

Publish or perish
**Fundamentals of a scientific
research activity**

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Overview of the presentation

- Why publish
- Responsibility of the institution and the researcher
- Research tools
- Assessing a research publication
- How to read a research paper
- How to write a research paper

why publish

- Publishing research increases its impact on our collective understanding and knowledge by way of sharing and dissemination
- However, its more prevalent objectives are:
 - promotions in the academic/research institutions
 - Requirements of the funding agencies
- HEC has also made it mandatory to have certain number of research publications for the position of Associate and full Professor.

Essential ingredients of research

- Perseverance
- Institution's responsibility
 - Rational teaching load
 - Promotion of research culture
 - Accessibility to research publications
 - Accessibility to National and International research funding agencies
- Researcher's responsibility
 - Extensive and Intensive literature search for the identification of:
 - Research area
 - Research project and research problem/question

Researcher's responsibility cont'd..

- Research tools:
 - Library (Mostly ineffective and insufficient in Pakistan)
 - Research search engine/databases
 - <http://scholar.google.com>
 - Web of knowledge <http://www.isiwebknowledge.com/>
 - Scopus <http://www.scopus.com/home.url>
 - Engineering village
<http://www.engineeringvillage2.org/controller/servlet/Controller>
 - Inspec archive (of science and technology from 1898 to 1968)
<http://www.theiet.org/publishing/inspec/index.cfm?origin=homepage-inspec-kb>
 - Inspecdirect <http://inspecdirect.theiet.org/>
 - Computing skills
 - Programming language (C/C++ is one of the most prevalent language especially relevant for ECE graduates)
 - MATLAB
 - Spreadsheet (MS Excel or Origin)
 - For details and references
 - “Research student’s guide to success” by Pat Cryer
http://www.postgrad_resources.btinternet.co.uk/index.htm
 - “How to get a PhD” by Phillips and Pugh

Some Electrical and Computer Engineering databases

<http://www.lib.utexas.edu/indexes/titles.php?subject=Electrical+and+Computer+Engineering>

The screenshot shows a web browser window with the address bar displaying the URL: <http://www.lib.utexas.edu/indexes/titles.php?subject=Electrical+and+Computer+Engineering>. The browser's address bar also shows the page title: "Databases - Electrical and ...". The browser's toolbar includes buttons for back, forward, home, and search, as well as a search bar. The browser's tabs show "Databases - Electrical and ..." and "Journal Citation Reports - ...". The browser's bookmarks bar shows "Free Hotmail", "Suggested Sites", "Web Slice Gallery", "How to make a boota...", "VBA Tips: Build an Exc...", "Verilog-AMS.com", "Solid-State Electronic...", and "Other bookmarks".

The main content area displays a list of databases, each with a title, a description, and a "Find it" button. The databases listed are:

- Academic Search Complete**
1990 - present. (EBSCO) [Full Text](#) [Find it](#) [UT](#) [About](#)
- ACM (Association for Computing Machinery) Digital Library**
1991 - present (ACM) [Full Text](#) [Find it](#) [UT](#) [About](#)
- Aerospace & High Technology Database**
1965 - present. (CSA) [Full Text](#) [Find it](#) [UT](#) [About](#)
- Annual Reviews Online**
1997 - present. (Annual Reviews) [Full Text](#) [Find it](#) [UT](#) [About](#)
- ASM (American Society for Metals) Alloy Center Online**
Most current edition. (ASM) [Full Text](#) [Find it](#) [UT](#) [About](#)
- ASM (American Society for Metals) Handbooks Online**
Most current edition. (ASM) [Full Text](#) [Find it](#) [UT](#) [About](#)
- ASM (American Society for Metals) Phase Diagrams**
Most current edition. (ASM) [Full Text](#) [Find it](#) [UT](#) [About](#)
- BIOSCIENCEnetBASE: Biology References Online**
1985 - present (CRC Press) [Full Text](#) [Find it](#) [UT](#) [About](#)
- Business Source Complete**
1990 - present. (EBSCO) [Full Text](#) [Find it](#) [UT](#) [About](#)
- DOE Information Bridge**
1994 - present. (U.S. Department of Energy) [Full Text](#) [Find it](#) [UT](#) [About](#)
- Ei Compindex**
1884 - present. (Ei) [Full Text](#) [Find it](#) [UT](#) [About](#)
- ESDU (Engineering Sciences Data Unit) Data Service**
Dates of coverage vary. (IHS) [Full Text](#) [Find it](#) [UT](#) [About](#)
- IEEE Xplore**

The right sidebar contains a section titled "Top Electrical and Computer Engineering Databases" with links to "Business Source Complete (About)", "IEEE Xplore (About)", and "INSPEC (About)". Below this is a section titled "Electrical and Computer Engineering Links" with links to "Electrical and Computer Engineering Research" and "Electrical and Computer Engineering Specialist: Larayne Dallas". At the bottom of the sidebar is a section titled "Electrical and Computer Engineering Specialist: Robyn Rosenberg".

The bottom of the screenshot shows the Windows taskbar with the Start button and several open applications: "MATLAB", "Microsoft PowerPoint ...", "Google Chrome", and "Research". The system clock in the bottom right corner shows the time as 08:00.

Using research databases effectively and efficiently

- Use of wildcards in search engines
- What is the difference between a reference and a citation?
- What is a citation map?

How to assess a Research Publication

- Journals/transactions/magazines
 - Journal Impact Factor from JCR (Journal Citation Report) – <http://www.webofknowledge.com>
 - <http://www.sciencegateway.org/impact/if02i.html>
 - For engineering journals a minimum IF of 0.25
- Conference
 - Frequency of the conference
 - Are the authors required to submit a paper in addition to presentation and/or poster?
 - Are the proceedings published and citable ?
 - Are the submissions peer-reviewed ?
 - Most conference proceedings available through IEEE or ACM portals are of acceptable quality

How to read research papers

- Read critically and creatively and explore comparative work
- Methodology of reading
 - Skimming
 - Vocabulary
 - Comprehension
 - Reflection and analysis
- References:
 - <http://www.eecs.harvard.edu/~michaelm/postscripts/ReadPaper.pdf>
 - <http://cseweb.ucsd.edu/~wgg/CSE210/howtoread.html>

How to write research papers

- General anatomy of a research paper

http://www.ifh.uni-karlsruhe.de/lehre/dokkurs/gutes-schreiben/paper_how-to.pdf

(an excellent reference)

- Tools
 - Word processing (MS Word, Latex)
 - Data analysis and presentation (Origin)
 - Bibliographic styles (End note)
 - Templates from the research journal publishers

Conclusion

- Concentrate on the researcher's responsibilities—extensive literature search, computing, reading and writing skills.

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