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Title

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Permalink

<https://escholarship.org/uc/item/78m397pg>

Journal

Education for Health, 30(3)

ISSN

1357-6283

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Publication Date

2017

DOI

10.4103/efh.efh_354_14

Peer reviewed

Academics Anonymous: A Medical Student's 12-Step Guide to Scholarly Productivity

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ABSTRACT

An important aspect of academic medicine is publication in peer-reviewed journals and other media. Early scholarly productivity in medical school may jump-start a successful academic career. Topic choice, search methodology, writing strategies, mentorship, and collaboration are all fundamental to successful academic productivity. The authors reviewed the importance of instituting the germinal stages of scholarly productivity during medical training and created 12 steps for facilitating productive academic writing by students.

Keywords: Collaboration, medical education, mentorship, publication, scholarship

Background

Medical school curricula strongly emphasize the importance of clinical competency, with clearly defined expectations and diverse opportunities for growth throughout the students' training years. Conversely, there is a notably lesser emphasis on scholarly involvement – that is, exploring an area of interest and writing persuasively about it to a knowledgeable audience. Seminars and similar academic activities focused on critical reading of the literature are essential additions to didactic instruction. However, the skill of effectively applying the existing literature in the process of creating and refining one's own scholarly work goes beyond the skill of critical appraisal.

The considerable lack of guidance and support in this area of medical education means that involvement in academic projects often falls heavily on the initiative and resourcefulness of the student, which leads to a discrepancy between the number of students who desire to participate in research and the number of perceived opportunities available. This is to the detriment of the learner, as the pursuit of scholarly productivity serves as an excellent vehicle for medical learning and creates lasting educational benefit for both the student and mentor.^[1] Further, the opportunity for collaborative mentorship in the creation of academic literature may cause gains in interpersonal proficiency and relational resources, the benefits of which reach well beyond the scope of academia.^[2]

In an era of concern continuing decline in the relative number of academic physicians across all specialties, the collective medical student body represents a vast pool of untapped academic talent and scholarly possibility.^[3] Especially in the early years of training, medical students are eagerly driven by intellectual curiosity and self-discovery. It is not difficult

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How to cite this article: Wei N, Bourgeois JA, Hategan A, Azzam A. Academics anonymous: A medical student's 12-step guide to scholarly productivity. *Educ Health* 2017;30:244-7.

Access this article online

Quick Response Code:



Website:
www.educationforhealth.net

DOI:
10.4103/efh.EFH_354_14

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to imagine that, with encouragement, opportunity, and a spark of inspiration, the contributions of the student body to academic literature—in addition their own education—could be immense.

Traditionally, scholarly productivity has taken the form of publications in peer-reviewed journals, which can be a tedious and daunting process. The modern-day medical student is greatly skilled and comfortable in not only accessing information digitally, but in sharing it via nontraditional platforms, for example, blogging, social media, and online media—providing effective and varied forums for discussion and the dissemination of knowledge.

The importance of establishing a pattern of academic productivity in medical schools upon subsequent academic success has been emphasized; producing publications in the medical schools was associated with increased publication rates during the ensuing professional career.^[4] Therefore, early institution of the foundation for publication can facilitate ongoing academic productivity. Many students enter medical school with experience or interest in academic projects, but feel that they lack the means to pursue it effectively. It is our hope that this article will offer helpful tools to empower students to initiate scholarly endeavors with confidence.

Step 1. Get Started

Starting a scholarly project can be difficult, especially early during medical training. Personal ambivalence, time constraints, lack of readily identifiable mentors, and lack of knowledge of the publication process may impede students' efforts to get involved in academic projects. The first step to productive academic writing is finding topics of personal interest while viewing clinical and academic experiences with an approach of "academic opportunism." Inspiration for academic projects may come from numerous places, including direct care experiences, professional conferences, reading the literature, or engaging in social media. Students can begin their research activities with case reports, case series, or comprehensive reviews of the literature derived from clinical experiences and supplemented by targeted literature reviews. Students should not wait for "natural seniority" to establish subject matter expertise, but rather, should take opportunities as they present.

Step 2. Develop a Bibliography of Resources

In our modern world, the size of body of medical information doubles every 5 years.^[5] This rapid increase in knowledge with a shift to electronic publication practices demands

"keeping up" not only with the latest medical developments in the field, but also with the information technology itself. The dexterity to access, evaluate, and utilize relevant medical information should now be considered a basic clinical skill. Many bibliographic databases are commercial products; however, several quality databases exist freely online: (a) PubMed and Medline, which are comprehensive and adequate for most clinical writing; inclusion in these databases is a rough marker for a medical journal's stature; (b) Cochrane Library, which includes high-quality evidence-based information on reviews and clinical trials; (c) Open-access journals, including the Public Library of Science and BioMed Central, which are both independent, open-access publishers offering journals in the field of medicine; and (d) Google Scholar and Google Books, which are Internet search engines that access information from various academic and scientific sources which are not necessarily found in licensed databases. Finally, while many may question the scientific validity of its medical content, there is no question that Wikipedia remains the quintessential open-access repository of web-based information.^[6]

Step 3. Be Organized

Being organized is critical; a task list with their respective deadlines will facilitate a feeling of mastery and efficiency while simultaneously optimizing chances of success. Create separate electronic files for each stage of the research and writing process. Plan specific and measurable short- and long-term goals for your research activity. Allow more time for complex cognitive tasks and less time for "instrumental" tasks, such as editing, proofreading, or formatting.

Step 4. Consider the Mechanics and Strategy in Developing Manuscripts

Write down all ideas and topics of interest as potential initial rough drafts which may be further developed. Keep eliminated draft material in a convenient file system, as it may be useful for another project later. Convert a conference paper or poster into a journal article as soon as possible while the data are still current. Transform small pieces into more complex articles whenever practical, for example, main points of an article can be used in blog posts, or data from pilot projects may be used as pilot data for grant applications.

Step 5. Select a Journal

Consider your target audience when selecting a journal for submission. Specialized journals may have less readership, but may offer dissemination of your work in a specific area of research. Decide on an appropriate journal as you are writing your article draft and tailor the length to the journal's

requirements, “building to fit.” Awareness of journal style is important. Take some time to familiarize yourself with the journal’s information for authors’ section and referencing style.^[7] Factors such as the circulation count, frequency of publication, length of the review process, review and publication fees, and availability of electronic and/or print formats are important considerations.

Step 6. Apply Careful Word Choices in Your Writing

A well-written and effective abstract will lead others to your work. Do not overuse the passive voice. To improve the clarity of your writing, aim for 85% of your sentences to be in the active voice.^[8] Expect that your manuscript may need to be expanded or condensed in order to meet the word count requirements of the journal. When editing for length, enlist an experienced collaborator with significant publication and reviewing experience.

Step 7. Consider the Order of Authorship

While there are no universal rules for order of authorship, some journals may have their own specifications. In the absence of journal-specific requirements, one method can be exercised: the first authorship is attributed to the person who developed the idea, gathered initial data or literature review, and wrote the first and final drafts. The last author may be a senior collaborator who is involved “early and late” but not as much “in between.” The second author’s involvement is early and ongoing, providing substantial help with the first author’s tasks. Third, fourth, and subsequent authors may be responsible for specific content area; their content contributions (including statistical analysis and the production of tables and figures) are often considerably more critical than their overall writing of the manuscript.

Step 8. Master the Submission, Refinement, and Revision Processes

When asked about the secret of his success as a scientist, Faraday had three words: “work, finish, publish” (as cited in Cragg^[9]). Recall the adage that “no submission is perfect” and that revision of even accepted papers is essentially universal. Interacting with journals can be frustrating, and be mindful that highly competitive journals can have an acceptance rate of <10%. Acceptance rates provide a measure of determining how competitive a specific journal is, while impact and ranking factors are indicators of journal quality. Journal impact factors are widely discussed in the publishing world and may influence subscriptions and where authors submit articles.^[10] However, it is generally better to seek a good match between the topic of the

manuscript and journal, rather than choosing journals solely based on impact factor. An accepted piece in a “moderate impact” journal has resonance, while a rejection by a “high-impact” journal has none. That said, it may be practical to submit to a journal of high impact factor on the chance it will be accepted. Even if rejected, such journals may provide helpful and detailed reviews which can help with revisions for another journal, including advice on alternative journals for submission. Be patient; this can be a long process, often requiring several months from the time of initial submission until a revised manuscript is accepted.

Step 9. Manage Negative Feedback

Receiving negative feedback is part of the academic writing experience and dealing with rejection may be discouraging, but it is not to be taken personally. Consider reviewers and editors to be “unacknowledged co-authors,” in that it is an acceptable practice to incorporate their ideas into revised submissions to other journals. Reconvene the author group for reassessment of strategy, revise your manuscript, and submit it elsewhere as soon as possible. Consider this as an opportunity to refine your work, while remembering that the true essence of writing is rewriting.

Step 10. Master Collaboration to Achieve Success

Learners are often encouraged to join experienced researchers in successful writing projects, with the goal of training the novice researcher-authors to become skilled writers. Be mindful that the fruits of collaborative academic writing may not necessarily take the form of publications, but also as a devotion to the experience of passion, or camaraderie in subsequent collaborations.^[11] Practice the act of “diversity celebration” in your writing; seek author groups from various medical specialties, other professional disciplines, and/or other universities. This often leads to fascinating author relationships and diverse perspectives.

Step 11. Consider Collaboration as an “Art unto Itself”

Always remember that in a collaborative academic writing project each contributor has an equal opportunity to add, edit, and remove text. In doing this, collaborators feel a sense of ownership and personal pride in the project, often resulting in an enhanced final outcome. Seek collaborators who are organized, productive, and committed. Find a colleague who is already an author and a peer reviewer. Most significantly, pursue mentorship from experienced academics whose research you value. Some projects you may need to author alone but you should still ask for local mentorship “pre-review” of manuscripts.

Step 12. Remain Open to Opportunities for a Scholarly Endeavor

Other ideas to consider for a scholarly endeavor include seeking to be a journal reviewer while still in medical school. Write to editors directly and volunteer your services. Some journals may welcome students as reviewers, especially if the student has established academic productivity and/or other credentials in a particular area, including other graduate degrees than the medical degree. Reviewing is an efficient way to stay up to date in an esoteric area as it forces you to master the current literature. Although it may not be formally recognized as an academic activity, consider becoming a blogger. With the rapid advances of technology in the academic publishing system, there is no area of scholarly practice that remains impervious to change. A faculty member's online identity contributes to an institutional reputation, and thus many institutions are now actively encouraging nontraditional dissemination and communication practices.^[12]

Conclusion

Producing publications and other scholarly activities is well within the reach of motivated medical students, particularly in collaborative mentorship with faculty members. These students who have the advantage of early experience in the area of scholarly writing, research literacy, and publication will reap benefits far beyond the completion of the project. The concepts of applied and facilitated academic productivity outlined here are also directly applicable to students of other health professions (e.g., dentistry, optometry, podiatry, pharmacy, and nursing); indeed, the opportunities to develop scholarly projects with students of other health professions can be prioritized in the name of interprofessional education.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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