Techniques for the oral and written dissemination of scientific information

Alexandru-Ionuț PETRIȘOR, PhD (Ecology), PhD (Geography), Habil. (Urban Planning)

COURSE INFORMATION

Program of studies	Faculty of Urban Planning, Doctoral School of Urban Planning
Type of course	Required course
Level of course module/unit	PhD
Number of ECTS credits	3 ECTS
Competences to be developed	1) Understanding the difference between study and research 2) Knowledge of the research specific jargon and algorithm 3) Acquire the abilities needed to make a poster, deliver a presentation or publish a paper 4) Learn basic principles of research ethics
Objectives	The course aims to provide students with the core research abilities, focusing on the dissemination of research through conference presentations and published articles. The course has a theoretical side – understanding and learning all of the above, and a practical one – writing a research article.
Teaching methods	Lectures, PowerPoint presentations
Evaluation	Attendance of at least 75% results in the accumulation of 3 credits. For writing an article, students may receive 3 additional credits. **Article editing guidelines (3 additional credits)** 1. Articles may be handed only at the scheduled date and time. *Exceeding the deadline results in the total loss of credits.* 2. Articles must be printed. Submission based on electronic devices (CD etc.) or e-mail is not allowed in any circumstance. *The lack of printed articles at the scheduled deadline results in the total loss of credits.* 3. Articles can be turned in by someone designed by the student, in absolutely the same conditions. 4. All formatting requirements, related to text processing (font, size) and editing (format of references and in-text citations) must be met. The rules of "*Urbanism. Arhitectură. Construcții*", available at http://uac.incd.ro/EN/Index/instr.htm, must be used. *Articles that do not meet the editing guidelines do not receive any credit.*
Bibliography	1) Petrişor A.-I. (2014), *Abordare şi metode de cercetare cu elemente de autorat ştiinţific (Research approach and methods with elements of scientific authorship)*, Editura Universitară „Ion Mincu", Bucharest, România, ISBN 978-606-638-107-9, 174 pag. 2) Petrişor A.-I. (2012), *Abordare şi metode de cercetare. Note de curs (Research approach and methods. Course notes)*, Editura Universitară „Ion Mincu", Bucharest, Romania, ISBN 978-606-638-027-0, 117 pp.

Course notes

Part I. General concepts of research

1. Definitions of research

– Action of researching, studying, searching, investigating, analyzing – object of the course
– Examination, view, check, test
– Consulting, documenting (see English – *research* vs. *search*, or French – *recherche* vs. *cherche*) – this is why for the above we often use *scientific research* (*research, recherche*)
– Visit, relation (Bible): *"research the imprisoned"* – Cazania lui Varlam, 1643
– Investigation (juridical) – this is why for the above we often use *scientific research* opposed to the *penal* one
– Military interpretation – recognition, acquisition of information on the enemy

2. Typology of research

Different authors distinguish:
– **Fundamental** research (also called **theoretic** or **basic**) aims to define or delimit concepts, elaborate theories and uses a classical approach, where the researcher starts from <u>observations</u> used to formulate <u>hypotheses</u>, tested through <u>experiments</u> producing <u>data</u>; their <u>analysis</u> leads to the confirmation or non-confirmation of hypotheses.
– **Applied** research solves specific issues through experiments and is also called experimental development. If the investigator modifies variables, it becomes **research-action**.
– **Descriptive** research analyzes in detail (including comparisons) the content of case studies or phenomena; can attempt to explain the results, analyze them in a historical content, make correlations, or include interviews.
– **Experimental** research tests hypotheses, often as part of fundamental research.
– **Operational (methodological)** research aims to develop new research methods.

Apart from these, though dictionaries do not make a clear distinction, there is a separation between <u>research</u> and <u>study</u>. Studies use known methods to test an existing theory in a new region or sample. Their scientific impact is limited, are rarely funded, and results are hardly publishable. Research includes an innovation element (method or theory), has a greater scientific impact, funding is easier and results are publishable. In general, studies can be a part of research.

Romanian laws distinguish:
1. **Fundamental research** – activity developed to acquire new knowledge of phenomena and processes, formulate and test hypotheses, conceptual models and theories
2. **Applied research** – activity designed to use scientific knowledge for the improvement or development of new products, technologies and services
3. **Technological development** – consists of system engineering and technological engineering, used to apply and transfer research results to the economy and society, aiming to introduce new technologies, products, systems and services or improve the existing ones, and includes:
   a. **Pre-competitive research**, oriented to the transformation of results from applied research in plans and schemes for new products, processes or services, including the production of experimental model and first prototype, which cannot be used for commercial purposes
   b. **Competitive research**, oriented to the transformation of results from pre-competitive research in products, processes and services able to answer directly to the demands of the market, including system engineering and technological engineering and design.

3. Phases of research

1. **Topic**: chosen based on resources; must underline novel, original elements
2. **Documentation**: extensive literature review to prove novelty using a critical approach (uncertainties: different opinions, lacks)
3. **Objectives**: what, when, where, how (suggest the means)
4. State **hypotheses** (empiric observations, previous studies, theoretic constructs, documentation)
5. **Work plan**: methods, data, analysis

4. Flow of research projects

– Establish the study design: data sources, analysis methods, sample size, variables, required and available resources, funding conditions.
– Proposal
– Experiments or observations – produce data
– Data processing, preliminary estimations (results)
– Data analysis; check if results are correct and credible, ask new questions
– Refine results; anticipate their dissemination (might need additional analyses); discussions with other experts
– Presentation of results

Part II. Elaborating publications and presentations

1. Posters

Sections of a poster
– **Title**: 2 lines – short and straight, is an attracting or rejecting business card. Avoid capitalizing: THIS TITLE IS CRYING OUT!
– **Authors and affiliation** (latest can be placed on the bottom part), including contact information
– **Abstract**: not needed, most times it is required before and published in a volume (sometimes with ISBN), people can search a poster because they read the abstract before
– **Introduction** (200 words): general and specific background (with references), hypotheses/ objectives
– **Materials, methods** (200 words) – brief and straight, state differences, eventual problems and their resolution
– **Results** (200 words): most important, use graphs, not tables
– **Conclusions** (300 words): specify the results and whether they support the hypotheses or not
– **Acknowledgements** (40 words) – funding

2. Conferences

Abstract
Authors must observe the guidelines. It can be structured implicitly or explicitly, including:
– **Introduction** – 2-3 sentences on the general and specific background, hypotheses/ objectives
– **Materials / methods** – 2-3 sentences
– **Results and discussion** – 2-3 sentences, show whether hypotheses are supported or not
– **Conclusion** – 1 sentence

Presentation
We live today in a world where broadcasting information passed from text to image, then to moving images and is going to 3-D moving images; we cannot capture people's attention by:
– Reading monotonously a written text (worst choice),
– Projecting images while reading monotonously a written text.

Most often, authors communicate in conferences using a Power Point presentation and its oral discussion. The best solution is to use automatic settings and comply with the warnings of the program, designed for a maximum impact. Authors should use 12 slides for a regular 15 minutes presentation: 1 introductory slide (title, authors, affiliation), 2 background slides with 2-3 references (not read, but indicate preliminary documentation), 1 slide with the objectives / hypotheses, 2 method slides, 3 result slides (graphs, not table), 1 discussion slide, 1 conclusion slide, 1 slide to thank the audience and ask for questions. The aim is to briefly present original findings, not what is already known.

Avoid:
– Designs loaded with useless elements; images used for background must be almost transparent
– Too many colors, fonts, useless clip-art images
– Too many slides, small fonts
– Copying the paper in a Power Point presentation
– Using visual transition between slides
– Automatic transition from one slide to another
– Tables

Tips for the beginning
– Link to the conference. Use a joke ("It's a little bit hot today", etc.), a formal formula ("I am honored to be here"); choice depends on the familiarity and relationship with the audience (people already known, prestigious personalities etc.)
– Author(s) must introduce themselves and present a 30 seconds abstract of their presentation focusing on original results

Tips for the presentation
– Classical teaching rules – do not point using the finger etc.
– Avoid: remote control, laser marker, Power Point marker; ideally use a radio / TV / car antenna
– Avoid automatic advancement of slides; ideally use arrows, Page Up, Page Down, or space key
– Check before whether the presentation is displayed correctly
– Submit it onto the screen using F5 or the program button; do not leave it opened for editing
– Permanent visual contact with the audience

Conclusion tips
– Thank the audience
– Allow time for questions
– Invite audience to ask questions
– Answer questions; "I don't know, but will check and contact you later; can I have your contact info" is also an answer
– Thank for questions, ask for more questions during the break
– Do not come to deliver the presentation and leave immediately

### 1890 Oxford University Rules of Civilized Polemics
1. In any scientific, social and politic polemics, the discussion should confine to the change of ideas and only at those ideas which have affinity with that issue.
2. The parties in polemics use as argument either scientific theories, or concrete facts, relevant in respect of the problem discussed.
3. The parties do not have the right to bring into discussion the opponent's character, temperament or past, as those neither confirm, nor invalidate the validity of the ideas they assert.
4. The parties do not have the right to discuss the reasons which determine the opponent's ideatic attitude, as he diverts the discussion from the issue itself.

5. Labeling the opponent by mentioning the thinking school, professional organization or political party he belongs to constitutes a violation of the polemics rules and proves the lack of arguments weakness.
6. In a civilized polemics it matters only the arguments brought by the opponent as a person and not as member of a school or organization. You are not right because you are a materialist thinker, an owner or a worker, but only if your arguments are convincing or not.

3. The Paper

Types
– Review – means review of literature from a certain area, presumes a good knowledge of the field; usually, authors have published extensively original research articles before
– Opinion (lesser in science) – similar to the previous one, can also underline methodological errors
– Original research
– Book reviews
– Invited – different from bulk invitations
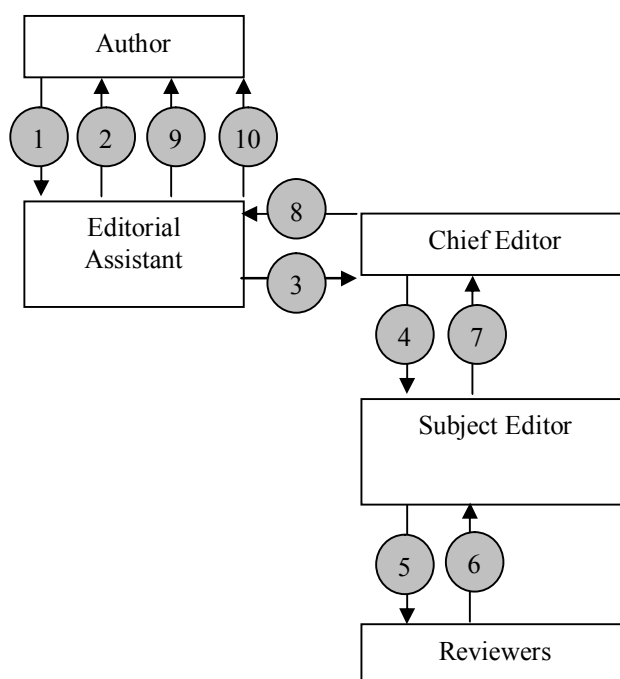

The "peer review" process
1. Author submits a paper
2. Editorial Assistant confirms reception and thanks the author
3. Editorial Assistant forwards submission to Chief Editor
4. Chief Editor can directly reject the submission – informs the Editorial Assistant, who informs the author on the decision, or sends it to the Subject Editor
5. Subject Editor can directly reject the submission – informs the Chief Editor, who informs the Editorial Assistant, who informs the author on the decision, or sends it to the Reviewers
6. Each reviewers decides whether the submission should be rejected or accepted as it is or conditioned on operating some changes, informs the Subject Editor
7. Subject Editor weights opinions, takes a decision and informs the Chief Editor
8. Chief Editor informs the Editorial Assistant on the decision
9. Editorial Assistant informs the Author. If the submission is accepted as it is, the Editorial Board decides in which issue it will be included and informs the Author. In some cases, the Author must sign specific forms – copyright transfer etc., or pay publication charges, if any. If the paper

is rejected, in some cases Authors are allowed to resubmit it to the same journal or must choose a different one ant start over. Changes can be major – in this case the Author operates them and shows each Reviewer how were his/her comments addressed (some journals reject papers if a single reviewer Rejected them); for minor changes, steps 6-8 lack.

10. Editorial Assistant sends the Author a final version of the paper for approval or minor changes.

Structure of papers

– Title
– Authors, affiliation, corresponding author
– Abstract
– Key words
– Classifications
– Introduction
– Materials and methods
– Results
– Discussions
– Conclusions
– Acknowledgements
– References
– Appendices
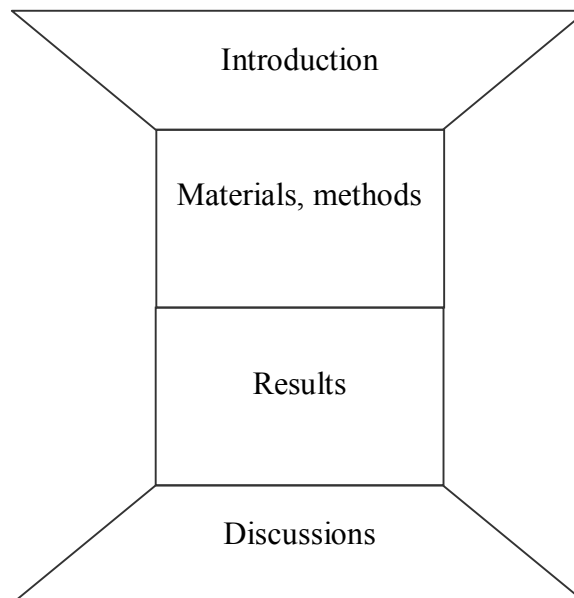
Title

– Brief, unambiguous, straight
– Appropriate generalization
– Marketing role: must attract
– No abbreviations
– Running title: short title, used in correspondence or headings

Authors

– People who contributed
– Order differs: Amfiteatru Economic – academic rank; other countries – coordinator is first or last
– Affiliation
– Corresponding author: will be addressed by readers, people requiring offprint copies
– Submissions imply that that the paper has not been published or submitted and is not considered for publication by any other journal, that the study and data are original, the contents of the paper known and approved by all authors, who contributed to writing the paper and/or carrying out the research described in the paper, and authors assume the full responsibility for the contents, correctness and originality of the submissions.

Abstract

– Is the "business card" of a paper
– Based on subject, can be structured implicitly or explicitly; structure mirrors entire paper
– Conventions correspond to the ones of the paper
– No abbreviations or citations
– Usually limited in size
– Last to be written, after the completion of full paper
– For international journals, it is usually the only free piece
– Structure: background, goal and hypothesis, methods, results, discussion, conclusions, recommendations
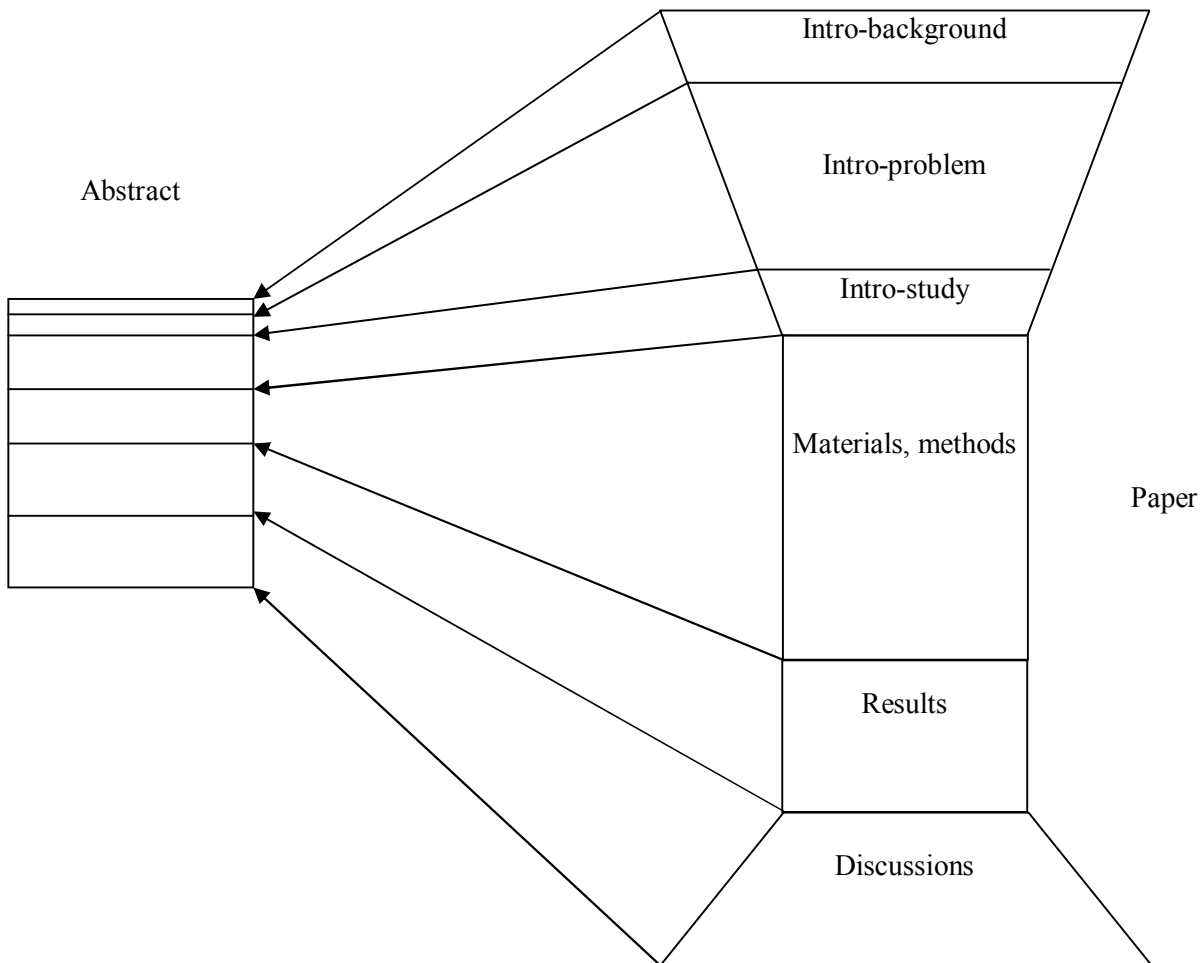
Key words
- Usually no more than 5 required
- Foreign journals use standards corresponding to certain databases
- Must not be generic (*e.g.*, urbanism, architecture), but specific
- Adapted to the aim of article: methods, theory

Introduction
Justifies the need of research by placing it in a context established through a literature review; it is the most documented part of an article and must prove a in-depth and up-to-date knowledge of a filed through references.

The introduction has several sections:
- General background – field and major area of interest: documented using very popular papers
- Specific context – theoretic or methodological. Review the literature underlining what is known and what isn't
- The issue: place it in the context of identified lacks
- For methodological papers, also discuss methodologies used by other studies
- Objectives or hypotheses of research

Materials and methods
Describe materials and methods used, including data and their analysis: experimental, lab techniques; questionnaire; data processing and analysis; elimination of values, observations that could affect the results. Usually standard methods are not described, but the paper where they were published is referred. However, any deviations are described. Passive voice is recommended to depersonalize the section; personal note is occasionally appropriate for theses or dissertations.

"Methods" include:
– General view of experiment
– Population, sample
– Place
– Restrictions, limiting conditions
– Sample (subject) selection
– Procedures (obligatory)
– Materials (obligatory, if there is no separate section)
– Variables
– Statistical analysis

"Materials", if existing, include:
– Lab equipment
– Field equipment
– Subjects (people, animals)
– Natural substances
– Materials produced
– Questionnaires, tests
– Computational models
– Mathematical models

Results
First state the objectives / hypotheses. Results are displayed as graphs (preferred) or tables; do not replicate information (graphs and tables presenting the same results). Also specify negative results. If there is a separate *Discussion* section, describe results (usually quantitatively: an increase, decreases, differs. If there is only one section, compare results with those of similar studies etc.

Discussions
Compare results with the hypotheses. Attempt to explain eventual differences or indicate that results support hypotheses. In the explanation, attitude differs from "a possible explanation is" to "certainly", based on statistical support. Compare the results with those of other studies supporting the hypothesis (or not). Identify conceptual or methodological limitations. Clearly indicate future research directions. Do not replicate the information in *the* Results section. For a common *Results and Discussion* section, information is ordered as R1 + D1 + R2 + D2 + R3 + D3 or R1 + R2 + R3 + D.

The general structure is:
1. Reference to the objectives / hypotheses
2. Reference (not copying!) to the most important results, to whether they support the hypotheses or not, and how do they compare to those of other studies
3. Possible explanations of results, eventually speculative
4. Limitations of study – what could prevent the generalization of results
5. Implications of the study (generalization of results)
6. Recommendations for future results and practical implications of results

Placement (identification) of results	*Brief presentation of most important results*	*Attempt to explain results, comparison with other studies, comments, generalization*
Results regarding... are presented in Fig./ Table...	Fig./ Table... indicates an increase/ decrease of... during... in the area...	The increase/ decrease can be explained by... could be due to... has been also described by...

References
– Cite only "first hand" sources
– Cite publications (with ISBN or ISSN), not Internet sites, brochures, *in press* papers
– Stiles – follow the guidelines
– Balance: not too many, not too few – depends on the type of paper
– New, rigorous papers
– The thirst for an impact factor determined ethic-less journals to ask authors to cite recent papers from the same journal
– Auto-citations o not matter

Citation of references in text
– Texts taken as they are must be inserted between quotation marks
– In-text references must be found in the list and conversely
– Most papers are cited in the introduction (theoretical and methodological background), some in the methods (if the methods were already used) and some in the discussions (comparison with similar studies)
– Two types of citation: author-focused (for important authors or unique studies – Smith (2008) shows that... or results- focused: similar studies indicate an increase of... (Smith, 2008; Jones, 2008; Smith and Jones, 2009)
– Citations using author(s) and year or numbers (corresponding to final list)

Acknowledgements
– Those who funded research: this paper is a result of the research project... funded by...
– Those who contributing to writing the paper with suggestions (if applicable) or in conferences – nominal
– Reviewers – generic, for their comments

Footnotes
Footnotes are avoided in sciences, but used in humane sciences, economy, sociology etc.

Submission
– **Cover letter**: very important for orienting the submission to reviewers most able to understand it. Must include copyright statements, compliance with editing guidelines and state the main focus: specific topic, type (theoretical, methodological, research etc.).
– **Potential reviewers**: some journals do not make specific statements, other ask authors to suggest potential reviewers, adding their own ones. Even though usually stated, authors must know that reviewers must be from another institution (usually a different country).

4. Communication in science

– Know your public
– Know your message – structure it if needed
– Presentation style: personal in communication, impersonal for papers; active – passive voice
– KISS – Keep It Simple and Short (humane sciences vs. sciences), formal or informal, jargon (*e.g.,*: *Triticum aestivum*), empty words
– Acronyms and abbreviations – when to use?
  • **Allowed**: etc./ş. a., et. al., unpub., n. d., c./ca., op. cit. (opp.), n. b., i. e./viz./sc., vs./v. (EN), v. (RO), e. g./d. e./d. ex./ex., A. D./A. C./C. E./D. C., B. C./B. C. E., p. (pp.), s. (ss.)/§ (§§), nr./no./#, vol., pers. comm./in litt., cf./apud, Reviews on Advanced Materials Science – RAMS – Rev. Adv. Mater. Sci. 30(1):27-59; measurement units, first names. Defined abbreviations: ISI, field-specific abbreviations
  • **Not allowed**: Fr.
  • **Names can be abbreviated**: Smith, Smith R., Smith Helen – text or references
– Bulleted lists

6. Getting famous

– "Publish or perish" – authors who do no publish remain unknown
– Authors who do not publish are not cited
– Be aware of metrics – high-rated journals bring more citations
– Keep a record of your publications
– Understand indices – Hirsch's index measures the value of a researcher