Responsible Conduct of Research and Ethical Publishing Practices: A Proposal to Resolve 'Authorship Disputes' over Multi-Author Paper Publication

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Abstract

Responsible conduct of research and ethical publishing practices are debatable issues in the higher education literature. The literature suggests that 'authorship disputes' are associated with multi-author paper publication and linked to ethical publishing practices. A few research studies argue authorship matters of a multi-author paper publication, but do not explain how to arrange author list meaningfully in a multi-author paper. How is a principal author of a multi-author paper to be decided? The literature also does not clarify whether language editor(s) could claim authorship for a research paper publication? The paper adopts qualitative methodology that subsumes descriptive, evaluative, and interpretative approaches to answer these questions. While answering these questions, the paper critically examines 'authorship disputes' and 'types of authorship' relating to research paper publication practices. At the end, the paper proposes a framework that would help to resolve authorship disputes over multi-author paper publication.

Keywords Authorship disputes · Research paper publication · Multidisciplinary research · Language editing services · Multi-author paper · Ethical publishing practices

Introduction

Publishing research papers in peer reviewed academic journals (PRAJ) does not only add 'authorship credits' but also becomes a consideration for promotion, research awards, rewards, administrative positions, and other academic benefits (Sandler and Russell 2005; Tarkang et al. 2017; Genova and Vara 2019). Academics use research papers as a tool to posit their ideas, arguments and findings to readers, and in turn command acclamation from the readers. Further, they receive recognition, eminence and distinction among other academics. Publishing research papers requires skill, expertise, and involvement which are not easy to develop and

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adopt in practice (Derntl 2014; Kent and Wanzek 2016). This is evident from the fact that researchers (academics) are not always successful in publishing their papers in PRAJ (Brown 2006; McGillivray and Ranieri 2018).

Unlike the nineteenth century and early twentieth century, now, multi-author papers are common in the PRAJ (Rahman and Muirhead-Allwood 2010). Lozano (2014) and Puljak and Sambunjak (2020) state that fifty years ago, in social science, basic science and applied science, single authorship was the norm, but has now become extremely uncommon. One may postulate the possible reason may be due to more frequent interdisciplinary and multidisciplinary research projects. However, this postulation is not supported by studies carried out by Papatheodorou et al. (2008), Poder (2010), Harzing (2010), and Ioannidis (2008). These research studies suggest that the numbers of multi-author papers are increasing not because of intradisciplinary, interdisciplinary, or multidisciplinary research works, but to take credit for multiple citations of a research paper.

According to Claxton (2005), Rennie et al. (2000), Rennie (2001), Frazzetto (2004), multi-author papers are associated with authorship disputes. Hama and Kusano (2001), Cronin (2001), Rahman and Muirhead-Allwood (2010) state that a long authors list is indeed a problem for research publications as 'authorship' is associated with 'accountability' and 'recipient of credits'. Erlen et al. (1997) remark that if there are several authors of a research paper, perhaps it becomes easier for authors to avoid accountability of the claims made in the paper. According to Engelder (2007), as the number of authors increases, the accountability, credit, and merit of authorship of a research paper are diluted. Benos et al. (2005) state that 'authorship disputes' is the most common ethical issue related to the publication practices. According to Claxton (2005) and Rennie et al. (2000), authorship disputes are a major concern for research publications. Many authors do not fulfill the necessary requirements for earning authorship of research papers (Mowatt et al. 2002; Pignatelli et al. 2005). Most of the researchers are not even familiar with formal standards for obtaining authorship credit for research paper publication (Seeman and House 2010; Bhopal et al. 1997).

With reference to multi-author paper publication, authorship disputes are associated with the following issues.

i)   Contributors to a research paper claim that they deserve to be authors of the paper publication but their names are omitted from the author list of the paper publication (Seeman and House 2010; Lozano 2014).

ii) The names of the non-contributors to a research paper are listed in the author list of a paper without their consent (Maronpot 2011; Tarkang et al. 2017).

iii) Some contributors agree to be the author of a paper at the initial stage of paper development, but withdraw their authorship when reviewers of the paper ask certain critical questions pertaining to their contributions to the paper. Some of them also withdraw their names from the author list when realizing that the paper is not going to be published in a reputed academic journal. They do so to retain their scholarly stature in the academic arena (Rennie et al. 2000).

iv) Contributors wonder how to prepare author list in a meaningful order in multi-author paper publication (Boyer et al. 2017).

v)   Contributors wonder who should be the first and last author of a multi-author paper publication (Tscharntke et al. 2007).

Against this background, the paper critically examines types of authorship and 'authorship disputes' over multi-author paper publication. Further, it discusses whether it is ethical to exclude English language editors' names from the author list of a paper publication. Finally, the paper proposes a framework to resolve authorship disputes over multi-author paper publication practices.

Literature Review

The expression 'authorship' refers to the creator or originator of an idea, or a developer of a product that justifies creative works. Authorship acquires significant privileges, responsibilities, and legal rights. In the academic arena, it forms the basis for rewards and career advancement (Committee on Publication Ethics (COPE) 2019).

Bebeau and Monson (2011) state that conflict about authorship credit of a research paper publication is an ongoing phenomenon in the academic world. They point to a lack of clarity on the criteria to be considered to award authorship to a person in a multi-author research paper publication. Further, they express that formulating a common set of authorship standards for responsible conduct of research within and across disciplines (subject of studies) would be prone to error.

De Vries et al. (2006) note that authorship and attribution discrepancies are not limited to a particular discipline but are scattered across all disciplines. In the year 1994, Association of American Medical Colleges published a handbook entitled *Criteria for Authorship and Attribution*, which indicated methods to determine the right author of a research paper publication, and how the most appropriate author list could be prepared in a multi-author paper. The American Psychological Association (APA) raised questions about sequencing authors' names in the author list of a multi-author paper. The APA (2016) in *Ethical Standards in Writing and Publishing* document states that authorship credit should be assigned to all those who have contributed to a publication; and the nature of contribution (e.g. research design, data analysis, writing the paper, etc.) should be made clear. The APA (2016, 2017) mentions that authors while taking credit for their research papers publication must take responsibility of the contents of the papers. The APA suggests that 'acknowledgements' are to be given to those who made 'minor contributions' to the research paper. Although the expression 'minor contributions' was not explained in detail, but it was clearly mentioned that "paid clerical assistants need not be acknowledged in a research paper publication" (Bebeau and Monson 2011, p.373).

With regard to 'co-authorship credit' of a research paper, Spier and Bird (2007) mention, "co-authors of a paper should be all those persons who have made significant scientific contributions to the work reported and share responsibility and accountability for the results" (p.1). Marusic et al. (2011) evoke that conceiving the ideas of research problems, designing the research, and writing the manuscript are the most important criteria for authorship.

The British Educational Research Association (BERA) (2018) in *Ethical Guideline for Educational Research* document states that "the authorship of publications normally comprises a list of everyone who has made a substantive and identifiable contribution to the research being reported" (p.3). For example, contribution to writing the draft, significant rewriting, content editing, literature reviewing, data analysis and interpretation, etc. Further, the document suggests that "academic status or any other indicator of seniority does not determine first authorship. Rather, the order of authorship should reflect relative leadership and contributions made to the paper" (p.34).

The APA (2020), in *What is Authorship and How is It Determined?* document recommends that mere possession of an institutional position, such as department chair, does not justify authorship credit. Minor contributions to the research papers need to be acknowledged either in footnotes or in an introductory statement. The American Educational Research Association (AERA 2011 in *Code of Ethics for Authorship* states that all those regardless of status, who have made substantive creative contributions to the generation of an intellectual product are entitled to be listed as authors of the product (Tarkang et al. 2017). Further, the document enunciates that creative intellectual contributions could be considered as writing first draft or substantial portions, significant writing or substantive content editing, contributing in generating ideas or basic conceptual schemes, collecting data, and interpreting data (Bebeau and Monson 2011, p.374). The AERA (2011) recommends that "a student name must be listed as a principal author on any multiple authored publication that substantially derives from the student's dissertation or thesis" (p.154). The Committee on Publication Ethics (COPE) in the year 2019 in its document *Promoting Integrity in Research and Its Publication* endorsed this view (p.12).

The International Committee of Medical Journal Editors (ICMJE) provides an inclusive guideline about authorship definition for paper publication in the PRAJ. The ICMJE (2019) recommends that authorship should be given to a contributor to the paper if and only if (s)he satisfies the following four criteria:

i)   "Substantial contribution to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; and
ii) drafting the work or revising it critically for important intellectual content; and
iii) final approval of the version to be published; and
iv) 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."

It also states that merely participating in the acquisition of funding and collection of data do not justify authorship.

Research Paper Publication: Ethical Issues of Authorship

According to Bebeau and Monson (2011), in the social science research and publication practices, "authorship involves the willingness to take responsibility for the outcome of the work, the capability to write the report, the ability to defend the theoretical understandings of a study, the methods, and analytical procedures used, and the study's conclusion" (p.385). In short, authorship could be claimed for a research paper publication when the contributors have the ability to defend their ideas mentioned in the research paper, and must take responsibility for the published contents. In conforming to this definition of ethical authorship, would it be suggested to award authorship credit to the English language editor of a research paper on a pretext that academics belonging to non-native English speaking lands mostly opt for English language editing service before submitting their research papers to the academic journal's consideration, review, and possible publication (Bebeau and Monson 2011; Lozano 2014; Warrender 2016).

In the Internet driven academic world, it is observed that 'English language editing service' has widened its limits and scope. On the one hand, editing service offers 'proofreading' and 'copy editing' and on the other hand, 'co-writing'. The expression 'co-writing' embraces the following tasks but not limited to these alone. For example, correction in graphical design, structuring the tables, correcting the wrong insertion of data in the data analyses passages, etc. But, with reference to 'proofreading' and 'copy editing', language editors correct the flaws in sentences, fix typos in passages, and develop the readability of the paper without correcting the contents or concepts of the paper. Proofreaders correct minor errors in the write up, such as, capitalization, typo, punctuation, word order, grammar, etc. The job of 'proofreaders' is not to rewrite or co-write the manuscript. Rather, they need to point out whether all passages are meaningful or not, whether certain paragraphs of a page need to be moved to another page or not, whether certain passages need to be removed from the paper or not, whether some more explanations are required to highlight an important point, etc. There is another type of proofreaders who deal with the research papers after their acceptance for publication in academic journals. They do not provide any English language editing services, but only enhance the structural uniformity in the paper for its publication in the journal.

The task of a proofreader is not the same as the task of a copy editor of research paper, even though some tasks overlap with each other. Specifically, the job of copy editors is to correct sentence structure, verb-tense agreement, ensure continuity between the sentences and passages, and improve the readability without changing the contents of the paper. Thus, a copy editor's service does not contribute any new ideas or new contents to the paper. In a nutshell, the objective of the copy editor and proofreader of a paper is to present the author's ideas in a lucid and grammatically correct manner. Many academics those are not native speakers of English opt for copy editing services for their research papers before submitting to an academic journal for publication. Lozano (2014) conveys, "proofreading and copy editing are skills and services that require an eye for detail and knowledge of the language" (p.374). Unlike authors, copy editors and proofreaders of a research paper are not accountable for the contents of a paper. Since copy editors and proofreaders do not satisfy the ICMJE (2019) ethical authorship requirements, it would be unethical to give authorship credit to the copy editors and proofreaders of a research paper. Thus, an English language editor, who does copy editing and proofreading must not be given authorship credit for a research paper publication.

Several reputed international academic journals advise authors, especially non-native English speaking authors, to opt for English language editing service before submitting their papers to the journal's consideration, review, and possible publication (Bebeau and Monson 2011). Lozano (2014) claims that English language editing services are often carried out by subject specific experts who do not only edit the language, but also improve the scientific contents to a large extent (p.363). This paper does not endorse Lozano's statement. The reason is, at various times, English language editors are not the subject experts who carry out the editing service of a paper. This paper brings the distinction between 'language editing service' and 'content editing service (co-writing)'. Subject specific experts primarily offer content editing service to a paper. They do not only correct the language used in the paper but also strike coherence between passages and sections, ensure logical sequencing of the events in the literature review section, interpret data correctly across the manuscript, write research findings in the conclusion appropriately, etc. Thus, it may be ethically problematic to exclude content editor's name from the authorship list of a research paper publication. But it is within the ambit of ethics not to give authorship credits to the English language editors who offer proofreading and copy editing services to a research paper.

On many occasions, English language editors do not have in-depth knowledge on contents of the paper. They may not know aims and objectives of the paper, significance of hypotheses, methodology adopted to carry out the research tasks, reasons for using certain tools and techniques to collect data, results of the research paper, etc. They are expected to edit the language only, not contents of the paper. Unlike English language editors, content editors are regarded as subject experts. They are familiar with literature, informed of research problems of a research paper. They edit concepts, arguments, and interpret data across the paper, etc. Hence, they are responsible and accountable for the contents of the paper. In this regard, it may be stated that if a content editor edits a paper of native speaker of English or non-native speaker of English academics, he or she deserves authorship credit in the publication practices.

This paper demonstrates an example below that shows the content editor's works on an abstract developed by a non-native speaker of English academic.

Critical Analysis of Societal Expectations from Higher Education Teacher

ABSTRACT

The paper is themed on societal expectations from a teacher especially in context of modern Indian Society. It is discussed under two major sub themes - a) challenges of contemporary Indian society, b) modern societal expectations from higher education teachers. Contemporary Indian society has clashing interest with one hand it is firmly holding flag of Indian spiritualism in the form of Indian values, festivals, yogic sciences and traditions and on the other hand it is blindly chasing materialistic pleasures of western world in the form of ICT use, mall culture, social networking and lifestyle. So today's Indian society has complex mix of social demands requiring blending of Indian Idealism and western pragmatism. In this context the challenges of contemporary Indian society can be visualized as: i) To develop the knowledge path among university, Educational institutions and society; ii) Collaboration between Industry and University and Higher Education Institutions; iii) To channelize the energy and potential of youth; iii) To integrate multicultural and internationally open communities; iv) To develop social sensitivity . Finally we can say that there is one motive to provide the quality of life of all stakeholders of the society bringing together them under the one roof marching towards common goal.

Sharma and Rawat (2018): Chapter 9's abstract

Critical Analysis of Societal Expectations from Higher Education Teachers

ABSTRACT

This paper delves into the changing societal contours and the societal expectations from higher education teachers with reference to contemporary Indian society. When change is an obvious phenomenon, two broad themes clash against each other and pose challenges to teachers' professionalism. On one hand is the traditional Indian culture where spiritualism and values are placed at the apex with reverence, and on the other hand, there is blind chase of materialistic pleasure especially by technological developments, social networking and unnatural lifestyles. In view of this, society as a stakeholder of higher education expects teachers to play multiple roles such as learning manager, learning facilitator, youth icon, and leader, among others. This implies that societal expectations from a teacher are many and diverse. From this point of view, the way higher education in India is organized needs a relook.

Sethy (2018): Content Editor's work on Sharma and Rawat (2018), Chapter 9's abstract.

The Council of Science Editors (2018) in the ethical authorship guideline suggests that English language editors shall not be included as authors of a research paper because authors of a paper must approve contents of the paper for its publication. The US National Institutes of Health (2019) disapproves English language editors as authors of a research paper publication.

Unethical Authorship and Research Paper Publication Practice

Unethical authorship is of two types.

i)   Individuals who meet the criteria for authorship are not listed as authors of a research paper (i.e. Ghost authorship).
ii) Authorship is given to individuals who do not meet the criteria of authorship of a research paper. (i.e. Guest authorship, Honorary authorship, and Gift authorship).

The term 'Ghost authorship' is used when major contributors to a research paper exclude themselves voluntarily from the author list of a paper (Boyer et al. 2017). This situation occurs when contributors sense that the paper is of low credibility, and given an opportunity, they can add some more relevant information to their research findings. Further, contributors think that it is not worthy to include their names in the author list of a paper as it is going to be published in a non-reputed academic journal (Clement 2014; Smith and Williams-Jones 2012). In some occasions, conflicting interests also cause

some contributors to exclude themselves from the author list of a paper (Lexchin 2012; Matheson 2011). For example, when an author of a research paper is the editor or associate editor of the journal to which the paper is submitted for publication, it is not ethical to play two conflicting roles for a paper publication in an academic journal.

Guest authorship refers to the inclusion of established scholars in a research paper for the benefit of enhancing status of the paper. It is believed that including established scholars in the author list of a paper has certain advantages in the review process and awards the paper high academic credit, as the work is claimed to be carried out in collaboration with renowned research scholars. Honorary authorship is offered to a department chair or to a senior professor of an institution to impress them (Eisenberg et al. 2011). According to Drenth (1998), the numbers of authors of research papers are increasing year after year because of the practice of honorary authorship. It is an attempt and effort of a researcher or an academic to make his/her superiors and bosses happy. Gift authorship works in a quid-pro-quo manner (Tarkang et al. 2017). In this case, academics who have not contributed or contributed negligibly to a research paper are included in the co-author list of a paper. The co-author(s) look for an opportunity to return the authorship gift to the author at a later time in some or other way. But as per the academic journals' ethical publication practices, contributors whose work is negligible should not be included in the author list. At best, they may be acknowledged in the paper. The above unethical authorship practices are noticed in many research papers publications (Seeman and House 2010; Smith and Williams-Jones 2012; Bennett and Taylor 2003).

To fix these unethical authorship practices, Smith (1997) suggests that academic journals should think of naming 'contributors' of a paper rather than 'authors' of a paper. This would give the readers, a vivid understanding of which contributor contributed what in the research paper and the expertise of each of the contributors. It would work just like the title in a movie where contributors' names are mentioned against their contributions to the movie making. In this case, each contributor gets his/her credit without any ambiguity, dispute, and disagreement. Rennie (2001) and Frazzetto (2004) propose the concept of 'contributorship' for multi-author paper publication. They suggest that there must be a disclosure to the readers about contributors' contribution to the research paper. This would ensure contributors' 'accountability' in the paper. Eisenberg et al. (2011) and Smith (1997) mention that academic journals have 'authorship guidelines', but not 'regulations', as a result, most of the journal papers accept multi-author papers. In some instances, the word count of authors' names exceeds that of the paper's abstract (Castelvecchi 2015). A physics paper has 5154 authors (COPE 2019), a genomics paper has more than 1000 authors, a paper in the *Nature* journal has 2700 odd-authors, a paper in the *Journal of Instrum* has 3000 authors, a paper in the *Physics Letters B* has 2900 odd-authors (Castelvecchi 2015). Such instances occur because of the lack of regulations for listing authors' names corresponding to their contributions in the paper. It is unethical to add gift author, honorary author, and guest author names to the author list of a multi-author paper.

With regard to multi-author papers, Tscharntke et al. (2007) convey that the author's position in a research paper becomes arbitrary if the number of authors is more than two. Laurance (2006) evokes that there is no accepted yardstick in assessing the actual

contribution of a group leader for a given scientific publication practice. Hunt (1991) and Anderson (1992) state that a simple way to determine credit associated with the sequence of authors' names in a multi-author paper is still lacking. However, readers belonging to scientific community assume that last author of a multi-author paper is the principal investigator and often the corresponding author (Strange 2008; Bennett and Taylor 2003; Loui 2006). Strange (2008), Bennett and Taylor (2003) express that it is a convention that the principal investigator's name appears as the last name of an author list of a multi-author paper.

In this context, a question arises; who shall be the first author (principal author) of a multi-author paper? It is observed that in the science disciplines, if a paper has more than two authors, then as per the convention, the principal investigator's name appears as the last name in the author list of a paper. The principal investigator is normally the senior member of the lab and perhaps the research grant getter. He/she is directly involved in the research works and the paper is an outcome of the research findings. The principal investigator may not be the principal contributor to the paper. The principal contributor is usually a research scholar or a post-doc who carries out most of the research tasks within the research group, and the research paper is an outcome of the group works. In this case, both principal contributor and principal investigator satisfy ICMJE (2019) authorship criteria. So, the question remains who shall be the first author of a multi-author paper – principal investigator or principal contributor? Further, how to list authors' names meaningfully in a multi-author paper for the readers?

The author of this paper suggests that principal investigator's name need not to mention as the last author in the author list of a multi-author paper. Rather, his/her name should be mentioned in an appropriate place of an author list based on his/her contribution to the paper, and in comparison with other authors' contributions to the paper. This practice would benefit the readers to know each and every author's contribution to the paper in a sequential manner.

A Proposal for Ethical Authorship Practice for Research Paper Publication

Authors of a research paper are accountable for the contents of the paper, and thereby deserve credit for the contents. According to Strange (2008), authorship has two vital functions. It gives professional benefits and credits for the quality and integrity of the published works. Rennie et al. (1997) indicate that authorship of a paper assumes the author of a publication has been involved in and is knowledgeable about all the aspects of the reported research. Thus, authorship credit in research publications requires both research and writing contributions (Bošnjak and Marušić 2012, p.751).

The paper proposes a framework to assist contributors of a research paper to arrange author list in a meaningful order for multi-author paper publication. The aim is to estimate each contributor's credit scores to a research paper and arrange in sequence the authors' names (from highest score to the lowest score) in a multi-author paper without any ambiguity, confusion, vagueness, and arbitrary valuation.

Table 1 A tool for evaluating authorial contribution to a research paper

Contribution to a research paper	Score
Concept development	4
Research Design	4
Research supervision	2
Study material collection (paid job)	1
Study material collection by the researcher	2
Data collection (paid job)	1
Data collection by the researcher	3
Data processing	3
Data Analysis and interpretation	4
Literature review	5
Writing the paper	5
Revising the article	4
English language editing services (copy editing and proofreading) – (paid job)	1
Content editing services	3

'Authorship credit' evaluation scheme in a 05 (five) point scale

0-No contribution: Names are not to be included in the author list of a research paper

1-Negligible contribution: Names need to be acknowledged in the research paper

2-Minimal contribution: Names need to be listed in the author list of a research paper

3-Significant contribution: Names need to be mentioned in the author list of a research paper

4-Major contribution: Names need to be mentioned in the author list of a research paper

5- Core contribution: Names need to be mentioned in the author list of a research paper

The following passages justify the scores assigned against contributions to a research paper for publication in an academic journal.

'Concept development' is an essential component of a research. It is the process of generating new ideas. It is synthetic in nature because it involves embracing new ideas while studying the literature and examining the validity, genuineness and appropriateness of these ideas for a research-worthy problem. It assists researchers not only to determine a research-worthy problem but also to initiate writing a research paper. According to Leedy and Ormrod (2005), finding a research-worthy problem through concept development serves as the starting point for a research work.

'Research design' is a component of a research work. It assists researchers to decide the methodology, tools, techniques, etc. to carry out the research. In short, it guides researchers to frame a sequential process for a research work. To carry out a research work, researchers must know the objectives, hypotheses, time availability, and other practical constraints, if any, to complete the research study. Researchers involved in framing the research design, therefore, deserve to be authors of a research paper publication.

'Research supervision' has two connotations. First, supervising the overall research work as a team leader or a group administrator. Second, guiding the novice researchers to carry out their research works. As a team leader, a supervisor does not get involved in the research work in true sense, but acts as a manager or administrator to check the timely progress of the research project. Here, the aim is to coordinate with the researchers to complete the research project on time and achieve the objectives of research project. As a guide to novice researchers (e.g. PhD students), the research supervisor guides the students to proceed from one step to another step to complete the research task and achieve the objectives of the research study. For

example, the research supervisor suggests the students on what to study, how to write ideas in the chapters, how to carry out the fieldwork, lab experiments if any, etc. But the research tasks are to be carried out by the student. Hence, research supervisor names must not be mentioned as the first author of a research paper publication. The AERA revised its authorship definitions in the year 2011, in which it states that "a student name must be listed as a principal author on any multiple authored publication that substantially derives from the student's dissertation or thesis" (AERA 2011, pp.153–154).

With reference to study materials collection, if researchers hire some persons to collect the study materials from different libraries, archives, and geographical places, then the hired persons' names are to be acknowledged in the research paper publication, but shall not be included in the author list. The reason is, the hired persons are not required to know why those study materials need to be collected. The hired person(s) are not required to know the contents of the study materials and thereby may not know what the research paper is about. They receive the payment from the researchers to collect the study materials. Since it is a paid job, individuals associated with study material collection need not know the contents of the study materials. This by implication suggests that they may not know the contents of the research paper which is developed from these study materials. Hence, the study material collectors shall not be given authorship credit in a research paper publication.

But, if researchers themselves collect study materials for a research study, then they carry out this task with mindfulness, careful thoughts, and critical verification. The researchers not only collect relevant literature for the research by understanding the content of each of the published article and filter those that are irrelevant to the study. Hence, this job contributes to the enrichment of contents of the research paper. Since it is a careful and mindful effort, this effort needs to be reckoned in the author list of a research paper publication.

The notion of 'data collection' is interpreted here as primary data collection through fieldwork or by doing experiments in the labs. Hiring persons against payments can also carry out this task. This is not a new phenomenon in the research-cum-academic world. The person who gets paid for data collection may be acknowledged in the research paper publication, but not listed as authors of a research paper. It is so because the hired person(s) would not know why they are collecting the data, if the data they have collected are valid, or reason out why they are valid. Since it is a paid job, the hired person may not have to know the relevance, importance and usage of the data for the development of a research paper.

If researchers themselves collect data from field visits or experimenting in the labs, they shall be given authorship credits for a research paper publication. The reason is, when researchers collect data from field visits or through lab experiments - they know what they are looking for? In the process, they even know if more data is required for the research work. Further, they have a clear knowledge on how these collected data can be used to answer the research questions. In short, while accumulating data, researchers might eliminate wrong or invalid data and collect more pertinent data for the research study, as they understand the usefulness and importance of data in the research study. Hence, researchers who collect data contribute to the development of a research paper substantially, and thereby are aware of the contents of the research paper.

After data collection, the next step is data processing. Data processing includes data entry in appropriate columns of an excel sheet and saving data for future use and reference. It requires certain level of skills, expertise, careful attention, and knowledge about naming the data sheet

for future use. The data sheet needs to be saved in such a manner that the data can be traced out easily and quickly for future use. Further, sufficient knowledge about the research is important for categorizing the data as it requires examining the validity and relevance of the data. Data processing validates the correctness of a data. To perform this task, researchers need to comprehend the research design and research questions of the research study. Hence, data processing demands authorship credits in a research paper publication.

The next step to data processing is data analysis and interpretation. To carry out this task, it requires a clear understanding about the research problem, research objectives and research questions of the study. Without the knowledge of these research components, a researcher may not know what to analyze, how to analyze, and what to interpret and how to interpret. Since a set of data can be analyzed and interpreted variously depending on the context and perspective, it requires careful attention to read the data and assign the correct meaning to the data. Data analysis and interpretation task certifies whether the tools and techniques used for the research work were appropriate. It also determines whether the data are adequate to answer the research questions. Hence, researchers involved in this work deserve authorship credit in a research paper publication.

Literature review plays an important role for a research study. It helps to formulate a research problem, research questions, and appropriate methodology to carry out the research tasks. According to Ellis and Levy (2008), a research problem is finalized based on literature review. Thus, it is stated that literature review is the foundation for a research work. It guides researchers to determine the research gap and know the extent of progress made on a research problem. Literature review also gives a comprehensive understanding about a research problem and information on the scholars who are working on the same research problem, their approaches and findings about the research problem. Researchers involved in this task thus must be rewarded with authorship credits in a research paper publication. In this regard, it may be stated that literature review is the foundation of a research work, as it assists researchers to decide on a research worthy problem to carry out the research study.

Writing a research paper requires skills, expertise, intelligence, and knowledge in the field pertaining to the research problem. It needs a clear understanding about the research design, methodology, and findings of the research study. It requires writing skills, logical and lucid presentation skills, content analysis skills, and knowledge about referencing style among others. Thus, writing a research paper is a professional work. Researchers involved in writing a research paper, therefore, must be rewarded the authorship credit for a research paper publication.

Revising an article means working on reviewers' suggestions and comments on the research paper. In this case, contributors to the research paper need to go through the suggestions and comments made by the reviewers, analyze the relevance of their suggestions and comments in the paper, and thereafter incorporate their suggestions appropriately for further consideration and publication in the journal. While making such changes to a paper, researchers know the contents of the paper and thereby know the claims and arguments made in the pre-revised and post-revised paper. Hence, researchers involved in the revising task must be credited with authorship of the paper.

English language editing services are carried out by professionals who have proficiency in English language. It is observed that professionals who carry out language editing tasks may not have the subject specific knowledge of the research. Bereft of their understanding about the arguments and claims made in the paper they do the job for a price. They fix the grammatical and structural errors of a sentence, typo of a word, etc. To do this task, they charge a fee. In

some agencies, the prices for doing the tasks are fixed, and in some other agencies, it is negotiable. It all depends on the agency that is providing the service and the number of days required to complete the task. The English language editors do the proofreading and copy editing tasks. While carrying out these tasks they do not change the ideas and contents of the paper, rather they correct syntax errors, typos, punctuation errors, etc. Thus, they do not contribute anything new to the content of the paper. Hence, they may at best be acknowledged in the research paper publication practices. Most non-native English speaking academics opt for English language editing service for their research papers before submitting to reputed academic journals for their publication. This practice is endorsed by most of the reputed academic journals across the academic disciplines. Hence, the paper submits that English language editors' names shall not be mentioned in the author list of a research paper publication.

However, with regard to 'content editing' services, content editors require knowledge on the subject on which the paper is developed. They require a detail understanding of the literature review, ideas and arguments stated in the paper among others. The content editors correct the content analysis, passage sequencing, ideas and arguments, and presentation style of the paper. While editing the contents of a research paper, they modify the contents of the paper and are aware of the claims made in the paper. In short, content editors develop a research paper to a publication material after a careful and painstaking editing works. Content editors of a research paper thus own the arguments and claims made in the paper and therefore are accountable for the contents of the paper. Thus, they deserve the authorship credit of a research paper publication.

Each contributor to a research paper acquires certain scores as described in Table 1. The contributor, who scores the highest, must be the first author of a multi-author paper. Authors list should be arranged from core contributor to minimal contributor to the research paper. Irrespective of contributors' scores, all the contributors shall be responsible for the content of the paper.

The research paper publication is relevant in the academic world, as authorship brings name, fame, recognition, awards, rewards and other academic benefits. The paper suggests the following tasks to resolve authorship disputes over multi-author paper publication in an amicable manner.

Resolving Authorship Disputes over Research Paper Publication Practices

Authorship is to be earned consciously and voluntarily. Clement (2014), and Belwalkar and Toaddy (2014) express that a research paper is developed in different phases. In a multi-author paper, the author list should be compiled based on the joint decision of all the authors at the end of the development of the research paper (Bebeau and Monson 2011, p.376).

Research task is a planned activity. Even though some researchers together carry out a research project and decide the outcomes of the research project, they should come together and discuss openly the order of the author list of a research paper publication (Erlen et al. 1997; Welsh et al. 2008). This view is endorsed and recommended by the Committee on Publication Ethics (2019) as well.

Authorship credits tie up with responsibility and accountability of the contents of the research paper. The contributors must arrive at a consensus on who would be the

communicating author in future endeavors for what so ever reason. The communicating author needs to earn a minimum score of five (05) with regard to the contribution to the paper (Refer to Table 1). Further, contributors to a research paper who score even two (02) must be listed in the author list of a research paper publication.

The paper submits that the best way to resolve authorship disputes is to;

i)   develop a culture of ethical authorship that would guide authors to adhere to publication ethics practices,
ii) discuss among contributors to the paper about author list before planning for a research paper development and publication, and
iii) revisit the contributions made by contributors to the paper at the end of a research paper preparation and finalize the author list in a meaningful way based on the contributions made to the research paper for publication.

The authorship of a paper should be based on contribution to the concept, design, execution, and interpretation of the data in a research study, drafting or substantively reviewing or revising the research article, and a willingness to assume responsibility for the study (NIH 2019; COPE 2019). Individuals who provide funding for the research, or assist in English language editing (proofreading and copy editing) services to the manuscript, or served as a departmental chair to monitor the researchers involved in the research task do not qualify for authorship credit (Warrender 2016). Puljak and Sambunjak (2020), Battisti et al. (2015), and ICMJE's (2019) authorship criteria state that individuals, who assist in getting research fund, offer general supervision to a research group, provide administrative help to carry out the research tasks timely, provide English language editing services (i.e. copy editing and proof-reading) are not entitled for authorship of a paper, but they can be acknowledged in the paper.

The COPE (2019) in *Authorship Determination Scorecard* and *Authorship Tie -breaker Scorecard* documents has mentioned that the first author name in a research paper is generally held to have made the greatest contribution to the research work. Data acquisition is limited to data gathering or collection only. So, the responsibility lies in collecting and storing data for research use. Thus, a person involved in data collection task can neither be endorsed as the first author of a multi-author paper nor the principal investigator of the research paper (Mc Nutt et al. 2018).

In the science disciplines, it is normal to have collaborative research. One of the reasons could be, a lab may wish to take advantage of some new technologies for which it needs collaboration from a few experts for laboratory experiments. In this case, if a paper is developed based on the experiment results then each and every contributor to the paper must satisfy ICMJE (2019) authorship criteria to become author of the paper. Again, an author list shall be prepared based on the scoring system mentioned in Table 1.

The Association for Psychological Science (APS) and The American Physical Society state that authorship should be limited to those who have made significant contributions to the concept, design, execution or interpretation of data of the research study. Other individuals who have contributed negligibly to the study should be acknowledged (COPE 2019).

Many PRAJ across the globe provide English language editing service on a payment basis. In most of the cases, language editors are not experts in the subject contents on which the paper is developed and written. English language editors while carrying out the editing tasks do not contribute any new content to the paper. They do not even satisfy the ICMJE (2019) criteria for authorship of a paper publication. Hence, they shall not be given authorship credit of a research

paper publication. Authorship must not to be offered; rather it should be earned by contributing substantially to the preparation of a research paper. Further, an author of a research paper must take responsibility of the content of the paper.

Conclusion

Authorship informs the readers about an author's expertise in research areas, understanding of concepts, and significant contributions to the existing literature with accountability and responsibility on research findings. The paper suggests that English language editor of a research paper shall not be considered author of a research paper publication practice. Authors of a PRAJ paper are highly respected by the academic peers. Thus, authorship of a paper is indeed an achievement. It brings kudos for the intellectual contributions to the academic disciplines and thereby to the society. Authors are also reckoned and awarded in various platforms for the contribution of their new ideas, thoughts, innovations, and discoveries of the worldly affairs. So it is the ethical duty and responsibility of the contributors of a research paper to take appropriate authorship credit as they deserve for a research paper publication.

'Authorship disputes' are closely linked with 'academic ethics'. Academic ethics is regarded as professional ethics because it applies to academics alone, and not to anyone else (Davis 2001). It is like medical ethics apply to doctors, engineering ethics apply to engineers, and so on. Since academic ethics apply to academics alone, it shall not differ from person to person belonging to different department or academic discipline. It must apply to each and every academic who involves in responsible conduct of research and ethical publishing practices.

Authorship is the currency by which academics are paid for their tenure, promotion, and grant funding (Tarkang et al. 2017; COPE 2019). 'Authorship' embraces two attributes; 'credit for the claims' and 'accountability for the claims' of the research paper. In the absence of these two attributes, the term 'authorship' does not stand valid. Someone who merely obtains project grant and provides top-level supervision would not qualify for authorship credits, but qualify for acknowledgment in the research paper (COPE 2019). To bring the uniformity and assign correct meaning to the author list for a multi-author paper publication, the paper suggests that it would be a good idea, if PRAJ would consider requiring authors to sign an agreement on their contributions to the paper before publication. This would help the journals to arrange the author list in a meaningful order by calculating the scores of the contributors as mentioned in Table 1 in this paper, from highest to the lowest, i.e. from first author to the last author. This practice may resolve authorship disputes over multi-author paper publication to a large extent.

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