from the American Nurses Association's Scope and Standards for Nursing Informatics Practice (2006): Nursing
Informatics is a specialty that integrates nursing science, computer science, and information science to manage and communicate data, information, and knowledge in nursing practice.

An early (and still valid) definition was proposed by Hannah (1985): "The use of information technologies in relation to any of the functions that are within the purview of nursing and are carried out by nurses in the performance of their duties. This comprises the care of patients, administration, education and research."

Other definitions also exist. For example, William Goossen, from The Netherlands, developed a longer definition:


"Nursing informatics is the multidisciplinary scientific endeavor of analyzing, formalizing and modeling how nurses collect and manage data, process data into information and knowledge, makes knowledge-based decisions and inferences for patient care, and uses this empirical and experiential knowledge in order to broaden the scope and enhance the quality of their professional practice. The scientific methods central to nursing informatics are focused on:

1. Using a discourse about motives for computerized systems,
2. Analyzing, formalizing and modeling nursing information processing and nursing knowledge for all components of nursing practice: clinical practice, management, education and research,
3. Investigating determinants, conditions, elements, models and processes in order to design, and implement as well as test the effectiveness and efficiency of computerized information, (tele)communication and network systems for nursing practice, and
4. Studying the effects of these systems on nursing practice."

Public Health Informatics - Public Health Informatics has been defined as the systematic application of information and computer science and technology to public health practice, research, and learning.

Information Science - Information science (also information studies) is an interdisciplinary science primarily concerned with the collection, classification, manipulation, storage, retrieval and dissemination of information. Information science studies the application and usage of knowledge in organizations, and the interaction between people, organizations and information systems. It is often (mistakenly) considered a branch of computer science. It is actually a broad, interdisciplinary field, incorporating not only aspects of computer science, but also library science, cognitive, and social sciences.

Information science focuses on understanding problems from the perspective of the stakeholders involved and then applying information (and other) technology as needed. In other words, it tackles systemic problems first rather than individual pieces of
technology within that system. In this respect, information science can be seen as a response to technological determinism, the belief that technology "develops by its own laws, that it realizes its own potential, limited only by the material resources available, and must therefore be regarded as an autonomous system controlling and ultimately permeating all other subsystems of society." [2] Within information science, attention has been given in recent years to human–computer interaction, groupware, the semantic web, value sensitive design, iterative design processes and to the ways people generate, use and find information.

Information science should not be confused with information theory, the study of a particular mathematical concept of information, or with library science, a field related to libraries which use some of the principles of information science.

Major Theories Supporting Health Care Informatics

Systems Theory
- Characteristics of Systems
  - Resistance to Change
- Systems and the Change process
  - Function vs purpose
  - GIGO
  - Entropy – the need to be replaced/wears out and negentropy – more complex, how IS systems grow

Information Theory
- Shannon and Weaver Information-Communication Model
  - Levels of communication
- Blum’s Model
  - Wisdom added (Review data, information, and knowledge)

Learning Theories
- Behavioral Theories
- Information Processing, or Cognitive Learning, Theories
- Adult Learning Theories
  - Learning Styles

Change Theories
- Planned Change
- Diffusion of Innovation
- Using Change Theories
  - Change Management
  - Put stages on board – and explain how it works in real life
    - Knowledge stage
    - Persuasion Stage
    - Decision Stage
    - Modification Stage
    - Confirmation Stage

Computer, Information, and Health Care Informatics Literacy

Point out page 33 with all the different terms
The use of standard vocabulary
Page 40 – more criteria
The use of wild cards – give VNS as an example
Talk about online database, MEDLINE
GUI – talk about importance
Page 47 Email/ legal and ethical concerns
Talk about Basic computer test for ESL – and issues involved
Talk about VNS 6 months refresher/ and doing audits
Talk about Risk management, and the use of quality improvement, sentinel event and JCAHO

Information Literacy
   Cognitive Information Literacy Skills
   Identifying and Defining
   Searching and Locating
   Evaluating and Retrieving
   Organizing, Managing and Using

Computer Literary
   Hardware
   Connectivity
   Software

Evaluating and Improving Literacy
   Diversity of Skills
   Identifying Literacy Objectives and Measuring Existing Knowledge
   Offering Training to Increase Knowledge
   Evaluating the Results of Training

Applications of Professional Knowledge
   Lifelong Learner
   Clinician
   Educator/Communicator
   Researcher
   Manager

Reading Assignment: Read Chapter 1 and 2

Homework: Draw a model of your definition of informatics in your discipline. Check out these Web sites for some examples:

   A. An Overview of Nursing Informatics
   B. A Mathematical Model of Communication (p. 2)

OR

Select one of the models described in the chapter on change management. Discuss how it might be used to evaluate a clinical-information or communication-technology implementation from a recent or current practice setting. Consider the following questions:

   A. Does the model include relevant concepts that are operating in the setting?
   B. Can relationships between the concepts be identified easily in the model?
   C. Could the model be used to structure an implementation evaluation by concretely identifying key elements of the change?
Lab:

Internet Search Engine Strategies

Select an Internet search engine and conduct a search using the terms health care informatics, healthcare informatics, and health informatics. Describe how similar or different your search results were with each of the different terms. Now repeat this activity using MEDLINE. MEDLINE is indexed with a controlled vocabulary while the Internet is not. How did this influence your search results?:

And

Website Evaluation

Conduct a Web search on "evaluating web resources." Select one or two sites and explore how they suggest Web sites should be evaluated. Create a form with a list of evaluation criteria that you can use to evaluate Internet sites. Two examples of sites with evaluating criteria are offered here:

A. Wolfgram Memorial Library
B. University of North Carolina Health Sciences Library

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