
Keys to Research Productivity

Expert Lecture –

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Outline

- What we can control
- Academia as a Career
- Best Practices in Publishing
- Rules of Writing a Research Paper
- Rule for Productivity

What We Can't Control? – Lots of Things

There are Lots of Things Around us that we Can't Control



Source: <https://twitter.com/daplfife/status/1587735833850875904>

We Can't Control the Phases of Life?

- 1) Brahmacharya (Student Life)
- 2) Grihastha (Household Life)
- 3) Vanaprastha (Retired Life)
- 4) Sannyasa (Renounced Life)

Adopted from: M. Sawhney 2022: https://www.linkedin.com/posts/mohansawhney_lifelessons-spirituality-mentoring-ugcPost-7004465445311328258-yEwl?utm_source=share&utm_medium=member_android

Can We Control the Phases of Academic Life?

- 1) Shishya (Learner)
- 2) Karta (Doer)
- 3) Daata (Giver)
- 4) Bodhi (Enlightened)

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Academia – Is it a Good Career Choice?

Academia as a Career

- Academia is more than a career choice.
- It is a lifestyle.
- It follows you home and it's by no stretch of imagination a typical 8-to-5 job.
- One may not be allowed into the system (in the case of tenure-track professorships).

Source: <https://www.quora.com/Why-is-a-career-in-academia-such-a-terrible-path-to-choose-now>

Academia as a Career

- There is an oversupply of Ph.D. holders. There are very few openings per year in some fields than the number of Ph.D. holder.
- You won't have a big paycheck. Working for a company will yield the greatest economic benefits.
- There is significant pressure to publish. A non-academic won't know the type of pressure this translates into.
- Grant money is the golden standard for many disciplines and applying is unbelievably time-consuming. Many academics spend more time applying for grant money than doing research.

Source: <https://www.quora.com/Why-is-a-career-in-academia-such-a-terrible-path-to-choose-now>

Academia as a Career

- The positive things clearly outweigh the negative ones.
- More freedom, time to travel, time to spend with activities of interest.,
- Intellectual stimulation than most if not all non-academics.
- Travel often to interesting places and have wonderful conversations with people who are at the cutting edge of the science.
- Working with a set of students who challenge and approach for help.

Source: <https://www.quora.com/Why-is-a-career-in-academia-such-a-terrible-path-to-choose-now>

Academic Life – 3 Main Tasks

- Teaching
- Research
- Services

Academic Life – Teaching

- Class room formal lectures
- Graduate and Undergraduate student mentoring

Academic Life – Research

- Publishing
- Project Proposal and Execution
- Patenting

Academic Life – Service

- Institutional Service
- Professional Service

Academic Life – Task Allocations

Important is to maintain or have a TRS% as to suit one's career objectives and stage of career.

Research Publishing – Best Practices

Why is it Important to Patent My Research Idea?

- Patent Provides Exclusive Right
- Patent Provides Competitive Advantage
- Technology Transfer
- Potentials for Financial Returns
- Increase Valuation
- Attract Investment
- Helps to Obtain Funding
- Satisfaction to see Lab Research → Mass Product

Source: <https://henrygoh.com/top-10-reasons-why-a-patent-is-important/>

What is the Right Time to File the Patent?

- Before Publishing the research
- OR
- After Publishing the research

Rules to Balance Patents and Publications

- File a patent before you present or publish your work in the public domain to be fully careful.
- Be careful while presenting your idea or writing an abstract.
- Avoid providing too many details that can enable a 3rd party to copy your invention.
- Present only broadly outline your ideas while discussing with potential organizations or companies.
- If you intend to have business discussions with a 3rd party, ensure that a none-disclosure agreement (NDA) is in place prior to the discussions.

Source: <https://www.enago.com/academy/publish-or-patent-first>

Publishing Venue – Where to Publish?

- Magazine, Transactions, Letters, or Conference Proceedings?
- Depends on the content of a manuscript.
- First fix a venue → Write? OR First Write → venue?
- Magazine Article – Broad scope
- Journal/Transactions Papers – Focused scope and concrete results
- Letters Papers – Focused scope and brief results
- Conference Proceedings Papers – Focused scope and quick dissemination to receive direct feedback from peers

Publishing Venue – Magazine?

- Articles should be broadly scoped.
- Technical articles may be suitable, but these should be of general interest to an engineering audience and of broader scope than archival technical papers or conference proceedings papers.
- Articles related to the background story behind engineering standards or practical experiences in product specification and design of mainstream systems.
- Tutorials on related technologies or techniques are also strongly encouraged.

Publishing Venue – Journal/Transactions?

- Journal/Transactions are archival venues, just not intended for quick dissemination of research.
- Articles should have both depth and breadth.
- The work should have **strong novelty**. It must advance the state-of-the-art to be published.
- The work should stand for decades without being outdated.
- The experimental results need to be rigorous.
- Manuscript need to **survive multiple iterations** of review process.
- **Long Review Cycles**. So authors should pay attention to every minor details. It may get one more round of revision just for a minor issue.

Publishing Venue – Conference Proceedings?

- Conference Publishing may be for quick dissemination.
- Conference Presentations facilitates direct interaction with peers.
- Conference attendance may help researchers in their career advancement.
- Conference reviews can help to improve the work further which may then eventually become a journal publishing.
- Work-in-Progress (WIP) and Research-Session-Demo (RDS) are alternative modes of dissemination to get feedback on ongoing research from the peers.

Conference → Journal OR Journal → Conference?

- Conference publishing first → corresponding journal
OR

Journal publishing first → corresponding conference

- To my experience: I see that most of the researchers follow the first option and few researchers follow the second option.
- In either case one shouldn't have the same text and figures.
 - These are two distinct publications for the authors.
 - After acceptance both the journal paper and conference paper appear in digital library, a **similarity software will flag** the similarity.

Shall I Target Journal/Transactions Submission Directly Without a Conference Paper of the Work?

- Short Answer: No
- Reviews received from the Initial Conference Version of the work can strengthen the work to become a journal paper eventually.
- Reviewers of the journal manuscript can have better impression if they find that it is already based on a quality conference paper.
- Journal have longer review cycle which may not correctly timestamp the idea published in the journal paper. Imagine rejection of the journal manuscript after 6-8 months of review cycle, loosing the time.

Conference → Journal: How to Do it?

- Publisher need anywhere between 30%-70% additional materials over the conference version for a journal article.
- Final judgement is typically up to the Editor-in-Chief (EiC) of specific journal/transactions.
- Key aspects of extending a conference paper to a journal article: additional novel contributions, thorough literature analysis, more experimental results, additional figures, and additional Tables.
- Complete rewriting of the text and redrawing of any figures used is a good idea to avoid similarity issues and the copyright aspects as in many cases the publishers conference proceedings and the journal/transactions may not be the same.
- Remember to cite the conference paper on the current journal paper; may be even write in the acknowledgement.

Journal → Conference: How to Do it?

- It is not common to present a journal published paper as a conference paper.
- Things are changing – Too many conference looking for audience
- Short conference paper as possible option
- Research Demo Session (RDS) papers is another option
- Complete rewriting of the text and redrawing of any figures used is a good idea to avoid similarity issues and the copyright aspects as in many cases the publishers of conference proceedings and the journal/transactions may be different.
- Remember to cite the journal paper on the current conference paper; may be even write in the acknowledgement.

Is it Important to Suggest Reviewers Names when Submitting a Journal/Transactions Manuscript?

- Short Answer: Yes
- Associate Editors are typically overloaded, they may pick few of the reviewers from your suggested list.
- The manuscript may be handled by an AE who is working on a closely, but not exactly on the area of the manuscript, so may take time to find sufficient reviewers.
- You never know your preferred reviewer may see your work favorably!

How Important is Open-Access Publishing?

- Thoughts on the current state of academic publishing
 - ❑ Journal papers are important OR Conference papers
 - ❑ Open Access is better OR traditional closed access
- Thoughts on Open-Access:
 - ❑ Arxiv (<https://arxiv.org/>), TechRxiv (<https://www.techrxiv.org/>)
 - ❑ Data Regulation – Quality Data is key
- One aspect of academic publishing that is very important/significant these days
 - ❑ Open Access and Research Reproducibility

Journal Review Process Takes Long Time, Should I Only Publish in Conference?

- Short Answer – No
- Journals are archival purposes and publish thoroughly reviewed works. So quality of work can improve if reviews are good.
- Option to time stamp the idea, before submitting to Journal:
 - Make a conference paper
 - Put it in open access depository like arXiv, TechRxiv, etc.

Journal Review Process Takes Long Time, Should I Submit to Multiple Venues for Faster Publishing?

- Short Answer: No
- Submitting same manuscript to multiple journals/transactions at a time is not allowed.
- Submitting same manuscript to a journals/transactions and a conference at a time is not allowed.
- Danger of being rejected without review from multiple venues.

I Can Publish in Journals, Why Should I Bother for Conferences?

- Short Answer – Yes
- Networking with Global Peers
- Direct Interaction with Peers → Boost Researcher's Confidence
- Meet people who can help in job search
- Meet people who can your reference for job search
- Meet people who can be reviewer of your next papers
- Meet people who can be external examiner of thesis/dissertation (if applicable)

Does the Look and Formatting of the Manuscript Matter during Submission?

- Short Answer: Yes
- Note: First Impression Lasts Long
- Reviewer maynot be interested to read details if the manuscript doesn't look professional and clear.
- Look and legibility are important to attract attention.
- Danger of the manuscript being returned without review.

How important is author ordering in a publication?

- Short Answer: No definite answer
- In some disciplines the faculty mentor is typically the last author.
- In some cases, the primary contributor is the first author and other is made based on level of contributions to the work.

How Important is Social Media for Researchers?

- Short Answer: Not Much
- How important is social media for researchers? Should Ph.D. students invest time in building profiles & networks social media?
 - Neutral – Publicity + Typical Negativity of social media (Privacy issues)
- How challenging do you feel it is for new Ph.D. researchers to get published? Any advice/tips?
 - Reasonable challenging for new researchers, Conference → Journals

Why Should I Spend Time as a Reviewer?

- Short Answer - Yes
- Early Learning: Researchers who are engaged in cutting-edge research can't find learning materials from the text books. By the time a research findings appear in text book, they are outdated. A researcher can stay up to date and learn from other researcher if he/she reviews their manuscripts.
- Learning Quality expected in a specific journal/conference. Accordingly, one can use that experience to improve own manuscripts before submissions.
- Service to the profession and community.

What are the Best Practices of Publishing?

- Short Answer: No definite answer
- Differs in one area of research to another area of research, from disciplines to another, and from publisher to another publisher. Some rule of thumb:
 - ❑ Publish one idea in one venue
 - ❑ Do best job for all text including references
 - ❑ Give credit to existing literature
 - ❑ Read articles/papers from a target venue before preparing own manuscript
 - ❑ Pay attention to each minor or major aspects; too many small → rejection
 - ❑ Learn to handle rejection

A Big Qeuestion – Where to Publish?

- As an author after I have always asked myself:
 - **First Option:** My article is an excellent scholarly product because it got published what my peers think as a selective or top avenue.
- OR
- **Second Option:** My article is an excellent scholarly product because it is read and/or cited by my peers and it makes the avenue great wherever it is published.
- Most of the researchers have a tendency to choose the first option from the above.
- However, I strongly believe that if an article has real strength then it should be second option.

Golden Rules of Writing a Research Paper

Typical Structure - Various Section

- Abstract
- Introduction
- Novel Contributions
- Related Prior Works
- Innovative Sections – Few of them to sale the paper
- Experimental Results
- Conclusions
- Future Directions

Abstract

- Brief overview of the overall work.
- Very important to sell the paper as gives first impression to the reviewers.

Introduction Section

- Must sell the research work in this Section.
- 2 to 3 paragraph big picture, social impact, motivation, etc. in a top-down fashion.
- **Last Paragraph** should mention paper organization.

Novel Contributions Section

- 3 Subsections
- What is the Problem Addressed? What is the Significance of the Problem? What Research Questions have been Addressed? What are the Challenges?
- What is the Solution Proposed? What are the Hypotheses?
- What is the Novelty and Significance of the Proposed Solution?

Related Prior Works Section

- Important Section
- What other researchers have done in this domain?
- What others have done to address the specific problem if the problem addressed is not new? Nothing wrong if multiple solutions of a old and relevant problem.
- Must present Table and/or Taxonomy to present the comparative perspectives to convince the reviewers and to improve readability.

Innovative Contributing Sections

- Good to present 2 – 3 Sections
- Follow **Top-Down** style to present the idea and contributions

Experimental Results Section

- Experimental Setup
- Datasets
- Results Analysis
- Direct Comparison if same problem is solved by others.
- Comparative Perspective if the problem is not handled before.

Conclusion Section

- This is **not** repeat of the abstract.
- Discuss what has been learnt in the process of this research execution and experimentation.

Future Directions Section

- Some pointer if someone wants to carry forward this research.
- Gives a good impression to the reviewer and reader that you have a clear vision of the research that is being undertaken.

Rules of Productivity

Rules of Productivity – 1 - Avoid Large Meetings

- Large meetings waste valuable time and energy.
- They discourage debate
- People are more guarded than open
- There's not enough time for everyone to contribute
- Don't schedule large meetings unless you're certain they provide value to everyone.

Adopted from: https://www.linkedin.com/posts/mehdi-soodi-phd-26590a16_team-energy-people-activity-7001759811293896704-bDJX?utm_source=share&utm_medium=member_android

Rules of Productivity – 2 - Leave a Meeting if You are Not Contributing

- If a meeting doesn't require your Input or Value Your Recommendations/Decisions → Your presence is useless
- It's not rude to leave a meeting. But it's rude to waste people's time.

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Rules of Productivity – 3 - Forget the Chain of Command

- Communicate with colleagues directly.
- Not through supervisors or managers.
- Fast communicators make fast decisions.
- Fast decisions → competitive advantage.

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Rules of Productivity – 4 - Be Clear, not Clever

- Avoid nonsense words and technical jargon.
- It slows down communication.
- Choose words that are:
 - ❑ Concise
 - ❑ To the point
 - ❑ Easy to understand
- Don't sound smart. Be efficient.

Adopted from: https://www.linkedin.com/posts/mehdi-soodi-phd-26590a16_team-energy-people-activity-7001759811293896704-bDJX?utm_source=share&utm_medium=member_android

Rules of Productivity - 5 - Ditch Frequent Meetings

- There's no better way to waste everyone's time.
- Use meetings to: 1) Collaborate, 2) Attack issues head-on, 3) Solve urgent problems
- But once you resolve the issue, frequent meetings are no longer necessary.
- You can resolve most issues without a meeting.
- Instead of meetings: 1) Send a text, 2) Send an email, 3) Communicate on a discord or slack channel
- Don't interrupt your team's workflow if it's unnecessary.

Adopted from: https://www.linkedin.com/posts/mehdi-soodi-phd-26590a16_team-energy-people-activity-7001759811293896704-bDJX?utm_source=share&utm_medium=member_android

Golden Rules of Productivity – 6 - Use Common Sense

- If a company rule doesn't: - Make sense - Contribute to progress - Apply to your specific situation
- Avoid following the rule with your eyes closed.

Adopted from: https://www.linkedin.com/posts/mehdi-soodi-phd-26590a16_team-energy-people-activity-7001759811293896704-bDJX?utm_source=share&utm_medium=member_android

Summary and Conclusion

- Listen to Yourself.
- Maintain a balance between patent, journal papers, and conference papers.
- Be your own example instead of following other. Everyone is different and unique, and have distinct constraints.
- Research is not about Publishing or Funding. It is about solving problems.
- Don't do just same things at different phases (e.g. Assistant, Associate or Full Professor) of career.
- Expectation should be different at different phases of career.
- Don't follow rules. Follow principles.