



Biomedical Informatics I
Unit 2. Essential Concepts in Biomedical Informatics
“Data in Medicine. Taxonomy of Information and Knowledge”

General frame of thematic unit 2 (UT2)

Unit Objective: Analyze the basic concepts necessary for the use of biomedical informatics in medical practice.

Objective of the session: The student will analyze and discuss the relevant concepts of the use of data in medicine, as well as the DIKW Taxonomy (Data-Information-Knowledge-Wisdom) and its implications for clinical practice.

Related Competencies: 1, 3, 2, 8.

Number of sessions: Two blended learning two-hour sessions in the computer lab, two weeks online in the virtual learning environment.

Period: January 9 to 21, 2012.

PROFESSOR GUIDE. FIRST SESSION UT2. ESSENTIAL CONCEPTS IN BIOMEDICAL INFORMATICS

First session (to be held from Monday 9 to Saturday 14 January 2012)

Topics to review:

- 2.1 Data in medicine: its acquisition, storage and use.
- 2.2. Taxonomy of information and knowledge.

Learning activities:

For the first session of UT2 we will have the following learning activities:

- Discussion of the case "Erick's consciousness loss" applying the taxonomy of information.
- PowerPoint presentation "Data in medicine and taxonomy of information" with discussion of the topic.
- Discussion by pairs of personal examples of data, information, knowledge and wisdom in medicine.
- Group discussion and conclusions.

Materials and teaching resources



In this session, we will use the following material:

- Moodle BMI virtual classroom.
- PowerPoint presentation ([Erick's loss of consciousness](#))
- PowerPoint presentation ([Data in medicine and information taxonomy](#))
- Tool for designing conceptual maps: <http://CMap.ihmc.us>
- Tool for developing online conceptual maps: <https://bubbl.us>
- Kieffer LF, Pilar M, Sánchez M. Data in medicine: its acquisition, storage and use. Taxonomy of information and knowledge. In: Sánchez M, Martínez AI, Alayola A, Eds. Biomedical Informatics. Mexico City: Elsevier Masson Doyma. 2011. pp 21-29.
- Wikipedia. [Scientific model](#).

Optional readings:

- Wikipedia. [Definition](#).
- Rowley, J. [The wisdom hierarchy: representations of the DIKW hierarchy](#). J Inform Sci 2007; 33(2): 163-80.

Methodology, how to do it:

The didactic planning for this first session of UT2 integrates the following activities:

1. Review of "Erick's loss of consciousness" PowerPoint presentation, discussion of the clinical case and possible answers to the questions outlined in the last slide (30 minutes).
2. Review of the presentation "Data in medicine. Taxonomy of information", using the mandatory readings as a conceptual framework for discussion, with an emphasis on their implications to the practice of general medicine. During the presentation we can discuss what is a scientific model, the fact that many of the concepts that will be covered in other courses will be presented with explanatory models (such as the pharmacokinetics of drugs, the metabolism of proteins, mental disorders and behavior, etc.) (60 minutes).
3. Slides 15 and 16 have Internet links to be explored, the link in slide 16 has "hot spots" on its web site which lead to definitions, notes and explanations about each concept described.
4. Discussion by pairs of students with personal examples of data, information, knowledge and wisdom, applicable to medicine and the health sciences (15 minutes).
5. Reflections and final conclusions with the entire group, guided by teachers (15 minutes).



Homework

1. Individually, students will draw a conceptual map about the DIKW taxonomy and its application to medicine. The conceptual map must be delivered through the virtual classroom homework section, at least one day before the next session. Please post as a gif or jpg image file, name the file: DIKW_nameofstudent (example: DIKW_fabiolatorres). For its elaboration, we propose two tools (the student may use either one):
 - <http://CMap.ihmc.us> This software is a powerful and free tool to develop conceptual maps, designed by the *Florida Institute for Human and Machine Cognition*. The program is available on the computers in the classrooms of the Department of Biomedical Informatics.
 - <https://bubbl.us> This tool is practical to build conceptual maps online, and is also free.
2. For the **second session of the UT2** "Essential Concepts in Biomedical Informatics concepts", reading of the following documents is **required**:
 - Zambrano F, A. Herrera, Pilar M, Gatica F., Fernández F. Chapter 3. Essential Concepts of Biomedical Informatics. In: Sánchez M, Martínez AI, Alayola A, Eds. Biomedical informatics. México City: Elsevier Masson Doyma, 2011. pp. 31-39.
 - Martínez A, Pilar M. Chapter 4. Assessment of technology in health. In: Sánchez M, Martínez AI, Alayola A, Eds. Biomedical informatics. México City: Elsevier Masson Doyma, 2011. pp. 41-49.

Assessment of the first UT2 session:

- Active participation in the face-to-face and online activities.
- Quality of the conceptual map "data in medicine and the DICS taxonomy" (due in the virtual classroom).



Biomedical Informatics I
Unit 6. E-learning
“The Net Generation in Medicine”
“Use of Technology for Scientific Presentations”

General frame of thematic unit 6 (UT6)

Unit Objective: Discuss the concepts of e-learning relevant to medical practice and apply them in their learning.

Objective of the session: The student will review e-learning relevant concepts and will reflect on their implications for medical practice and professional continuing development.

Related Competences: 1, 3, 2, 6, 8.

Number of sessions: One blended learning two-hour session in the computer lab, one week online in the virtual learning environment.

Period: March 19 to 24, 2012.

PROFESSOR GUIDE. SESSION UT6. E-LEARNING

Session to be held from Monday 19 to Saturday 24 March 2012.

Topics to review:

- 6.0 E-learning
- 6.1. The Net generation: social and educational aspects.
- 6.2 Virtual learning environments.
- 6.4. Use of technology in scientific presentations.

Learning activities:

For this **session** we will have the following learning activities:

1. Analysis and discussion of the E-learning PowerPoint presentation.
2. Review and discussion of the video "[A vision of students today](#)".
3. Creation of a blog by subgroups (website www.blogger.com) about the theme "pregnancy in adolescents", based on the clinical case. (Page 121, Biomedical Informatics textbook)



4. Participation by subgroups in Moodle's chat room for distribution of work in the blog creation and assigned activities.
5. Find in PubMed the meta-analysis of David A. Cook about Internet based learning in the health sciences, and discuss its results.
6. Prepare a PowerPoint presentation by subgroups using the tool "Google docs" (docs.google.com), about the pregnancy in adolescents clinical case and the current evidence-based clinical recommendations available on the web.

Materials and teaching resources:

Readings:

- Gatica F, Rosales A, Villamar J, Martínez AI, Flores F. Chapter 12. Net generation. In: Sánchez M, Martínez AI, Alayola A, Eds. Biomedical Informatics. Mexico City: Elsevier Masson Doyma. 2011. pp 121-130.
- Rosales A, Gatica F, Villamar J, Flores F. Chapter 13. Virtual environments for learning and use of wikis, blogs, podcasts and social networks in medicine. In: Sánchez M, Martínez AI, Alayola A, Eds. Biomedical Informatics. Mexico City: Elsevier Masson Doyma. 2011. pp 131-144.
- Flores F, Gatica F, Rosales A, Villamar J. Chapter 14. Use of technology in scientific presentations. In: Sánchez M, Martínez AI, Alayola A, Eds. Biomedical Informatics. Mexico City: Elsevier Masson Doyma. 2011. pp 145-157.
- PowerPoint presentation "[E-learning](#)".
- Video "A vision of students today" (<http://www.youtube.com/watch?v=dGCJ46vyR9o>))
- Site for blog creation by subgroups: www.blogger.com
- PubMed site www.PubMed.org
- Moodle's chat room.

Methodology, how to do it:

1. Review the "**E-learning**" PowerPoint presentation, and the integrated video "**A vision of students today**" (<http://www.YouTube.com/watch?v=dGCJ46vyR9o>). Interactive discussion with the group, using the readings as background (20 minutes).



2. Find in PubMed the meta-analysis of David A. Cook about Internet-based learning in the health professions. Then answer the following questions individually:
 - In what journal and date was the paper published?
 - Please read the abstract. What is the conclusion of this work? What do you think about the results and conclusions?
 - Comment on your answers with your neighbor (15 minutes) and then with the whole group.
3. Organized by subgroups (each student has been randomly assigned to a “virtual subgroup” in Moodle’s platform), students will start a blog on the website www.blogger.com about the clinical case “*pregnancy in adolescents*” (page 121 of the Biomedical Informatics textbook). They will use the chat of the virtual classroom by subgroups for organization and work distribution in the creation of the blog (10 minutes).
4. Review of the clinical case “pregnancy in adolescents”, answer the questions presented in the textbook and add the information in the newly created blog. In this activity, it is pertinent to look for various multimedia resources available in the Net, obtain the requested information and integrate it in the blog (20 minutes).
5. Prepare a 5-slide PowerPoint presentation by subgroup using Google Docs, about the pregnancy in adolescents clinical case, following the indications mentioned in page 147 of the textbook). Each subgroup will present their final document to the group. Peers and the rest of the group will provide constructive feedback, applying the principles described in the readings (35 minutes).
6. Group discussion of the revised case report and conclusions (15 minutes).

Homework:

- Posting on the virtual classroom of the blog site and the final PowerPoint presentation, by subgroup.

Assessment of the UT6 session:

- Active participation in the face-to-face and online activities.



- Quality of the blog and attached information, by subgroups
- Characteristics of the PowerPoint presentation, following the readings' criteria.