Expanding the individual research 'Bubble' through student collaboration and mentoring

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Abstract

This paper draws from case studies of collaborations between a faculty member of an English Language Teaching professional graduate program in Japan and students selected to assist with research studies. While it is widely acknowledged that such research "mentorship" usually requires more work and patience than solo research efforts (or team efforts with experienced researchers) would, the author will attempt to show – through personal examples – the potential benefits yielded by such collaboration, both to the student and also to teacher him/herself. By guiding students into the world of research, and exposing the inner workings of experiments previously only seen in research reports, the research process itself is demystified, thereby enabling students to clearly articulate their own ideas in a practical and researchable manner. This practical knowledge combines positively with a discernable increase in students' confidence in their own ideas, thereby yielding tremendous potential for future student-initiated research collaborations. The teacher similarly gains from exposure to student ideas, thereby expanding the researcher's own "bubble" of expertise in new and exciting directions.

1. Introduction

In the present world of academia, with research publication being ever more emphasized, required, and rewarded by universities, it is only natural that professors would want to make use of graduate students (and, in some cases, specific undergraduate students with academic potential) to perform many of the more menial, monotonous, and/or time-consuming tasks involved in their own research. Beyond the rationale of lightening the professor's own workload, thereby enabling him/her to engage in more varied types of academic endeavors, such use of research assistants is widely assumed to be beneficial to the students themselves, as giving them hands-on research experience which they can then apply towards starting their own academic careers. What is less widely acknowledged, however, is that the tasks and limited responsibilities typically engaged in during research assistantships alone are rarely sufficient to give students a clear picture of the research they are engaging in, and even less so how to embark upon their own research. In order to fully prepare students to take a productive role in world of conducting research, it is necessary for the professor to engage in active mentorship. This mentor role is significantly more challenging and time-consuming than it would be to simply act as a manager or employer. Whereas in a manager role, the professor can simply direct students in the performance of specific tasks, mentorship requires making the student assistant a full-fledged partner in the research study, with full knowledge of the aims and procedures of the entire study, and even the right to offer their own opinions on such matters. This approach makes it incumbent upon the professor to give up a large degree of "ownership" over his/her own study in pursuit of expanding students' own knowledge of and interest in clinical, field, or action research. While dedicated teaching professionals will often still make the decision to sacrifice control of their research agenda for the sake of students, this paper will argue that, in addition to the widely assumed benefits to students, such mentorship relationships can yield more direct benefits to academics. Case studies of student research mentorship relationships will be analyzed to demonstrate that, by

engaging students directly in research investigation, students own unique ideas, talents, and knowledge can help the mentor to discover new paradigms for analysis of results often leading to a richer understanding of the research findings and possibly even initiating collaboration on future, student-led studies.

2. Research mentorship in academia

Formal research assistantship positions are a common feature of academic life. Teaching assistantship and research assistantship positions are both frequently offered by universities as a way for graduate students to gain practical work experience while also providing a means to afford their studies. For students pursuing academic work, the benefits of structured research experience in the course of their graduate education can be profound. In a study of tenure-track faculty in the U.S., it was discovered that those with experience as a student research assistant consistently published more and had more successful track records with research grant applications than those who had not worked as research assistants during their graduate school days (Porter & Umbach, 2001). It has long been acknowledged that graduate education alone does not adequately prepare many students for academic life (e.g., Walker, Golde, Jones, Conklin Bueschel, & Hutchings, 2008). Mentorship, which has been a mainstay in the business world for many years as a means of bridging the gap between education and full-inclusion in working life, has become an increasingly popular means of enhancing graduate students' research potential (Write-Harp & Cole, 2008). It has also seen increased application and popularity in *undergraduate* teaching, especially in the hard sciences, where such faculty-student collaborations, have become common (Katkin, 2003). In both cases, active research participation under the auspices of faculty mentorship enable students to get hands-on experience in research which can enhance their understanding of subject material. For graduate students, especially, who may be contemplating careers in academia, such experience is invaluable as it enables them to get an inside perspective on the profession they are considering joining.

In the Japanese context, such mentor relationships are hardly novel. Throughout the culture, from elementary schools to businesses, there is a common expectation that younger, less experienced people (*kohai*) pay deference to older, more experienced colleagues (*sempai*) (e.g., Haga, 2004). This outlook makes it relatively easy to establish mentorship programs within Japanese universities, whether they be formal, as in the case of the Graduate Teacher Researcher Assistantship program (Sakamoto & Tamanyu, 2014) at Sophia University (Tokyo), wherein graduate students are paired with faculty researchers in order to practice specific skills (e.g. conducting studies, teaching classes, publishing papers, presenting at conferences, etc.), or informal relationships cultivated directly between professors and students. Mentorship in academia has been well studied (e.g., Johnson, 2002), and several discrete beneficial functions have been identified, including facilitating career development and transition and providing psychosocial support (McCarron, 2006). In a study on the effects of formal graduate mentorship, Sakamoto and Tamanyu (2014) found that such student-faculty collaboration was effective in training students for academic life, and provided valuable opportunities for scholarly development; however, the relative benefit and quality of the mentor/mentee relationships were directly tied to the time and effort put on the development of the relationship. Such findings have led to many institutions trying to incentivize faculty to cultivate such mentor relationships with both graduate and undergraduate students through incentive grants and training awards (e.g., Cepanec, Humphries, Rieger, Marshall, Londono, and Clarke, 2016).

3. Case Studies: Research Mentorship and Collaboration with Students

Herein I will discuss three cases of mentorship with students centered on research studies with the goal of showcasing both the difficulties and the benefits these collaborations produced. The three will be discussed serially, as the projects engaged upon were independent of each other. Two of the students were graduate students in the English language teaching masters-level program where the author is employed, and the third was a high-caliber undergraduate student with professional interest in linguistics and language teaching (and currently a graduate student in the field). The research goals, as well as the training and mentorship involved in achieving the research aims will be discussed, along with feedback from student collaborators. Feedback was obtained through informal interviews (as the focus was on the research project itself – not on the process of training student collaborators). The interviews were conducted, taking written notes at the conclusion of the research collaborations. Written notes from discussion meetings during the course of research collaborations were also consulted for this research. Later discussion will attempt to draw attention to similarities in benefits to both students and researchers gained through such research mentorship.

3.1 Case study #1: Mentorship for fostering excellence

3.1.1 Subject

"Yumi" (pseudonym) is a high-proficiency English speaker from southern Japan. She was approximately 30 years old, and had worked in the business world before deciding to get into the teaching profession. She had previously taken courses taught by the author and had been identified early on as having substantially more interest in research and theoretical endeavors than most of her cohorts (as the graduate program is a considered to be a "professional" program, there is explicitly more emphasis on practical teaching methodology than on language acquisition theory), and thus a good potential collaborator. She was in her terminal semester of the graduate program when asked to join one of the author's research projects.

3.1.2 Research project

As Yumi was invited to participate in an ongoing project, she – uniquely, among the cases described in this paper – was uninvolved in the initial data collection process, but rather, was given complete control over the data analysis portion. The project itself was a study of Chinese character identification by non-native speakers which the author had conducted at a Chinese language center in Taiwan. The analysis of the project entailed recording thousands of test responses into a spreadsheet, and then conducting statistical tests to determine correlations between level, L1, and L2 processing strategies.

3.1.3 Mentorship activities

Yumi had previously taken graduate level research methods classes (from the author), including components on using statistical measures; however, the analysis of such a large and complex project required frequent meetings to discuss how to go about designing implementing the statistical tests. As several different factors were being measured and compared, the mentorship enabled a hands-on, concrete practicum for Yumi to use several statistical measures, including T-tests, Chi-square, and ANOVA. Because of the large number of variables needing

to be controlled in various analyses, the student had to be aware of every minute detail of the study procedure and the theoretical rationale and aims of this line of research, so discussion became very detail-oriented, and some statistical tests were repeated multiple times until everything was properly controlled. This analysis work extended for nearly half a year.

3.1.4 Mentorship results

Yumi, herself, describes this as her "first step into the world of research," and that the degree of fine-tuning and complex thought required in the planning, production, and analysis of such research was "eye-opening" for her. She had previously been pondering undertaking doctoral research, and according to her, the work on this project had pushed her definitively in that direction. Early on, the author had given her the option of either receiving an hourly wage for the work performed on the project or to join as a co-author in publishing the project, and she chose the second option in anticipation that such publication activity would enhance her competitiveness on future doctoral program application. Furthermore, the student (by this time having graduated from the master program, and working as a teacher elsewhere in Japan) seized the opportunity to present the research with the author at an international conference in China.

3.1.5 Benefits of the mentorship

Obviously, for Yumi, the benefits for such collaboration were tremendous and very concrete, given her future professional goals. She got "hands-on" training in various types of research design and analysis, as well as being able to make her first academic conference presentation (as well as having the potential for journal publication in the future). While the work expectations were both voluminous and high, for a future academic, embracing such an opportunity for mentorship seems like a rather obvious decision. What about for the primary researcher (i.e., the author), however? In all probability, the amount of work and time undertaken in the mentorship vastly exceeds the amount that would have been necessary to do the work myself. I will readily admit that, in order to economize time, I would have likely hired someone to do the transcription work anyway, but had I undertaken the analysis work, already being fully acquainted with the aims and procedures of the project, as well as having a fuller grasp of the statistical methods needed to analyze the data, it's likely that the analysis would have been completed within 1-3 weeks, rather than six months. The number of meetings and the amount of explanations required to undertake the project was roughly analogous to teaching an extra class. Therefore, the question is *was there any value to the lead researcher* (i.e., the author) *to engage in such mentorship rather than conducting the research alone*. This case provides some of the clearest evidence of direct benefit of fully including students in research endeavors. While much of the time in my meetings with Yumi were devoted to instruction in how to conduct statistical tests and the undergirding logic and parameters to research design, the flow of information was not one-sided. Indeed, at several points, Yumi was able to introduce new ideas and lines of inquiry into the research which had never occurred to the author. While Yumi is not a Chinese-speaker, still, as a native Japanese speaker (and thus, one familiar with the Chinese character system), she was able to bring new insights into the study that the author would have missed. On the purely practical side, she just happened to be a master of Excel, and managed to teach the author some new tricks for spreadsheet management. Finally, the bonds built through the research collaboration (and subsequent reporting) have their own value. Through the process of the study, Yumi was able to elaborate upon the ideas

being discussed, ultimately coming up with at least two possible future studies of her own (one of which there is currently in planning stages to be conducted in collaboration with the author).

3.2 Case study #2: Mentorship to assist struggling students

3.2.1 Subject

"Mamiko" (pseudonym) is from central Japan. She enrolled in the graduate English language teaching program straight out of undergraduate school, and as such, had no teaching experience prior to commencing her graduate coursework. She had encountered numerous problems over the course of her tenure in the program, frequently having trouble following lectures and not handing in assignments and essays that were poorly constructed and frequently late. The research collaboration was conducted in the first semester of her second year in the program.

3.2.2 Research Project

The research project Mamiko assisted on was a study regarding trends and effects in Japanese and English-medium written peer review during the essay writing process. Mamiko, along with another graduate student (not featured herein) was tasked with reading papers collected from two undergraduate academic writing courses, and enumerating and classifying the peer comments obtained during review sessions according to a prescribed rubric. The two graduate students were expected to independently evaluate all of the papers, keeping careful notes of their classifications, and then compare their notes. In cases of disagreement in classification, the author cast the deciding vote.

3.2.3 Mentorship activities

The project required full explanation of the goals of the research (which were to determine how both peer commentary and authors' reactions to it would vary, depending upon whether said commentary was delivered in the students' L1 or L2), as well as substantial training for the students to be able to accurately classify the comments according to type. Follow-up meetings were conducted to assess progress, as well as for the author to rule on disagreements in classification between the two graduate assistants. Students were paid (hourly) for their work, which lasted about 3 months during a singled semester. While the author conducted the statistical analysis himself (in contrast to Case Study #1, above), the two students were made aware of the procedures for analysis, as well as the results, and were given full credit before their peers for their efforts. The students were invited to present the results in-class along with the author.

3.2.4 Mentorship results

This mentorship was decidedly more limited in scope than in Case Study #1; however, this is largely a result of the fact that the goals of the invitation to research mentorship were very distinct from that case. In the case of Yumi (i.e. Case Study #1), the invitation was proffered due to the perception of exceptional research potential to be nurtured. In this case, by contrast, Mamiko was invited to participate in the research project out of concern that she was floundering academically and professionally, and with the hope that some hands-on experience would help her to better conceptualize academic course content, and thereby help her to improve her own performance in the graduate program. Mamiko was far from unintelligent,

being just as capable of insightful in-class observations as any of her peers, but was having trouble with visualizing some theoretical constructs due to their abstract nature. She furthermore had admitted several times having trouble reading and understanding papers concerning primary research (especially anything using quantitative methodologies). As such, it was hoped that by gaining an inside perspective on a study, that she would be able to positively transfer that knowledge towards facilitating understanding of other studies.

Fortunately, the research collaboration did produce some of the desired results. Mamiko's subsequent course performance, while still not excellent, improved substantially. In her final semester in the program, she decided to retake a course (which she had previously almost failed) with the author which focuses largely upon psychometric experimentation, and the improvement was staggering. She often used the study she had participated in as a point-of-reference for identifying experimental procedures, thereafter. After graduation and upon taking up a high school teaching position elsewhere in Japan, Mamiko was excited about opportunities for conducting action research in the classroom, which (by her own admission) she previously would not have even considered as a possibility.

3.2.5 Mentorship benefits

This particular case study used research collaboration as a means of remediation of academic performance. The benefits for Mamiko were mostly that of improved ability to follow the more abstract aspects of coursework, as well as to read and comprehend research literature. Just the fact that she was no longer "intimidated" by research, and in fact was looking forward to trying her hand at teaching research upon launching her professional career has to be seen as a sizeable positive result of the collaboration. An unexpected possible bonus, according to Mamiko, was that in the course of reading dozens of undergraduate essays and analyzing them in order to classify the peer review comments, she discovered that her own knowledge of English essay structure and style was improved. She claimed that she was able to reverse engineer the writing styles and rhetorical "tricks" she observed in the papers and to apply them productively to her own essays in her graduate coursework. While the author cannot comment directly concerning whether or not there were any notable improvements in her essay writing ability, it is still a notable and encouraging side-benefit of the research collaboration.

For the author, the benefits of the collaboration are less concrete than in the case of Yumi. While there is definitely a case to be made for the benefits of hiring Japanese L1 speakers to perform the analysis work – especially of those peer comments made in the Japanese language – realistically, any Japanese student (graduate or undergraduate) could have done the same work. Why take on the added work entailed by giving the responsibility to an underperforming graduate student? In this case, most of the benefit to the author took the form of Mamiko's increased classroom performance, which translated into reductions in the amount of time spent required assisting and/or monitoring her engagement and output in subsequent courses. Additionally, there was the benefit of improved relationships produced by the collaboration. Subsequent to the shared research experience, Mamiko was more forthcoming both inside and outside of the classroom. She shared more in class, and was more willing to communicate both successes and struggles with coursework to the author in courses he instructed. Finally, as Mamiko had been in the habit of emailing regular updates of her progress while working on the research project, the author found that this habit transferred spontaneously and positively to her coursework, as she suddenly became immensely more communicative, sending frequent status updates on assignments. While these benefits were

much less "tangible" than the case of Yumi (at least concerning future research agenda), still the improvement to in-class performance variables was significant and seemed to validate the decision to invite her to participate in the project.

3.3 Case study #3: Mentorship of an undergraduate student with graduate potential

3.3.1 Subject

"Hikari" (pseudonym) is an exceptionally gifted student from western Japan. Having a "confusing" background combining stints living overseas and international schooling, her English proficiency (while technically her L2) is in many ways higher than her Japanese (L1) proficiency. Her high language proficiency and academic performance brought her to the author's attention while she was enrolled in the undergraduate introductory linguistics class that he teaches. Over the course of the semester, as she realized how linguistic theories and phenomena fit into (and helped to explain) patterns within her own life, she "fell in love with" linguistics, and realized that language teaching and linguistics sciences could be her professional calling.

3.3.2 Research activities

Given her burgeoning interest in the field, and the perception of her academic potential, the author invited her to work as his research assistant in two different projects over the course of a year and a half. Both projects entailed psychometric testing procedures to determine lexical retrieval procedures in visual word recognition by Japanese learners of English. A laptop computer loaded with *DMDX* software and an experiment program script was checked out to Hikari, who was tasked with recruiting 30 students (for each study) to take a 10 minute computer test. All test-takers had to fit a certain demographic profile, and testing had to be conducted in a quiet area where the test-taker would be able to concentrate on the test exclusively. At the conclusion of the testing phase, the laptop was returned to the author to perform statistical analyses.

3.3.3 Mentorship activities

Given the nature of the author's research work, he has hired and worked with untold numbers of undergraduate assistants doing similar testing work; however, this was the first such undergraduate research assistant with a declared interest in both the work (beyond generating a paycheck) and the research results, and as such, Hikari was invited into much deeper involvement with the projects upon which she participated. Whereas most such assistants merely need to know the parameters of the actual job they are doing, and many have little or no interest in the purpose of the actual test, Hikari was brought into full participation with the aims, procedures, and methodology of the experiments, and was anxiously awaiting knowledge of the results both times. As such, her case involved many more meetings to discuss progress, possible problems in testing to resolve, and the statistical testing procedures themselves. While her knowledge at the time precluded her from being of direct assistance in the statistical analysis of the results, there were still attempts to explain what the tests (in these cases, t-tests and ANOVA tests) were and how they worked.

3.3.4 Mentorship results

Hikari's initial interest and enthusiasm for language science deepened immensely over the course of the mentorship. Through the mentorship, she acquired a much better understanding of the sorts of research inquiry which can be pursued within the linguistics field. During the course of subsequent study, she zeroed in on a sociolinguistic subfield of interest upon which she was able to conduct direct investigation under the auspices of another faculty member (as recommended by the author who does not do such work himself) which ultimately led to several conference presentation and journal publication opportunities while still an undergraduate. Currently, Hikari is pursuing a Master degree in language education in North America, is planning to pursue her education through a doctoral degree (with hopes of eventual employment in the tertiary education sector) and she is still in regular contact with the author.

3.3.5 Mentorship benefits

The biggest benefit for Hikari was the development of professional interests and a career path. While she has accomplished much since, the mentorship activities were her first real foray into the field of language acquisition research, and it was by nurturing and honing her interest in such that she was able to find her own linguistic subfield upon which to make her mark. Even though her interests have turned towards sub-disciplines in which she was best served by working with other academics, by her own admission, it was the initial mentorship which turned her spark of interest into a steady flame, which has only grown in strength over time.

For the author, the benefits have been ongoing, and arguably the mentor relationship shows no signs of abating. The degree of pride felt in watching such academic talent, nurtured from seed form, blossom so spectacularly cannot be underestimated. Having watched Hikari move from a mere interest in linguistics to publishing and presenting at academic conferences while engaging in graduate studies has been heartening. It is the case of watching a student slowly turn into a colleague, and being blessed with the opportunity for input all along the way. While, to date, we have not engaged in any collaborative research activity since the two projects she was hired to assist with, such collaboration is something we both would like to engage in in the future, and it's likely to happen at some point. In the meanwhile, Hikari sends regular updates regarding her graduate studies and her research agenda as it slowly takes shape. The author fields regular questions about homework, papers, and the like, and has ultimately enjoyed the ability to speak on increasingly complex levels about theories, models, practices, and academic life in general with this former student.

4. Discussion

The three case studies discussed herein are meant to showcase differences in aims, procedures, and results of research mentor relationships with students. In each case, the reader will note that there were benefits both to the student and to the researcher (author). The case of Yumi probably represents the most direct type of *quid pro quo* research relationship between (especially) graduate students and instructors. She was recruited due to perceived academic potential, and that potential was cultivated, ultimately enabling her to become a full-fledged research *collaborator*, and even (in the near future) the primary investigator, whereupon the roles between the author and the former student will, in many ways, be reversed. Hikari was, likewise, a case of academic potential being discovered and fostered, but at a much earlier point in life. Due to a lower level of academic knowledge and experience, she did not reach as high

a level of collaboration as someone like Yumi (nor was there any expectation for her to do so as an undergraduate student), but the potential for similar research collaboration in the future exists as Hikari continues to hone her academic potential. Given the increased prominence and popularity of undergraduate research collaborations, her case truly seems to validate the potential benefits of bringing such young (and usually inexperienced) students into full participation in research studies. Finally, the case of Mamiko is easily the most dissimilar of the three. She was selected not for high academic potential, but rather as more of a means of academic intervention. The author has no real expectations of any future research collaboration or other direct benefit of the mentorship; however, by entrusting her with responsibility for a research project, Mamiko was enabled to significantly improve her academic performance, and generally that entrusted responsibility seemed to be paid back within the classroom context. While potentially counterintuitive, her case seems to indicate that, in select cases, research collaboration and mentorship can be used equally effectively for remediating "problem students" as for cultivating the talents of "superstar" students.

5. Conclusion

The mentorship experiences described herein are probably far from atypical. The author, like many academics, regularly finds himself in the position to hire students to perform menial and/or time-consuming tasks associated with research. Not every such employment relationship involves such active mentorship or prolonged contact, and it is not the contention of the author that they should. In many (or possibly most) cases, it is well enough that students need a job and academics are better served hiring them than by performing "grunt labor" themselves, and that is the extent of the relationship. The contention of this paper, as showcased in the three case studies described herein are that more intensive mentorship through research activities can be used productively towards accomplishing a number of aims. Firstly, the assistantship of the students simply facilitates accomplishing research aims, but by expending time in effort in mentorship, there are numerous attainable benefits to both student and professor. By leading students into full participation in research activities, academics can benefit from students' ideas and experience, and if the students have sufficient interest in the field, such relationships can lead to later research collaborations headed by the former students themselves. Beyond merely advancing research aims, however, research collaboration can also be used as a means of pedagogical enhancement, granting weaker students hands-on experience and confidence which will help them to more fully grasp classroom content.

Looking at the cases detailed herein, some general pieces of advice for aspiring research mentors become apparent. First, recognize that there need not be a rigid division between research and pedagogy, and that it is through effective mentoring (whether of graduate or undergraduate students) that the two activities become maximally complementary. The "hands-on" component of conducting research can be used to fulfill and enhance pedagogical goals. Secondly, the time spent in research mentoring, while potentially daunting, truly does have the potential to pay dividends. Dividing research tasks among many partners enables the researcher to accomplish more in a shorter time frame. Those hours invested in turning the student into an effective research collaborator will ultimately yield time savings from reduced labor (compared to solo research activities). In addition to time savings, by enabling students to fully collaborate in research, the researcher gets the full benefit of the student's individual talent, experience, and knowledge, often leading to better overall results in the experiment. Finally, don't make the mistake of thinking that one can't learn from one's students. Once empowered as a full

collaborator, students may make surprisingly acute observations which can either revolutionize your perceptions of the present study or lead to exciting future investigations. As it is always beneficial to expose one's ideas to critical inquiry and outside review, to discount the potential for students' insight into our research is to ignore a valuable source of feedback and thought.

The three case studies here cannot be taken as the sum total of possible experiences, as case studies are, by their very nature, individualistic. It is likely that there are as many possible research collaboration results as there are students; however, these are offered to the reader in order to open minds to the possible advantages to opening up one's research agenda to more active student participation.

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