



How to go about Researching?

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Overview

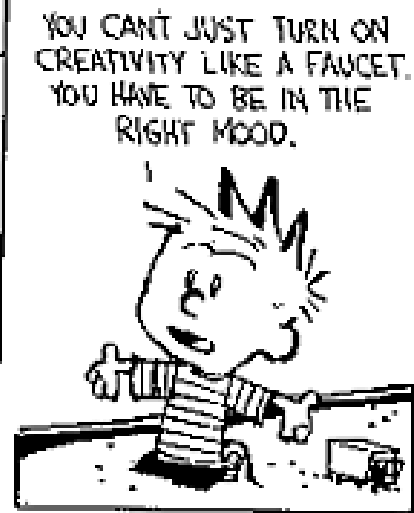
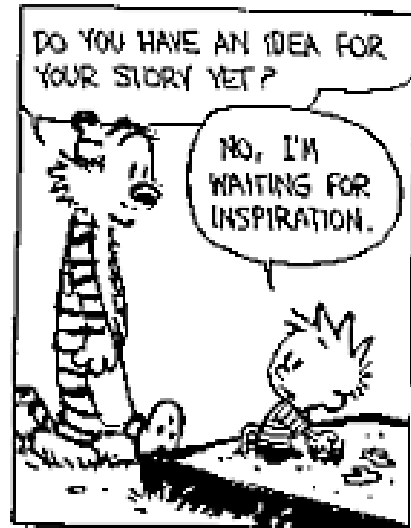
- The Scientific Enterprise
- Basics
- Reading Skills
- Managing References
- Writing Skills
- Presentation Skills
- Funding your Research
- Publish & Get Cited or else Perish!

The Scientific Enterprise.

- Philosophy of Science
 - To construct theories and define laws of the properties of nature.
- Why advance Science?
 - New knowledge derives from Science
 - It is a systematic investigation to gather information on a particular subject or problem and establish facts, principles or laws relating to it.
- Research rests on Scientific Methods
- Communicating Science

Basics

- Be Motivated! Its you & your Research.
- Get your Fundamentals Right.
- Think – Have clarity in thought.
 - Be Inquisitive, Intuitive, Hungry for Information, and Open Minded.
 - Always Question:
 - What? How? Why?
- Ideate – Hypothesize – Gather Data – Analyze – Publish - Present – Get Cited!
- Research will never be complete, its an ongoing process.



Reading Skills

- Ways of Reading.
- Reading Strategies.
- Reading Goals.
- Reading for Scientific Reporting.

Ways of Reading

- Read from beginning to end (2x),
- Read & mark / underline,
- Read & make notes,
- Read & make summaries,
- Read & make schemes of concepts / relationships between concepts,
- First read global, then read the whole text,
- Determine what you already know, then read .

Reading Strategies

- Global Reading.
- Thorough Reading.
- Selective Reading.
- Critical Reading.
- Application of reading types depends on the goal of reading!
- Reading for an exam:
 - Global > Thorough > Selective
- Reading for scientific reporting:
 - Global > Selective > Critical

Reading for Scientific Reporting

- Overall goals:
 - Defining an overall research problem and formulating specific research questions.
 - Finding already existing answers to research questions

Global Reading Goals

- Get an overview of the contents.
- Refresh what you already know.
- Will this text help me to formulate my research questions or does it provide answers to these questions?
- Select the parts that are useful for selective and critical reading.

Global Reading

- Pay attention to:
 - Title and subtitle
 - Author: name, profession, institute
 - Name of journal, publication year
 - Abstract and / or summary
 - Introduction
 - Conclusion
 - Headings of sections
 - Illustrations (tables, graphs, diagrams...)

Global Reading ...

- Look out for Signals:
 - Firstly .., secondly .., etc.
 - 1 .., 2 .., 3 ..; a .., b .., c ..
 - To summarize / To conclude
 - For example
 - Marked text:
underlined, italic, bold, different font, etc.
 - Change of margin
 - First and/or last sentence of each paragraph.

Selective Reading for Scientific Reporting

- Study the parts you have selected in the global reading phase
- Mark, underline, identify keywords or summarize
- Rephrase to formulate overall research problem and / or specific research questions
- Rephrase to give answers to research questions in own words

Critical Reading

- Do you agree with the author?
- Is what the author writes reliable?
- Are all relevant aspects included?
- Are all arguments used acceptable?

Are all Arguments used Acceptable?

- Facts:
 - Can be checked
- Opinions:
 - Do you agree or not?
- Advices:
 - Based on what?
- Remarks:
 - Justifiable?

Critical Reading

- Use:
 - Yourself, your own knowledge and your own norms and values
 - Your knowledge of the authority of the author and / or the medium (e.g. refereed journal or not)
 - Acceptability of the line of argumentation

Types of Argumentation

- Description / prescription
- Induction / deduction
- Causes / consequences
- Comparison
- In favour / against
- Necessary conditions / sufficient conditions
- Use of authorities

PROBLEMS OFTEN LOOK
OVERWHELMING AT FIRST.



THE SECRET IS TO BREAK
PROBLEMS INTO SMALL,
MANAGEABLE CHUNKS.
IF YOU DEAL WITH *THOSE*,
YOU'RE DONE BEFORE YOU
KNOW IT.



FOR EXAMPLE, I'M SUPPOSED
TO READ THIS ENTIRE
HISTORY CHAPTER. IT LOOKS
IMPOSSIBLE, SO I BREAK
THE PROBLEM DOWN.



YOU FOCUS
ON READING
THE FIRST
SECTION?

I ASK
MYSELF,
"DO I EVEN
CARE?"



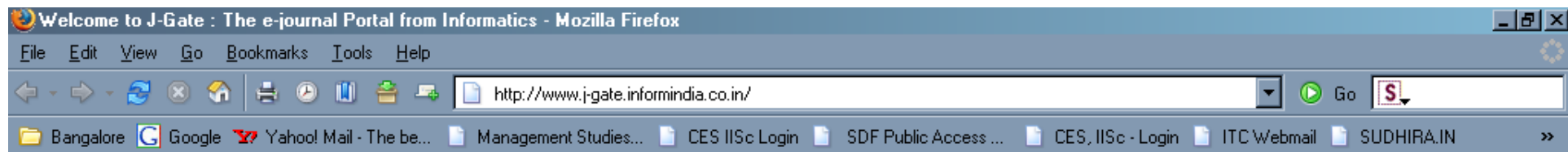
Managing References

- Scout for Literature
- Store
- Catalogue – Index
- Cite Properly
- Tools for Managing Bibliographic Information
- Styles of citation

Where to Look for Literature?

- E-Library Resources of JRD Tata Memorial Library: <http://www.library.iisc.ernet.in/ebrary.html>
- NCSI: IISc LIBRARY CATALOGUE: <http://www.ncsi.iisc.ernet.in>
- Directory of Open Access Journals: <http://www.doaj.org>
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- Google Books: <http://books.google.com>
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- Elsevier's Science Direct: <http://www.sciencedirect.com>
- SCIRUS: <http://www.scirus.com>
- J-Gate: <http://www.j-gate.informindia.co.in>

The screenshot shows a Mozilla Firefox browser window displaying the SciGate website. The browser's address bar shows the URL <http://www.ncsi.iisc.ernet.in/iisc-services.php>. The website's header includes navigation links: [HOME](#), [SERVICES to IISc Users](#), [OPEN SOURCES \(by Subject\)](#), [OPEN SOURCES \(by Type\)](#), and [IISc Publications](#). The main content area features a search bar with the text "Search SciGate:" and a "go" button, along with links for "Advanced Search" and "Search the Net". Below the search bar, a red banner reads "Information Services to IISc Users". The main text describes the services provided by SciGate, including access to premium e-resources and information services for faculty, students, and staff of IISc. A sidebar on the right contains a "MySciGate Login" form with fields for "Profile Name" and "Password", and a "Try This Site!" section with a link to "Center for Biological Sequence Analysis (CBS)".



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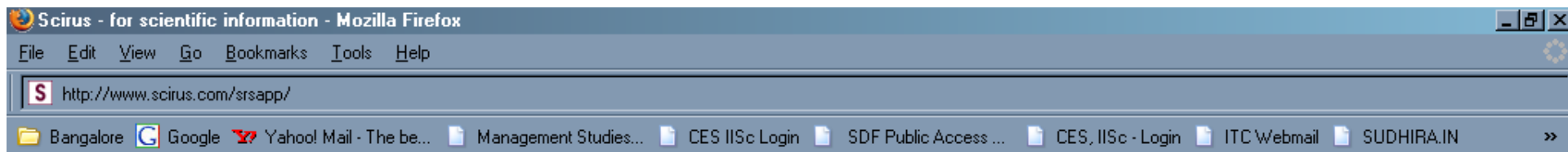
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urban economics

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- Multiple Resolution Pilot
- CrossRef Search
- CrossRef Annual Meeting 2005
- New members this week
- CrossRef Indicators

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CROSSREF ANNUAL MEETING 2005

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Draft agenda

Program topics include: digital preservation, cross-publisher search, DOIs for book chapters, and innovations in scientific publishing.

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CrossRef is an independent membership association, founded and directed by publishers. CrossRef's mandate is to connect users to primary research content, by enabling publishers to do collectively what they can't do individually. CrossRef is also the official DOI registration agency for scholarly and professional publications. It operates a cross-publisher citation linking system that allows a researcher to click on a reference citation on one publisher's platform and link directly to the cited content on another publisher's platform, subject to the target publisher's access control practices. Our citation-linking network today covers millions of articles and other content items from several hundred scholarly and professional publishers.

DOI Resolver

If you encounter a DOI (e.g., 10.1037/0003-066X.59.1.29) that is not hyperlinked, you can enter it in the box below:

TIP: You can turn a DOI into a URL by appending http://dx.doi.org/ to the front of it.

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Search Strategy

- SYNONYMS
- BOOLEAN OPERATORS, BRACKETS, COMBINE
- TRUNCATION
- Boolean Operators
 - “AND” OPERATOR: RECORDS THAT INCLUDE BOTH TERMS
 - “OR” OPERATOR: RECORDS THAT INCLUDE EITHER OF THE TERMS
 - “NOT” OPERATOR: RECORDS THAT INCLUDE ONE TERM BUT NOT ANOTHER TERM

Free Tools for Managing References

- Stand alone
 - JabRef – open source and platform independent: <http://jabref.sourceforge.net>
- Available Online!
 - Connotea: <http://www.connotea.org/>
 - CiteULike: <http://www.citeulike.org/>

MANAGING REFERENCES WITH JABREF

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#		Author	Title	Year	Journal	Bibtexkey
1		Bushnell, P. G. and Steffens...	Exercise metabolism in two species of co...	1994	Polar Biol.	Bushnell...
2		Caldarone, Elaine M. and St...	Relationship of {RNA}/(DNA) ratio and te...	2003	Mar. Ecol...	caldaron...
3		Finn, R. N. and Fyhn, H. N. ...	Physiological energetics of developing e...	1995	Mar. biol.	Finn1995
4		Finn, R. N. and Henderson, ...	Physiological energetics of developing e...	1995	Mar. biol.	Finn1995a
5		Finn, R. N. and Rønnestad, L.	Fuel and metabolic scaling during the ear...	2002	Mar. Ecol...	Finn2002
6		Herbing, I. Hunt von and Wh...	The effects of body mass and feeding on...	2002	J. Fish Biol.	Herbing...
7		Meeren, T. van der and Jers...	Growth and survival of {A}rcto-{N}orwegi...	2001	Aquacult...	Meeren2...
8		Meeren, Terje van der and ...	Fatty acid composition of unfed larvae (G...	1993	Journal o...	Meeren1...
9		Nelson, Jay A. and Tang, Yo...	Differences in exercise physiology betwe...	1994	Physiolog...	Nelson1...
10		Rainuzzo, J. R. and Reitan, ...	Comparative study on the fatty acid lipid ...	1992	Compara...	Rainuzz...
11		Rainuzzo, Jose R. and Reita...	The significance of lipids at early stages ...	1997	Aquacult...	rainuzzo...
12		Rønnestad, I. and Tonheim, ...	The supply of amino acids during early f...	2003	Aquacult...	ronnesta...
13		Schurmann, H. and Steffens...	Effects of temperature, hypoxia and activ...	1997	J. Fish Biol.	Schurma...
14		Abrams, Peter A. and Ginzb...	The nature of predation: prey dependen...	2000	Trends i...	abrams00
15		Acevedo, Miguel F. and Wall...	Modelling and control of a simple trophic...	2000	Ecol. Mo...	Acevedo...
16		Aksnes, Dag L. and Utne, A...	A revised model of visual range in fish	1997	Sarsia	aksnes1...
17		Alabek, A. and Kappel, E. ...	Food intake in fish	1991		alabek91

Article (caldarone03)

Caldarone, E.M.; St-Onge-Burns, J.M. & Buckley, L.J.
Relationship of RNA/DNA ratio and temperature to growth in larvae of Atlantic cod *Gadus morhua*
Mar. Ecol. Prog. Ser., **2003**, 262, 229-240

Abstract

The RNA, DNA, and protein content of larval cod *Gadus morhua* reared in the laboratory at 3 temperatures and 3 densities of prey was measured. The data were used to define a quantitative relationship between RNA/DNA ratio (R/D), water temperature (T), and protein-specific growth rate (SGR, % d⁻¹). The nucleic acid content of each larva was determined with both a 2-dye flow-injection fluorometric assay (FIA) and a 1-dye/1-enzyme fluorometric microplate assay (MFA) in order to calibrate each methodology. The resulting equations were: SGR=3.65 R/D+1.02 T-13.05 for FIA, and SGR=4.03 R/D+0.88 T-11.16 for MFA. Measured growth rates ranged from negative (-8% d⁻¹) to 20% d⁻¹. Water temperature and larval R/D explained 37 to 39% of the variability in the observed growth rate. The models are applicable over temperatures ranging from 2.5 to 9.5degreeC and can be used to determine short-term growth rates of cod larvae collected from both the laboratory and field.

Status: Updated group selection.

Working with JabRef

- This is the main window from where you work with your databases. Below the menu bar and the toolbar is a tabbed pane containing a panel for each of your currently open databases. When you select one of these panels, a table appears, listing all the database's entries, as well as a configurable selection of their fields.
- You decide which fields are shown in the table by checking the fields you want to see in the **Preferences** dialog.

Adding a new entry

- There are several ways to add a new entry.
- The New entry menu action shows a dialog where you can choose the type of the entry from a list.
- When a new entry is added, by default an editor dialog for the entry will be opened. This behaviour can be toggled in the Preferences dialog.

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Croups

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10	Ando, Yasuhiro and Kobayashi, ...	Positional distribution of docosahexaenoic aci...	2004	Aquacultu...	ando04a
11	Ando, Yasuhiro and Kobayashi, ...	Positional distribution of n-3 highly unsaturat...	2004	Aquaculture	ando04
12	Ang, K. P. and Petrell, R. J.	Pellet wastage, and subsurface and surface f...	1998	Aquacult...	ang1998...
13	Anras, Marie-Laure Bégout and...	Measuring cultured fish swimming behaviour...	2004	Aquaculture	anras04
14	Aragao, Claudia and Conceicao...	Amino acid pools of rotifers and (A)rtemia un...	2004	Aquaculture	aragao04
15	Balon, Eugene K.	The theory of saltatory ontogeny and life hist...	1985		balon1985
16	Baskerville-Bridges, B. and Klin...	Development and evaluation of microparticul...	2000	Aquacult	Baskervill...
17	Beer, W. Nicholas and Anderso...	Modelling the growth of salmonid embryos	1997	J. Theor...	beer97
18	Belal, Ibrahim E. H.	A review of some fish nutrition methodologies	2005	Bioresour...	belal05
19	Bell, J. C. and McEvoy, L. A. an...	Optimising lipid nutrition in first-feeding flatfi...	2003	Aquaculture	bell03
20	Beyer, Jan E.	Recruitment stability and survival -- simple si...	1989	Dana	beyer198...
21	Blyth, P. J. and Valdimarsson, S...	Diurnal and seasonal variation in feeding patt...	1999	Aquacultu...	blyth199...
22	Boeuf, Gilles and Le Bail, Pierre...	Does light have an influence on fish growth?	1999	Aquaculture	boeuf199...
23	Bogacki, P. and Shampine, L. F.	An efficient (R)unge-(K)utta (4,5) pair	1996	Computer...	bogacki96
24	Boraas, Martin E. and Seale, Di...	Rotifer size distribution changes during transi...	1998	Hydrobiol...	boraas98

Article

Required fields Optional fields MyOwn Abstract BibTeX source

Author: Claudia Arago and Luis E. C. Conceicao and Maria Teresa Dinis and Hans-Jorgen Fyhn

Title: Amino acid pools of rotifers and (A)rtemia under different conditions: nutritional implications for fish larvae

Journal: Aquaculture

Year: 2004

Volume: 234

Pages: 429--445

Bibtexkey: aragao04

Status: BibTeX key is unique.

Editing an entry

- To open an editor dialog for an existing entry, simply double-click in the leftmost column of the appropriate line, or select the entry and press ENTER.
- If "Allow editing in table cells" is not selected in the dialog window **Options** --> **Preferences** --> **General**, a double-click anywhere on the appropriate line will open the editor dialog.

Importing Bibliographic Information

- Most online journals offer features to download / export bibliographic information
- Look for “export citations” / “download citations”
- If you have an option for “citations + abstract”, select it
- Download in any popular formats (*.bib, *.ris, *.enl, etc. formats)
- When working with Jabref
 - Go to File>> Import and Append >> Auto-detect Format
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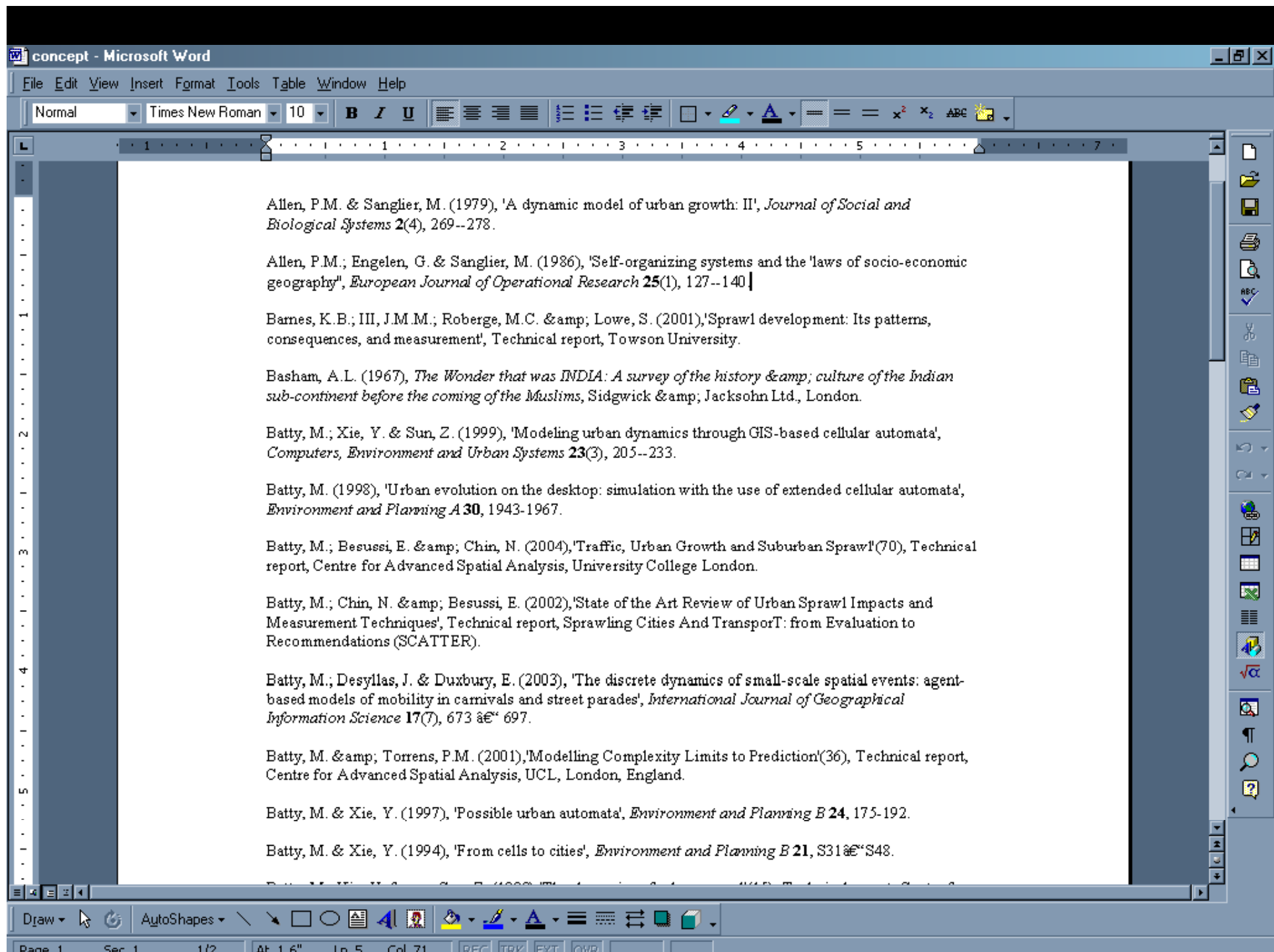
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<input checked="" type="checkbox"/>		Batty, Michael; Xie, Y. & ...	The dynamics of urban sprawl	1999	Batty1...
<input checked="" type="checkbox"/>		Behera, G.; Rao, P. P. N...	Growth of {B}angalore {C}ity since 19...	1985	Beher...
<input checked="" type="checkbox"/>		Benenson, Itzhak & Torre...	Geosimulation: {A}utomata-based mo...	2004	Bene...
<input type="checkbox"/>	D	Couclelis, Helen	Cellular dynamics: {H}ow individual d...	1987	Coucl...
<input type="checkbox"/>	D	Davis, Kingsley	The {U}rbanization of the {H}uman {...	1965	Davis...

Article (Subbiah1990)
Subbiah, S.V.
Urban climate in Tamil Nadu, India: A statistical analysis of increasing urbanization and changing trends of temperature and rainfall
Energy and Buildings, **1990** , 15 , 231-243

OK Stop Cancel Help



Writing Skills

- Problems and Purpose
- Report Structure
- Standard Report Elements
- References to Information Sources
- Hints for Writing
- Report Writing: Do's and Don'ts

Problems & Purpose

- Report Writing Problems:
 - When you have to write a report or paper, what do you find difficult?
- Purpose of the Report:
 - All report writing activities should be based on a clear definition of the purpose of the (research) work (to be) done.
 - Structure and contents of the report are completely based on the purpose.
 - Always ask: Why am I writing what I am writing?

Report Structure

- Translate the purpose of a research assignment into a number of questions that have to be addressed.
- These questions, and the answers to them, will together make up the contents of the report.

Standard Report Elements

- Title Page
- Abstract
- Executive Summary
- Preface
- Acknowledgements
- Glossary
- Table of Contents
- List of Illustrations
- List of Tables
- Main Text
(Introduction-core-Conclusion)
- Footnotes or Endnotes
- Bibliography
- Appendix or Annexure

References to Information Sources

- Fundamental rule:
 - Proper references to secondary information sources must always be made as soon as part of the text, or just an idea, is not your own!
- Why?
 - Plagiarism is not allowed in science
 - Allow reader to check original sources
 - Justification for statements
 - Safeguard against mistakes made by the other author!

Hints for Writing

- Always think of clear and logical relationships in the text!
- Report:
- Start (intro): What are you going to say
Purpose of the research
- End: conclusion.
- Introduction + conclusion = summary

Report Writing Do's

- Do write down immediately what comes up in your mind (during the work)
- Do decide on purpose / structure at start
- Do explain structure to reader
- Do explain function of every new chapter
- Do begin new chapter on new page
- Do make several versions
- Do work individually in group reports

Report Writing Don'ts

- Do not add new information in a conclusion or summary
- Do not postpone writing
- Do not forget about your target group
- In the first draft, do not worry about exact formulations

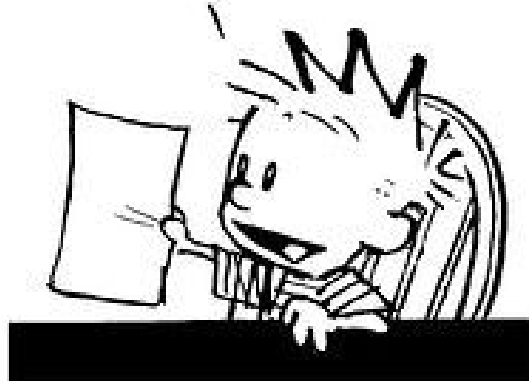
I USED TO HATE WRITING
ASSIGNMENTS, BUT NOW
I ENJOY THEM.



I REALIZED THAT THE
PURPOSE OF WRITING IS
TO INFLATE WEAK IDEAS,
OBSCURE POOR REASONING,
AND INHIBIT CLARITY.



WITH A LITTLE PRACTICE,
WRITING CAN BE AN
INTIMIDATING AND
IMPENETRABLE FOG!
WANT TO SEE MY BOOK
REPORT?



"THE DYNAMICS OF INTERBEING
AND MONOLOGICAL IMPERATIVES
IN *DICK AND JANE*: A STUDY
IN PSYCHIC TRANSRELATIONAL
GENDER MODES."



Presentation Skills

- Verbal Presentations
- Purpose of a Verbal Presentation
- Structure
- Preparation
- Duration
- Visual Aids
- Making Slides
- Speaker Notes
- The Presentation Itself!

Verbal Presentations

- When you have to make a verbal presentation, what do you find difficult?
- What Shall I Say?
- Who is the Audience ?
 - Who are they?
 - Why will they be listening?
 - What do they want to learn?
 - What are their interests?
 - What do they already know?
 - What language do they speak?
- What is the Purpose of the Presentation?

Purpose of a Verbal Presentation

- Always ask yourself: Why am I saying what I am saying?
- Purpose:
 - Communicate findings / information
 - Introduce the subject to people
 - Interest people in the subject
 - Present proposals
 - Raise questions for discussions
 - Influence decisions
 - Make people read your paper

Purpose of a Verbal Presentation

- The primary purpose of a verbal presentation is to stimulate attention.
- Without that attention no purpose can be achieved!

Structure of a Verbal Presentation

- Introduction
 - Catch attention (title / opening line)
 - Subject and aim and reasons
 - Relevance for audience
 - Overview (outline of the presentation)
- Core (3-5 questions depending on time)
- Closing
 - Conclusion linked to purpose
 - Recommendations / implications / questions left
 - What do you expect from the audience

Verbal Presentation Preparation

- Make a logical story:
 - Introduction
 - Core topics
 - Closing
- With smooth links from one part to the other

Verbal Presentation Preparation

- Traps to avoid:
 - Trying to cover too much
 - Lack of structure / cohesiveness
 - Not written for speaking
 - Not allowing sufficient time to prepare

Duration of a Verbal Presentation

- If you may decide on the duration yourself:
 - Do not speak for longer than 15-20 min.
- If the duration is dictated:
 - Make sure you will complete your presentation in time (i.e. not halfway)
- Rehearse your presentation to know its duration and to find out what you can tell.

Visual Aids

- Benefits:
 - Increase impact
 - Focus attention
 - Clarify complex ideas
 - Stimulate
 - Lasting impression (of whole presentation)
 - Increase confidence
 - Provide frame of reference

Making Slides

- One topic per slide
- Topic translated in slide title
- 6-9 lines
- 6-10 words per line
- Use big type sizes (>30 points)
- No fancy type styles
- Lowercase better than CAPITALS
- Insert many pictures!
- Simple graphics, no detailed tables

Speaker Notes

- All good presenters have them
- Designed to be used as a reference
- Should help with structure and timing of the talk
- Brief - no script!
- Make sure they are legible

Speaker Notes ...

- What do you have on paper?
- Write introduction in full
- Key questions + key answers in short
- Keywords, details, quotations, figures, names
- Links between topics in full
- Closing in full
- Instructions for use of media

WHEN & WHERE Check-list

- Nature of the occasion
- Who will be there?
- Available audio visual facilities
- Size of room and screen
- What other presentations will be made?
- Duration of the presentation
- Start time
- Questions and discussions afterwards?
- Paper required?
- Organiser's contact number
- How to travel to the site

The Presentation Itself:

Dealing with Nerves

- Manage not prevent
- Prepare thoroughly
- Rehearse your presentation
- Reconnaissance of the premises (does the technology work / can you use it / etc.)
- Catastrophize the situation (what if ...)
- Don't apologize
- Positive self talk / You are in charge!

The Presentation Itself: DO's

- Do repeat the most important information (readers can repeat, listeners cannot)
- Do engage the audience (e.g. asking questions and eye contact)
- Do use clear and legible visual aids
- Do speak loud and clear
- Do show a lot of enthusiasm (body language)
- Do be confident (if you prepared well)

The Presentation Itself:

DON'Ts

- Do not use written language, difficult words or long sentences
- Do not read from a script
- Do not speak too fast
- Do not speak too monotonous
- Do not be afraid of introducing short breaks (e.g. to let people watch a slide)
- Do not stand in front of screen

The Presentation Itself: Dealing with Questions

- Types of questions:
- Barely audible or badly phrased
- Irrelevant
- Technical
- Private interest
- Answers:
- repeat back
- answer briefly
- translate the jargon
- answer privately afterwards

The Presentation Itself: Dealing with Questions

- Types of questions:
- Thoughtless
- “Funny”
.....
- Provocative
- Answers:
- answer briefly / do not cast scorn on it
- deal with in a serious manner
- answer concisely do not be drawn into argument

Funding

HOW ARE WE GOING TO INVENT A ROBOT? WE DON'T KNOW ANYTHING ABOUT MACHINES.

MAYBE YOU DON'T.

IT'S EASY. THERE ARE JUST FOUR SIMPLE MACHINES TO ALTER FORCE: THE LEVER, THE PULLEY, THE INCLINED PLANE AND, UM, THE INTERNAL COMBUSTION ENGINE.

TAKE MY WORD FOR IT, I'M AN EXPERT AT INVENTIONS.

SO WHERE DO WE START?

WE ASK MOM FOR A RESEARCH GRANT.

Publish & Get Cited or else Perish

- Bibliometrics
 - Effectiveness of your research
 - No of papers or citations?
- Citation Analysis
 - ISI Web of Knowledge
 - Scopus
 - Google Scholar
- What's your H-index?

Credits

- Bill Watterson for Calvin and Hobbes.
- Dr. Corné van Elzakker, ITC, The Netherlands.
- Information and Documents of the Basic Research Skills module of ITC, The Netherlands.

Thank you.

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