

Essential modules for teaching publication writers

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Abstract

Medical writers often help train researchers to compose and publish scholarly articles. Although this represents only a small portion of what medical writers do, it is important for those who train academic researchers to be knowledgeable and competent. Here, I describe 16 modules, each consisting of specific writing and editing activities, which need to be taught to *publication writers*. I also suggest a simple evaluation system for assessing 14 competencies in medical writing and editing needed by publication writers to perform their role successfully.

Keywords: Medical writing, Scientific writing, Scholarly articles, Training modules, Evaluation, Editing

One of the main functions of medical or research institutions is to advance knowledge by conducting research. Once completed, research findings are communicated either as presentations in conferences or in the form of academic publications or both. To make research findings available to a wider audience, most academic work is published in a journal article form.

For manuscripts to pass peer review, they must effectively communicate information in the most understandable and expedient fashion. A principal reason why some cutting-edge research never gets published is that it is poorly written and communicated. To overcome this problem, medical communicators who specialise in medical writing and editing should collaborate with academic researchers to help them develop their publishing careers.

Medical writers and editors who specialise in scientific writing and publishing (referred hitherto as '*publication writers*') primarily write, edit, or develop medical materials by gathering, organising, interpreting, and presenting information in a manner appropriate for the target journal. The articles they prepare include original articles,

reviews, case reports, short communications, special reports, or letters to the editor, which require both specialist knowledge and communication expertise. Publication writers must possess superior writing and editing skills to be able to help researchers compose and publish their scholarly articles. This can be achieved through continuing education and appropriate training using specially developed medical writing and editing modules for academic publications.

However, there are few medical writing and editing modules to teach publication writers how to help researchers effectively communicate in scholarly publications, and modules need to be continually developed. These modules must specifically address the different aspects and components of writing, editing, and publishing of scholarly articles. Importantly, the essential modules that need to be taught to these publication writers must be carefully integrated into a well-organised curriculum.^{1,2} Such modules can also be used in medical writing and editing internship programmes in academic institutions.³

In this article, I introduce 16 essential modules, each consisting of specific medical writing and editing activities, which can be taught to publication writers to enhance their ability to help researchers write effectively (Table 1). I also suggest a simple system for evaluating 14 competencies in medical writing and editing of scholarly articles that can be used to ensure that publication writers can perform their role successfully (Table 2).

Essential modules

Module 1. Writing, editing, and reviewing a medical paper

In this module, the publication writer comprehensively reviews a medical paper and corrects the style, format, syntax, language, science, content, logical flow, and overall impact of the study. The publication writer carefully upgrades the paper's

Table 1: Summary of modules, critical activities, and essential skills developed

Module	Critical activities	Essential skills developed
1. Writing, editing, and reviewing a medical paper	Correcting, upgrading, improving, reviewing, and confirming text	In-depth analysis, critical appraisal, accurate assessment, attention to detail
2. Writing and editing a cover letter	Improving tone, writing declarations, suggesting reviewers	Synthesis, microediting, attention to detail, in-depth understanding
3. Clarifying journal decision letters ⁴	Analysing, clarifying, and simplifying journal decisions	Critical thinking, in-depth analysis/interpretation, simplifying sentences
4. Rewriting and editing of papers conditionally accepted ⁴	Reviewing, re-editing, proof checking, and providing point-by-point responses	Critical appraisal, knowledge assessment, ensuring appropriate revisions
5. Writing and editing of responses to reviewers' comments ⁴	Rewriting responses, editing explanations, ensuring accurate scientific rebuttal	Careful analysis, accurate interpretation, writing concise responses
6. Rewriting and editing of papers for submission to another journal ⁴	Rewriting/editing of text, providing advice on new target journal	Critical thinking and analysis, appraisal of peer-reviewed journals, text rewriting
7. Writing and editing of posters and slide presentations ⁴	Streamlining/organising text, checking figure resolution, evaluating presentation/layout	Detailed preparation, microediting, attention to detail
8. Writing and editing of oral presentation script and coaching presentations ⁴	Editing text that encourage audience interaction, audio recording, coaching presentations	Creation of interactive script, proficiency in audio file preparation
9. Styling papers to conform to the guidelines for authors ⁴	Rewriting/editing to adhere to author guidelines, clarifying unclear points of guidelines	Attention to detail, assessment of deficiencies/unnecessary parts, journal appraisal
10. Support with online submissions ⁴	Editing/preparing files and disclosures, online submission	Mastery of submission software, preparation of files, online submission proficiency
11. Annotating galleys ⁴	Checking for minor errors, annotating PDF-formatted galley	Attention to detail, accuracy in making annotations in the PDF file
12. Citing different types of material found online ⁵	Citing non-print materials, e-publications, post-publication peer review, and supplements	Citation of and familiarity with online materials, citing electronic materials
13. Writing and editing references ⁶	Correcting citation format, checking reference accuracy, formatting references	Attention to detail, accuracy in following journal instructions, reference formatting
14. Abstract writing and editing ⁷	Abstract writing, formatting, and styling; meeting word limits and structural formats	Concise study summation, mastery of rules in abstract editing, meeting requirements
15. Communicating with authors (author-editor relationship) ⁴	Clarifying unclear parts with authors, writing queries to authors	Improved communication, discussion synthesis, enhanced author-editor relationship
16. Ethical issues in medical writing ⁸⁻¹²	Reviewing materials on ethical issues, attending meetings on ethics, correcting ethical issue statements	Familiarity with ethical issues/legal implications in medical writing, accuracy in editing ethical statements/declarations

medical terminology, checks the validity of the methodology, reviews scientific nomenclature, improves readability, performs a structural review, gives advice on the most appropriate format, and confirms the number and format of keywords. These activities sharpen the publication writer's ability to make an in-depth analysis of the study; effectively communicate research findings; make a critical appraisal of the writing style and content of the manuscript; accurately assess the novelty,

scientific knowledge, and impact of a study; macroedit (substantive or content editing); and microedit (copy or line editing).

Module 2. Writing and editing cover letters

Here, the publication writer improves the text and tone of a cover letter by highlighting the importance of the study, writing statements to acknowledge the efforts of contributors or declare competing interest(s), and suggesting possible reviewers. By undertaking

these activities, the publication writer harnesses skills in synthesising the main study highlights, as well as in microediting, paying attention to detail, and understanding the novelty of a study.

Module 3. Clarifying journal decision letters⁴

This module allows the publication writer to carefully analyse and clarify decisions made by the journal editor following peer review. As necessary, the publication writer rewords or simplifies sentences in the decision letter for clarity and ease of understanding. These activities refine the publication writer's ability to think critically, analyse and accurately interpret the journal editor's decision, and simplify but preserve the meaning of difficult or ambiguous sentences in decision letters.

Module 4. Rewriting and editing of conditionally accepted papers⁴

For papers that are conditionally accepted for publication, the publication writer thoroughly reviews and determines the exact decision of the journal editor, re-edits the newly added parts, proof checks the rest of the manuscript for consistency and logical flow, and assists in preparing the point-by-point responses to the comments raised. These tasks improve the publication writer's ability to make a critical appraisal of the manuscript, clearly assess the scientific knowledge and depth of the study, upgrade and clarify author responses, and ensure appropriate revisions in the paper to answer the issues raised.

Module 5. Writing and editing of responses to reviewers' comments⁴

The focus in this module is for the publication writer to edit or rewrite point-by-point responses to the comments raised, upgrade the explanations of revisions made in the text and cover letter, edit or reword scientific rebuttal by building persuasive and scientific-based arguments, and provide advice, support, and composition for designing response content. This process enhances the publication writer's ability to make a careful analysis and interpretation of journal editors' and reviewers' comments, think critically and evaluate the manuscript and author responses, assess scientific knowledge and depth of the study, and provide concise responses to all comments.

Module 6. Rewriting and editing of papers for submission to another journal following rejection by the original target journal⁴

Here, the comments of the original target journal are carefully analysed by the publication writer. The

publication writer then rewrites or edits the newly added parts in the manuscript according to the salient comments raised, and provides advice on the selection of a new target journal. These activities broaden the publication writer's ability to think critically and analyse reasons for manuscript rejection, make a precise appraisal of peer-reviewed journals, and rewrite and edit the paper to address important points raised in the original comments.

Module 7. Writing and editing of posters and slide presentations⁴

In this module, the publication writer organises and streamlines the text, checks the quality and resolution of the figures, and evaluates and edits the layout and appearance of a poster and slide presentation. By carefully doing these activities, the publication writer perfects skills in the detailed preparation of poster and slide presentations, microediting, in designing the layout, and in organising text and figures.

Module 8. Writing and editing of oral presentation scripts and coaching presentations⁴

The presentation script is edited by the publication writer to ensure a spoken tone that encourages interaction from the audience about the technical content of the presentation. Also, the publication writer records the oral presentations, coaches the speaker on delivery of the presentation, and corrects pronunciation. These activities polish the publication writer's ability to create an interactive presentation script and enhance proficiency and expertise in preparing audio files in different formats and delivery speeds.

Module 9. Styling papers to conform to the guidelines for authors⁴

The publication writer meticulously rewrites and styles a paper to adhere to the guidelines for authors of the target journal and clarifies unclear points of the guidelines for the authors. With these activities, the publication writer masters the ability to examine the details of author instructions, make a critical assessment of a manuscript's deficiencies and unnecessary parts, and appraise scholarly journals.

Module 10. Support with online submissions⁴

As most scholarly journals now require online submissions, the publication writer edits and prepares all files and disclosures needed, assists authors in submitting their papers online, and ensures successful manuscript online submission. These activities improve the publication writer's ability to use

different types of journal submission software, prepare all required files, figures, and tables in the correct format, and master all the necessary elements and steps of online submission.

Module 11. Annotating galleys⁴

The publication writer carefully checks the galley of an article for errors in formatting, punctuation, terminology, spelling, typescript, and headings. These activities hone the publication writer's skills in making concise electronic annotations in the PDF file and sharpen the publication writer's attention to detail.

Module 12. Citing different types of material found online⁵

Materials found online are a vast resource for citation in scholarly articles. For this module, the publication writer appropriately cites non-print materials associated with journals, accepted publications ahead of print, e-pages and e-publications for journals, e-letters, post-publication peer reviews, and data supplements. The publication writer thus becomes proficient in identifying and citing different types of relevant materials found only online, gains familiarity with different types of online material typically used as sources in the medical literature, and improves the ability to cite these online materials.

Module 13. Writing and editing references⁶

The reference section is one of the most neglected parts in scholarly articles and can contain careless spelling, typographical, and formatting errors. In this module, the publication writer corrects the citation format of the references in the text, checks the accuracy of all references, and formats the references in accordance with the journal's guidelines. This greatly refines the publication writer's ability to format references and follow journal instructions.

Module 14. Abstract writing and editing⁷

The abstract contains the highlights of the completed research and must follow the format required by the target journal. In this module, the publication writer rewrites an abstract to meet the standard style, word limit, and structural requirements. The publication writer therefore refines the ability to make a concise summary of the results, highlight key findings, and meet word or formatting requirements.

Module 15. Communicating with authors (author–editor relationship)⁴

With the aim of enhancing the author–editor relationship and achieving a better appraisal of the

scholarly article, the publication writer builds and maintains a collaborative relationship with the author, clarifies any ambiguous parts of the article, and develops a feedback mechanism with the author. Alternatively, the publication writer writes polite queries regarding unclear parts in the text for the authors to address if they are unable to meet and discuss these parts immediately. In this process, the publication writer improves the ability to clarify issues; extract, synthesise, and summarise important points from the discussion; and build and strengthen the author–writer/editor working relationship.

Module 16. Ethical issues in medical writing^{8–12}

The publication writer must ideally be familiar with ethical and legal issues in medical writing and publishing (e.g. reporting data, conflicts of interest, financial disclosures, and declarations). To achieve this, the publication writer reads and must thoroughly understand materials on conflicts of interest, financial disclosures, duplicate publications, or other declarations related to manuscript submission. Participation in meetings or conferences on ethics in medical writing and publishing can enhance the publication writer's understanding of target journal requirements regarding ethical declarations and help the publication writer correct ethical issue statements in the manuscript text.

Competency evaluation

Competency evaluation is necessary to assess the publication writer's skills and overall competency as a medical writer and editor of scholarly articles. This can be done before, after, or both before and after training. The competency evaluation can be used for setting expectations and for performance evaluation. This evaluation system described here consists of 14 competency areas. The publication writer or the publication writer's supervisor rates the level of competence for each area. I suggest using a 'PAGE' rating system, where P is poor, A is average, G is good, and E is excellent. A rating of P or A indicates a strong need to improve and master essential skills in medical writing and editing of scholarly articles. A summary of the different competency areas for evaluation is shown in Table 2.

Competency 1. Appropriately uses language and syntax

Consistently corrects language and syntax of the scholarly article. This involves a comprehensive check of grammar, punctuation, spelling, hyphens,

Table 2: Summary of competency areas of medical writers and editors of scholarly articles for evaluation

Competency areas
1. Appropriately uses language and syntax
2. Correctly eliminates ambiguities
3. Ensures correct structure and format
4. Meets the word count requirements
5. Accurately writes ethical statements and disclosures
6. Makes concise corrections and achieves brevity
7. Adheres to guidelines for authors
8. Accurately corrects the science, content, study design, and logical flow
9. Correctly identifies sources of errors
10. Highly adaptable and flexible
11. Promotes effective teamwork
12. Effectively sets priorities
13. Can work and make decisions independently
14. Interacts harmoniously with colleagues and remains open to suggestions

capitalisation, units of measure, typographical errors, terminology, sentence construction, references, structure, format, logical flow, and relevance. The publication writer also correctly explains or defends any corrections of the language and syntax made based on published rules/guidelines on scientific writing and editing.

Competency 2. Correctly eliminates ambiguities

Accurately identifies and corrects ambiguities and inconsistencies in the text, tables, figures, and references.

Competency 3. Ensures correct structure and format

Comprehensively writes or consistently edits the text to meet the structural and format requirements of the target journal in terms of manuscript sections, headings, text requirements, abbreviations, and units of measure.

Competency 4. Meets the word count requirements

Appropriately rewrites or edits the title, abstract, and main text to the required character or word count of the target journal.

Competency 5. Accurately writes ethical statements/ disclosures

Writes or edits the necessary ethical statements and disclosures relevant to the manuscript.

Competency 6. Makes concise corrections and achieves brevity

Correctly identifies the most appropriate sentences or parts that can be removed from the text for brevity.

Competency 7. Adheres to guidelines for authors

Provides correct advice on meeting content guidelines, or can edit and style a paper to the journal guidelines.

Competency 8. Accurately corrects the science, content, study design, and logical flow

Comprehensively assesses and corrects the science, content, design, and logical flow of the study; correctly evaluates the reliability of results; and can explain or defend any corrections made from a scientific point of view.

Competency 9. Correctly identifies sources of errors

Correctly identifies possible sources of mistakes that may bias the findings.

Competency 10. Highly adaptable and flexible

Can interact and carry out in-depth discussions with diverse authors of different medical fields.

Competency 11. Promotes effective teamwork

Works well as part of the editor–author team and is able to provide personalised support during the writing process and full editing assistance after peer review until acceptance.

Competency 12. Effectively sets priorities

Can set priorities when working with multiple articles.

Competency 13. Can work and make decisions independently

Can competently and quietly work independently, but is aware of personal limitations. Welcomes constructive criticisms and strives for continuous improvement of work and relationships with authors and co-workers.

Competency 14. Interacts harmoniously with colleagues and remains open to suggestions

Works well individually or with others, interacts harmoniously with colleagues, and remains polite and open to suggestions.

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