This is the authors' final peer reviewed (post print) version of the item published as:


Available from Deakin Research Online:

http://hdl.handle.net/10536/DRO/DU:30041412

Reproduced with the kind permission of the copyright owner.

Copyright : 2012, Emerald Group Publishing Limited
Challenges in collaborative writing: addressing authorship attribution

The Authors

Ambika Zutshi, Faculty of Business & Law, Deakin University, Melbourne, Australia

Gael McDonald, Faculty of Business & Law, Deakin University, Melbourne, Australia

Linda Kalejs, Faculty of Business & Law, Deakin University, Melbourne, Australia

Abstract

Purpose – Increasing pressure to enhance research coupled with a desire for a broadening of academic input, are prompting greater levels of collaboration. Research collaboration can generate notable benefits but can also pose a variety of challenges. The purpose of this paper is to explore the reasons, facilitators, benefits and challenges of academic collaboration. It also provides suggestions to manage identifiable risks and enhance team dynamics.

Design/methodology/approach – This is a conceptual paper exploring prior literature in relation to the contentious points of research collaboration, particularly in regard to authorship attribution.

Findings – The authors present two checklists that researchers can utilise to ensure the successful completion of collaborative projects. The checklists incorporate the main factors required for effective collaborative work and research, and form a foundation for discussion among team members.

Originality/value – The paper draws upon experiences, observations, academic literature and protocols, and provides strategies and recommendations to enhance collaboration and authorship attribution. The two checklists presented in the paper are value-adding for team members.

Keyword(s):

Authorship; Research work; Research collaboration; Authorship attribution; Co-authorship; Contribution; Order of authorship.

Introduction

Publishing is an integral requirement of a university academic’s career irrespective of the discipline area, specialisations offered, or country. To facilitate the process, collaboration is a natural catalyst to enhance both the quality and quantity of publications produced. Questions that are often raised in relation to collaboration are, for example: do we want to encourage collaborative research? What are the specific characteristics of effective collaboration? For what specific purposes is collaboration appropriate? (Katsouyanni, 2008, p. 7). Collaboration, like any other team effort, offers both benefits and challenges that need to be addressed if the full benefits are to be achieved. By way of definition, collaborative research can be conceptualized as a research project completed by groups from different disciplines.
(interdisciplinary collaboration), either belonging to the same country (national) or to more than one country (international). Collaboration may also be parallel research efforts by groups from different countries applying the same protocols across various locations, or by any combination of the above (Katsouyanni, 2008, p. 1). This definition of collaborative research encompasses cross-disciplinary and international research, and hints at the potential complexities involved in collaborative work. In addition to the above discussion, it should be noted that collaborative outcomes can lead to a range of outputs such as conference papers, journal papers or grant and funding applications, as all are likely productive outputs from the collaborative process. Collaborative efforts can also extend beyond authors, encompassing journal editors and peer reviewers, all working towards a successful publication outcome and professional development for the authors (Gilmore et al., 2006).

While collaborative endeavours are common in the health and medical disciplines, with significant commentary related to those disciplines, the literature on the challenges involved in collaborative research and, specifically, collaborative writing in the academic discipline of business, has been remarkably sparse. This paper seeks to address this deficiency. The intention of this paper is twofold. It seeks first to explore the reasons, benefits, facilitators and challenges associated with collaborative writing. Second, within the context of the business discipline, the paper reflects on the tasks required both administratively and intellectually, specifically in relation to authorship, to be undertaken by authors to address potential difficulties that may arise between collaborators. It is important to note that the intention is to discuss collaboration at the individual or micro level (Rigby and Edler, 2005), not at the institutional, governmental or multi-institutional level (Barker and Powell, 1997; Huxham and Vangen, 2000), and to draw from the body of knowledge and experience surrounding collaborative research within the sciences to benefit the discipline of business.

**Drivers and facilitators of collaboration**

The antecedents prompting collaborative work in the discipline of business can be seen in both the drivers and the benefits of collaboration (Table I). Enhancing academic status and building a research profile are crucial to academic survival and reputation (Ligthelm and Koekemoer, 2009, p. 29), with drivers for collaboration being remarkably self-evident. They relate, primarily, to the increasing pressure to publish as a result of factors including not only government research assessment exercises, but also organisational imperatives that seek to have current research inform teaching. At a pragmatic level, increasing organisational demands have also been coupled with increased workloads and the consequential desire by many faculty staff to find more efficient ways to achieve research outcomes. Collaboration is, therefore, seen as a means of expediting research performance. A further driver that has prompted greater levels of collaboration is the desire for broader intellectual contribution to research questions and interpretive discussion. At a more personalised level, it is also believed that we are, by nature, social beings, and naturally seek out interaction with others for collaborative endeavours and personal reward (Melin, 2000).

Researchers (Madiba and Dhai, 2006; Yonge et al., 1996) have cited a country's culture as a potential driver for research collaboration. Some countries heavily promote the concept of collaboration, whether this is due to a broad understanding of the value of contributions from different perspectives, or from an inherent cultural orientation, as is seen in more collective cultures such as those of South-East Asia. More research is required to identify cultural differences and how collaborators from different cultural backgrounds may have to compromise their work ethic for a successful outcome. The macro reasons promoting
collaboration are more obscure, but have been identified as the result of changing government regulation and the allocation of funding (Dundar and Lewis, 1998; Madiba and Dhai, 2006; Rigby and Edler, 2005), as well as globalisation (Glanzel and Schubert, 2004; Katsouyanni, 2008; Abramo et al., 2009).

Facilitators of collaboration are deemed to be additional factors that can further prompt the occurrence of the collaborative process. They can influence an individual's decision favourably towards working in a team environment, rather than undertaking solo research and single-authored papers. Many of the facilitators exist as a result of changes in the external environment. For example, developments in information and communication technologies such as e-mail, Skype, Facebook, live-chat and Twitter, are all providing greater capacity for sharing of information, and the development and nurturing of network relationships (Abramo et al., 2009; Melin, 2000). These new modes of communication can, however, have their drawbacks. The lack of non-verbal cues during online communication, if not recognised and addressed, can potentially result in misunderstanding between team members, and the sheer volume of material generated can be daunting. These difficulties are highlighted by a respondent in an empirical study on collaborative writing: “Handling reams of successive handwritten changes is no fun, but handling emailfuls [sic] of successive electronic documents is no easier” (Noël and Robert, 2004, p. 73).

While developments in information technology have undoubtedly enhanced opportunities for research collaboration, a further facilitator has been noted by Abramo et al. (2009) and Melin (2000). They observe that it is now easier for research collaborators and joint authors to meet and work together regularly as a result of developments in transportation modes and ease of travel. Reductions in the cost of travel have been a further facilitator of collaboration, given the frequency with which co-members of a team can meet on a regular basis in order to develop their research agenda. It will be interesting to see what effect the pressure for a greener environment and a reduction in one's carbon footprint will have on the willingness of academics to interact in person.

Gender and personality have also been found to be facilitators of collaboration (Burnett and Ewald, 1994; Hafernik et al., 1997; Heffner, 1979). There is, potentially, a natural inclination for females to share information and form partnerships readily (Bozeman and Corley, 2004: Epstein, 1991). It has also been noted that owing to personality differences, some of us collaborate to satisfy our “social” as well as our intellectual needs (Melin, 2000). Collaborators can also experience benefits simultaneously at the interpersonal level, as collaboration can contribute to the development of long-term friendships, even where there is not necessarily face-to-face contact, but only e-mail communication (Melin, 2000). For some academics, collaboration also provides much-needed support, specifically during times of increased personal or professional demands (Holmes et al., 2009). Irrespective of the reason, the reality is that more academics are moving towards writing papers collaboratively as they have observed and/or experienced many of the benefits from writing in partnerships.

Benefits of collaboration

One of the significant benefits of collaboration is the potential contribution to the academic knowledge base through integration and cross-fertilisation of ideas (Katsouyanni, 2008; Katz and Martin, 1997; Melin, 2000; Yonge et al., 1996). This is particularly noteworthy in cross-disciplinary research, where ongoing debate with representatives from other disciplines can enrich and contribute to the discussion and research conclusions (Madiba and Dhai, 2006).
Early career researchers may reap benefits through publishing collaboratively with mentors or supervisors, forming networks with academic colleagues and contributing to the research outputs of the faculty (Polonsky et al., 1998). The opportunity to interact with colleagues not only has immediate benefit to the project on hand, but has also been recognised as enhancing the individual collaborator's own knowledge base. This knowledge acquisition is also a long-term benefit (Melin, 2000).

More immediate and compelling benefits of collaboration for individual academics are the positive impacts of collaboration on both the quality and quantity of output. In relation to enhanced quality, this outcome has been recognised by a number of researchers (Liggett et al., 1994; Noël and Robert, 2004; Presser, 1980; Sauer, 1988). The increase in quality is deemed to be due to the inherent quality assurance process that occurs in written content and analysis through multiple reviews of the material (Hafernik et al., 1997; Noël and Robert, 2004). As with the old adage, “more hands to the pump producing more out-flow”, it has been noted that collaboration results not only in an increase in the quality of publications, but also an increase in the quantity of papers produced by team members (Abramo et al., 2009; Floyd et al., 1994; Hafernik et al., 1997; Melin, 2000). Additional benefits noted are the likelihood of papers being accepted into high impact factor journals (Holmes et al., 2009), and increased citations of papers (Frenken et al., 2005; Katsouyanni, 2008; Katz and Martin, 1997; Rigby and Edler, 2005). Research indicates that cross-national team member affiliations, reviewers and editors, in particular from North American or European regions, may increase the likelihood of a successful publishing outcome in high-ranking marketing and business journals (Rosenreich and Wooliscroft, 2006; Svensson, 2005; Svensson and Wood, 2007). Probably as a result of greater levels of productivity in the form of more papers produced and in better journals, an ancillary benefit which has been observed has been an increase in academic salary/benefits (Sauer, 1988).

Having multiple collaborators has also been found to effect the timelines associated with paper preparation (de Beaver, 2001; Hafernik et al., 1997). Possibly due to either direct pressure and/or increased motivation for individual team members to meet deadlines, papers generated in collaboration with others appear to have quicker turn-around times, thus increasing the efficiency of the activity. Other benefits of collaboration, which have frequently been identified, are greater access, either to a country location or information sources, and to resources, which could include funding and data sets (Abramo et al., 2009; Hafernik et al., 1997; Katsouyanni, 2008; Katz and Martin, 1997; Melin, 2000; Yonge et al., 1996). Clearly, there are tangible benefits in regard to increased output; but it should also be acknowledged that the process of collaboration may also yield beneficial outcomes, particularly in regard to the support and encouragement of individual team members (Holmes et al., 2009). This positive environment has been found to be most conducive to the forming and maintaining of long-term friendships (Floyd et al., 1994; Melin, 2000; Noël and Robert, 2004), enhancing the feeling of self-worth and providing professional development opportunities for early career researchers.

**Challenges of collaboration**

While the benefits of collaboration are evidential, one also needs to be cognisant of the challenges accompanying working in a team. A frequent topic of conversation and discussion amongst academics during the collaborative process are their experiences in working in teams. The feelings vary from enthusiastic endorsement to concern and trepidation at collaboration. This is usually a direct reflection of academics' past experiences, observation,
or hearsay from other colleagues about the pitfalls of working with certain individuals. The nature of the project and the associated timelines could also be a contributing factor in authors' mixed views on the collaborative process. In such instances, based on the eclectic mix of personalities and strengths, a collaboration experience with person A may vary significantly for persons B and C, respectively, each having their own experientialist perspective. All too frequently, the process by which collaboration occurs has the potential to create difficulties that range from confusion and misunderstandings, through to significantly damaging relationships. Based on the findings of their research into collaboration, Floyd et al. (1994) posited that collaborative relationships can be summed up in four main categories, based on the motivation for collaboration and the power balance between the team members. The categories identified were: collegial, mentoring, meritorious, and directing (Floyd et al., 1994, p. 742). Research also indicates that “status self-enhancers” are often rejected and dismissed by group members as controlling and demanding of privileges, with most group members striving for social inclusion and accurately representing their “status” within the group (Anderson et al., 2006).

Of specific interest in regard to research collaboration are concerns regarding research author attribution. Authorship guidelines and protocols exist within the science and medical disciplines, for instance, the International Committee of Medical Journal Editors (2008, 2009) set prescriptive guidelines to assist authors with the writing and submission of articles within the bio-medical discipline. Attribution, however, can still be problematic. For researchers within the business and management disciplines, existing guidelines and protocols from the sciences can aid in attributing authorship, but there are potential difficulties in extrapolating from the pure sciences to business given the variances in team size and the inherent tasks to be assigned.

Attribution challenges experienced through the collaborative process appear to relate to such issues as order of authorship, working with students, individual workloads and credit, opportunism and plagiarism, honorary authorship, and ghost authorship. Intriguingly, the order of authorship is one of the challenges which has received the most attention (Grando and Bernhard, 2003; Hafernik et al., 1997; Holmes et al., 2009; Madiba and Dhai, 2006; Melin, 2000), followed by concerns relating to authorship with students and graduate assistants (Ashfield History Project, 1960-2010; Grando and Bernhard, 2003; Yonge et al., 1996). The issues of ghost authorship (British Sociological Association, 2010; Grando and Bernhard, 2003; Madiba and Dhai, 2006) and guest authorship (Madiba and Dhai, 2006), or honorary authorship (British Sociological Association, 2010; Mowatt et al., 2002), raise concerns regarding the inclusion of authors when there may have been minimal or no real contribution. For each of these challenges, fortunately, there are strategies which can be used to minimise the issues, and they are worth exploring as a means of reducing potential negative impacts and enhancing the collaborative process.

Who should be an author?

The issue of authorship centres on critical questions:

- Who has the right to be an author?
- Given the role or contribution to the project, what should be the order of authorship?

While there are some stated guidelines (see below), the above-mentioned questions can be better resolved through a more in-depth examination of an individual's roles and
responsibilities, level of contribution and accepted rules of acknowledgement within a collaborative project.

Questions need to be raised in reference to paper contributors, for example, what are the roles and responsibilities of the various contributors? This is the point where potential clashes of ideas, values and work ethic begin. As a starting point, to address potential difficulties it is recommended that team members, as soon as practicable, define roles and allocate responsibilities. These responsibilities could be both administrative and in relation to the writing of the paper (Tables II and III). Ideally, these roles should be discussed and agreed upon, preferably in writing, similar to a contractual agreement, at the beginning of the project to avoid potential future conflict. It is important, nevertheless, to be aware and acknowledge that these roles and associated tasks are not set in stone and may require a degree of fluidity, as tasks within the research process are re-assigned. There may also be overlap in tasks assigned. For instance, to ensure that the final paper does not read like a collection of paragraphs and sentences created by numerous individuals but, rather, reads as one synchronised voice indicating team effort, co-authors should read each other's contributions to ensure language flow, that ideas are connected, and that the academic content has merit.

The administrative and writing tasks that require assignment and delegation among the team are easily identified. The most common tasks connected with paper preparation and submission include: securing university ethics clearance, proof reading, ensuring spelling consistency (for instance, American versus British English), consistency of writing style eliminating observable jumps between co-authors' writing styles, paper submission and the tracking of submissions. If no response is received from the editors of a journal within a reasonable timeframe (four to five months), follow-up is required by a designated team member to ensure that the paper has not been lost or misplaced. Once the paper has gone through the first cut and the reviewers' comments are received, assuming the paper receives “revise and resubmit” status, work to address the reviewers' comments needs to be allocated. Additional tasks also include the preparation of a cover letter describing how the reviewers' comments were addressed in the revised paper, followed by the resubmission of the revised paper.

Of equal importance to authorship inclusion, is the question of authorship omission. The Australian Research Council, Australian Government: National Health and Medical Research Council (2007, p. 21) has indicated that any of the following contributions do not necessarily earn authorship of a paper:

- being head of department, holding other positions of authority, or personal friendship with the authors;
- providing a technical contribution but no other intellectual input to the project or publication;
- providing routine assistance in some aspects of the project, the acquisition of funding or general supervision of the research team; and
- providing data that has already been published or materials obtained from third parties, but with no other intellectual input.

In the debate on the roles and responsibilities, Holmes et al. (2009, p. 907) concede that if “potential co-authors do not participate actively and in a timely fashion, they do not qualify for authorship”. What happens when one of the authors does not contribute? Where do you, as a team or individual, draw the line? What if one of the co-authors is faced with prolonged
illness, or an illness in their family or other personal circumstances that impact on their contribution? What happens when one author is found to be plagiarising material from other sources, including their own work? The issue of “self-plagiarism” is debatable to say the least as it can take a number of forms. For instance, it is generally acceptable to use the same research methodology and literature review when a researcher(s) is undertaking longitudinal or replication studies. One, nevertheless, needs to be wary of this issue when an author uses the same material across different papers and journals without disclosing the sources; or when that author intentionally does not inform other team members of the same material being used in other publications. What implications does this have for the team and individual authors (not to mention the institution)? These are some of the realities of the process of writing and publishing. They become compounded when we are collaborating with people who have personal and professional responsibilities that make competing demands on an individual's time and energy, resulting in conflicting priorities and, at times, the taking of short cuts. What happens if the paper is rejected? In such instances, who is to blame – the reviewers, the editor, or members of the team? Who is to blame for a rejected paper or unfavourable comments from the editor? Is it the first author or the team? Ideally, the decision on which journal to submit a paper to would have required team consensus.

Whilst citing the recommendations of the International Committee of Medical Journal Editors in March, 2000 (Mowatt et al., 2002, p. 2770; Holmes et al., 2009; Madiba and Dhai, 2006) outline three criteria that need to be fulfilled for an individual to be an author:

1. “Conceiving and designing the review or analysing and interpreting the data (we considered the following contributions, common to the conduct of systematic reviews, to fulfil this criterion: conceived of or designed the review, designed the literature review, conducted the literature search, screened results of searches, assessed quality of included studies, abstracted data from included studies, performed statistical analysis, interpreted data, contacted authors of primary research, or industry, or supervised the work of co-authors, if any).
2. Drafting the review or revising it to make important changes in content.
3. Approving the final version before it was submitted to the editor based on the CRG through which it was to be published in The Cochrane Library”.

The ARC's (2007) Australian Code for the Responsible Conduct of Research also mentions guidelines for authors planning to collaborate and disseminate their information via papers. The ARC reinforces that:

Attribution of authorship depends to some extent on the discipline, but, in all cases, authorship must be based on substantial contributions in a combination of: conception and design of the project, analysis and interpretation of research data and drafting significant parts of the work, or critically revising it so as to contribute to the interpretation.

Similar guidelines, albeit from our perspective but with more flexibility, have also been outlined by the British Sociological Association (2010, p. 2):

- Everyone who is listed as an author should have made a substantial, direct, academic contribution (i.e. intellectual responsibility and substantive work) to at least two of the four main components of a typical scientific project or paper: conception or design, data collection and processing, analysis and interpretation of the data, and writing
substantial sections of the paper (e.g. synthesising findings in the literature review or the findings/results section).

- Everyone who is listed as an author should have critically reviewed successive drafts of the paper and should approve the final version.
- Everyone who is listed as an author should be able to defend the paper as a whole (although not necessarily all the technical details).

To sum up, “authorship practices should be judged by how honestly they reflect actual contributions to the final product” (Authorship Guidelines, 1999). However, it is often in the grey areas where problems occur. For example, the Code of Conduct for the Responsible Practice of Research (The University of Western Australia, 2009) emphasises that, if an individual has successfully secured funding or collected data, these requisites alone do not entitle authorship on the subsequent work. To assist with resolving these issues, the Committee on Publication Ethics (2010) provides direction and case studies to address disagreements associated with authorship. Similarly, Sahu and Abraham (2000) address the “rights and responsibilities” of an author, the latter including areas of order of authorship, leadership, giving recognition and credit for earlier work, and avoiding any potential difficulties with respect to plagiarism.

Order of authorship

A contentious point when collaborating is the order of authorship listed on the paper, with the first author usually denoting leadership of the research project. Alternatively, an author regularly being attributed second, third or fourth authorship on papers, without any declaration of level of contribution, may be perceived by colleagues and supervisors as an individual lacking leadership, vision and original research idea generation skills. If there are two authors, do we make an assumption that there has been an equal contribution? It should be noted that the contribution between two parties is not always black-and-white and, accordingly, the order of authorship becomes either “arbitrary or alphabetic” (Grando and Bernhard, 2003, p. 123; British Sociological Association, 2010). Some authors make a statement on their paper as to the percentage of individual contribution, or whether authorship has been finalised alphabetically with equal levels of contribution. It is noted that use of alphabetical order of authorship naturally disadvantages authors with family names towards the end of the alphabet, such as U, V, …, Z. Two research collaborators, involved in frequent co-authorship, may negotiate between them to rotate the first authorship (Hafernik et al., 1997).

Challenges in authorship attribution can become numerous with three or more authors. In such a scenario, the team needs to agree on the order of authorship and contribution. The challenge is further compounded when new authors become involved with an existing collaborative team. Where regular research collaborators have agreed to rotate first authorship, care must be taken to ensure that agreement to rotate the authorship order is based on actual contribution, not solely for reasons of courtesy, as, in the long term, this practice can lead to a breakdown of relationships and, more importantly, respect. It is apparent that “the way that authors set their names on articles may not always reflect the real situation” (Melin, 2000, p. 32). In disciplines, such as the sciences, it is common to form large collaborative work teams which, consequently, reflect in the publications (including acknowledgements). In contrast to the sciences, publications within the business discipline generally involve fewer than four authors.
Deliberation on the order of authorship is directly linked to referencing and citations. Depending on the chosen referencing style (for instance, the Harvard referencing style), generally, only the first author is cited in the text, while the remaining authors are denoted by “et al.”. As a result, in the long term, if the order of authorship is not rotated, appearing as the second half of the writing team may adversely impact on an individual’s research career and lead to tension within the team.

Madiba and Dhai (2006, p. 49) suggest that both the “eligibility and order of authorship should ideally be debated and decided before the paper is written, with each author stating his/her contribution”. An unspoken rule in relation to authorship is that the person who suggests the idea for the paper is allocated first authorship. Ideally, they would also make a substantial research contribution (Authorship Guidelines, 1999; Hafernik et al., 1997; Madiba and Dhai, 2006). Conflict and resentment may still result if the idea generator does not make any further contribution towards the actual researching, writing, editing, submission or revision of the paper. Is this person still entitled to lead authorship? The answer will be dependent on a number of factors such as the dynamics of the writing team, the individual personalities of authors, the initial contract and negotiation between the authors, and whether the team collaborates regularly. In some instances, the lead author may subsequently be willing to move down the authorship list after acknowledging the deficit in their contribution.

In another scenario, the order of authorship could be determined by the allocation of tasks. For example, Table III outlines some of the “intellectual” aspects of writing a paper/grant application that need to be finalised (along with administrative tasks) when assigning roles and responsibilities within a team. Assignment of tasks may be divided in numerous non-prescriptive ways, with each team developing its own particular style coinciding with circumstances and resources. Starting with the assignment of the lead authorship to the team member contributing the original research idea, the next task involves undertaking a comprehensive literature review. If a research assistant (RA) is involved in collecting literature or data, supervision and verification of the RA’s work by a co-author will be required to ensure that significant areas in the literature have not been overlooked. Depending on the team dynamics and writing styles, the abstract and introduction may be written by one person or contributed by the entire team. The same pattern may follow for the conclusion, recommendations and further research sections. Alternatively, teams may decide to split tasks, with one person writing the limitations and future research sections and another drawing the main conclusions from the findings section in summarised fashion. Once again, the team will need to finalise whether they will have separate “Discussion” and “Findings” sections or an overlapping “Discussion of the findings” section. Amongst these issues, we cannot overlook the research methodology section required in both qualitative and quantitative papers. In some instances, the choice of journal may determine the structure of the paper which will, in turn, dictate the allocation of tasks and, consequently, become the basis for the order of authorship of the paper.

To avoid order of authorship disputes, it has been suggested that the listing of contributors be on the basis of their role and contribution, seen as beneficial and equitable (Smith, 1997b). The British Medical Journal has taken the initiative in publishing both traditional author-named articles, and an alternative method of publishing which provides a list of contributors and guarantors (British Sociological Association, 2010; Smith, 1997a). The concept of contributorship has also been recommended by Madiba and Dhai (2006, p. 49), thus precluding the ranking of authors, with the authors and their contributions listed in the by line.
Authorship with students and research assistants/fellows

A senior investigator/academic may also be involved in the supervision or mentoring of students or another academic. The senior person's role, their order in the authorship and their contribution (or lack of) can, at times, also lead to dissatisfaction, frustration or even complaints from the student or mentee. This issue is particularly acute when there is a noticeable power imbalance between the collaborating parties (Yonge et al., 1996, for a possible agreement; British Sociological Association, 2010; Cooksey and McDonald (2010); Floyd et al., 1994; see also the Ashfield History Project for an example of another agreement in a research project). Specific questions relate to whether supervisors/mentors should be listed on every publication resulting from their students/mentees' work, and whether the latter party should be the first or second (or even last) author. It has been suggested that recognising and applauding their junior's work by making them the first author, especially if the junior member has done the majority of the work, is the correct way to proceed (Grando and Bernhard, 2003).

Work published from a thesis presents four authorship choices. The pros and cons should be discussed and agreed upon at the time of signing the student's candidature agreement. First, the supervisor(s) is to be listed as co-author on all the publications resulting from the student's work, at which time the order of authorship should be determined. Second, the supervisor(s), by default, nominates the student as first author, as they are responsible for collection of the data and the research process. This scenario becomes blurred if the original idea for the project had been suggested by the supervisor, not the student, even though the research was to be undertaken by the student. Third, there is agreement between the parties that the supervisor(s) will be co-author(s) only on an agreed number of publications resulting from the thesis and, possibly, with a timeframe determined, for instance, for a three-year period post-graduation. The fourth option is that the supervisor(s) are acknowledged in all resulting publications, but not as co-authors on any of the papers. There are many options with no written rules surrounding this area. The generosity and academic integrity of the supervisor(s) plays a key role in which of the above choices is made.

Similar tensions surrounding the order of authorship may arise when the work is being undertaken by a RA or research fellow (RF). In many instances, once the project has received funding, the RA or the RF may be involved with the research project from start to finish (i.e. literature review, data collection, designing the data collection medium – questionnaire or interview guide – data entry and analysis, and write up). Ideally and ethically, because of the extent of their contribution and involvement in the project, the RA/RF should appear as a co-author on the paper. This, however, is not always the case. The justification is that the RA is being employed and remunerated to complete certain tasks, and the original project idea originated from the academic. Although there is no steadfast rule surrounding this area, various academics, depending on their personality and discipline, include the RA's contribution in their acknowledgements. In reality, however, especially within the management discipline, this is currently a rare occurrence. Recognising this as an ethical but nonetheless practical issue, an agreement should be made. As a guideline, if the RA has undertaken significant work and it forms part of the paper's content (e.g. the RA researched and wrote the “literature review” section), they will be listed as a co-author on the paper. The key distinction is that the RA has provided a written contribution to the paper. This issue becomes a little bit easier in relation to the RF, especially if their name is on the grant application. Accordingly, having been involved from the inception of the project, their
contribution is comparatively less debatable and they are included as co-authors, albeit not always the first one.

A very useful set of guidelines has been provided by the 1996 President and Fellows of Harvard College (Authorship Guidelines, 1999) recommending the following criteria when planning to finalise authors and the order of authorship on a paper:

- Everyone who is listed as an author should have made a substantial, direct, intellectual contribution to the work. For example (in the case of a research report), they should have contributed to the conception, design, analysis and/or interpretation of data.
- Everyone who has made substantial intellectual contributions to the work should be an author. Everyone who has made other substantial contributions should be acknowledged.
- When research is done by teams whose members are highly specialised, individual contributions and responsibility may be limited to specific aspects of the work.
- All authors should participate in writing the manuscript by reviewing drafts and approving the final version.
- One author should take primary responsibility for the work as a whole, even if he or she does not have an in-depth understanding of every part of the work.
- The primary author should assure that all the authors meet basic standards for authorship and should prepare a concise, written description of their contributions to the work, which has been approved by all authors. This record should remain with the sponsoring department.

Conclusion

The reality is that most academics are required to research and publish to survive within the higher education environment and if seeking career progression. This pressure, often coupled with a genuine desire to seek other forms of academic interaction, has resulted in a need to more effectively identify and select potential collaborators. Research collaboration can, however, result in a unique set of challenges for both the team and the individuals involved. Collaboration can be a test of personalities, ideas and, more importantly, trust – the essential element connecting individuals in their roles as researchers and authors. This is not to say that there will not and should not be any conflicts in a team. Differences of opinion, rigorous academic debate, critical and constructive discussion of different views are often the ingredients required for a good team to continue to work for long periods of time and to produce a critical, well written and researched piece of work. However, it is at the point where the conflict becomes dysfunctional or when disagreements occur that a team's productivity can be disrupted, which can impact relationships.

We agree with Yonge et al. (1996, p. 366) that a collaborative research project should satisfy the following criteria:

- The research promotes ethical working relationships, compromise, and creativity.
- Professional and research ethics are observed.
- Collective thought is valued.
- Each researcher is motivated to participate and be accountable for the scientific integrity of the outcome.
Synergy among the members of the team promotes trust and cohesiveness.

First-time collaboration can form the foundation of a successful long-term collaborative relationship once any potential conflicts of personality, ego, desired levels of contribution and learning/writing styles are overcome. The development of open communication leading to trust has been found to be a significant determinant between cross-sector research and development collaboration (Couchman and Fulop, 2007). Trust, communication and attraction were also found to be at the core of the academic collaborative process framework developed by Sargent and Waters (2004). Morris et al.’s (1999) discussion of relationship marketing can be used as an analogy here, as during collaboration we are trying to maintain our loyalty towards our partners and collaborators. The significance of communication, shared values, uncertainty, and our behaviour and actions, all contribute to building a long term, successful “relationship commitment” (Morris et al., 1999, p. 661). Once understanding and trust have been established between individuals, and complementary strengths and skills ascertained, colleagues can embark on the creation of a high-quality research output. Trust is important in this context because of the intellectual property issues of transparency and ethical behaviour which are necessary to counteract opportunism and plagiarism (Melin, 2000). A “feeling of equity” of roles and responsibilities, and being perceived as being treated as an equal partner in the collaborative team are also essential to reduce conflict.

It is acknowledged that a collaborative research team is comprised of a number of individuals who have come together for a specific purpose, and that each member may have a different learning profile that is reflected in their work methods and communication. We know that individuals differ according to age and gender, and their general personality which is determined by upbringing and cultural influences. Similarly, undertaking research is, essentially, a learning experience but learning styles vary and Nachmias and Shany (2002, p. 316) “offer descriptions of the different ways in which people acquire knowledge, think, and learn”. Individual differences in learning styles and personality can potentially create conflict. To reduce, if not eliminate conflict, teams that are experiencing difficulties or may be embarking on a long-term project, where cohesion is essential in order to maintain both momentum and funding, could find it advantageous if team members undertook personality profiling. The individual results could provide an understanding and appreciation of the differences in work ethic, personality, learning and writing styles that could potentially later lead to miscommunications and misunderstandings.

An example of a widely accepted personality test is Myers-Briggs (MBTI, 2009; HumanMetrics, 1998-2008; Jung, 2009). The well-researched Big Five Personality Traits (Anderson et al., 2006) reveal that individuals exhibit different degrees of extraversion (sometimes called surgency), agreeableness, conscientiousness, neuroticism (sometimes reversed and called emotional stability), and openness to experience (sometimes called intellect or intellect/imagination). Nonetheless, one should also acknowledge that requesting co-authors to undertake any kind of personality or learning-style tests, may itself become a point of heated discussion and may be perceived as offensive or biased by certain individuals.

To further enhance the collaborative process, it has been proposed that there be clear identification of the collaborative project’s leader or “champion” (Lefley, 2006, p. 175). Traditionally, this should be the person proposing the original research idea who will assist in co-ordinating the management/administrative processes of both the research and the writing. The champion takes on the role of strategic team member selection, recruiting co-authors who are best able to add value to the paper, and, potentially, minimising chances of
personality conflicts. The strategies behind selection may vary depending on the requirements, skills, knowledge and status of the team leader. Strategic team member invitations may be issued due to reputation, expertise in either similar or complementary/multi-disciplinary research backgrounds, collegiality, or previous work or publishing history. The “champion” approach can also be used for the preparation of subsequent papers, and the “champion” could be varied for each paper.

For academics and researchers embarking on a collaborative research project and paper preparation, it is suggested that risks associated with dissatisfaction involving team member contributions, writing, order of authorship, and personality confrontations be identified, minimised and controlled. This may be achieved through early identification of the roles and responsibilities of team members, both at administrative and intellectual levels, and the establishment of clear protocols. Establishing clear expectations by addressing potential conflicts, miscommunications or misinterpretations, are imperative when working in a team, especially teams with multiple members or when a new contributor migrates into the group. The inclusion of new members and, consequently, an increase in team size has the potential to heighten collaboration issues which could lead to team disbandment. To avoid such a scenario and the potential negative outcomes requires insight and management.

Realistically anticipating challenges and addressing risks through the employment of contingency planning can make the difference between a successful versus a stressful or imploding collaborative experience. Identifying and understanding team member personalities, and clarifying expectations and timelines along with roles, can considerably work in favour of project completion. Leadership and strategic team selection is also important. Realising one's own strengths, abilities and ambitions, and strategically recruiting research team members with complementary skills and areas of expertise, will most certainly result in quality output and assist in reducing the risks posed by collaborating with friends. One's previous observations and experiences of collaboration provide valuable lessons that should be acknowledged rather than ignored when thinking of new collaborations.

Whilst this paper is conceptual in nature, it has suggestions for future research. First, in order to better ascertain the keys to successful research collaboration, it would be appropriate to undertake more comprehensive empirical research of the experiences of individuals who have been involved in collaborative projects. The empirical work will also assist in collection and documentation of collaborative experiences across disciplines and academic levels. Whether those experiences differ based on the researcher's academic level (for example, full professor versus an early career researcher who is new to the academic journey) will also be able to be determined. Second, the majority of the research currently published in the area of collaboration reflects experiences from the science disciplines. How the collaborative team dynamics work in other major disciplines, such as those in business schools, needs to be further explored. Last but not least, the contentious area of the real impact of information and communication technologies on productivity and, more significantly, on the long-term relationships between collaborators, would benefit from further attention. Collaboration can be a fun, learning, fulfilling experience that should be cherished and embraced as an important chapter in an academic’s life even with all the inherent challenges.
<table>
<thead>
<tr>
<th>Reasons</th>
<th>Collaborative work</th>
<th>Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government research assessment exercises</td>
<td>Facilitation of communication due to ICT developments (Abramo et al., 2009; Melin, 2000)</td>
<td>Cross-fertilisation of ideas (Katsouyanni, 2008; Yonge et al., 1995; Melin, 2000; Katz and Martin, 1997)</td>
</tr>
<tr>
<td>Pressure to publish (department expectations) regarding research informing teaching</td>
<td>Development in transportation modes and reduction in travel costs (Abramo et al., 2009; Melin, 2000)</td>
<td>Different discipline view points (Madiba and Dhai, 2006)</td>
</tr>
<tr>
<td>Increased workload to achieve more targets with fewer resources</td>
<td>“Gender”: females more likely to collaborate (Haferink et al., 1997; Burnett and Ewald, 1994; Hediner, 1998)</td>
<td>Increase in individual collaborators knowledge (Melin, 2000)</td>
</tr>
<tr>
<td>Competitive academic environment and greater efficiency needed in achieving research outcomes</td>
<td>Personality differences (Melin, 2000)</td>
<td>Increase in quality of publications (Presser, 1980; Sauer, 1988; Liggett et al., 1994)</td>
</tr>
<tr>
<td>Broader intellectual contributions sought</td>
<td></td>
<td>Quality assurance of written content and analysis (Haferink et al., 1997; Noel and Robert, 2004)</td>
</tr>
<tr>
<td>Culture of a country (Madiba and Dhai, 2006; Yonge et al., 1996)</td>
<td></td>
<td>Increase in number of publications (Abramo et al., 2009; Melin, 2000; Haferink et al., 1997; Floyd et al., 1994)</td>
</tr>
<tr>
<td>Change in government (and accordingly university) regulations to allocate funding (Madiba and Dhai, 2006; Dandar and Lewis, 1998; Rigby and Edler, 2006)</td>
<td>Globalisation and political restructuring (Glanzel and Schubert, 2004; Katsouyanni, 2008; Abramo et al., 2009)</td>
<td>High impact factor of journals (Holmes et al., 2009) and increased citations (Frenken, 2005; Katz and Martin, 1997; Katsouyanni, 2008; Rigby and Edler, 2005)</td>
</tr>
</tbody>
</table>

Table I. Reasons, facilitators, benefits and challenges of academic collaboration
Table I
Reasons, facilitators, benefits and challenges of academic collaboration

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Author 1</th>
<th>Author 2</th>
<th>Author 3</th>
<th>Author 4</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choosing and inviting the co-authors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;Contractual discussions&quot; about levels of contribution</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communicating and ensuring transparency between co-authors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supervising and integrating the work of co-authors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contacting industry partners</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Choosing the journal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appointment of the research assistant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proof reading (e.g. grammar, spelling and in text references) of the paper</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formatting the reference list</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contact the editor of the journal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Submission of the paper (via e-mail)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Submission of the paper (online)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complete online questions during submission</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recommending potential reviewers for the paper</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tracking of the submitted paper</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Writing cover letter for the revised paper</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resubmitting the revised paper (online/ e-mail)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disseminating reviewers’ feedback</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Addressing reviewers’ comments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Adapted from Mowatt et al. (2002) and Yonge et al. (1999)

Table II
Administrative-related tasks associated with papers
Table III
Roles and responsibilities with respect to research collaboration

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Author 1</th>
<th>Author 2</th>
<th>Author 3</th>
<th>Author 4</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idea for the paper</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finalising the research criteria</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undertaking the research</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial literature review</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Update of the literature review</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Checking the literature review undertaken by the research assistant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Title for the paper</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abstract for the paper</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Keywords of the paper</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completing ethics application for data collection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Introduction of the paper</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research method write up</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data collection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data entry</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data analysis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interpretation of the data</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data write up (findings)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discussion of the findings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall discussion of the paper</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conclusion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Limitations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Future research areas</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coming up with a framework/model</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drawing of framework/model (does the person who originated the idea draw it, or another person?)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identifying potential funding</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applying for funding</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Adapted from Mowatt et al. (2002) and Yonge et al. (1996)

Table III Roles and responsibilities with respect to research collaboration

References


**Corresponding author**

Gael McDonald can be contacted at: dean-bl@deakin.edu.au