Guest Editorial

Time to shift from Authorship to Contributorship

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Many of the times editors receive complaints from Author X that my name is missing in paper and Y author has only done language enhancement and his name is listed in paper published in Journal.

Many of the times we have dilemma regarding authorship i.e., should we include statistician as author as he has conducted important analysis which helps us to arrive at conclusion? Should we include UG students who have helped in data collection for the study as author? Both are important part and parcel of study as without them study and interpretation of data was not possible.

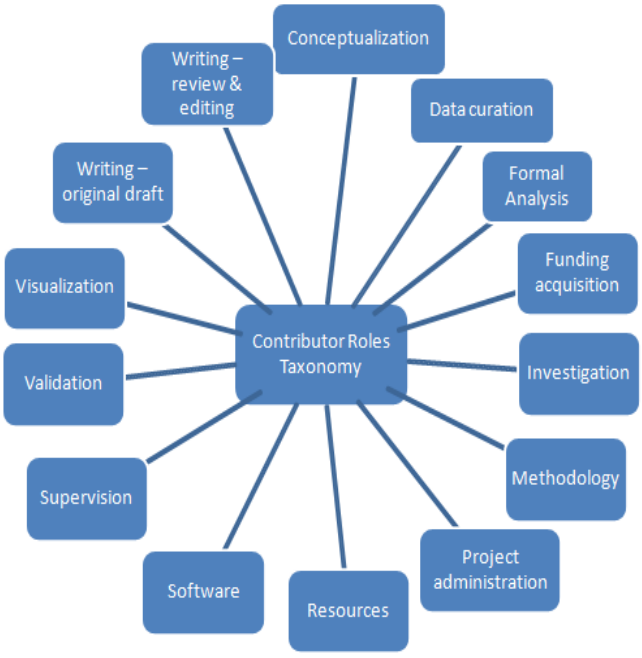
The ICMJE recommends that authorship be based on the following 4 criteria:[1]
1. Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND
2. Drafting the work or revising it critically for important intellectual content; AND
3. Final approval of the version to be published; AND
4. Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

So, as per the ICMJE none of above will be included in list of authors. It is important that every author of a contribution be credited as such. It is equally as important that a person not be named as an author when he or she is not. How to solve this?

In mid-2012, the Wellcome Trust and Harvard University co-hosted a workshop to bring together members of the academic, publishing, and funder communities interested in exploring alternative contributorship and attribution models. Following the workshop, and working initially with a group of mainly biomedical journal editors (and members of the ICMJE), a pilot project was established to develop a controlled vocabulary of contributor roles (taxonomy) that could be used to describe the typical range of 'contributions' to scholarly published output for biomedical and science more broadly.[2]

CRediT (Contributor Roles Taxonomy) is high-level taxonomy, including 14 roles, that can be used to represent the roles typically played by contributors to scientific scholarly output. The roles describe each contributor's specific contribution to the scholarly output (Figure-1).

Figure-1: 14 Roles as Contributor Roles Taxonomy



Before going further let's understand all 14 roles.[2]

1. Conceptualization: Ideas; formulation or evolution of overarching research goals and aims.

2. Data curation: Management activities to annotate (produce metadata), scrub data and maintain research

data (including software code, where it is necessary for interpreting the data itself) for initial use and later re-use.

3. Formal analysis: Application of statistical, mathematical, computational, or other formal techniques to analyze or synthesize study data.

4. Funding acquisition: Acquisition of the financial support for the project leading to its publication.

5. Investigation: Conducting a research and investigation process, specifically performing the experiments, or data/evidence collection.

6. Methodology: Development or design of methodology; creation of models.

7. Project administration: Management and coordination responsibility for the research activity planning and execution.

8. Resources: Provision of study materials, reagents, materials, patients, laboratory samples, animals, instrumentation, computing resources, or other analysis tools.

9. Software: Programming, software development; designing computer programs; implementation of the computer code and supporting algorithms; testing of existing code components.

10. Supervision: Oversight and leadership responsibility for the research activity planning and execution, including mentorship external to the core team.

11. Validation: Verification, whether as a part of the activity or separate, of the overall replication/reproducibility of results/experiments and other research outputs.

12. Visualization: Preparation, creation and/or presentation of the published work, specifically visualization/data presentation.

13. Writing (original draft): Preparation, creation and/or presentation of the published work, specifically writing the initial draft (including substantive translation).

14. Writing (review & editing): Preparation, creation and/or presentation of the published work by those from the original research group, specifically critical review, commentary or revision-including pre-or post-publication stages.

Since 2014, the contributor taxonomy-otherwise known as CRediT (Contributor Roles Taxonomy) has been widely adopted across a range of publishers (more than 124) to improve accessibility and visibility of the range of contribution to published research outputs. Use of CRediT has number of important and practical benefits to the research ecosystem more broadly, including and not limited to:[3,4,5]

Authors

- Helping to reduce the potential for author disputes.
- Supporting adherence to authorship/contributorship processes and policies.
- Enabling visibility and recognition of the different contributions of researchers, particularly in multi-authored works – across all aspects of the research being reported (including data curation, statistical analysis, etc.)
- Support identification of peer reviewers and specific expertise.
- Support grant making by enabling funders to more easily identify those responsible for specific research products, developments or breakthroughs.
- Improving the ability to track the outputs and contributions of individual research specialists and grant recipients.
- Easy identification of potential collaborators and opportunities for research networking.
- Further developments in data management and nano-publication.
- Inform ‘science of science’ (meta-research) to help enhance scientific efficacy and effectiveness.
- Enable new indicators of research value, use and re-use, credit and attribution.
- A reduction in honorary authorship and the ambiguity of researcher contributions.
- Those interested in specific kinds of contributions can assess researchers on that specific basis.
- Cross-disciplinary and cross-subfield collaborations will be facilitated.
- The development of scientific software will be facilitated.
- Meta-science will be greatly facilitated.
- Provide visibility and recognition to each and every contributor that are key to research output i.e., statisticians and others in “specialist roles” will be more appropriately recognized (and eventually, rewarded).

- Improving the ability to track the output and contributions of each individual research specialist and grant recipients, intern improving potential collaboration and opportunity for research networking
- Affirm the contribution that have been made (and avoid difficult conversations with colleagues later), find complimentary expertise for future collaborations

Publishers

- Provide more information for readers, reduce number of author disputes, and find peer reviewers based on more detailed information of their expertise.

Universities

- Much more useful to understand specific author contributions for hiring, promotion, and tenure processes.

Funders

- Identify more easily expertise of potential grantees, and find peer reviewers.

Bibliometricians

- This will serve as a rich source of data for analysis.

Potential Barriers in Implementation: Every change has potential barriers in implementation and same is applicable to CRediT implementation[6] i.e.

- Adding contributorship roles can be challenging for articles with large numbers of authors. Assigning authorship roles, needs to be part of the joint work of creating the paper, not just a step at the end for the corresponding author.
- For adoption to happen researchers need to know what's in it for them (for the middle authors, a lot) - important to communicate what the benefits are.
- Contributor roles & CRediT Taxonomy, can be used differently by different groups of people.
- Are some contributor roles valued more than others?
- CRediT only deals with a way to make contributorship transparent, it does not fix all problems in scholarly publication.

We also need to see that how is information on contributor roles ingested? How does it go from machine-readable to visible to human readers? How does it interact with publication workflows, data repositories, etc.? Can Crossref accept author roles as part of article meta-data? Looking at all pros and cons following are recommendation for applying the CRediT taxonomy by Journal editor.

Recommendations for applying the CRediT taxonomy are:[2]

- List all Contributions: All contributions should be listed, whether from those listed as authors or individuals named in acknowledgements; those who are not reaching up to the level of authorship, must be included as contributor
- Multiple Roles Possible: Individual contributors can be assigned multiple roles, and a given role can be assigned to multiple contributors;
- Degree of Contribution Optional: Where multiple individuals serve in the same role, the degree of contribution can optionally be specified as 'lead', 'equal', or 'supporting';
- Shared Responsibility: Corresponding authors should assume responsibility for role assignment, and all contributors should be given the opportunity to review and confirm assigned roles;
- Make CRediT Machine Readable**:** CRediT tagged contributions should be coded in JATS xml v1.2

It's high time to move from authorship to contributorship, if not, let's take initiative to start looking contribution in scientific field with altogether different perspective by using authorship with contributorship and make win-win situation for all contributors.

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