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Christopher B. Reznich & William A. Anderson

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PERSPECTIVES

A Suggested Outline for Writing Curriculum Development Journal Articles: The IDCRD Format

Christopher B. Reznich and William A. Anderson

*College of Human Medicine
Michigan State University
East Lansing, Michigan, USA*

Background: *During the past decade, medical school and residency faculty have been active in developing and revising curricula for medical education programs. Many of these curriculum development efforts ultimately are published in peer-reviewed professional journals as articles or abstracts. Unlike research publications, no uniform format currently exists for reporting curriculum development efforts in the peer-reviewed literature.*

Summary: *A suggested format for organizing curriculum development manuscripts consists of the introduction, development, curriculum, results, and discussion (IDCRD). Detailed descriptions of each section are discussed herein.*

Conclusions: *The IDCRD manuscript outline is intended to provide useful guidance to medical educators in publishing their curriculum development efforts. Journal editors are encouraged to recognize the importance of providing uniform descriptions of curricula so that readers can benefit from the experience of others and replicate successful curriculum efforts.*

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During the 1990s, medical educators were busy revising or developing new curricula for undergraduate and graduate medical education programs. Major medical education reform initiatives such as the Community Partnerships in Health Professions Education,¹ Undergraduate Medical Education 21,² the Robert Wood Johnson Generalist Initiative,³ and the Association of American Medical College's Medical School Objectives Project⁴ have generated much new and revised medical school and residency curricula. Whether responding to national initiatives, residency review committee mandates, or changes in health care delivery, medical educators were forced to rethink the content and structure of educational programs for preparing the physicians of tomorrow. As these curriculum development and revision efforts were completed, descriptions of innovative courses, clerkships, and rotations began to appear in peer-reviewed professional journals. The publication of these new curricula serves several important purposes. First, the reporting of successful curriculum development efforts allows other medical educators to replicate successful curricula. Second, medical educa-

tors can use these articles to better understand the process of curriculum development and revision. Finally, the need for scholarly productivity as measured by published articles provides an impetus for many curriculum developers to submit their work for publication.

Sheets and Anderson⁵ noted several problems in the reporting of curriculum development efforts in professional journals. First, unlike research projects, no uniform format existed for the organization of curriculum development articles. Research articles generally follow the standardized "IMRAD" article format of introduction, methods, results, and discussion.⁶ Second, several of the curriculum development articles did not report complete information. In fact, only 29% of the articles Sheets and Anderson reviewed described all essential components of a curriculum, and only 12% of the articles described all of the steps taken to develop the curriculum. If these articles are to assist other medical educators in developing curricula, then a more standardized and complete description of the curriculum is required.

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Correspondence may be sent to Christopher B. Reznich, Office of Medical Education Research and Development, College of Human Medicine, Michigan State University, A-206 East Fee Hall, East Lansing, MI 48824. E-mail: reznich@msu.edu

This article proposes a standardized outline for reporting curriculum development projects in undergraduate, graduate, and postgraduate (i.e., fellowship) medical education in peer-reviewed professional journals. The focus of the outline is for reporting curriculum development efforts at the individual course, clerkship, or rotation level but not entire medical school or residency curricula. The outline was developed to achieve three goals: (a) to be similar to the generally accepted IMRAD format for reporting research articles, (b) to report both the process and products of the curriculum development effort, and (c) to be consistent with the “instructions to authors” of peer-reviewed journals in the health professions. The remainder of this article is devoted to an explanation of the development of the outline, a description of the outline itself, and suggestions for implementing the outline in medical education journals.

Development of the Format

In developing the journal article outline, we first reviewed “classical” curriculum development literature^{7–10} as well as more recent publications^{11–13} to identify essential information required to report both the process of curriculum development and the resultant products. The commonly cited steps in describing the curriculum development process were needs assessment, learning objectives, selection of content, organization of content, selection of learning experiences, organization of learning experiences, selection of evaluation methods, and how the curriculum is implemented. The commonly cited products of curriculum development efforts were goals and objectives, instructional strategies, evaluation strategies, and an implementation plan.

Second, we reviewed published curriculum development articles to determine how curriculum development projects were reported in the peer-reviewed health professions literature. We developed a checklist to identify the presence or absence of the commonly cited curriculum development steps and products. Additionally, we made notations about how well each of the articles discussed the curriculum development process and products, and the overall length of the article.

Using this information, a draft journal article outline was developed, designed to meet the three criteria noted earlier; incorporate the commonly cited curriculum development steps and products; and present the information in a concise, organized manner. The Appendix presents the suggested outline for writing curriculum development journal articles. The outline comprises five sections: introduction, development, curriculum, results, and discussion (IDCRD).

Introduction

The introduction describes the overall context of the curriculum development effort. It establishes the need for a curriculum from a national and a local perspective, and it reports any pertinent prior curriculum development efforts. This section also includes relevant literature that guided the development process to assure readers the work being presented was based on an analysis of prior efforts and not merely a “reinvention of the wheel.” The introduction has the following subsections.

Statements of the importance of the curricular topic from a national perspective. This subsection establishes a national need for the curriculum, thereby justifying its publication for a national audience. The national need can include a widespread clinical problem not currently addressed in medical education or a national mandate for curricular change.

Statements justifying the need for a curriculum to address the problem. This subsection describes the performance problem or knowledge deficit addressed by the curriculum and explains why a curriculum (as opposed to other administrative action) is required to address the problem.

Descriptions of curricular efforts by others. Many curriculum development projects are based on successful prior curriculum development efforts that identified appropriate content and instructional methods. Such efforts should be briefly discussed in this subsection.

Statement of need for the curriculum at your institution, description of the institutional context. The skill or knowledge deficit the curriculum is intended to address should be clear to the readers. Furthermore, a description of the context for the curriculum should be included so that readers can determine whether the described curriculum is viable for their institutions. Thus, a statement of local need for a curriculum should accompany a description of the institutional context within which the curriculum was implemented. This allows readers to compare their own institutional context to the author’s to determine if the program is applicable to their local resources, constraints, and needs.

Overview of the remainder of the article. A preview of the remainder of the article serves as an agenda for readers. Generally, these are subheadings of the manuscript.

Development Process

This section summarizes the steps used to design and develop the curriculum. They should be explained in

sufficient detail so that the reader can replicate or adapt the process, including information about the specific curriculum design steps planned, individuals involved, and final curriculum decisions. The development process section comprises the following subsections.

Descriptions of the process used to develop the curriculum. This subsection should include a description of the major steps in the curriculum development process such as needs assessment, literature review, review of other curricula, and the people involved.

Decisions made about the scope and selection of curricular topics and overall structure. This subsection briefly describes the major decisions made that determined the content, overall structure (e.g., block vs. longitudinal rotation) and instructional methods of the curriculum (e.g., problem based vs. conferences).

Curriculum

Although describing all components of a curriculum is generally not possible, including an overview of the whole and an example of the parts is helpful. Tables and figures can present the topics and a graphic depiction of the curricular structure. A table that provides the objectives, content, methods, and evaluation strategies of one important instructional unit will convey much of the product of the curriculum development process. The curriculum section comprises the following subsections.

Overview of the entire curriculum. A description of the overall curricular goals for the entire curriculum gives readers a clear picture of what the entire curriculum is designed to accomplish. A graphic depiction of the major units and their relations also aids readers.¹⁴

List of curricular topics. A table or list of curricular topics provides an efficient overview of the curricular content.

Description of overall teaching and learning strategies used. This subsection describes the major instructional and learning strategies used throughout the curriculum, emphasizing the variations on instructional innovations.

Description of learner evaluation strategies used. As with instructional strategies, this subsection provides a description of the major learner evaluation strategies used, again emphasizing innovative approaches to evaluation.

Detailed description of one unit of instruction. This subsection describes a typical unit of instruction supplemented with a table of unit objectives, content,

and instructional and learner evaluation strategies, which provides readers with a clear picture of the specifics of the curriculum.

Results

This section provides a clear description of the way the curriculum was implemented and the results of that implementation. Information about evaluation has two major foci: the performance of learners (i.e., how well the learners acquired the knowledge, skills, and attitudes) and an evaluation of the curriculum itself (i.e., how well the curriculum met the needs that brought about its development). This section comprises the following subsections:

Description of when and how curriculum was implemented. A description of the curriculum implementation plan and how the plan was followed informs the reader of many important practical considerations.

Learner evaluation data from new curriculum. Including a summary of learner evaluation data testifying to curricular effectiveness is important. Learner satisfaction measures on how well the curriculum was accepted are not sufficient for publication in peer-reviewed journals. Aggregate pre- and posttest scores, and even longer term outcomes-evaluation data, are required to support a case for curricular effectiveness.

Description of curriculum evaluation strategies and data. Beyond the issue of how well learners learned are issues of curriculum evaluation: How well did the curriculum “perform?” One schema for curriculum evaluation focuses on curricular content (i.e., Is it up to date and comprehensive as measured by expert review?), process (i.e., Are all curricular elements present and consistent with each other? Was a systematic curriculum development process followed?), effect on participants (i.e., satisfaction of both learners and implementers), and outcomes (i.e., Did the learners learn?).

Discussion

This section provides observations about the curriculum and its development and evaluation. Such comments can help others avoid problems the developers encountered and could suggest additional lines of curriculum development and educational research that could contribute to the ongoing improvement of medical education. The major issues to be addressed in the subsections include the following.

Discussion of the learner and curriculum evaluation data. As in a more traditional scientific paper, the author seeks to interpret the results: What do the numbers mean? Did the curriculum fill the need as

designed? Did the students learn as intended? Also included should be a discussion of the impact of the implementation of the curriculum on the resources of the institution, especially faculty and staff.

Description of any revisions based on data.

This subsection should discuss what changes will be made to the curriculum content and methods (including evaluation) the next time the curriculum is taught.

Suggestions for others in developing similar curricula and lessons learned.

Herein, the author should describe what he or she would do differently next time. Included should be a discussion of the pitfalls that others should take care to avoid, noting any innovative solutions that could help other programs that may be deficient in certain resources.

Summary statement. The summary statement should present the most important message for the reader. The author also should include a summary review of the highlights of the article that ties back to initial statement of the problem and how it was addressed by the development of a curriculum.

Final Thoughts

Journal articles produced following this outline will provide comprehensive descriptions of both the product and the process of curriculum development. We encourage medical educators to use the outline as a general guide and not an absolute; the outline might need to be customized to fit the requirements of specific curriculum development efforts and peer-reviewed journals. For example, submitting a manuscript as a work in progress might not require the level of rigor and completeness with respect to curriculum evaluation and data collection that a more comprehensive article would require.

Other authors have called attention to the need for more rigorous curriculum evaluation. Specifically, we see a need to generate reliable and valid evaluation data that would help journal editors decide whether a report of a curricular innovation is worthy of dissemination and that would help readers decide whether a curricular innovation would generalize to their institutional contexts. Levinson,¹⁵ for example, listed criteria for internal and external validity that can help guide medical educators as they both design evaluations of their curricula and report the results of curricular interventions. We believe that rigorous evaluation designs and the data generated by them should be included as part of the overall curriculum development and implementation process, especially when curriculum developers hope to disseminate their work in the peer-reviewed literature.

Journal editors are encouraged to recognize the importance of providing complete descriptions of curricula so that readers can benefit from the experience of others and replicate successful curriculum efforts. We hope the IDCRD journal article outline provides useful guidance to medical educators in publishing their curriculum development efforts.

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Appendix: A Suggested Outline for Writing Curriculum Development Journal Articles

I. Introduction

- A. Statements of the importance of the curricular topic from a national perspective.*
- B. Statements justifying the need for a curriculum to address the problem.*
- C. Descriptions of curricular efforts by others.*
- D. Background or statement of need for the curriculum at your institution (institutional context).
- E. Overview of the remainder of the article.

*Include references to literature.

II. Development Process

- A. Briefly describe the process used to develop the curriculum.
 - 1. Literature review.
 - 2. Needs assessment (e.g., survey, interview).
 - 3. Review of other curricula.
 - 4. People involved.
- B. Describe decisions made about the scope and selection of curricular topics and overall structure.

III. Curriculum

- A. Present a brief overview of the entire curriculum: overall goals, graphic depiction.
- B. List of curricular topics.
- C. Description of overall teaching and learning strategies used.
- D. Description of learner evaluation strategies used.
- E. Detailed description of one unit of instruction.
 - 1. Text to describe the unit.
 - 2. Summary table to describe objectives, content, instructional and evaluation strategies.

IV. Results

- A. Description of when and how curriculum was implemented.
- B. Summarize learner evaluation data from new curriculum.
- C. Description of curriculum evaluation strategies and data.

V. Discussion

- A. Discussion of the learner and curriculum evaluation data.
- B. Description of any revisions based on data.
- C. Suggestions for others in developing similar curricula, and lessons learned.
- D. Summary statement.
 - 1. Highlights of the article, what should be important for readers to remember.
 - 2. Ties back to initial statement of the problem.