Scientific
Research

Forging a Template for Undergraduate Collaborative Research: A Case Study

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Undergraduate collaborative research is highlighted in many university initiatives; however there is a lack of exemplars in disciplines that do not employ the scientific method. "Pop Music Reviews" was an attempt to forge a template for Women's and Gender Studies. This paper presents a description of the pilot project and provides qualitative assessments by the first- and second-year students, fourth-year teaching assistant (TA), reference librarian, and professor. Together, the appraisals indicate that there are two different but equally necessary components for a successful collaborative research endeavour: the structural setting and the social and emotional environment. In both these components, there were weaknesses in the areas of planning and background training. Yet, the benefits as perceived through the experiences of the various participants were significant. Reported gains included increased understanding of research processes and applications, enhanced critical thinking skills, expanded disciplinary knowledge, improved student motivation and confidence, greater interest in graduate studies, and the fostering of collegial interacttions and mentoring.

Keywords: Collaborative Research; Critical Thinking; Research Skills; Women's and Gender Studies

Introduction

"Pop Music Reviews" was a pilot project in undergraduate collaborative research at the Pauline Jewett Institute of Women's and Gender Studies at Carleton University, Ottawa, Ontario (2011). The key goals were to enhance student research skills, cultivate departmental integration, and augment the body of knowledge in the discipline. Additionally, the project was intended to create a basis for a functional model in undergraduate collaborative research because one was not in place within our department, nor was a relevant template readily available from neighboring universities or related fields. In the beginning, the endeavor looked to be relatively small and simple with straight-forward educational concepts and well-established pathways. Challenges along the way, however, revealed pitfalls and complications in the current state of undergraduate collaborative research programs. Ultimately, "Pop Music Reviews" was deemed a success and now frames a foundation for future integration of research and learning activities. This paper presents a description of the project and provides qualitative assessments by the students, teaching assistant (TA), professor, and reference librarian in the hopes that sharing our experiences will be of benefit to others who are committed to advancing team research activities at the undergraduate level.

During our initial search for a useful template, the question arose as to why undergraduate collaborative research is regularly touted but seems to be rarely practiced in the arts, humanities, and most social science fields (with the exception of psychology). The general benefits of such activities have been verified and established for more than a decade. The publication of the Boyer Commission's report on educating undergraduates in research universities spurred a host of collaborative projects and programs (Kenny, 1998). Since that time, multiple studies have overwhelmingly demonstrated that undergraduate participation in collaborative research has positive learning outcomes (Kardash, 2000; Taraban & Blanton, 2008). As a result, many institutions of higher education, including Carleton University, have inaugurated comprehensive agendas for promoting hands-on undergraduate collaborative research (Research at CU, 2012). Even so, these initiatives typically do not enjoy equal access, involvement, or rewards across the various academic disciplines (Craney, McKay, Mazzeo, Morris, Prigodich, & De Groot, 2011).

Much of the undergraduate collaborative research activities have been and continue to be carried out in fields of study that employ the experimental method (biology, chemistry, physics, psychology, and engineering, among others). In conventional laboratory-related research, the utilization of undergraduate student researchers has been shown to be effective in terms of time, cost, and faculty and departmental recognition. Accordingly, the analyses of science-based undergraduate research programs tend to reflect the gains in terms of efficient learning of the scientific method, greater departmental retention, and higher levels of graduate school entry (Bauer, 2003; Seymour, Hunter, Laursen, & De Antoni, 2004). In the non-laboratory social sciences, arts, and humanities where the traditional experimental method is less common or non-existent, there remains a lack of participation, exemplars, and outcome evaluations. Our quest for a relevant model showed that the absence of a definitive undergraduate collaborative research program in our Women's and Gender Studies department was

not unique. A need for prototypes and support appears to be shared across many areas of study.

Project Background and Overview

United by the broad premise that collaborative inquiry, investigation, and discovery are at the heart of the academic enterprise in Women's and Gender studies, "Pop Music Reviews" was initiated by professor Debra Graham, institute director Katharine Kelly, and reference librarian Janet Hempstead. Graham implemented the project in two of her courses on gender and popular culture: a small first-year seminar class ("Sex and the City") and a second-year class ("Gender and Pop Culture") that utilized two fourth-year TAs (Ronald Couchman and Virginia Carney). Kelly acted as internal advisor, external liaison, and general support. Hempstead directed all activities related to secondary research. A series of discussions amongst the three led to the fundamentals for the research premises and design.

"Pop Music Reviews" was developed as the collaborative research instrument for three critical reasons. First, popular music and its criticism in specialty magazines and fanzines (print and online publications) constitute one of the key sources of gendered associations, assumptions, and definitions for contemporary youth culture. In other words, the research topic of music reviews had appeal and relevance for the undergraduate students. Secondly, while musical genres and lyrics have been the subject of many gender related studies, mainstream music journalism has received little systematic scholarly attention in Canada. Thus, the popular content not only had the potential to be motivating for the individual students but also could be meaningful for the larger discipline. Finally, the structure of the project entailed a linking of activities and associations that promised to be beneficial for integrating and promoting departmental academic accomplishment. In short, the content and framework of the project were developed to serve our students, department, and discipline.

The general division of duties and responsibilities in "Pop Music Reviews" provided for all invested parties to make major contributions. Professor Graham orchestrated the overall drafting and delivery of the plan, established the deadlines, and supervised the performance-based components. The work of 72 first- and second-year undergraduate students furnished the primary research data and some basic analyses. Librarian Hempstead developed and guided the secondary research program. TAs Carney and Couchman assisted students with a variety of challenges, and acted as liaisons between the professor and class members. Carney and Couchman were also offered the chance to evaluate the data and write up the study under the guidance of Graham as a directed independent study course during the subsequent semester. Couchman continued the project using this option. Kelly provided methodological advice throughout the process to all participants and handled everything beyond the classroom that arose within and outside of the institute of Women's and Gender Studies.

Research was conducted during the curriculum-based semester; however much work was required beforehand and afterwards. Prior to introducing the project into the classrooms, Graham produced the basic research documents: objectives and background, research question and methodology, directions, consent forms, data report sheet, and questionnaire. Hempstead developed the library assignment, created online help sites, and helped produce a working bibliography. Kelly provided information on how to move the plans through the University ethics committee and approval systems in a timely manner. She also formed the venues for explaining the project goals and progress with the other professors in the department as well as sharing the information with administrators, including the Dean, Provost, and President. Moreover, Kelly created the project evaluation tool that was completed by the students at the close of the term. At this point, the project was ready for delivery in the classroom setting.

During the first few weeks of the semester, the students received a general introduction to research by Graham and the TAs, whom emphasized the importance of integrity for obtaining accurate results. Through lecture, discussion, and in written format on the course websites, the students were given the list of the project's objectives, a detailed set of directions, summary of background case studies, the research question and methodology, and explanation of project limitations. All students were supplied with consent forms, a data report sheet, and questionnaires; first-year students also were provided with a starter bibliography.

For the primary research element, each class member selected two music review articles based on her or his own preferences from current issues of CHARTattack, a popular Canadian online music magazine.[1] The only choice requirement was that one review had to feature a male performer(s) and one had to highlight a female performer(s). The student-researcher then presented the consent form and the two articles in one-on-one, face-to-face interviews with four university-aged peers of his/her choosing who were not enrolled in the participating courses. After the interviewees consented to the project and read the materials, they were given the written questionnaire. Student-researchers had the opportunity to add their own set of questions and a discussion component to the end of the standardized interview session. Likewise, a space was devoted for additional comments by the interviewees. In order to compile the data, student researchers completed a report form that registered basic information such as titles of the articles, interview dates, age, race, and sex of interviewees, and so on.

The secondary research portion was launched early in the term. For the first-year students, Hempstead conducted a session and activity in the library's instruction room. These students received a few points towards their final project grade by successfully completing the research activity assignment. For the second-year students, Hempstead delivered an in-class lecture in which she reviewed basic search skills and further explained more detailed tools relevant to this project. For both classes, she created web-based library course pages. These sites highlighted important resources for research, interviewing, and writing, and contained contact information for Hempstead as well as the library help desk.

TAs Carney and Couchman, who led tutorial sessions for the second-year students, were integral connectors in the research process. In weekly meetings with Graham, they reported on class members' emotional responses (excitement and fears),

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[1]CHARTattack is a Toronto-based site that launched in 1996 as the online component of *Chart Magazine* (which ran from 1991 to 2009). Prior to October 2011, CHARTattack claimed it was a leading Canadian source for pop music information and reviews. In October 2011, the owners sold CHARTattack to a small media company called andPOP, whom have since rebranded the site as an indie and alternative music space.

areas of confusion, and problems in implementation, which could be addressed in lecture and/or by slight modifications to the plan. Carney and Couchman also gave direct support for student needs on a wide range of issues. During their sessions, they answered a multitude of research questions with particular emphasis on when and how to cite sources of information, as introduced in the library session. They also played an important role in boosting students' confidence for the interviews and written portions of the project.

Towards the end of the semester, after completing the primary and secondary research, each student was required to produce an "Assessments and Results" paper, which was submitted electronically to the course website. This written assignment compelled students to formulate their own critiques of the articles' content as well as present analyses of their interview findings. The paper format included the data report (cover sheet), text, end notes, bibliography, and appendices A (copies of the articles) and B (copies of the completed questionnaires). Consent forms were turned in under separate cover as stipulated by the ethics guidelines. Following the "Assessments and Results" paper deadline, the project evaluation (produced by Kelly) was carried out by the TAs.

After the semester ended, Couchman commenced with analyzing the 287 interviews and 72 "Assessments and Results" papers as part of his independent study option. The collection and assembly of the interview forms were problematic on two fronts. Students were supposed to attach scanned copies of their interview sheets as appendices to their papers in a single format. Unfortunately, technical difficulties with the University scanners in combination with the firm deadline caused the interview sheets to be reproduced in an array of media and delivered in a multitude of ways to several different destinations. Moreover, the hand-written data on each form had to be individually input into a computer program, which took more time than we had estimated. In hindsight, these problems could have been easily solved if the questionnaire had been produced and executed using current online survey software, such as FluidSurveys or Survey Monkey.

Despite the challenges in data gathering, Couchman and Graham carried the project to conclusion with assistance from others on the team. Kelly helped Couchman set up a statistical analysis program and Taylor Grant (one of the participating second-year students) aided with data input.[2] Through the process of considering the qualitative observations and running the statistical analysis, Couchman was able to clearly identify and map sets of patterns. The results of "Pop Music Reviews" strongly suggest that in the contemporary Canadian music press, women are underrepresented and a gender bias is placed on the value of a performer/performance. Couchman and Graham shared the findings of "Pop Music Reviews" through several venues: they delivered a joint conference presentation (Couchman & Graham, 2011) and co-authored a paper intended for publication.[3] As a final step, all participating students and CHARTattack representatives will receive notification of any and all future publications.

The framework of "Pop Music Reviews" for an undergraduate research project was sound, the spirit of collaboration remained true and upbeat, the findings were significant, and the

participants were generally pleased with the process and outcomes. Yet, there is much room for improvement. What follows are specific insights into the difficulties and attainments of the project from the points of views of students, TA, librarian, and professor.

Student Evaluations

To evaluate "Pop Music Reviews" from student perspectives, we used two sets of documents: voluntary written comments by interviewees and the student researchers' post-project evaluations (n = 51), which were comprised of open-ended questions. Both sets indicate an overall positive response to the project. Nevertheless, the complaints and recommendations are an important place to start because they have the most promise for improving our template and future endeavors. While no particular patterns of negativity could be discerned in the interviewees' commentaries, the student researchers' answers revealed four areas of weakness—technology, student expectations regarding performing primary research, dealing with the lack of predictability, and time management.

The most common suggestion by the student researchers was to employ a user-friendly computer program for data input and collection. Typical of the remarks, one student wrote "Paper surveys are more difficult to administer. Online surveys would reach more people, would eliminate scanning and save trees ☺." Clearly, the recommendation for using up-to-date technology, even while retaining the face-to-face format, is well-founded and should be instituted with proper training for faculty and staff.

Many students noted that they did not anticipate doing primary research in Women's and Gender Studies coursework and further stated that the prospect of primary research was daunting for them, as demonstrated in the following excerpts from the evaluation forms.

> Before the course, research to me was just finding journals online and books in the library. I just expected to do what I normally did.
> Overwhelmed but I felt supported by the structure and extra information provided.
> It was intimidating because I had never done it before; however, it was exciting to be doing something different.

Performing primary research individually and in groups should be foreseen by undergraduates in all disciplines because it is one of the core fundamentals of academia. The disclosures by the student researchers indicate a compelling need for more participation by faculty and staff in creating comprehensive research curricula in the areas outside of laboratory-based studies. Increased collaborative participation depends on more models and targeted support for work in the underdeveloped fields; otherwise, these subjects of academic research will continue to be carried out in traditional individualistic modes.

The evaluation comments further reveal that students who participate in projects such as "Pop Music Review" will likely require considerable emotional support as they encounter "something different". Bolstering student confidence by Carney and Couchman demanded a good deal of time and comprised a crucial element in retaining student motivation and success. In our ongoing efforts, we will integrate more structured and directed ways to assist both participating students and TAs with the psychological demands of the research process itself and as

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[2]Heather Montgomery, a fourth-year undergraduate student in psychology, also helped with the statistical data analysis program.
[3]The paper has not yet been accepted for publication.

a "new" type of student activity.

One of the most unsettling aspects of the study for the student researchers was the wide-range of perspectives and interpretations given by their peer interviewees. Many registered discomfort with this situation in their written observations, such as the researcher who pointed to her greatest challenge as "Trying to not act surprised when I heard answers!" Another astutely recorded, "Their [interviewees] views were all so varied. People take different elements into account and focus more on some things than others mey [sic]. Lots of different interpretations of the same product!" Experienced researchers expect the unexpected; emerging scholars, as revealed in the evaluations, are sometimes thrown off-balance by the lack of predictability. More background training in interviewing skills, including role-playing, and further explanations about the unanticipated aspects of research would have been useful for student learning. Future project plans will better prepare students researchers to cope with the surprising elements inherent in the research process.

Time management is often a difficult issue for first- and second-year university students. The pressures for them are compounded when working within a collaborative research project because the responsibility for the success of others also depends on their ability to organize tasks and assignments. A number of the student researchers voiced concerns, some subtle and others blatant, along these lines, including "I learned that you need lots of patience to be engaged in a research project. It is a long process"; and "Challenges for me included procrastination at first and then I became overwhelmed with the workload." In our project, the "Assessments and Results" paper due date was clear and firm but completion of the other components was left open. A stepped set of deadlines that required students to first complete an annotated bibliography, then submit interview forms and data sheets, and finally to produce the paper would have constituted a more effective learning approach at this undergraduate level. Forthcoming projects at the first- and second-year will entail a multi-staged structure of graded tasks rather than one final mark for the work at the close of the project.

Despite the chinks in planning and judgement, the majority of interviewees and student researchers valued "Pop Music Reviews" as a positive learning experience. The three principle achievements from the students' perspectives were: 1) enhanced critical thinking abilities; 2) increased appreciation of research as a process for knowledge building; and 3) a greater sense of self empowerment.

For the interviewees, attention to critical thinking skills was voiced in terms of the music review context. Of the 287 interviewees, 66% noted that they would not have reflected on the circumstances of gender, race, and/or class if they had not been asked to consider these issues in the "Pop Music Reviews" questionnaire. Almost 50% of those who made such remarks went on to claim that they will continue to reflect on the representation of identity politics in music journalism. As our student researchers interacted with their peers through the research process and discussion, thinking critically became a valued shared experience. The educational benefits of collaborative research projects can expand, as they did in this case, to beyond the limits of the classroom.

Likewise, the evaluation documents showed that most of the student researchers found "Pop Music Reviews" worthwhile because they became better at critical thinking, as evidenced in the following quotes:

> I became more aware of gender, sex, and race in music. I can't not see it now.
> For myself, I learned how I don't prepare enough and how I was oblivious and accepting of gender bias before this project.
> I have a choice to be a critical thinker and I do not need to be a passive consumer [and] just receive these messages. It is important/crucial to question/ interpret/engage in how media relays certain messages.

The tasks of undergraduate collaborative research demand observation, interpretation, analysis, and communication—all of which serve to develop critical thinking skills. This outcome is significant because it is central to the university's core mission and is one of the key objectives emphasized in the very fields that currently lack sufficient undergraduate collaborative research programs.

Perhaps the most significant effect of "Pop Music Reviews" was student researchers' greater understanding of research as a means that could help them create knowledge and meet the challenges of their world. Their reflections are infused with a sense of commitment to the greater good and self-assurance in their newly-found capabilities.

> I like doing research for something that contributes to meaningful work.
> Thought it was cool, being in charge and finding out new info that you did not know before.
> I actively negotiate meaning from culture and have the ability to produce it.
> I love doing research. It contributes in some shape or form to changing situations or pushing further research.
> I can do primary research and make it count as a scholar and academic.

According to the student researchers and their interviewee peers, involvement with the project of "Pop Music Reviews" allowed them to expand the boundaries of their thinking and gave them new insights into themselves, others, and the purpose of research activities.

Teaching Assistant's Review

This project served several important objectives that justified the extra hours and workload required for the "Pop Music Reviews" project beyond the regular TA assignments: improved student interaction and interest, and sound preparation for graduate studies. The increased connections and interactions with students resulted in greater discussion and debates in all tutorial sessions, even those on topics not related to the research project. Students commented on several occasions that they felt "part of a team" and were more comfortable contributing to class discussion as a result of being involved in a larger project together.

As well, the research model used in "Pop Music Reviews" engages interest and insight into graduate studies. It was not uncommon to answer questions from second-year students about graduate school, something that did not happen in tutorials from other classes. Even while authorization from the University ethics committee and approval systems were completed by Graham and Kelly, both the TAs and participating students got experience with consent forms and ethics approval

regulations as undergraduates, something that can often seem daunting to graduate students when attempting to begin their own research. This suggests that collaborative primary research gets students comfortable with and ready for the possibility of graduate school.

As an undergraduate TA, the independent study course that resulted from "Pop Music Review" allowed for learning opportunities and primary research contributions that are often inaccessible to undergraduate students. The constant coaching and mentoring received from Kelly and Graham helped with early preparation for subsequent entry into a Master's program. Analyzing data, co-authoring a journal article, collaborating on this educational article, presenting at an academic conference, and contributing to an undergraduate research model provided a smooth transition and extension from undergraduate to graduate studies. This pre-graduate training and research support led to accepting an offer to a graduate program at Carleton University rather than study at other contending post-secondary institutions.

In an increasingly competitive market, the "Pop Music Reviews" cooperative undergraduate research framework yields a particularly significant advantage for students aspiring to become professors or research professionals. In addition to the learning benefits, the focus on collaboration throughout the project's framework builds professional relationships and networking opportunities that continue to prove valuable to the TA(s) long after the project is complete. As such, this research model needs to be more widely applied to programs, particularly in the arts and social sciences.

The areas suggested for improvement echo in part those highlighted by Graham. Online survey data collection would greatly reduce the time commitment needed from the TA(s). Also, having students record their data on hard copies and entering them into the online system would provide a means to set up a peer editing exercise where students can validate the data input by others. This would further stress the importance of recording accuracy to first- and second-year students.

The independent study option is integral for the TA experience. If it is not available, a research assistantship could also be used to fulfill the learning objectives. Finally, two TAs working on the project instead of one would greatly increase the collaborative experience by allowing the TAs to work within their own peer group. This would provide an equalizing relationship that could help balance the power dynamic offered through collaboration with professors, research librarians and directors. Aside from these minor adjustments, the "Pop Music Reviews" collaborative research model offered unique training and experiences that should be implemented where possible in other departments and become commonplace at the undergraduate level.

Reference Librarian's Analysis

Teaching and learning are asynchronous processes. Particularly when acquiring library research skills, learning rarely happens at the time of teaching. A key innovation of this research project was in moving beyond the "one shot instruction session" framework to provide continuing support to the student researchers (Deemer, 2007; Veldof, 2006).

Through library instruction, students are encouraged to think critically about their sources. Because they are writing academic papers, key sources are scholarly journal articles or books from academic presses. However, other sources may be used in concert with critical theory to illustrate the issue that is being discussed. Students are taught how to recognize the various sources, and where best to locate them.

Many student researchers begin with Google Scholar; however, they may encounter problems when attempting to access the text to a document. Strategies are demonstrated that help people to locate these sources. As well, background reference resources such as dictionaries and encyclopedias provide disciplinary vocabulary for search queries and conceptual knowledge for evaluating search results. Passing the print versions around in class and introducing the electronic versions helps student to understand how they can be used in the information-gathering phase of conducting research. The range of topics and sources covered often surprises them.

The ability to navigate the Library's website is an essential self-scaffolding measure because it provides access to most of the self-help resources, including a self-guided tour podcast. By demonstrating how to construct search queries in the library catalogue, two objectives are realized: students learn the wide array of research resources that are available to them, and they are encouraged and empowered through their newly-acquired ability to transfer searching skills to the databases.

Library instruction sessions can be customized to the requirements of the research assignment. Some of the components are: tour, lecture, demonstration, pop-quiz, question-and-answer, lab time, and show-and-tell. The class size of the first-year seminar permitted the planning of a library session including all of the elements mentioned except the library tour. A "starter" bibliography was developed collaboratively with Graham and provided to the first-year class. The first-year students were offered an optional library assignment that probed their understanding of the above-mentioned topics as well as practical information about using library search tools. Lab time was set aside for this activity. The class was brought together after the hands-on session for a discussion of their experiences and a wrap-up.

Given the size of the second-year class, a lecture/demonstration session was prepared that reviewed database and catalogue searching to the entire class. Since the students were to construct their own bibliographies, RefWorks, a citation manager that is integrated with the catalogue and most article databases, was introduced. Among other capabilities, RefWorks allows students to produce bibliographies easily from a selection of references.

Students may enroll in the second-year class without having completed a first-year course in women's studies. Unfortunately, this was not accounted for when planning the second-year library session, and foundational knowledge was assumed. In this class, the students were provided with contact information for the librarian but no effort was made to reconnect with the students. Although there was further communication with Graham, because there was no formal communication channel with the TAs, this gap went unrecognized and the TAs incurred an extra teaching burden.

The following semester, a different teaching program was arranged for second-year classes. The librarian liaised with the TAs directly. The library session was taught in each of the four tutorials; the smaller class size encouraged discussion and clarification. As well, a month after the instruction session the librarian met with each tutorial section again for a hands-on research question-and-answer session. These sessions were tuned

through conversations with the TAs who were familiar with the issues that students were facing. The students indicated that they felt much better prepared to complete the research tasks.

A second issue with the second-year class is that although the students were given interview tips, they required more practical information. A list of books that they could consult was provided within the course guide, but this class would have benefited from a workshop on interviewing skills. Our partner in the Library Learning Commons, Learning Support Services, could have developed such a session. Learning Support already offers workshops such as study skills and critical thinking skills.

Participating in original research conducted in the undergraduate classroom is exciting, but it takes a carefully constructed team to manage the process. Partnering with faculty and teaching TAs, not only for teaching but also for research, "embeds" the librarian (Drewes, 2010; Bowler & Street, 2008). As a result, one can observe that a librarian's teaching makes a difference. The librarian's practice is energized through increased levels of collaboration.

Professor's Appraisal

The merits of "Pop Music Reviews" far outweighed the problems and inconveniences. Three achievements were prominent, even though each area could have used fine-tuning: considerable student gains in logical analysis and self reliance through active learning; the engagements of professional modeling and integration at every level; and a positive shift in the culture surrounding undergraduate collaborative research.

First- and second-year students were able to concentrate on primary and secondary data collection, input, analyses, and reporting because the other research tasks in "Pop Music Reviews" were provided and modeled for them (such as developing a research question, planning a method, and so on). They understood that the success of the larger project rested directly on their foundational input, which in turn depended on strong critical thinking, sound logic, and efficient communication skills. Most students were able to achieve these specific learning expectations within the semester. In tandem with understanding their vital role in "Pop Music Reviews", students realized that the outcome of their labors went beyond a personal grade for the course. Motivation was enhanced because their work promised to be influential and recognized within the wider context of gender studies and music journalism. This condition invigorated the students with a sense of self-empowerment in their studies and in their world. The goals for enhanced student research capabilities and confidence were met quickly and with enthusiasm, which made the project worthwhile.

Yet, all did not go smoothly. Some students misunderstood the directions, others misinterpreted survey questions, and many mismanaged their time. These shortcomings can be ameliorated with better planning. In the future, student focus groups will be conducted beforehand to test the draft documents for clarity and ease of execution. As pointed out, a stepped series of deadlines will be instituted. As well, more time will need to be allotted for the professor's supervision of research components. Undergraduate collaborative research programs offer rich rewards in terms of student learning but they also come with high demands for preliminary preparation and performance management.

The modeling of research and related skills produced high quality interactions between students, TAs, librarian, professor, and administration. The first- and second-year students had the opportunity to call upon a wider range of exemplars and advisors than in traditionally-formulated research projects. This advantage affected the positive learning outcomes and class retention, although our assessment did not specifically address this factor. Likewise, TA Couchman became fully assimilated into the intellectual profession of research through his analyses and productions, as mentored by Graham and Kelly. In turn, the professor and librarian were more fully integrated into the fabric of university administration through Kelly's leadership. Bringing together a mixture of ranks and roles in a concerted research effort resulted in greater insight and understanding of academic life at all stages.

The expectations of the TA duty to students and professor were substantial; however, their initiation to the project and early support were inadequate for the amount of responsibility they were given. Carney and Couchman, fortunately, are extremely intelligent and motivated; and they fulfilled their obligations with excellence. In the future, potential TAs should be fully informed by the professor about the scope of their responsibilities before accepting the post, and they should attend a workshop developed by departmental faculty for specialized training in research. Furthermore, there should be options for either assessing the research data and/or writing up the results with the professor. The TA role in undergraduate collaborative projects such as "Pop Music Reviews" abounds with advanced learning opportunities and connections; as such it is most beneficial for students who are planning to continue their studies at the graduate level.

"Pop Music Reviews" created a buzz around research and innovation in Carleton's Women's and Gender Studies. Departmental colleagues were encouraging and looked forward to further engagement. Scholars from related disciplines at the University, such as Sociology, asked to be "let in on the action". Incoming undergraduates also voiced interest in the courses that had participated. Curiosity and confirmative outreach spread to neighboring Women's and Gender Studies departments during conference presentations. In brief, the culture surrounding undergraduate collaborative research shifted in an optimistic direction because it was shown to be a practical and constructive undertaking. Future projects hold the promise of expanding the practice to include more academics and levels of integration. In so doing, adjustments will need to be made for recognizing and accommodating the extra faculty and staff workloads.

"Pop Music Reviews" was inspiring because in working through the problems and research together, students invigorated the process with their questions and enthusiasm, TAs developed leadership and advanced research abilities, the librarian came to be seen as an important "insider" for the job, and colleagues and administrators provided welcome support. And we, as a group, contributed to the understanding of each other and our society.

Conclusion

The basic template of "Pop Music Reviews" for collaborative undergraduate research in Women's and Gender Studies proved to be well-designed: professor(s), librarian(s), and administrator(s) work together to establish the research question, methodology, processes, evaluation, and outreach; undergraduate students contribute the primary research data and narrow-scope

analysis; undergraduate TAs act as liaisons between students and faculty and staff; and undergraduate TAs have the opportunity to analyze the full data under faculty supervision as well as communicate findings jointly with professor(s) through conference presentations and publications. Taken together, the qualitative assessments of "Pop Music Reviews" by students, TA, professor and librarian reveal shortcomings and successes. The deficiencies were due to insufficient allocations of time and resources for proper planning and background training, suggesting that workload commitments should be carefully considered in developing such projects. The accomplishments of "Pop Music Reviews" propose that participation in undergraduate collaborative research is conducive to academic and personal learning, knowledge production, and the fostering of collegiality among students, faculty, and partnering staff and administration. The first- and second-year students and fourth-year TAs perceived that the fusion of research and education increased their development across a broad range of cognitive skills and personal abilities: experience in research processes and applications, critical thinking skills, disciplinary knowledge, engagement and self-reliance, interest in graduate studies, and social integration. The positive outcomes to the professor and reference librarian included new research partnerships and opportunities, recognition and encouragement by peers and administration, and classroom productivity. Overall, the experiences of the participants in the "Pop Music Reviews" project confirm that undergraduate collaborative research-based education is valuable and it should become a standard practice with a wide array of exemplars and models across the various disciplinary fields.

REFERENCES

Bauer, K. W., & Bennett, J. S. (2003). Alumni perceptions used to assess undergraduate research experience. *The Journal of Higher Education, 74,* 210-230. doi:10.1353/jhe.2003.0011

Bowler, M., & Street, K. (2008). Investigating the efficacy of embedment: Experiments in information literacy integration. *Reference Services Review, 36,* 438-449. doi:10.1108/00907320810920397

Couchman, R., & Graham, D. (2011). *Gender, youth, and media.* Ottawa: University of Ottawa, CHARTattack. URL (last checked 23 August 2012). http://www.chartattack.com/

Craney, C., McKay, T., Mazzeo, A., Morris, J., Prigodich, C., & De Groot, R. (2011). Cross discipline perceptions of the undergraduate research experience. *Journal of Higher Education, 82,* 92-113. doi:10.1353/jhe.2011.0000

Deemer, K. (2007). Making the most of the one-shot you got. *Community & Junior College Libraries, 14,* 21-26. doi:10.1300/J107v14n01_04

Drewes, K., & Nadine, H. (2010). Academic embedded librarianship: An introduction. *Public Services Quarterly, 6,* 75-82. doi:10.1080/15228959.2010.498773

Kardash, C. M. (2000). Evaluation of an undergraduate research experience: Perceptions of undergraduate interns and their faculty mentors. *Journal of Educational Psychology, 92,* 191-201. doi:10.1037/0022-0663.92.1.191

Kenny, R. W. (1998). *Reinventing undergraduate education: A blueprint for America's research universities.* Stony Brook, NY: The Boyer Commission on Educating Undergraduates in the Research University.

Research at CU (2012). Undergraduate research. URL (last checked 23 August 2012).
http://www1.carleton.ca/research/research-at-cu/undergraduate-research/

Seymour, E., Hunter, A.-B., Laursen, S. L., & De Antoni, T. (2004). Establishing the benefits of research experiences for undergraduates in the sciences: First findings from a three-year study. *Science Education, 88,* 493-534. doi:10.1002/sce.10131

Taraban, R., & Blanton, R. L. (2008). *Creating effective undergraduate research programs in science: The transformation from student to scientist.* New York, NY: Teachers College.

Veldof, J. R. (2006). *Creating the one-shot library workshop: A step-by-step guide.* Chicago, IL: American Library Association.