Thinking beyond the page: Getting more out of traditional writing assignments

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Abstract

Formal writing assignments are common in upper year courses, intended to further develop literacy skills, as outlined in the University of Guelph’s learning objectives. However, term papers are often submitted at the end of the semester and consequently, students receive little feedback on them. In addition, students report that term papers can feel separated from the rest of the course material and have minimal real-world relevance. In a recent re-design of an upper year course (KIN*3600: Human Development and Aging), the formal research paper was replaced by a more comprehensive research assignment. Students were asked to write a scientific research paper on the topic of their choice and then translate the research findings into a multi-media format in order to convey the information to a non-scientific audience in a useful way. This process was designed to mimic the Knowledge Translation (KT) information exchange process. In addition, peer-evaluation was incorporated throughout the writing assignment using a novel online peer-evaluation, assessment and review (PEAR) tool, created by Teaching Support Services at the University of Guelph. The PEAR tool mimics the peer-review process, allowing students the opportunity to critically review each other’s written work and provide feedback for improvement before the final paper is due. This report will outline the design and implementation of the comprehensive research assignment. Student response to the peer-evaluation of writing activity will be discussed and examples of successful multi-media projects, highlighting knowledge translation, will be presented.

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Introduction

While much focus has been placed on improving student engagement in the classroom and increasing active teaching and learning strategies, the same advances are not consistently achieved with assessment strategies. Individual final term papers are commonly used in upper level science undergraduate courses as a method for assessing research ability and critical analysis skills while strengthening scientific literacy and communication. Despite these noble learning objectives, there are significant pedagogical challenges associated with many traditional writing assignments.

One of the main pedagogical concerns with traditional writing assignments is that they rely predominantly on summative feedback.¹ Due to increasing class sizes, it can be extremely time-consuming for faculty or graduate teaching assistants to provide meaningful feedback on written work throughout the semester. Furthermore, in upper year courses in particular, term papers are often considered ‘high stakes’, in that they comprise a significant percentage of the final grade (40%+), although little to no formal guidance is provided during the semester. In fact, many written assignments are submitted on the last day of classes and students may receive no feedback on their performance other than a final grade. This ‘last day’ approach can make the writing assignment seem extraneous from the course material, and the practical importance of the research conducted is not always apparent. A final concern with faculty-graded writing assignments is the lack of knowledge sharing between peers. Students conduct a tremendous amount of

research throughout the semester in order to write a convincing paper, yet very little attention is paid to the potential opportunity for peer-teaching of this information.

In an effort to address these pedagogical concerns, the final term paper previously used in a 4th year Human Development and Aging class in the Kinesiology program at the University of Guelph-Humber was replaced with a multi-component research assignment. Specifically, a guided peer-review activity was added to the written research paper in order to provide students with meaningful formative feedback throughout the semester, while a complementary multi-media presentation of the research findings was added in attempt to enhance student engagement and challenge their creativity and communication skills, while also facilitating sharing of research between classmates.

This paper will describe the successes and challenges of this comprehensive group research project in its first year of implementation. The instructional material and assessment overview will be presented, as well as data from student feedback surveys and examples of top multi-media projects from the preliminary course offering. Suggestions for future research and improvements to the assessment design will also be discussed.

Assignment Overview

In previous offerings of KIN*3600: Human Development and Aging, a single term paper worth 40% of the final grade was the only assessment strategy other than a midterm and final exam. In the fall of 2011, class enrollment had increased significantly from 30 students to 120 students. In order to accommodate the larger class size, the individual term paper was replaced by a comprehensive research assignment in self-selected groups of two to four students. The updated assignment was weighted with the following breakdown: 20% written paper, 5% peer-review of writing and 15% knowledge
translation applied project. Therefore, the grade attributed to the updated research assignment did not change (40%), rather multiple components were added to create a more comprehensive learning experience for students. While the assignment was carried out largely in groups, an individual grade was assigned for the ability to serve as a reliable peer-reviewer (5%). A voluntary feedback survey was administered at the beginning and end of the semester to gauge students’ perceptions of the new assessment design.

By completing the new comprehensive research assignment, students are expected to achieve the following learning objectives, which would not have been achieved through traditional writing assignments:

1. Further strengthen literacy skills by critically reviewing peers’ written work and articulating the strengths and weaknesses professionally.
2. Further develop communication skills by translating research findings to a level appropriate for non-scientific populations.
3. Display creativity by generating a multi-media representation of their research findings.

Rationale for Update #1: Peer evaluation, assessment and review (PEAR)

The first update to the traditional writing assignment was the inclusion of a peer-review component. Many writing assignments rely heavily on summative feedback, in which the assessment is conducted at the end of the course, most often by the professor or teaching assistant in order to judge a single performance and assign a grade, with no
opportunity for student improvement.\textsuperscript{2} Many students do not even collect their graded assignment at the end of the semester or read their feedback so that they can improve in subsequent courses. In comparison, formative feedback is aimed at building a more comprehensive picture of a learner's abilities and is often based on more than one assessment and may take place several times throughout the course, creating a more complete profile, rather than single score. Most notably, students are actively involved in the formative process.\textsuperscript{3}

In the context of this course, the main goal of peer-review was to provide students with additional formative feedback throughout the writing process so that the quality of their final term paper could be improved. Due to the large class size, this level of feedback could not have been achieved by the professor marking alone. A secondary learning objective of peer-review was to improve students' literacy skills through critically analyzing research and articulating its strengths and weaknesses professionally. It was anticipated that by reflecting on the grading criteria to evaluate their peers' work, students would also increase awareness of the strengths and weaknesses in their own written work. Finally, a positive side effect of reviewing classmates' work is that students would be able to learn about a topic area they would not have otherwise been exposed to through regular course material.

It should be noted that peer-evaluation has been used frequently in higher education, as both a replacement of instructor grading (to save on time and resources), and


\textsuperscript{3} Strijbos and Sluijsmans, “Unravelling peer assessment,” 265-269.
as a supplement to instructor grading (to increase feedback to students). In both of these applications, qualitative and quantitative feedback may be used. However, if quantitative peer-evaluation is to be used to replace instructor grading, it is imperative that it be both accurate and reliable. Previous studies have shown that increasing training of assessors and frequency of peer evaluation throughout the semester (i.e. practice) may help increase reliability. Discouragingly, other studies have reported consistently poor reliability of quantitative peer-evaluation, even when six or more peer reviews are averaged. Many factors likely contribute to the success of any peer-review activity (i.e. skill level, prior experience, program of study, single or multiple assessments, type of activity, personal vs. anonymous etc.), and, therefore, should be considered in order to optimize the effectiveness of peer evaluation for grading purposes.

In an attempt to maximize compliance with the activity, while minimizing student anxiety regarding the accuracy of peer-administered grades, peer-review of writing comprised only 5% of the overall grade for this assignment. This level of grading appeared reasonable to the majority of students involved in the assignment (Table 1, page 7). The peer-review process for this assignment was facilitated with the support of the online PEAR tool (peer evaluation, assessment and

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5 Elke Van Steendam, Gert Rijlaarsdam, Lies Sercu, and Huub Van den Bergh, “The effect of instruction type and dyadic or individual emulation on the quality of higher-order peer feedback in EFL,” Learning and Instruction 20, no. 4 (2010), 316-327.


review) developed by the University of Guelph Teaching Support Services, which mimics the scientific peer-review process.

Details of PEAR Assignment

For the formal paper, students were instructed to write an eight to ten page critical research paper on any topic of their choice relating to the physiology of human development and aging. The paper was handed in midway through the semester (week six) using the online PEAR tool. Each student in the class was randomly assigned two anonymous papers to review individually, analogous to the scientific review process. This layout ensured that each group paper received between five and seven full sets of reviews. Students reviewed each paper using a standardized rubric to assign a numeric grade and also provided qualitative feedback by answering four open-ended prompting questions (i.e. describe one area of the paper that could use improvement along with an example of how this can be improved). Minor grammatical edits were also made directly on the electronic files. Students had two weeks to submit their reviews back to the online PEAR site, which were then anonymously sent to the original authors (Figure 1).
Upon receiving their reviews, the original authors assessed the quality of each review based on a standardized rubric and assigned a grade to their peer for their role as a reviewer. This ‘dual-role’ is a novel feature of the PEAR tool. That is, students receive a grade for their ability as an author (based on the peer-evaluation of their first draft), and students also receive a grade for their ability as reviewer (based on the peer-assessment of the quality of reviews that they provided). Collectively, these two grades were worth 5% of the final mark in the course.

Finally, each group had the option to make changes to their original paper based on the reviewer comments before resubmitting their final version to the professor (i.e. the editor) for grading two weeks later. Throughout the entire process, students were aware that the professor could monitor the feedback and remove any inappropriate reviews; however, no such incidents arose.
Students’ Satisfaction with the PEAR Process

Seventy percent of students completed surveys regarding their satisfaction with the PEAR assignment at the beginning and end of the semester and provided written informed consent to have their information included for research purposes as approved by the University of Guelph Research Ethics Board. There was no significant difference in final grade or gender between students who consented and those who did not consent.

Overall, results suggest that the PEAR assignment was successful in that students felt that peer-review improved the quality of their final paper and they found it to be a valuable learning experience (Fig 2 A, H). Specifically, 62% of students report that they now plan to ask a classmate to review their written work before submitting it for grading, whereas this behaviour was uncommon prior to completing the assignment (only 35% did) (Fig 2 B, C). Particularly important with the PEAR design, >60% of students believe that both components of the peer-review activity (i.e. reviewing and being reviewed) helped to improve their writing skills (Figure 2 D, E). Two secondary goals were also achieved through the PEAR assignment as the majority of students report learning about a new topic and also being more conscious of the grading criteria when writing their own paper (Fig 2 F, G).
Survey results also provided useful information about student satisfaction with specific components of the assignment structure (Table 1). The majority of students are comfortable with having 5% of their grade peer-marked; however, they would be concerned if the peer-review was weighted greater than this. Also, having multiple students review their work appeared to contribute to this acceptance and students greatly support that the peer-review process is anonymous. However, students felt that the peer-review assignment was challenging and would not like to review more than 2 papers, although the effort required was worth the outcome for 64% of respondents. Interestingly, 60% of students report that they would have likely participated in the activity, even if it was optional.
Table 1: Student response to pre & post-assignment survey questions.

<table>
<thead>
<tr>
<th>Question</th>
<th>% of Respondents</th>
<th>Mean</th>
<th>Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am confident in my abilities to grade other students' work.</td>
<td>10  50  29  10   0  2.4  2</td>
<td></td>
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<tr>
<td>I am looking forward to reviewing my peers' work.</td>
<td>5  21  24  26  14  3.3  4</td>
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<tr>
<td>I like that multiple classmates will review our group's work.</td>
<td>48  24  14  3   2  1.8  1</td>
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<tr>
<td>I like that the peer review process is anonymous.</td>
<td>71  22  5   2   6  3.4  1</td>
<td></td>
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<tr>
<td>Having to submit a first draft midway through the semester has helped me be more productive in my research.</td>
<td>14  40  17  7   2  3.0  2</td>
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<tr>
<td>I think it is reasonable to have a small portion of my grade (5%) be evaluated by my peers</td>
<td>16  47  12  10  7  2.5  2</td>
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<tr>
<td>I would like the PEAR assignment to be worth more than 5%</td>
<td>12  16  22  29  21  3.3  4</td>
<td></td>
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<tr>
<td>I would like to have reviewed more than 2 papers.</td>
<td>9  12  22  23  24  3.5  4</td>
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<tr>
<td>Reading other groups' papers helped me appreciate the complexity involved in writing a good paper.</td>
<td>17  60  14  9   6  2.1  2</td>
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<tr>
<td>Critically analyzing my peers' writing was a challenging task.</td>
<td>3  41  16  24  5  3.0  2</td>
<td></td>
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<tr>
<td>The time required to complete the peer-review process was worth the benefit I got out of the experience</td>
<td>16  48  21  10  5  2.4  2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If the PEAR activity was optional, I would still have participated.</td>
<td>12  11  17  34  76  3.5  8</td>
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Questions in bold are from the pre-survey. Questions in normal font are from the post-survey.
1 = Strongly agree, 2 = somewhat agree, 3 = neither agree nor disagree, 4 = somewhat disagree, 5 = strongly disagree

From this feedback, it appears that the majority of students had a positive response to the peer-review assignment. However, it is important to note that ~10% of survey respondents report an overall negative experience. Future research should consider who these students are and potential reasons for their dissatisfaction. It is possible that their academic strengths or weaknesses, or prior experiences with peer-review could contribute to these opposing sentiments.8

Improvements to the PEAR process

Although successful in its initial offering, several improvements could be made to the peer-review assignment. If time permits, committing in-class time to train students as peer reviewers may significantly improve the reliability of both qualitative and quantitative feedback.9 The training could be achieved by having examples of written work from a previous semester at different levels of performance serve as a common benchmark for all

students to evaluate. Students would then perform a practice review and compare their evaluation to the instructor’s comments on the same paper. While this takes additional effort on the instructor’s part, it is expected that the student benefit would warrant it. This training activity would likely improve student confidence in their own ability and the ability of their classmates to act as reliable reviewers.10

As a potential modification, instead of allowing students to pick their own topics, one might consider limiting the topic choices of students by providing a set of four or five topics that students could select from. Then options would exist to have students review two papers on the same topic, or review two papers from different topics. This adjustment may be useful in early level courses where the ability to define a topic and set boundaries has not yet been developed.

Currently, the data on the success of this initial offering is largely descriptive. Future research should consider the accuracy and usefulness of both qualitative and quantitative feedback. Initial instructor impressions of this assignment suggest that students value the qualitative feedback more so than the quantitative feedback when editing their final papers. As such, future activities may want to emphasize qualitative feedback for formative purposes. Another area for consideration is in pairing reviewers and authors. Although the current assignment used random pairing, there is some evidence to suggest that skill level is an important factor to consider for effective peer-evaluation.11 Whether stronger students benefit from peer review to the same degree as


weaker students should be explored, as should potential for marking bias when unequal skill levels are paired (i.e. do strong students mark weaker students too harshly?). In addition, ESL students (English as a second language) were not considered in the current study, but their inclusion as both peer reviewers and writers may present additional challenges in terms of difficulty and time required for the editing process.

Rationale for Update #2: Multi-media knowledge transfer (KT) project

As an extension of the formal written paper, students were asked to translate their main research findings into another format (i.e. anything other than a written paper) that would be meaningful to a non-scientific target audience. The formal guidelines for the assignment were purposefully vague to allow for creativity by the students. Assignments were evaluated based on the effectiveness of the message in the given format, the rationale for selecting their defined target audience, and the ability to communicate critical research findings to a different audience. The work was presented in a student showcase during regularly scheduled class time in the last week of classes. Members of the university community and beyond were invited to view the projects and interact with students at their displays. Students were also encouraged to circulate the showcase and learn from each other’s projects while voting on their favourite project to win a non-academic prize (gift card); however, no official peer-evaluation was conducted. All formal evaluation of the multi-media assignments was done by the professor.

The primary goal of this assignment was to emphasize the knowledge translation process that is becoming paramount in the scientific community, as evidenced by the
mandate of the Canadian Institute of Health Research (CIHR). Knowledge translation is a dynamic process whereby researchers who create new knowledge also have the responsibility of disseminating that knowledge to those who will benefit from it. It can be quite a challenging process, requiring exceptional communication skills at multiple levels. However, this exchange of information is recognized by CIHR as an integral part of any research intended to improve the health of Canadians. Since the nature of research conducted by students in the current assignment would vary, it was the responsibility of each group to identify the appropriate target audience for their findings, determine the best format to convey their message and then justify their decision as part of their evaluation criteria.

Across Ontario, creativity is recognized as an important learning outcome of all university graduates, regardless of discipline, although assessments rewarding creativity are not always abundant in science majors. Therefore, a secondary goal of this assignment was to challenge students’ creativity and foster their love of learning. In addition, it was expected that this less-traditional assignment would increase student engagement and excitement for their research throughout the course, while not overwhelming students by placing yet another unrelated assignment on them. The link in content between the written paper and the multimedia project is key to this comprehensive research assignment.

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Examples of projects & student feedback

In the first offering of this assignment, all students performed far above expectations. One example of a creative applied project was an illustrated children’s book teaching the importance of sleep for motor learning skills in a child-friendly language. Top projects also included food product development, cookbooks and cooking shows teaching the benefits of consuming omega-3 fatty acids to reduce risk of heart disease in older adults. Other imaginative multi-media formats included iPhone Apps, social media campaigns, radio commercial jingles and advertisements located in campus residence buildings and bus shelters, among many others.

The use of a community showcase was a very effective method to highlight the students’ many accomplishments. Although not given grades for attendance, all 120 students were present for the showcase and were actively involved in presenting their projects. Many students provided positive feedback on the experience:

“I thought the applied project was an extremely unique and challenging assignment. The wellness/health fair presentation style was great because it required us to put a lot of thought into our project as not only our professor but also all of our peers would be seeing it. It was amazing to see the creativity of my peers and fun to participate in their interactive projects. It’s rare that undergraduate assignments provide insight into real world application of our degrees but this project certainly afforded that. This evaluation format was not only a worthwhile experience but it was designed to get the best out of the students, which it certainly did.”

“The applied project encouraged me to dig deeper, acquiring a greater understanding and appreciation for the material that I was writing about. I think it’s safe to say many students do not enjoy writing a final paper but I found with the applied project as the end assignment, it gave the paper meaning. It also helped me to put myself in a real word setting to get my findings across to the general population. It was refreshing to have an interactive presentation in contrast to the typical university assignment as well as having the freedom to apply the information to the project in any way I liked.”
Improvements to the Knowledge Transfer process

Overall, the implementation of a multimedia project was an effective strategy to emphasize knowledge transfer, challenge communication skills, and encourage creativity, student engagement and pride. The success of this project could easily be duplicated in various disciplines. Future applications should consider an interdisciplinary approach to the final applied project, whereby students from media studies, social science or computer engineering could partner with health science students to help elevate the multimedia project to its full potential. Another area for modification in smaller classes would be to make the assignment more focused, identifying specific community groups to partner with each semester. All students could then work creatively to develop the best method to communicate their research findings to the community partner in a meaningful way, with the best project selected by the partner (if applicable). Finally, incorporating a level of peer-review into the multi-media project could serve as a valuable tool; encouraging groups to work co-operatively while providing timely feedback throughout the early stages of the knowledge transfer process to strengthen the overall project quality.

Conclusion

Research papers promoting scientific literacy will continue to be used in higher education. However, as instructors, it is crucial that we recognize the value of our assessment strategies and use them to their full potential. By including peer-review of writing as part of these assignments, students can improve their literacy skills by acting as both an author and reviewer, learning about the scientific peer review process and the skills required to articulate strengths and weaknesses professionally, as well as learning to
deal with criticism in a professional manner. Peer review can also assist students in focusing on the grading criteria and objectives of the assignment, ultimately contributing to a stronger final paper. By including a multi-media project emphasizing knowledge translation, one can push communication skills by encouraging students to consider research as it applies to the greater community. This reinforces the notion that not only the content, but also the dissemination and application of the content is critical. This strategy also encourages creativity and love of learning as students showcase their work to their peers and community.

Future work should be done to assess the potential success of these two approaches in various settings, including 1) introductory classes, when the skills are first being introduced as opposed to mastered, 2) undergraduate literature review courses, where enrollment is getting too large for individual faculty to provide repetitive meaningful feedback and 3) graduate courses, where greater emphasis could be placed on both the peer-review and knowledge transfer process, reflecting greater level of skill in the students as well as preparing them for the realities of scientific publishing and grant requirements.

As educators, we strive to maximize student learning and engagement while working within the constraints of our given course context (size, resources, time, etc). Even with these boundaries in mind, traditional term papers should be considered as more than just straightforward writing assignments. A comprehensive research assignment as outlined herein may offer a unique opportunity for students to develop broad-spectrum communication skills and showcase their creativity in a highly engaging activity, while still refining fundamental research and writing skills.
Bibliography


