ΠΑΝΕΠΙΣΤΗΜΙΟ ΘΕΣΣΑΛΙΑΣ

Μεταπτυχιακό πρόγραμμα " ΑΣΚΗΣΗ ΚΑΙ ΥΓΕΙΑ"

Μάθημα: Μεθοδολογία παρουσίασης δεδομένων και συγγραφής της διατριβής

Τίτλος Διάλεξης: Προφορική Παρουσίαση – Μέρος 1ο

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Today's Menu

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- **Reading & Presenting Scientific Documents**
  - **How to read a Scientific Paper**
  - **Understanding the "science behind the words"**

Journal Club

what is it ?

- It is like a group or a lab meeting (something like a private small conference)
- It happens within colleagues or different research groups
- Usually it is biweekly or monthly
- The main goal is:
  - To discuss the latest scientific news
  - To share new knowledge acquired in a meeting
  - To discuss future ideas and design research

Journal Club

how to be prepared

- Choose an interesting paper (for you and the group) *for the given topic*
  - Present only one paper
  - Avoid review papers
- Make sure you understand the scientific background
  - Read other papers with similar topics
- Make sure you understand the experimental details and the methodology
  - Read other papers with similar methodology

Journal Club
visual effect

- Make sure visuals are easy to see & read
  - Do not use *fancy characters*, **red color**, and very small or very big letters
- Beware of Power Point
  - Concentrate on content and not on gloss
  - Use the minimum number of slides
  - Avoid low contrast colors
  - Avoid excessive text and avoid reading text to the audience
  - Avoid excessive "cute" animations – can be distractive
  - General rule: concentrate on the audience, not on the slides

Journal Club
what is the best way to present

- Practice your presentation with a timer
  - 25 min for a ½ hour presentation is optimal
- No one understands everything
  - Start from the beginning and keep it simple
  - Remember the BIG PICTURE
  - It is better to *tire* an arrogant "know-it-all" than to *leave* someone behind

Journal Club
what is the best way to present

- Half of your job is to guide the audience throughout your presentation
  - Tell them what you are doing
  - Walk them through the material
- Present an outline of your talk
  - Put it on a board or repeatedly show it during the talk
  - It helps you stay on track

Journal Club
"drills – presentation tips"

- Presentation tips – Χρήσιμες συμβουλές
  - Tell them what you are going to tell them (outline)
  - Tell them the story (body of your presentation)
  - Tell them what you just told them (concluding summary)

Journal Club

"Structure of the presentation"

- Structure – Δομή & Περιεχόμενα για την παρουσίαση βιβλιογραφίας
  - Hypothesis - Υπόθεση
  - Experimental design & details – Σχεδιασμός έρευνας & πειραματικό πρωτόκολλο
  - Experimental data – Ανάλυση δεδομένων
  - Interpretation – Εξήγηση δεδομένων
  - Conclusions - Συμπεράσματα
  - New Hypothesis & future research – Μελλοντικές μελέτες

Reading & Presenting Scientific Documents

Understanding the "science behind the words"

The main purpose of a scientific paper is to report new results, usually experimental, and to relate these results to previous knowledge in the field.

Reading & Presenting Scientific Documents

How to read a scientific paper

1. **How are papers organized?**
2. **How do I prepare to read a paper, particularly in an area not so familiar to me?**
3. **What difficulties can I expect?**
4. **How do I understand and evaluate the contents of the paper?**

Reading & Presenting Scientific Documents Type of Research

Τύποι Έρευνας	Ερωτήματα

Reading & Presenting Scientific Documents

How are papers organized?

- **Abstract**
  - **It gives a brief background to the topic**
  - **Describes concisely the major findings of the paper**
  - **Relates these findings to the field of study**
- **Introduction**
  - **This section presents the background knowledge necessary for the reader to understand why the findings of the paper are an advance on the knowledge in the field**
- **Materials & Methods**
  - **The purpose of this section is to describe the materials used in the experiments and the methods by which the experiments were carried out.**
  - **In principle, this description should be detailed enough to allow other researchers to replicate the work.**

Reading & Presenting Scientific Documents

How are papers organized?

- **Results**
  - **The logic of the Results section follows directly from that of the Methods**
  - **The Introduction poses the questions addressed in the early part of Results**
- **Discussion**
  - **The data in the paper are interpreted; that is, they are analyzed to show what the authors believe the data show**
  - **Any limitations to the interpretation should be acknowledged, and fact should clearly be separated from speculation.**
  - **The findings of the paper are related to other findings in the field. This serves to show how the new findings contribute to new knowledge, or correct the errors of previous work**

Reading & Presenting Scientific Documents

How are papers organized?

- **Acknowledgements**
  - **Contributions of other workers are recognized**
  - **Financial support from scientific or commercial entities are recognized (you, the reader are free to speculate on any conflict of interests)**
- **References**
  - **List of research papers and other works cited in the text**

Reading & Presenting Scientific Documents

How do I read a paper?

1. **Read the Title and the Abstract**
   - **Review in your mind what you know about the topic**
   - **If you don't know enough to understand the paper, choose a textbook or a review paper to brush up your knowledge**

If you are familiar with the topic then…

Reading & Presenting Scientific Documents

How do I read a paper?

2. Skip the Introduction or read it very briefly
3. Go straight from the Introduction to the Results
4. Visit the Materials and Methods as needed to clarify what was actually done.
5. If you are interested in a particular point given in the Abstract go straight to the relevant section of the Results and from there to the Discussion for interpretation of the findings.

Reading & Presenting Scientific Documents

How do I read a paper?

- Some "code-words"
  - "Data not shown"
    - This is often for reasons of space; it is accepted by the journal when the authors have documented their ability to do the experiments properly (usually in previous papers)
  - "Unpublished data"
    - This means that the data are not of publishable quality or that the work is part of a larger story that will one day be published
  - "Preliminary data"
    - It usually means that the experiment was done only once or with a small number of subjects (πιλοτική έρευνα)

Reading & Presenting Scientific Documents

Difficulties in reading a paper

Some problems may lie with the reader and many other are the fault of the writer

- Some papers are poorly written
  - Some scientists are poor writers and many others do not enjoy writing
  - Also, the author is typically so familiar with the material that it is difficult to step back and see it from the point of view of a reader not familiar with the topic
  - Are you reading an article published in a narrowly specialized journal or a technical paper?

Reading & Presenting Scientific Documents

Difficulties in reading a paper

- Bad writing has several consequences for the reader
  - The *logical* connections are often left out
    - Instead of saying why an experiment was done, or what ideas were being tested, the experiment is simply described
  - Papers are often cluttered with a great deal of jargon
  - The authors may not provide a clear road-map through the paper;
    - side issues and fine points are given equal air time with the main logical thread, and the reader loses this thread

Reading & Presenting Scientific Documents

Difficulties in reading a paper

- **Looking for the method/technique**
  - **All too often, authors refer back to previous papers; these refer in turn to previous papers in a long chain. Often that chain ends in a paper that describes several methods, and it is unclear which one was used or what have been the modifications performed through the years**
- **What is SPECULATION and what is FACT**
  - **Many authors do not clearly distinguish between fact and speculation, especially in the Discussion. This makes it difficult for the reader to know how well-established are the "facts" under discussion.**

Reading & Presenting Scientific Documents

Difficulties in reading a paper

- **Overstating the importance of the findings**
  - **All authors are ambitious and wish to publish in *trendy* journals. As a consequence, many may overstate the importance of their findings, or put a speculation into the title in a way that makes it sound like a well-established finding**
- **Misleading titles**
  - **Too often the title is nothing more than a speculation and the hasty reader may well conclude that the issue is settled when it isn't**

Reading & Presenting Scientific Documents

Evaluating a paper

1. **What <u>questions</u> does the paper address?**
- **Σε ποια <u>ερωτήματα</u> προσπαθεί να απαντήσει η μελέτη;**
2. **What are the main <u>conclusions</u> of the paper?**
- **Ποια είναι τα κύρια <u>συμπεράσματα</u> του άρθρου;**
3. **What <u>evidence</u> supports those conclusions?**
- **Ποια <u>στοιχεία</u> στηρίζουν αυτά τα συμπεράσματα;**
4. **Do the data actually <u>support</u> the conclusions?**
- **Τα ευρήματα της μελέτης <u>στηρίζουν</u> ξεκάθαρα τα συμπεράσματα;**
5. **What is the <u>quality</u> of the evidence?**
- **Ποια είναι η <u>ποιότητα</u> των ευρημάτων;**
6. **Why are the conclusions <u>important</u>?**
- **Ποια είναι η <u>σημαντικότητα</u> των συμπερασμάτων;**

Reading & Presenting Scientific Documents

1. What <u>questions</u> does the paper address?
Σε ποια <u>ερωτήματα</u> προσπαθεί να απαντήσει η μελέτη;

- **What are these questions – where can we find them?**
  - **In a well-written paper, the <u>Introduction</u> generally goes from the general to the specific, eventually framing a question or set of questions. This is a good starting place**
  - **In addition, <u>the results</u> of experiments usually raise additional questions, which the authors may attempt to answer. These questions usually become evident only in the Results section.**

Reading & Presenting Scientific Documents

2. What are the main conclusions of the paper?
Ποια είναι τα κύρια συμπεράσματα του άρθρου;

- **Read the final sentence of the abstract**
  - **This question can often be answered in a preliminary way by studying the abstract of the paper. Here the authors highlight what they think are the key points**
  - **This is not enough, because abstracts often have severe space constraints, but it can serve as a starting point**
  - **Still, you need to read the paper with this question in mind**

Reading & Presenting Scientific Documents

3. What evidence supports those conclusions?
Ποια στοιχεία στηρίζουν αυτά τα συμπεράσματα;

- **Generally, you can get a pretty good idea about this from the Results section**
  - **In the ideal case, the Discussion begins with a section of the form "Three lines of evidence provide support for the conclusion that... First, ...Second,... etc."**
  - **In any case, you need to be sure that you understand the relationship between the data and the conclusions**

Reading & Presenting Scientific Documents

4. Do the data actually support the conclusions?
Τα ευρήματα της μελέτης στηρίζουν ξεκάθαρα τα συμπεράσματα;

- **Read carefully the figures and the tables, see whether the data agree with the conclusions**
  - **One major advantage of doing this is that it helps you to evaluate whether the conclusion is strong**
  - **It might be the case that the data do not actually support the conclusion the authors wish to reach**

There are at least two different ways this can happen:

- **i. The logical connection between the data and the interpretation is not sound**
- **ii. There might be other interpretations that might be consistent with the data.**

Reading & Presenting Scientific Documents

5. What is the quality of the evidence?
Ποια είναι η ποιότητα των ευρημάτων;

This is the hardest question to answer, but it is one of the most important skills to learn as a young scientist

1. **You need to understand thoroughly the methods used in the experiments**
2. **You need to know the limitations of the methodology**
3. **You need to distinguish between what the data show and what the authors say they show**
4. **You should ask if the proper controls are present**
   - **Controls tell us that nature is behaving the way we expect it to under the conditions of the experiment.**
   - **You should try to develop the habit of asking "where are the controls?" and looking for them**

Reading & Presenting Scientific Documents

6. Why are the conclusions <u>important</u>?
Ποια είναι η <u>σημαντικότητα</u> των συμπερασμάτων;

1. **Do the conclusions make a significant advance in our knowledge?**
2. **Do they lead to new insights, or even new research directions?**

Again, answering these questions requires that you understand the field relatively well

Reading & Presenting Scientific Documents Summary

Γενικές Συμβουλές

Διαβάστε το άρθρο 3 φορές:

- **Την πρώτη φορά διαβάστε την περίληψη, την εισαγωγή και τα συμπεράσματα. Εάν το άρθρο είναι καλογραμμένο, οι ερωτήσεις και οι απαντήσεις θα είναι ξεκάθαρες**
- **Την δεύτερη φορά διαβάστε το άρθρο όλο από την αρχή και κρατήστε σημειώσεις για τυχόν ερωτήσεις και απορίες.**
- **Την τρίτη φορά διαβάστε το άρθρο με κριτική διάθεση. Αναρωτηθείτε, ποιες είναι οι σημαντικές ανακαλύψεις; Τα αποτελέσματα είναι λογικά; Η μεθοδολογία είναι σωστή; Τι θεωρούν οι συγγραφείς του άρθρου ως δεδομένο; Ποια η συνεισφορά της μελέτης αυτής στην επιστημονική γνώση;**