The Journal of Effective Teaching

JET

an online journal devoted to teaching excellence

Volume 16/Issue 2/September 2016
JET

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Letter from the Editor-in-Chief: Gaming the Classroom

Russell L. Herman

The University of North Carolina Wilmington, Wilmington, NC

There are many ways to include active learning in our courses. One form is cooperative learning. There have been many studies about in-class and online collaboration of students (Burke, 2011; Jones & Jones, 2008; Saleh, 2011; and others in this journal). As recalled by Brame and Biel (2015), cooperative learning “is defined as the instructional use of small groups to promote students working together to maximize their own and each other’s learning.” (From Johnson, Johnson, & Holubec, 2008.) One day I was thinking about the value of collaborative projects and recalled the notion of cooperation in decision making in the form of game theory as shown in the 2001 movie, A Beautiful Mind, based on the 1998 book by Nasar. Can game theory be used in cooperative learning?

The simplest game theory example is the Prisoner’s Dilemma which was proposed in the 50s to explain why two rational people might not cooperate, even if it seems in their best interests to do so (Kuhn, 2014). This scenario has become a common tool in police drama interrogations. Consider that two criminals have been arrested for a crime and are being interrogated separately. Each prisoner knows that if neither talks, the case against them is weak. As a result, they will be punished for lesser charges and each will get two years in prison. If both confess, each will get five years in prison. If only one confesses and testifies (squeals) against the other, the one who did not cooperate with the police will get 10 years in prison and the other one would go free. The payoff diagram is shown in Figure 1.

![Figure 1. Typical payoff diagram for the Prisoner’s Dilemma. Each prisoner has the choice to be silent or turn in the other prisoner. A region is the sentence for Prisoner 2.](image-url)

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In the prisoner's dilemma there is an optimal solution for both prisoners. However, if each prisoner acts in what appears to them to be in their own self-interest, then they may end up getting a non-optimal sentence. This general two-person, two-move game can be applied to many other situations. As depicted in Table 1, there are two players (Row, Column) with two moves (Cooperate, Defect). For the Prisoner’s Dilemma the move “silent” corresponds to cooperate and “squeals” corresponds to defects.

Table 1. A payoff matrix (table) similar to Figure 1.

<table>
<thead>
<tr>
<th></th>
<th>D</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>P, P</td>
<td>T, S</td>
</tr>
<tr>
<td>C</td>
<td>T, S</td>
<td>R, R</td>
</tr>
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</table>

The goal is to find a strategy for each player. If the Column person (C) cooperates, then the Row person gets a reward (R) if he cooperates or a Temptation (T) if he defects. In the latter case the row gets the better deal. However, if the Column person defects, then the Row person gets punishment (P) if he defects or is otherwise a Sucker (S). In the first case the row gets the better deal. So, overall, the Row person should defect in either case to suit his self-interests. A similar argument can be made by the Column person. Thus, two rational players will both defect, resulting in punishment P. For the example in Figure 1, the prisoners each get two year (P, P in Table 1.) On the other hand, two irrational players might do better if T<P.

An example of using game theory in education is presented by Easley and Kleinberg (2010). Two equally good students are under pressure to complete a presentation. However, they both have to study for an exam. The exam and presentation are equally weighted. If they study for the exam, then they get a grade of 90. If not, then they are only prepared to get a 74. They know they can get an 80 on their partly completed presentation. However, if one person puts more works into it, they can raise their grade to a 90. If both work on it, they can perfect it and get a 100.

Assuming they cannot contact each other to figure out what the other student plans to do, they each need to decide whether to study for the exam or work on the presentation. The payoff, or average grades received for each player’s decision are shown in Figure 2. For example, if they both work on the presentation, they each get a 100 on the presentation and a 74 on the exam. The average is an 87. However, if one works on the exam and the other adds to the presentation, the first gets a 90 and the other an 82. Just like the game in Table 1, the optimal path for each individual is to do the exam and forgo the presentation. However, if each person makes this decision, then the both get an 85 which is not the optimal grade.

There are other instances of using game theory in teaching. Lo, Nuryyev, Su, and Decosta (2015) applied game theory to the relationship between students’ grades and their teaching evaluation of faculty. The choices of evaluating faculty high or low hinged on the student being satisfied with their grades. However, the discussion of game theory
played a minor role in their overall study. Similarly, Pitt (2000) discussed applying game theory to group project assessment. In their paper the authors describe the ideas of game theory, but did not actually apply game theory. He discusses various strategies students might use indicating that the best strategies that promote teamwork in groups may disadvantage some students, affecting their assessment.

One group did a study on collaborative learning in online study groups (Chiong & Jovanovic, 2012). In observing in detail the motivations of students in online collaborative work, the authors found that in scenarios similar to the students in the above example, that the more active participants were encouraged to maximize their payoffs while the less active students remained inactive.

In 2013 a professor of behavioral ecology decided to put the game theory he was teaching into practice (Nonacs, 2013). Instead of giving a typical closed book exam in which the room remained quiet, he gave them the option to take the exam, consisting of one question, using anything they could find and even work in self-selected groups, keeping in mind that they needed to arrive at the answer as a group. Students would have to use a game-theoretic to arrive at a group result and accept the payoff as a group after collaborating on the exam. The author referred to this as cheating, though there was some structure that was described ahead of time. Overall, the averages were better, though there were a few individuals who preferred a lone wolf status and their grades were not better except in one case.

Applying game theory to collaborative learning is still in its infancy. This is probably because students are not comfortable thinking cooperatively and once the groups get larger, the payoffs are not better. Studies in game theory have come out recently indicating interesting results for the Iterated Prisoner’s Dilemma (Hayes, 2013) in which the players repeat the game making decisions on the history of the decisions made by their opponents. This might be applicable to seniors who have repeatedly done collaborative learn-

**Figure 2. Payoff (grade) diagram for the student’s study strategies:** Each student either studies for the exam or works on the presentation. The shaded region is the resulting grade average for Student 2.

<table>
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<tr>
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<td>Presentation</td>
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<td>Student 2</td>
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<td></td>
<td>87</td>
<td></td>
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<tr>
<td>Presentation</td>
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ing, or made other decisions in their education process, and learned how to game the system. While using game theory might be appealing, there is still much to be learned as to how it works in practice in the classroom.

References


Student-teachers Across the Curriculum Learn to Write Feedback Does it reflect on their writing?

Esther Cohen-sayag
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Abstract

The study examined the connection between writing competency and writing feedback experiences through academic writing course for student-teachers across the curriculum. The aims of the course were to prepare student-teachers to their role as writing facilitators and to improve their writing. Experimental and control group differed in course plan focused on writing feedback as the depended variable. A significant improvement was found in writing formative feedback. Interaction effect between formative feedback, writing composition and time was significant, but the expected advantage of writing feedback course was not found.

This study examined feedback from the giver point of view and points at the importance of writing formative feedback among SL writers as prospective teachers but also puts some questions on the relations between writing feedback and writing competency.

Keywords: Writing feedback, writing facilitator, formative feedback, corrective feedback.

Writing feedback is an assessment tool as well as instructional approach to teaching writing named "learner-centered instruction", which focuses on individual feedback, used by language teachers and subject matter teachers as well. This approach is differed from "content-based” approach to writing which involves explicit instruction of writing, focuses on grammar, syntax, text structure and style of writing used by language teachers (Kasanga, 2004, p.65). Individual feedback is based on learning to write through practice in a process based on between-draft comments, focused on the process and leads to improve the writing product and writing competency as well. Writing feedback is the most common strategy used among teachers across the curriculum, but only few programs of teacher education suggest deep learning and practice in writing feedback. But most of the studies on writing feedback refer to language teachers in English, only few of them refer to across the curriculum teachers.

This study examined how across the curriculum student-teachers can improve their feedback writing and how this improvement in corrective and formative feedback affects their writing competency. The focus of this study is on feedback givers - student-teachers learning to write feedback and on the relation of writing feedback to writing competency.

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Literature review

Writing feedback is one of the ways to create a communicative writing event, in which teacher and student create a dialogue on the writing product in order to understand how writing intentions can be better realized.

Feedback writing to others can help writers clarify their own thoughts and raise questions such as to whom are we writing, why, and what are our intended message. Feedback can enhance motivation, engagement and interest towards writing (Srichanyachon, 2012).

Comments on writing can pose questions, request clarifications, correct or suggest corrections and can be a starting point for a dialogue with the addressee (Bitchener, 2008; Bitchener, & Knoch, 2009; Lillis, 2003). Although teachers face pupils' lack of motivation towards writing, most writing assignments at school are not authentic and lack communicative intentions. Students write to their teachers usually in order to abide by their demands and rarely experience a real expressive motive for writing (Lam & Law, 2006; Burning & Horn, 2000).

The complexity of feedback writing depends on the context of the writing circumstances, teachers' perceptions and goals and on the writing assignment (Straub, 2000). Researchers distinguish between direct-corrective feedback, and indirect-formative feedback (Biggs, 1988; Hounsell, 1997). Direct-Corrective feedback focuses on editing the text as the main act of the feedback, resulting in a corrected version of the text (Sugita, 2006). Indirect-Formative feedback aims to develop writers' self-assessment. Wingate (2010) describes the aim of formative feedback: "The main purpose of formative assessment is to guide and accelerate students’ learning by providing them with information about the gap between their current and the desired performance." (pg.520). Formative feedback focuses on different strategies from the corrective feedback: marking the mistakes, writing suggestions, adding explanations for the corrections needed, reminding writers' of their task or objectives of writing, and directing writers to their audience instead of corrections, mainly on spelling, punctuation or grammar and syntax (Beach & Friedrich, 2005, Bitchener, 2008; Ellis, 2009; Shute, 2008; Sweeler, van Merrienboer, & Paas, 1998).

The impact of Feedback on writers: Researchers point at teachers' feedback to students has high impact on their perceptions and writing behaviors (Connors & Lonsford, 1993; Furneaux, Paran, & Fairfax, 2007). Ferris and Roberts (2001) found that direct corrective feedback is more productive with writers of low level proficiencies than indirect feedback. It was also argued that second language (L2) writers have a limited processing capacity and therefore feedback focused on limited aspects of writing will be more effective than unfocused feedback which might cause a cognitive overload (Bitchener, 2008). Van Beuningen (2010) in her review on corrective feedback concludes that for L2 writers direct-corrective feedback is more efficient than indirect feedback, explaining that L2 writers are unable to infer the rules from underlying grammatical errors to other writing assignments: "Empirical evidence so far seems to suggest that learners benefit more from direct correction than from indirect CF, especially when CF targets errors within the
grammatical domain.” (pg.19). Truscott & Hsu, (2008) examined formative feedback through the impact of marking locations of errors and found that students did not transfer the corrections to a different text. Srichanyachon (2012) concluded that direct feedback fits for students with weak English skills because of writers’ lack of language knowledge, the researcher added that, explanations are needed to be attached to the corrections in order to expand writers’ knowledge. But, researchers claim that the impact of writing feedback on writing improvement is difficult to prove because of methodology differences: different population, different points of view, different situations and manipulations, (Bitchener, 2008; Ferris 2007; Guénette, 2007; Lee, 2004; Moore, 2000).

The problematic of writing feedback: Implementation of writing feedback as an assessment and teaching method conceal within it several difficulties. Research on the practice of writing feedback among teachers points to three main problems: (a) teachers usually write feedback in order to correct a specific text failing to address their feedback to the development of strategies and understanding of writing processes (Lee, 2003; 2004). (b) Although teachers are aware of the importance of motivation and of the impact of their feedback on motivation, they usually write corrective feedback, give few praising comments and display critical attitudes towards the writers (Kasanga 2004; Sugita, 2006). (c) Student-teachers develop a technical approach towards the writing process; ignoring content and ideas; focusing on spelling and grammar rules (Arikan, 2006; Cohen-Sayag, Asaf & Nathan, 2013).

This study describes changes in student-teachers writing corrective and formative feedback during a course whose aims were to develop insights and practices of writing feedback and to improve their writing competency. In the course, student-teachers across the curriculum learned to write feedback to pupils and peers on compositions and summaries. The full results of the study were published in Hebrew (Cohen-Sayag, Nathan & Triebish 2012). This article will focus on L2 Hebrew speakers, since they were the weak group but improved significantly.

Research questions were: 1. To what extent will writing feedback (CF and FF) change the feedback of the experimental group? 2. To what extent will learning to write feedback create an advantage for improving writing in the experimental group in comparison to the control group, both are L2 Hebrew speakers? 3. How will writing competency and writing formative and corrective feedback interact before and after the course?

The Course

The guidelines of the course plan were based on practical suggestions in the research for preparing teachers to their role in feedback writing:

(1) Reflection- Ferris (2007) suggests teaching writing feedback starting with reflective processes on their own writing, which will enable participants to talk about their writing experiences and receive feedback, on the other hand the researcher emphasizes that teaching feedback writing should be formal and can't rely on experiences alone.
(2) Authentic feedback- teaching student-teachers to learn about children's writing should be based on experiences with texts written by children (Colby & Stapleton, 2006; Moore, 2001).

(3) Variety of experiences- Researchers suggest exposing student -teachers to a variety of evaluation experiences to be applied in writing, which help them choose the rhetorical style content and quantity of the comments in their feedback (Connors & Lunsford, 1993; Fife & O'Neill, 2001; Straub, 2000).

(4) Reading aloud writing products- Rijlaarsdam, Braaksma, Couzijn, & Janssen (2008) suggest that writing feedback should be based on reading aloud learners' written texts with peers which enables a better dialogue on the writing product.

Every session started with reading articles and writing summaries. This was the starting point to reflect on their writing. During the course students read six articles about reading, writing and language and were asked to write summaries. The students prepared indicators for every specific assignment and were instructed to use the indicators in their feedback to peers. The instructor of the course supervised these indicators with the whole class discussing genre, main ideas and different option of language use.

Writing feedback – experience of writing feedback on compositions with peers and school-students was the main activity of this course. Compositions taken from fifth and six graders were the authentic writing texts of school-students for which student-teachers wrote feedback. They wrote comments on six different compositions, consulted on comments with peers, and discussed the feedback based on ten guidelines for efficient feedback (Nicol, 2010; Nicola & Macfarlane-Dick, 2006) referring to: Written in terms which the writer can understand; pointing specifically to the places needed to be corrected; non-judgmental but descriptive; balancing between positive and negative comments; selective according to writers capability to accept; provided in time; include suggestions for further writing; guiding writers to the process of writing; include explanations to the writers on the corrections needed; conclude your feedback.

The course activities combined writing at students' level in the college with writing feedback at pupils' level.

Example of writing feedback activity: The example demonstrates a product of one activity which started with student-teachers reading an article, and writing a summary, followed by writing feedback to a peer (presented in Table 1, first column). Subsequently, reading others' feedback and writing an evaluation of this feedback took place in pairs (Table 1, second and third column).

Discussions guided by the instructor on feedback raised pedagogical questions about, clarity and necessity of comments, lack of praising, comments on wording preferences, inconsistency of comments and the comments' potential contribution to the writers. These discussions aimed to shape and deepen their knowledge, perceptions and practices of the writing process and writing feedback.
Table 1: Example of two pairs criticizing feedback writing: (translated from Hebrew).

<table>
<thead>
<tr>
<th>The feedback on a summary of one student-teacher</th>
<th>Pair of Student-teachers responding to this feedback</th>
<th>Pair of Student-teachers responding to this feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>You need a good opening sentence.</td>
<td>It is not helpful because we did not know what a good opening sentence might be.</td>
<td>This comment could be helpful if you would give a clue, for example: the opening sentence in this task should include the aim of this article.</td>
</tr>
<tr>
<td>You are too close to the language used in the article.</td>
<td>It is an important comment but needs an example.</td>
<td>You need to explain it.</td>
</tr>
<tr>
<td>Lack of coherence [The comments related to several ideas written in bullets].</td>
<td>Can cause the writer to think of text structure.</td>
<td>Important comment, but need to connect to writing summary in particular.</td>
</tr>
<tr>
<td>Maybe there is a missing connector.</td>
<td>This is very helpful.</td>
<td>This comment can result in thinking.</td>
</tr>
<tr>
<td>162 words in the summary</td>
<td>What does it mean, you can write that a summary needs to be 1/4 of words comparing to the original text.</td>
<td>Unnecessary, Explain your comment.</td>
</tr>
</tbody>
</table>

All the activities described above interacted during 13 consecutive weeks (90 minutes every meeting). Writing feedback to peers and discussing feedback in the class guided by the instructor in the course created collaboration in feedback writing. This collaboration aimed to avoid poor feedback or misjudgment of the texts for which they were writing feedback.

We assumed that participating in the course will widen their options of writing feedback and thus their feedback will improve in terms of more correct and efficient formative or corrective comments which will show their understanding of the writing process and of their role as teachers. It was also assumed that this process will improve student-teachers own writing.

**The Context of the Study**

The participants of this study attended a four year B.Ed. program at a Teachers College in Israel. The students belonged to six different departments (kindergarten, special education, elementary school, junior high school, art education and physical education). Studies included three major domains: pedagogy, (psychology and education), different disciplinary areas (literature, mathematics, sciences, etc.) and field practice within a teaching methodology course. The program included 2-3 language courses (depending on the
grade they achieved in a language admission examination). The language courses focused on academic writing, grammar and oral proficiency. This academic writing course was mandatory for students of the third year and was focused on writing feedback for second language and first language Hebrew speakers. Arabic students constitute 50% of the students in the college. The majority of these Arabic-speaking student-teachers will teach Hebrew as a second language to Bedouin children, and therefore they are expected to achieve a satisfactory level in Hebrew writing and in teaching Hebrew writing. The participants were asked to give their consent to participate in the research, and had other options to take another course of academic writing.

Method

The study is a longitudinal pedagogical intervention performed with experimental group and control group. The intervention focused on corrective and formative feedback to peers and to school-students. Both experimental and control groups learned with the same teacher, were involved in reading and writing activities based on the same articles, discussed and created indicators for writing tasks. Feedback writing activities were not part of the program of the control group and were used only in the intervention group. During the study, repeated measures were used on the quality of writing (between–subjects array) and on writing feedback (within–subjects array).

Participants

86 native speakers of Arabic student-teachers participated in the study, 53 in the experimental group and 33 students in the control group. The students were from different disciplinary areas literature, mathematics, sciences, etc. No significant difference was found between the control and the experimental groups in a writing composition test before the course: The mean score in the experimental group was 50.72 (±19.06) \( n = 46 \) and the mean score in the control group was 44.04 (±13.58); \( n = 28 \); \( t = 1.61 \); \( p = 0.08 \) (n.s.).

Research Tools

The tools had been developed in a preliminary study (Cohen-Sayag, Asaf & Nathan, 2013). In this article we will present results from two tools which will give the answer to the interaction between writing competency and writing feedback.

1. Writing composition: This test examined writing competencies of the student-teachers as an effect of the activities held during the course. The test lasted for 30 minutes, during which students were asked to write an argumentative text about advertisement in the media. To support their writing and speed it up, they got an opening paragraph which presents a disputed point of view in this issue. The participants were asked to take side and explain their claims.

2. Writing Feedback: Two compositions (a story and an argumentative text) written by fifth-grade students and two text summaries of expository text (The Nile) written by sixth grade students were used to examine feedback writing of the student-teachers to pupils.
The students were asked to write comments on the compositions and summaries that can help school-students to improve their writing. Every participant wrote comments on different composition and summary in pre- and post-test in order to avoid rehearsal of the same comments in pre and posttest.

**Data Analysis**

Analysis of the Composition - Each composition of the student-teachers was evaluated according to four criteria: ideas, structure, vocabulary and language (spelling, punctuation, syntax and grammar), and each of the criteria was evaluated on a scale of three levels. The maximum score was 12 points calculated to percentages. Reliability between judges was $\rho = 0.86$ (Kappa test).

Analysis of Feedback writing - Analysis of the feedback writing data was first analyzed by correct and incorrect comments, such as wrong suggestions of grammar or wrong corrections of punctuations. Incorrect comments were calculated in percentages before and after the course. The improvement of writing feedback was calculated on the correct comments solely. Second, the comments were coded to global and local comments by their location in the written text. Local comments were in the text while global were at the end of the text. Third the feedback data was classified into 20 comment types (see appendix A) and were classified into 10 formative and 8 corrective feedback types. None of the comments are typical of Hebrew language but rather general comments that teachers use in their feedback.

Corrective Feedback were: suggestions of new ideas; correct spelling; corrections regarding text structure; rephrasing wording problems; suggestions on style; criticizing writers’ ideas or standpoints; correction of grammar and syntax errors; adding transitional sentences;

Formative feedback were: Request for clarifications of information; marking places in need of correction; asking questions on content; general global comments; asking questions regarding the connection between ideas; Asking questions regarding text structure; guidelines how to improve writing in the future; explanations regarding genres.

Two comments were not coded as formative or corrective, praising and grading (17; 11; see appendix A), because their classification to either corrective or formative is not clear cut.

Reliability testing: Coding the comments into the 20 comment types was tested on ten cases of feedback by three judges achieving a relatively high level of reliability (89% agreement).

The data was tested by frequencies, qualitative analysis and t test, examining changes in mean score of the CF and FF within time. T test on the grades of writing composition test between pre and posttest examined the differences between the experimental and the control group. The connections between number of feedback types, and writing composition
grades was tested through ANOVA using composition grades as the depended variable and feedback types and time as independent variables.

Two limitations of the study are important to take into consideration; first the writing feedback included two different acts, writing feedback to peers and to children, which were not controlled. Second, the improvement of writing compositions in both experimental and control group could be a result of a floor effect.

Results

The findings will be presented in three parts according to three research questions: Changes in feedback writing, the improvement of writing and its relation to writing feedback.

I. To what extent will writing feedback (CF and FF) change the feedback of the experimental group?

Five findings pointed at student-teachers improvement of writing feedback:

1) Incorrect comments were 35% in the pre-test and reduced to 25% in the post test. Student-teachers showed less misjudgment of the writing texts they were evaluating.

2) Correct comments divided into formative and corrective comments showed that the participants doubled their formative comments from mean score of 8.48 (±4.67) to mean score of 15.35 (±4.60) N = 37, this change was statistically significant (t = -5.349***). On the other hand their corrective comments on pupil's compositions almost did not change, starting with a mean score of 7.10 (±5.36) changing to a mean score of 8.10 (±8.33) n.s.

3) Global comments increased significantly- pre-learning mean score was $\bar{X} = 4.66$ (±3.77) and post-learning mean score changed to $\bar{X} = 9.05$ (±4.60); (N = 44) $t = -5.23$ ($p < 0.01$).

4) Praising comments increased from a mean score of $\bar{X} = 3.7$ (±3.19) to a mean score of $\bar{X} = 5.5$ (±4.06) (N = 22) $t = -2.09$ ($p < 0.05$). This finding points at student-teachers' increase of their awareness and knowledge of how to encourage writing, as will be demonstrated below.

5) Changes in feedback according to genre: the number of comments on writing a summary increased significantly more than other genres: from a mean score of $\bar{X} = 4.98$ (±3.27) at the pre-test, to a mean score of $\bar{X} = 7.91$ (±5.47) at the post-test; (n = 44) $t = -3.26$ ($p > .001$).

Qualitative analysis of three student-teachers' global comments to a summary will illustrate the changes in writing feedback:

*The Journal of Effective Teaching, Vol. 16, No.2, 2016, 5-19* ©2016 All rights reserved.
a) Pre-learning feedback: "The summary is good but you have to correct your grammar and rewrite some sentences."

Post-learning feedback: "Encouraging comments: You have no spelling mistakes, the structure is good: you have an opening, a body and an ending. Corrections: you did not use punctuations as needed. There is no division into paragraphs."

Before the course his/her feedback was very vague although its general judgment was right. After the course the student-teacher learned to recognize the good elements of the students' writing and decided to be clearer in praising comments referring to structure and spelling as good parts of the summary and to point to punctuation and structure as the weaker elements of the summary. The titles "Encouraging comments" and "corrections" following the indicators seemed as if the student-teacher addressed the instructor of the course.

b) Pre-learning feedback: "Good summary, I don't have any comments."

Post-learning feedback: "The summary is good regarding the language and structure. But he did not write all the main ideas from the text. The connections between the sentences are good. The sentence at the end is unnecessary (quotations should not be included in the summary)."

At the beginning, the student concluded that his/her feedback as 'good' and it seemed that s/he did not know how to handle the task of writing feedback. After the course the student praises the writer trying to be concrete (language and structure) and to comment on important issues such as: main ideas, connections between sentences, etc. S/He explains claim for the unnecessary sentence in brackets, demonstrating knowledge on writing a summary. The student used third person (he) "he did not write all the main ideas" addressing the instructor of the course.

c) L. pre-learning feedback: "A nice summary, but you have to emphasize some details so the readers of your summary will understand how important the Nile is for Egypt."

Post-learning feedback: "A very nice summary. You used your own words, very well. You clarified the main ideas from the text. Pay attention to punctuation."[she marked the missing places of punctuations marks]

Before the course the student started with "a nice summary, but" she continues with a good point of view directing the writer to the aim of his writing, but the comment was vague and could leave the writer with a question. After the course she refers in her feedback to concrete measures such as: the use of your own words, the main ideas and the punctuation. Indeed, she yielded a very good communicative point "to emphasize some details in order that the readers of your summary will understand how important the Nile is for Egypt." This change demonstrates the weakness of indicators, which on the one hand help student-teachers to write clear feedback, but on the other hand cause her to stick to the indicator and leave her good point behind.
Concluding these results, the changes in feedback writing were revealed in four main ways: 1. Comments at the post learning stage were more specific giving the students detailed information and explanations which were incorporated into the feedback, such as: *the structure is good: you have an opening, a body and an ending*; 2. Some of the students changed their opinions about the same composition and recognized more positive/negative points of view. 3. Early in the course praising was general. After the course praising was detailed. 4. After the course comments were abiding by the indicators, sometime in titles like, "praising comments", "comments on structure" which point at thinking in clusters when writing feedback.

II. To what extent will learning to write feedback create an advantage for improving writing in the experimental group in comparison to the control group?

Results of writing composition test showed statistically significant improvement in composition writing, in both groups as provided in Table 2.

<table>
<thead>
<tr>
<th></th>
<th>Mean score and S.D.</th>
<th>N</th>
<th>Df</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-learning</td>
<td>51.62 (±19.0)</td>
<td>36</td>
<td>35</td>
<td>**-2.039</td>
</tr>
<tr>
<td>Post-learning</td>
<td>59.02 (±14.3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-learning</td>
<td>44.56 (±14.6)</td>
<td>23</td>
<td>22</td>
<td>***-3.268</td>
</tr>
<tr>
<td>Post-learning</td>
<td>54.34 (±16.2)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*** p< .000 ***p< .001

III. How will writing competency and writing formative and corrective feedback interact before and after the course?

Interaction effect between formative comments, writing composition grades and time was statistically significant: $\bar{X} = 11.70 (±5.74) (f(2;74) = 12.18 ; p < .000)$ with moderate size effect $R^2 = 0.25$, meaning that, learning to write formative feedback affected the improvement in writing composition within time, but this result was not found in corrective feedback. Interaction effect between, corrective comments, writing composition grades and time was not significant: $\bar{X} =5.82 (±5.43) (f(2;51)=0.23; n.s.)$ with small effect size: $R^2=0.032$.

**Discussion**

Two premises underlies in this study in two perspectives:

a. Teacher education- student-teachers across the curriculum need to understand and practice feedback writing in order to prepare them for their role as writing facilitators.
b. Writing and the feedback process: writing feedback can be fertile environment for writers to improve their writing.

a. Teacher education: Assessment is one of the important components of teacher role, but is not the focus of teacher education programs, as might be expected (Hill, Bronwen, Gilmore, & Smith, 2010). This study dealt with student-teacher assessment abilities through a process of learning to write feedback and with the interaction between writing and feedback. The findings show that student-teachers changed their writing feedback to a more formative type of feedback. The participants in the experimental group wrote more formative comments at the end of the course, indicating their understanding of the writing task and the role of feedback. They wrote more global comments, more praises, gave more explanations, and were more concrete in their comments on pupils' compositions, all of which represent their knowledge of writing. By these acts they overcome difficulties of teachers using feedback comments: incomprehensible comments, too general or vague comments, focused on negative perspectives, and unrelated to the assessment criteria comments (Wingate, 2010). In this study student-teachers met these difficulties and improved their writing feedback while they wrote indicators for the writing assignment and feedback to their peers and to school-students. They learned to give more formative feedback which was realized by writing explanations, suggestions and clear requests about text structure and genre. This improvement prepares them for their role as writing facilitators in their teaching disciplines.

The contribution of this study to the field of teaching writing and teacher education can be concluded by four conclusions: First, this study support peer learning to promote writing: since most of the activities in the course were based on peer learning, we can say that peer learning regarding feedback writing for SL student-teachers with First Language speakers can improve writing and contribute to prospective teachers across the curriculum to widen their understanding of writing process. Second, using indicators while writing feedback might have led to an analytic approach for writing and make their knowledge more explicit. But it is important to recognize that indicators might create superficial type of feedback, abiding by the indicators and leaving behind student-teachers' intuitive understanding of writing. It can also cause students to write to the instructor in the course instead of the writer. Third, writing feedback does not automatically reflect on feedback givers' own writing competency, it seemed that formative feedback is more connected to reflect on writing competency, but this needs to be reexamined in further research. Fourth, the task of writing feedback to unknown writers can reduce empathy and thus change feedback type. Authentic situations are recommended (see also Moore, 2000) in further research on teacher education, where student-teachers will write feedback to their pupils in the practicum and thus avoid situation of "unknown" addressees while writing feedback.

b. Writing and the feedback process: Researchers described receiving feedback as an act which develops self-assessment, which is essential for the writing process (Nicola & Macfarlane-Dick, 2006; Hattie & Timperley 2007; Hill, Cowie, Gilmore, & Smith, 2010; Wingate, 2010). But in this study student-teachers were feedback givers and the question was, whether giving feedback will impact on their writing competency? The improve-
ment in formative feedback which also improved writing composition could be that formative feedback does not only reduce ambiguousness for the feedback receiver, as Straub, (2000) and Shute, (2008) explained, but it is also reduces ambiguousness of the feedback givers. Second language writers, became clearer in their writing as they were guided to write feedback.

It seemed that while researchers shift their focus to Corrective feedback mainly for second language writers (Van Beuningen, 2010), this study point on the benefit of formative feedback to SL writers in higher education. In this intervention we recognized that peer review was straightforward, honest and accurate (see the example in pg.6) and was not characterized by the negative side of peer feedback as reported in the review of Junining (2014) pointing at lack of trust in the accuracy, sincerity and specificity of peer comments.

The expectation to find an advantage in the experimental group over the control group in the composition test did not materialize. This result can be explained by the difference between writing requirements which are much beyond feedback writing: while writing process requires production of ideas and knowledge, organization of these ideas in text structure, it requires a high level of language awareness and self-criticism based on reflective thinking (Torrance& Galbraith, 2006; Nystrand 2006 Hayes, 2012). Writing feedback requires language awareness to identify mistakes, but not to produce language; discourse knowledge to identify text structure, but fewer efforts for creating text structure. Writing feedback demands identification of coherence, but fewer efforts in creating coherent text. Most of all, it does not include self-criticism. Therefore, writing feedback is important activities on the rout to improve writing, but writing process demands higher level of linguistic competency.

This study exposed a complex alignment of variables which is hard to control in pedagogical interventions: "content-based" instruction of writing versus individual instruction based on writing feedback, teacher feedback versus peer feedback, receiving feedback versus giving feedback and writing feedback to school-students versus writing feedback to peers. Further research is needed, which will control this complex alignment and examine the outcomes of learning to write feedback on writing competency of the feedback givers.

References


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Appendix A:

Twenty Types of comments

1. Questions about the objectives of writing;
2. Suggestion of new ideas;
3. Correction spelling mistakes;
4. Suggestions regarding text structure;
5. Request for clarifications on information (e.g. relevance of ideas or accuracy of using terms);
6. Marking places in need of correction;
7. Rephrasing wording problems;
8. Underlining or writing question marks next to spelling, syntax, or wording errors;
9. Suggestions on style;
10. Criticizing the writers' ideas or standpoints;
11. Grading or giving an evaluative comment;*
12. Asking questions on content;
13. General global comments (on ideas, structure, language and style, etc.);
14. Correction of grammar and syntax errors;
15. Asking questions regarding the connection between ideas;
16. Adding transitional sentences;
17. Praising the writing;*
18. Asking questions regarding text structure;
19. Guidelines how to improve writing in the future;
20. Explanations regarding genre;
Interdisciplinary Studies: A Site for Bridging the Skills Divide

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Abstract

This study explores student learning outcomes from an Introduction to Interdisciplinary Studies course. The article focuses on students’ perceptions of cognitive abilities, skills and attributes developed through participation in an interdisciplinary research and design project. Participants were 50 students enrolled in the course. A pre-post survey matched pairs design was used to analyze data generated from Likert scale responses. Content analysis was used to analyze responses to open-ended survey questions. The study’s findings illustrate the potential interdisciplinary studies programs have for fostering the development of skills required for success in the workplace and for good citizenship.

Keywords: Interdisciplinary studies, skill development, student learning outcomes.

The debate concerning the purpose of higher education has had a long history. Today there are two main positions (Selingo, 2015). One side argues that because of the rising cost of higher education, there is an expectation that the money spent should lead to a good-paying job. Consequently, students should leave college with the skills required to succeed professionally. The other side values the overarching goal of liberal arts education—producing a well-informed, moral citizenry. Individuals who hold this view argue that students should leave college with the knowledge, skills and disposition needed to be contributing members of society. Though these two perspectives appear to be in conflict, upon further examination, this may not be the case.

The nature of today’s global workplace requires specific skills to meet new challenges and demands. Results from the American Association of Colleges & Universities (AAC&U) 2013 Employer Priorities survey found that 95% of employers are looking for college graduates who can “contribute to innovation in the workplace” (Hart Research Associates, 2013, p. 1). Other priority skills and attributes identified include the “ability to solve complex problems” and “ethical judgement and integrity” (p. 1). Employers indicated that they would like universities to place more emphasis on critical thinking, oral and written communication and applied knowledge. The National Association of Colleges and Employers’ (2014) Job Outlook 2015 survey also identified top skills / qualities employers are looking for today. These include the ability to work in a team (77.8%), leadership (77.8%), written communication (73.4%), problem-solving (70.9%), and a strong work ethic (70.4%). The results from these reports suggest that to prepare students...
for professional success, universities need to shape learning experiences that develop cognitive abilities (problem-solving, critical and creative thinking), character traits (leadership, integrity) and social skills (collaboration) (National Association of Colleges and Employers, 2014).

The seriousness of the challenges we as a society face today requires citizens to possess specific knowledge, skills and dispositions. In the context of higher education, initiatives for promoting civic engagement and global citizenship focus on developing critical thinking skills, knowledge about global issues and cultural competence (Montiel-Overall, 2012), and personal attributes such as openness, curiosity and respect (De Fazio, 2013). While many university mission statements include the goal of producing responsible citizens, to date there is little evidence that they are succeeding in fulfilling this mission (Beaumont, 2002). According to Chickering (2010), “[Universities] have so far failed to graduate citizens who have attained the levels of cognitive, moral, intellectual and ethical development required to address complex national and global problems” (p. 57). He argues, “The larger issues of interdependence, identity, purpose, meaning and integrity have been eclipsed by short term goals oriented towards securing a well-paying job upon graduation” (p. 58).

The discussion concerning outcomes from higher education raises two key questions: 1) How much emphasis should universities place on preparing individuals to not only to succeed in the workplace, but also to serve as responsible contributing members of society? 2) What strategies can universities employ to achieve both of these goals? This study illustrates how interdisciplinary studies (IDS) programs and courses can provide students with a unique opportunity to develop the professional and citizenship skills required for the 21st century.

**Conceptual Framework**

This research is situated within the theories of student learning and development, and interdisciplinary studies. This study draws on Dewey’s philosophy of education that views learning as an experience in which the whole person in engaged, intellectually, emotionally and with the environment in which the learning takes place. Dewey rejected the mind/body dualism and viewed thinking, acting, and feeling as intertwined and inseparable from each other. He also viewed education and society as inextricably linked—education for the purpose of social change and the greater good. For Dewey, a truly educative experience is one that brings about personal change and growth (Dewey, 1944). Current theories of student development also focus on addressing the whole person (Walker, 2008). Instead of focusing solely on cognitive development, many of the more recent theories recognize the complex nature of the developmental process and consider a number of factors that affect the way college students change and grow. For example, Chickering and Reisser’s (1993) psychosocial theory identifies seven vectors or tasks students progress through during college. These tasks include cognitive, physical, emotional and interpersonal growth, identity formation and developing purpose and integrity. These theories highlight the multi-dimensional nature of student learning and develop-
ment and underscore the need to adopt a holistic approach for facilitating personal and intellectual growth (Baxter Magolda, 2009).

Because interdisciplinary research provides new possibilities for understanding and resolving some of the most pressing issues facing society today, there is growing recognition of the need for and value in interdisciplinary teaching, thinking and research in higher education (Boix Mansilla, 2005; Holley, 2009; Krometis, Clark, Gonzalez, & Leslie, 2011; Lattuca, Voigt, & Fath, 2004; Repko, 2012, 2014; Szostak, 2007). The theory of interdisciplinary studies as a way of understanding the world focuses on the key concepts of complexity (Newell, 2001), common ground and integration (Repko, 2012, 2014). According to Repko (2014), common ground “is that which is created between conflicting disciplinary insights, assumptions, concepts, or theories and makes integration possible” (p. 131). Interdisciplinary integration, the cognitive process of bringing together and blending insights from two or more disciplines, results in a broader understanding of a complex real-world problem that may lead to new viable solutions (Repko, 2014). Engaging in the processes essential for interdisciplinary work require specific cognitive abilities and dispositions, including the ability to embrace complexities, appreciate different points of view and being open to new ways of understanding the world.

**Description of the Study**

**Participants and Course Description**

Research was conducted at a medium-size, four-year public liberal arts institution located in the southeastern region of the USA. The purpose of this study was to assess student learning outcomes from an Introduction to Interdisciplinary Studies course. Study participants were 50 students enrolled in the course during three consecutive semesters, from spring 2014 to spring 2015. The 300-level three-credit course is required for interdisciplinary studies majors. It also serves as a cognate course for non-IDS majors, and therefore is open to students from all majors and academic levels. Although the make-up of students varied from semester to semester, participants in this study consisted primarily of upper-class interdisciplinary studies majors.

The course was delivered face-to-face in two 75 minute class meetings per week for 15 weeks. Repko’s (2014) *Introduction to Interdisciplinary Studies* was used as the required course textbook. The overarching course goal was to provide students with an overview of the theoretical and practical applications of interdisciplinary studies in today’s world. The first half of the semester focused on the foundations of interdisciplinary studies. Textbook topics covered included interdisciplinary studies and you, defining interdisciplinary studies, placing interdisciplinary studies in a historical context, becoming an interdisciplinary, and engaging in the interdisciplinary research process. Additional time was devoted to textbook Chapter 3, “The Interdisciplinary Studies ‘Cognitive Toolkit.’” This chapter describes the cognitive abilities, traits and skills of an interdisciplinary. The material covered in the first half of the semester served to lay the groundwork for students to complete the main assignment—an interdisciplinary research project.
The second half of the semester was devoted to project-based learning (Markham, 2011). In small groups (2-4 students) students worked on a “Research & Design” (R & D) project to develop a museum exhibit proposal for a display that showcased an interdisciplinary understanding of a complex real-world problem. The project consisted of five stages: conceptual, immersion, analytic, design, and dissemination. Students selected their own project topics. Exhibit topics included terrorism, poverty in America, and sexual orientation discrimination. To complete the project, students engaged in the interdisciplinary research process as described in the course textbook (Repko, 2014). Students were given class time to work in their groups. Assessment of the project was based on a written museum exhibit proposal, oral presentation of the proposal, and student level of participation.

Data Generation and Analysis

A pre–post survey design was used to collect quantitative and qualitative data. Before the project was introduced, students completed a 20-item interdisciplinary skills self-assessment survey. The 20 items on the survey were adapted from cognitive abilities, skills and traits identified in Repko’s (2012, 2014) interdisciplinary studies textbooks. A 5-point Likert scale was used to indicate current skill levels. Each ability, skill and trait listed on the survey was discussed before students completed the assessment form. In addition to the abilities, skills and traits rating scale, students were also asked to provide responses to open-ended questions. On the pre-survey, students were asked to list the interdisciplinary abilities, skills and traits they “need to work on”; the post-survey asked students to name the “abilities, skills and traits developed the most by engaging in interdisciplinary thinking and research.” The post self-assessment survey was administered the end of the semester, after students completed the R & D project (see Table 1).

A mixed method approach was used to analyze the data; statistical analysis of the Likert scale survey responses, and content analysis (Patton, 2002) of the qualitative survey responses. The data set consisted of a total of 50 matched pairs of pre and post surveys. All quantitative data were entered on an MS Excel spreadsheet. Analytical tests were run to determine mean scores and the numerical gain between the pre and post mean scores. A two-tailed matched pairs t-test was performed to determine if there was a statistical difference in the pre and post survey responses. Qualitative data were entered on a MS Word document. Responses to open-ended questions were entered on a data table. The “find” function was used to generate a count of word occurrences that corresponded to each of the 20 items. Illustrative comments for each element were identified and recorded. Although potential limitations of the study include the sample size and the use of self-reported data, the analysis methods employed served to meet a central aim of the research—to investigate student perceptions of learning outcomes from engaging in interdisciplinary thinking and research.
Table 1. Skills Self-Assessment Post-Survey Instrument.

<table>
<thead>
<tr>
<th>Cognitive abilities</th>
<th>Current Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
</tr>
<tr>
<td>Perspective taking: Ability to view a problem, phenomenon, or behavior from multiple perspectives</td>
<td>5</td>
</tr>
<tr>
<td>Critical thinking: Capacity to analyze, critique and assess</td>
<td>5</td>
</tr>
<tr>
<td>Integration: Ability to blend insights from different perspectives to produce a more comprehensive understanding or create new meaning</td>
<td>5</td>
</tr>
</tbody>
</table>

**Skills**

<table>
<thead>
<tr>
<th>Skills</th>
<th>Current Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
</tr>
<tr>
<td>Communicative competence: Ability to communicate effectively with individuals from different disciplines</td>
<td>5</td>
</tr>
<tr>
<td>Abstract thinking: Ability to think of ideas and concepts not related to the problem at hand</td>
<td>5</td>
</tr>
<tr>
<td>Dialectical thinking: The ability to weigh opposing views to reach a reasonable reconciliation of positions</td>
<td>5</td>
</tr>
<tr>
<td>Creative thinking: Ability to generate new ideas</td>
<td>5</td>
</tr>
<tr>
<td>Holistic thinking: Ability to think about a problem as part of a complex system; to apply a “big picture approach” to problem solving</td>
<td>5</td>
</tr>
<tr>
<td>Metacognition &amp; reflective thinking: Taking time to “think about your thinking”</td>
<td>5</td>
</tr>
</tbody>
</table>

**Traits**

<table>
<thead>
<tr>
<th>Traits</th>
<th>Current Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
</tr>
<tr>
<td>Entrepreneurship: Willingness to chart new territory</td>
<td>5</td>
</tr>
<tr>
<td>Love of learning: Excitement at the prospect of exploring new ideas</td>
<td>5</td>
</tr>
<tr>
<td>Empathy: Understanding the views of others</td>
<td>5</td>
</tr>
<tr>
<td>Appreciation of diversity: Being open to diverse ideas and people</td>
<td>5</td>
</tr>
<tr>
<td>Humility: Ability to recognize the limits of one’s expertise (and the need to draw on insights from other disciplines)</td>
<td>5</td>
</tr>
<tr>
<td>Receptive to other disciplines: Being open to information from any and all relevant disciplinary perspectives</td>
<td>5</td>
</tr>
<tr>
<td>Willingness to collaborate (with disciplinary experts and/or as part of a team)</td>
<td>5</td>
</tr>
<tr>
<td>Willing to achieve “adequacy” in multiple disciplines: Having a basic knowledge of relevant disciplines</td>
<td>5</td>
</tr>
<tr>
<td>Tolerance for ambiguity: Accepting that understanding a complex problem is an ongoing process; being okay with uncertainty</td>
<td>5</td>
</tr>
<tr>
<td>Ethical consciousness: Recognizing and avoiding personal and disciplinary bias</td>
<td>5</td>
</tr>
<tr>
<td>Civic-mindedness: Wanting to improve the quality of life in a community</td>
<td>5</td>
</tr>
</tbody>
</table>

List adapted from Repko, 2012, 2014
Abilities, skills & traits that have been developed the most by engaging in interdisciplinary thinking and research:
Results

Students’ interdisciplinary skill self-assessment surveys were analyzed to gain their perceptions of skills developed over the course of the project. Table 2 presents the quantitative survey data: pre and post-survey mean scores; mean gain scores, and p-values for each item on the survey. Analysis of the data indicates that students perceived an improvement in skills over the duration of the project. All 20 items showed a significance level at $p < .02$; 17 items met the significance level at $p < .01$. Items with the lowest p-values (highest significance) were perspective taking, integration, ethical consciousness, tolerance for ambiguity, and holistic thinking. As Figure 1 below illustrates, the items with the greatest perceived gain were the same five items, but ranked in different order: tolerance for ambiguity, holistic thinking, ethical consciousness, integration, and perspective taking. It should be noted that although the results show a mean gain in all 20 items, lower ability levels for specific items were recorded by some students on post-surveys.

Responses to the open-ended questions presented in Table 3 also suggest that students developed a range of cognitive abilities, skills and traits during the project. All 20 items were mentioned in students’ comments. While some of the skills identified most often in students’ comments were skills that met the higher level of statistical significance i.e., perspective taking and integration, skills that did not meet the significance level of $p < .01$ were also frequently mentioned, specifically “appreciation of diversity” and “willingness to collaborate.” Both of these items had high pre-survey mean scores and therefore, the Likert-scale post-survey responses may not reflect the degree of perceived improvement. Analysis of student comments also suggests that students developed problem-
Table 2. Pre-Post Survey Mean Ratings in Assessment of Interdisciplinary Skills and Traits Developed.

<table>
<thead>
<tr>
<th>Survey Item</th>
<th>n</th>
<th>pre-survey mean score</th>
<th>post-survey mean score</th>
<th>gain</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Perspective taking</td>
<td>50</td>
<td>3.86</td>
<td>4.48</td>
<td>0.62</td>
<td>6.044</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>2. Critical thinking</td>
<td>50</td>
<td>3.82</td>
<td>4.28</td>
<td>0.46</td>
<td>2.676</td>
<td>.010</td>
</tr>
<tr>
<td>3. Integration</td>
<td>50</td>
<td>3.58</td>
<td>4.22</td>
<td>0.64</td>
<td>5.039</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>4. Communicative competence</td>
<td>50</td>
<td>3.92</td>
<td>4.40</td>
<td>0.48</td>
<td>3.412</td>
<td>.001</td>
</tr>
<tr>
<td>5. Abstract thinking</td>
<td>49</td>
<td>3.65</td>
<td>4.27</td>
<td>0.62</td>
<td>4.302</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>6. Dialectical thinking</td>
<td>49</td>
<td>3.82</td>
<td>4.24</td>
<td>0.42</td>
<td>3.065</td>
<td>.004</td>
</tr>
<tr>
<td>7. Creative thinking</td>
<td>49</td>
<td>3.84</td>
<td>4.35</td>
<td>0.51</td>
<td>3.562</td>
<td>.001</td>
</tr>
<tr>
<td>8. Holistic thinking</td>
<td>50</td>
<td>3.58</td>
<td>4.40</td>
<td>0.82</td>
<td>4.873</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>9. Metacognition &amp; reflective</td>
<td>48</td>
<td>3.69</td>
<td>4.19</td>
<td>0.50</td>
<td>3.118</td>
<td>.003</td>
</tr>
<tr>
<td>10. Entrepreneurship</td>
<td>50</td>
<td>3.74</td>
<td>4.28</td>
<td>0.54</td>
<td>3.841</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>11. Love of learning</td>
<td>49</td>
<td>4.14</td>
<td>4.61</td>
<td>0.47</td>
<td>3.783</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>12. Empathy</td>
<td>50</td>
<td>4.16</td>
<td>4.50</td>
<td>0.34</td>
<td>2.759</td>
<td>.008</td>
</tr>
<tr>
<td>13. Appreciation of diversity</td>
<td>49</td>
<td>4.27</td>
<td>4.59</td>
<td>0.32</td>
<td>2.421</td>
<td>.019</td>
</tr>
<tr>
<td>14. Humility</td>
<td>50</td>
<td>3.82</td>
<td>4.32</td>
<td>0.50</td>
<td>3.989</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>15. Receptive to other disciplines</td>
<td>49</td>
<td>3.92</td>
<td>4.45</td>
<td>0.53</td>
<td>4.846</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>16. Willingness to collaborate</td>
<td>49</td>
<td>4.14</td>
<td>4.51</td>
<td>0.37</td>
<td>2.644</td>
<td>.011</td>
</tr>
<tr>
<td>17. Willing to achieve adequacy</td>
<td>50</td>
<td>3.76</td>
<td>4.34</td>
<td>0.58</td>
<td>4.225</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>18. Tolerance for ambiguity</td>
<td>50</td>
<td>3.44</td>
<td>4.28</td>
<td>0.84</td>
<td>4.876</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>19. Ethical consciousness</td>
<td>50</td>
<td>3.58</td>
<td>4.32</td>
<td>0.74</td>
<td>5.002</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>20. Civic-mindedness</td>
<td>50</td>
<td>4.16</td>
<td>4.62</td>
<td>0.46</td>
<td>4.128</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

solving skills. Although problem-solving was not listed as one of the 20 items, students expressed the view that through their engagement in the interdisciplinary research process they were able “to integrate ideas to better achieve a new idea or solution” and “to stop and think about different ways to solve a problem.”
<table>
<thead>
<tr>
<th>Item</th>
<th>Occurrence</th>
<th>Illustrative Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Perspective taking</td>
<td>12</td>
<td>· Learning to use multiple disciplines to understand &amp; deal with a complex problem.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>· Ability to view a problem from multiple perspectives.</td>
</tr>
<tr>
<td>2. Critical thinking</td>
<td>2</td>
<td>· Critical thinking</td>
</tr>
<tr>
<td>3. Integration</td>
<td>9</td>
<td>· The ability to integrate ideas to better achieve a new idea or solution.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>· Integrate ideas to come up with a new idea.</td>
</tr>
<tr>
<td>4. Communicative competence</td>
<td>5</td>
<td>· Communicative competence</td>
</tr>
<tr>
<td>5. Abstract thinking</td>
<td>3</td>
<td>· Thinking outside the box.</td>
</tr>
<tr>
<td>6. Dialectical thinking</td>
<td>3</td>
<td>· I feel like my dialectical thinking has improved.</td>
</tr>
<tr>
<td>7. Creative thinking</td>
<td>7</td>
<td>· Generate new ideas</td>
</tr>
<tr>
<td></td>
<td></td>
<td>· Being able to stop and think about different ways to solve a problem.</td>
</tr>
<tr>
<td>8. Holistic thinking</td>
<td>3</td>
<td>· Learning how to really look at the big picture.</td>
</tr>
<tr>
<td>9. Metacognition &amp; reflective thinking</td>
<td>5</td>
<td>· My metacognition. Taking time to slow down and gather my thoughts before continuing.</td>
</tr>
<tr>
<td>10. Entrepreneurship</td>
<td>4</td>
<td>· Entrepreneurship</td>
</tr>
<tr>
<td>11. Love of learning</td>
<td>6</td>
<td>· Wanting to know more (love of learning).</td>
</tr>
<tr>
<td>12. Empathy</td>
<td>3</td>
<td>· I have definitely learned to understand and appreciate the views of others.</td>
</tr>
<tr>
<td>13. Appreciation of diversity</td>
<td>10</td>
<td>· Taking into consideration that not everyone thinks the same way I do – have an open mind.</td>
</tr>
<tr>
<td>14. Humility</td>
<td>3</td>
<td>· Humility</td>
</tr>
<tr>
<td>15. Receptive to other disciplines</td>
<td>6</td>
<td>· Being able to see different sides of a problem and see the subject areas that would help me solve that problem.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>· Being more receptive to others’ ideas and disciplines.</td>
</tr>
<tr>
<td>16. Willingness to collaborate</td>
<td>6</td>
<td>· More willing to work with others.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>· The ability to collaborate better.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>· Working well with others.</td>
</tr>
<tr>
<td>17. Willing to achieve adequacy</td>
<td>2</td>
<td>· Willingness to achieve adequacy</td>
</tr>
<tr>
<td>18. Tolerance for ambiguity</td>
<td>1</td>
<td>· Tolerance for ambiguity</td>
</tr>
<tr>
<td>19. Ethical consciousness</td>
<td>4</td>
<td>· I have developed my openness to new ideas and reduced my bias (or at least recognize them &amp; address them).</td>
</tr>
<tr>
<td>20. Civic-mindedness</td>
<td>2</td>
<td>· Civic-mindedness</td>
</tr>
</tbody>
</table>
Discussion and Implications

Results from this study provide insights about the potential role interdisciplinary studies programs can play in helping universities prepare students to meet the demands of the 21st century. First, the findings document the range of skills that can be developed through an interdisciplinary studies course. The findings suggest that students believe that over the course of the project they developed intellectual capacities, personal attributes and social skills. Students indicated an improvement in a number of different cognitive abilities, including perspective taking, integration, problem-solving, abstract thinking, holistic thinking, critical and creative thinking and reflective thinking. The cognitive abilities developed encompass a broad spectrum of higher order thinking skills—skills that are essential for deeper learning (Laird, Seifert, Pascarella, Mayhew, & Blaich, 2014). Personal attributes were also developed. Attributes students identified, ethical consciousness, empathy, tolerance for ambiguity, and appreciation for diversity, contribute to moral and character development. In addition to fostering cognitive and personal growth, the interdisciplinary project provided students with opportunities to develop social skills. Meeting the aims of the project, to construct an interdisciplinary understanding of a complex real-world problem, required group members to work effectively in a team environment.

Second, the findings indicate that interdisciplinary work can help develop the skills today’s employers want and need. Many of the skills developed through the project are the skills identified on employer priority lists, including the top two cognitive abilities in demand, innovation and problem-solving (Hart Research Associates, 2013). Student comments reflect the view that their work on the project stimulated creative thinking that helped them generate new ideas for the purpose of solving problems. Another top skill in demand is teamwork. Students’ comments suggest that through the project, they developed the ability to engage collaboratively and work “well with others.” The real-world focus of the project and the small group structure were key factors that contributed to developing the set of skills needed for today’s job market.

Third, the study illustrates how interdisciplinary work can serve to foster the development of skills required for good citizenship. Students indicated that through the project they developed ethical consciousness—engaging in self-reflection and recognizing the role personal bias plays in shaping relationships, attitudes and understandings. Students also developed an appreciation of diversity, perspective-taking and empathy; attributes that require reserving judgement, willingness to listen, trying to understand other points of view and valuing individual differences. These qualities are particularly important given the divisiveness and incivility in today’s society. Humility, tolerance for ambiguity and a love of learning were three additional traits developed. These traits require an acknowledgment that there may not be one right answer and that the search for understanding is an ongoing and exciting process. Many if not all of these attributes are essential to the process of shaping a citizenry committed to building a stronger society. Current efforts for developing citizenship skills in the context of higher education focus on encouraging students to participate in experiential learning, service learning and study abroad programs (see e.g., Brunell, 2013; Johnson, Grazulis, & White, 2014). This study shows
how some of these same outcomes can be achieved in the interdisciplinary studies classroom setting.

Fourth, the study finds that many of the skills employers are looking for are the same skills required for good citizenship, including the ability to solve problems, creative and critical thinking, civic mindedness, moral judgement and integrity, effective communication, and collaboration / working as a team. This finding is important because shows the false dichotomy that exists between the two sides in skills debate (Braskamp, 2008; Humphreys, 2009; Schneider, 2014). Perhaps the most significant finding from this study is not only do the skills employers need and the skills required for good citizenship intersect, but because of its real-world focus (Holley, 2009; Newell, 2010; Repko, 2014) and the nature of the work, interdisciplinary studies provides a unique opportunity for students to develop the full range of these skills. The primary tasks, finding common ground and integration require a combination of cognitive abilities, personal attributes and skills that promote both professional and civic development and growth.

The findings from this study have implications for interdisciplinary studies curriculum and programs. To achieve the desired outcomes, the curriculum should include activities that require students to: 1) Think about and investigate global issues, 2) Work collaboratively to develop the skills and traits of an interdisciplinarian, and 3) Engage in the process of problem-solving by looking for interdisciplinary connections that can provide new understandings that may lead to new discoveries and solutions for the complex real-world problems we as a society face.

Although there is growing recognition of the importance of interdisciplinary teaching, thinking and research in higher education, the findings suggest that IDS programs can do more to promote the value they may bring to institutions of higher learning. This value includes:

- Providing students with unique opportunities to develop a broad range of abilities, attributes and skills—skills needed to succeed both in the workplace and as a contributing member of society,
- Bridging the skills divide. Demonstrating that the “purpose of higher education” does not have to be an either / or debate—to develop the skills for a good paying job or the skills required for good citizenship. IDS programs can serve as a place for creating the common ground required to bring the two sides together, and
- Supporting university missions to prepare students to be responsible citizens by providing evidence of student learning as it relates to this goal.

Promoting the value IDS programs offer will require the development and implementation of communication strategies that modify current perceptions of interdisciplinary studies by providing new understandings about the potential IDS courses, programs and degrees have for making an important contribution to students, universities, the workforce and society.
Acknowledgement

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References


Teaching Evolution: The Blog as a Liminal Space

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Abstract

A threshold concept is a challenging concept that acts as a doorway leading to deeper understanding and a dramatic shift in perception. A learner that is involved in grasping a threshold concept is said to be undergoing a threshold experience within a liminal space or learning environment. We used the blog as a liminal space for our students to engage with the theory of evolution, which is a threshold concept. In order to teach evolution effectively it is necessary to address both understanding and acceptance of evolutionary theory. To explore the latter in an introductory biology course, we used a series of reflection assignments, submitted by students using a blog format, designed to inform, engage, and probe students’ views on evolution without dismissing their prior beliefs. Using the blog feature on our learning management system (LMS), students were asked to feel free to express their views on the nature of science (NOS), evidence for evolution and natural selection, and the application of the concept of non-overlapping magisteria (NOMA) to the evolution-versus-creationism debate without fear of being graded poorly for a wrong response. Grades were based solely on the level of engagement expressed via thoughtful responses to the specific prompts within each reflection assignment. A student reflection rubric was used to grade and assess student performance and allowed us to examine how students integrated evolution into their prior knowledge. We found the blog to be a highly effective online tool to closely analyze students’ written reflections on a topic that can be both intellectually and emotionally challenging.

Keywords: Threshold concept, liminal space, evolution, student reflection, rubric, blog, NOMA, NOS.

Threshold concepts

A threshold concept is one which, when grasped by the learner, can result in a completely new way of thinking. It is described as a doorway that leads to a deeper understanding of a concept and a significant shift in perception (Meyer & Land, 2003). While the identification of particular threshold concepts in the various disciplines and sub-disciplines is a continuing process, producing much discussion and disagreement (for example, see Ross, Taylor, Hughes, Whitaker, et al., (2010) or Rountree & Rountree, (2009)) the general

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characteristics of these concepts are well established. Threshold concepts are, by their nature, both transformational, meaning they produce a profound shift in the learner’s thinking, and troublesome, or conceptually difficult, alien, tacit, or counterintuitive. Confronting a troublesome concept can produce a phenomenon in which the learner remains “defended” and does not wish to let go of familiar ways of thinking (Meyer, Land, & Baillie, 2010).

The crossing of this threshold is characterized by a threshold experience, in which the learner must navigate the conceptual landscape (Land et al, 2005). In order to do this, the learner must first be willing to enter a liminal space in which the threshold experience happens. Within this liminal space, the learner approaches the concept and engages with it fully. The threshold experience itself is not unlike an adolescent state where the learner oscillates between child-like ways of thinking and newer, adult ways of thinking punctuated by feelings of frustration, moments of clarity, and confusion. This learning process therefore is rarely linear, but involves venturing out or taking bold excursions into unfamiliar waters of the new concept and retreating or taking recursions back into areas of confusion or previously held notions, before the concept is grasped fully. (Land et al, 2005). Students who refuse to enter the liminal space and engage in the struggles associated with the threshold experience are said to exist in a pre-liminal state where their understanding of the concept remains vague at best.

Struggling to master a concept is part of the threshold experience and in this paradigm of learning the role of the instructor, among other things, is to create a supportive liminal environment, encouraging them to engage in the messy process of trying to grasp the threshold concept (Land et al, 2005; Cousin, 2006). While the liminal space is a conceptual construct, meant to evoke an arena where students can move back and forth, toward and farther away from a robust understanding of the concept, recent research has demonstrated the usefulness of online tools as an actual liminal space (Gerofsky, 2015; Tate, Gillum, & Mandalas, 2014; Wood, 2012). These tools, such as the use of student blogs, have become important parts of many teaching strategies (Oravec, 2003) and have attributes that make them perfectly suited for the threshold experience. Owen, Grant, Sayers, & Facer (2006) describe “social software” (including blogs) as allowing students to feel “supported to take risks and develop understanding in unfamiliar knowledge domains.” Wood (2012) found that the blog-as-liminal-space was successful in encouraging learners to engage with threshold concepts in a personalized way.

**Evolution as a Threshold Concept**

The majority of students entering college have little exposure to evolutionary theory with most having only a vague idea of its importance in biology (Alters & Nelson, 2002; Moore, Cotner, & Bates, 2009). In a previous article we described how we present the theory of evolution to students in an introductory biology course, using highly relevant examples such as antibiotic drug resistance, lactose tolerance, evolution of skin color, and the evolutionary tradeoff between sickle cell anemia and malaria (Wolf & Akkaraju, 2014). While this approach continues to work for us in promoting understanding of evolutionary theory it still does not address the students’ acceptance of evolution or how they
integrate evolution with their personal beliefs to achieve some degree of cognitive equilibrium (Dagher & BouJaoude, 1997). While seemingly connected, it has been shown that there appears to be no relationship between student understanding and acceptance of evolution (Sinatra, Southerland, McConaughy, & Demastes, 2003) and therefore each aspect needs to be addressed differently.

Evolutionary theory, and the concepts embedded in it, has been identified as threshold concepts (Taylor, 2006), meaning that they are both troublesome and transformational (Meyer & Land, 2003). Threshold concepts have been described as troublesome because they can appear illogical or conflict with some previously held belief or understanding (Perkins, 1999). While this describes the barrier to acceptance of all threshold concepts, when considering evolutionary concepts, and specifically the reality of the evolution of the human species from previous “lower” life forms, the barriers can acquire special significance. Unlike other threshold concepts, accepting evolutionary theory often conflicts, not just with a previously held belief, but also with ideas that may form the very basis of a student’s notion of themself. Put simply, there is no moral question when considering whether someone accepts the relationship between surface area and volume or other threshold concepts in biology (Ross, Taylor, Hughes, Kofod, et al., 2010). But accepting that our species is the product of a contingent, non-teleological process rather than a special act of creation can strike at the core of a person’s self-perception, the meaningfulness of their life and their personal ethic.

There is thus a special challenge faced by teachers of evolution attempting to guide students through that “portal, opening up a new and previously inaccessible way of thinking about something” (J Meyer & Land, 2003, p.1). For this reason, providing a low-stakes environment in which students can wrestle with the concepts may be even more critical. We found success previously using a low-stakes environment (Wolf, & Akkaraju, 2014) when measuring student understanding of evolution. Application of the same model toward exploring acceptance seems logical to us.

We decided that our strategy would incorporate the non-overlapping magisteria (NOMA) framework for addressing the conflict between theological and scientific explanations for natural phenomena, popularized by Gould, (1997), who argued that:

“The net of science covers the empirical universe: what is it made of (fact) and why does it work this way (theory). The net of religion extends over questions of moral meaning and value. These two magisteria do not overlap, nor do they encompass all inquiry...” (pg. 4)

NOMA has been recently endorsed by the National Academy of Sciences (Science, Evolution, and Creationism, 2008) and Eugenie Scott, the former Executive Director of the National Center for Science Education has argued against the “false dichotomy” of creationists versus evolutionists (Scott, 2000). Both of these institutions are dedicated to educating the U.S. populace on issues of science in general and evolution in particular. While we understand that NOMA is controversial in its own right, we felt it could be useful in our attempts to guide students toward accepting that we should appeal to scientific expla-
nations (versus theological or metaphysical) such as evolutionary theory when trying to study the workings of the natural world.

We also decided to introduce the concept of the nature of science (NOS) in these reflections, in order to allow students to explore the difference between scientific and non-scientific explanations of the natural world. It has been demonstrated that an understanding of NOS has a strong impact on the acceptance of evolutionary theory (Sinatra, et al., 2003).

Here, we describe our use of the blogging function within the Blackboard LMS as a liminal space. We explored the process of the acceptance of evolutionary theory in terms of a threshold experience as learners attempt to integrate their new knowledge with preexisting beliefs. More specifically we will report on how a series of ten online reflections (or blogs) can be effective in prompting learners to enter the liminal space and engage with challenging topics such as NOS, NOMA, and evolution.

**Methods**

We conducted our study at Bronx Community College in a single section of Introduction to General Biology, a mixed majors/non-majors course, taught by one of us (SA). In a previous work (Wolf & Akkaraju, 2014) we piloted the approach of encouraging student participation in a discussion board style reflection on evolutionary theory. Here we present a refinement of this approach by taking into consideration the student’s skill and experience in reflective thinking, motivation to reflect, and level of comfort in reflecting honestly (Stamper, 1996). To this end, we designed a series of ten reflection assignments to be rolled out over the course of the semester. Students were directed to complete a task (which typically involved watching an online video or PowerPoint presentation) on a specific aspect of evolutionary theory, nature of science, or the evolution-versus-creationism debate (Table 1). The videos for reflections 1-3, 5, 8 and 9 were from the *Evolving Ideas* series from the Public Broadcasting System (http://goo.gl/MEzIW1). Reflection 4 was from Khan Academy’s *Evolution and Natural Selection* (https://youtu.be/Me_041nrRZk). Reflection 6 was a teaching module on NOMA that was developed by the authors as a PowerPoint presentation. Reflection 7 was from (Nadeau, 2014). Reflection 10 was from an episode of the PBS program by NOVA entitled, “Judgment Day: Intelligent Design on Trial” (https://youtu.be/7HZzGXnYLi).

After completing the task, students were required to post a response/reflection on the Blackboard campus pack blog tool hosted on our Blackboard LMS. The prompts provided for completing the reflections were identical from week to week (except for reflection 10) and asked students to first summarize the viewing, then interpret it, and finally respond to it emotionally (Table 2).

Instructions for the reflections along with a grading rubric (See Table 3) were posted in a folder within the Blackboard system and each reflection assignment became available to
### Table 1: Reflection Topics.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Type of Presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Nature of Science</td>
<td>“Isn’t Evolution Just a Theory?” (video clip)</td>
</tr>
<tr>
<td>2 Evidence of Evolution</td>
<td>“How do we know evolution happens?” (video clip)</td>
</tr>
<tr>
<td>3 Evolution vs. Creationism</td>
<td>“Why is Evolution Controversial Anyway?” (video clip)</td>
</tr>
<tr>
<td>4 Process of Evolution</td>
<td>“Natural Selection” (video clip)</td>
</tr>
<tr>
<td>5 Evidence of Evolution</td>
<td>“What is the Evidence for Evolution?” (video clip)</td>
</tr>
<tr>
<td>6 Evolution vs. Creationism</td>
<td>NOMA (instructor-developed PowerPoint module)</td>
</tr>
<tr>
<td>7 Evolution vs. Creationism</td>
<td>“Even the Pope isn’t a Hardcore Creationist” (news item)</td>
</tr>
<tr>
<td>8 Human Evolution</td>
<td>“Did Humans Evolve?” (video clip)</td>
</tr>
<tr>
<td>9 Evidence of Evolution</td>
<td>“Does the theory of evolution really matter?” (video clip)</td>
</tr>
<tr>
<td>10 Evolution vs. Creationism</td>
<td>“Intelligent Design on Trial” (video clip)</td>
</tr>
</tbody>
</table>

### Table 2: Reflection Prompts.

<table>
<thead>
<tr>
<th>Reflection</th>
<th>Type of Prompt</th>
<th>Reflection Prompts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 9</td>
<td>Task</td>
<td>Watch the presentation titled ...</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>What were the most important ideas?</td>
</tr>
<tr>
<td></td>
<td>Interpretation</td>
<td>The most meaningful aspect of the video was ...</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Before I watched this video, I never knew that ...</td>
</tr>
<tr>
<td></td>
<td>Outcome</td>
<td>Having watched this video clip I now realize that ...</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This video makes me think/feel ...</td>
</tr>
<tr>
<td>10</td>
<td>Task</td>
<td>Watch the video “Intelligent Design on Trial”</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Explain the idea of NOMA (Non Overlapping Magisteria) proposed by Stephen Jay Gould about religion and science.</td>
</tr>
<tr>
<td></td>
<td>Interpretation</td>
<td>What are your thoughts on this controversy based on what you have learned about Non-Overlapping Magisteria (NOMA)?</td>
</tr>
<tr>
<td></td>
<td>Outcome</td>
<td>How would you vote if your child went to a public school in Dover? Would you vote to have Intelligent Design taught in the science classroom? Do you consider Intelligent Design a scientific theory?</td>
</tr>
</tbody>
</table>
Table 3. Student Reflection Rubric.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Beyond expectations</th>
<th>Meets expectations</th>
<th>Below expectations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Describes the overall idea of the presentation correctly and includes all the main elements.</td>
<td>Describes the overall idea of the presentation correctly but leaves out one important element.</td>
<td>Presents the overall idea with some errors and leaves out two or more important elements.</td>
</tr>
<tr>
<td>Interpretation</td>
<td>Explains the most meaningful aspect of the presentation with appropriate detail and explains why it was meaningful.</td>
<td>Explains the most meaningful aspect of the presentation with some detail and explains why it was meaningful.</td>
<td>Does not provide sufficient detail to explain the most meaningful aspect of the presentation and does not explain why it was meaningful.</td>
</tr>
<tr>
<td>Outcome</td>
<td>Explains emotional reaction to the presentation using appropriate language and level of detail. Writing reveals deep engagement with the topic</td>
<td>Explains emotional reaction to the presentation using appropriate language and some detail. Writing reveals moderate engagement with the topic</td>
<td>Does not explain emotional reaction or does not use appropriate language or details. Writing reveals only superficial engagement with the topic.</td>
</tr>
<tr>
<td>Fluency</td>
<td>Writing is free of grammar, punctuation, and spelling errors</td>
<td>Writing is mostly free of grammar, punctuation, and spelling errors</td>
<td>Writing has too many grammar, punctuation and spelling errors that is distracting to the reader.</td>
</tr>
</tbody>
</table>

The students sequentially as the semester progressed. Students were graded on their level of engagement with the topic rather than the correctness of their response. The students used the blog tool in Blackboard to submit their assignments. By a majority vote the students decided that these blogs should be made visible to all students in the class and not just to the instructor. Instructor feedback was also visible to other students although the grade for each reflection was kept private. Even though the blogging environment was designated as the primary liminal space, occasionally discussion of these topics would spill over to the classroom, which then served as the secondary liminal space. At the end of the semester, student reflections were provided codes to anonymize them and they were catalogued so that both authors could analyze them independently.

Results

A total of 20 students participated in the reflection assignments and there were an average of 17.7±1.3 (SD) responses per reflection. The difference reflects the fact that 2 students
ceased to participate in the reflection blogs. We analyzed student reflections by: a) exa-
mining each student’s excursive and/or recursive journeys through the liminal space while highlighting the troublesome and transformative elements of this threshold experience; (b) exploring the degree of acceptance and integration of evolutionary theory among the students engaged in reflective writing; (c) identifying key concepts that were presented in each assignment and assessing student level of engagement and understanding.

We followed each student’s unique liminal journey and recorded any troublesome and/or transformative elements of the threshold concept that might have been experienced (Figure 1). Except for one student (Student E) who began this journey from within the liminal space and crossed the threshold with ease, all other students began at the pre-liminal stage. A total of seven students (A, B, C, E, J, S, and T) crossed the threshold and entered the post-liminal state. The remaining 13 students were in different stages of liminality by the end of the semester. Overall, we captured 29 troublesome instances and 37 transformative instances experienced by this group of students (Figure 1).

![Figure 1: A snapshot of the liminal journey undertaken by 20 students](image)

In the case of evolution, many students are simply unaware of the sheer amount of evidence that supports it and so when faced with a piece of new information they may find it overwhelming or just far-fetched. In Table 4, we present some examples of troublesome aspects related to the acceptance and integration of evolution. Students A and Q had trouble with the NOS, a concept that appears to be fairly straightforward but contains nuances that are not always obvious to the novice learner. This knowledge is therefore tacit or implied. Both students have trouble distinguishing an everyday guess, a scientific theory, and a philosophical idea. The concept of NOMA appears to be fairly straightforward but it too can be troublesome for the learner who does not get all of the nuances. Student I clearly explains NOMA but misuses the word “belief” when talking about evolution, a
<table>
<thead>
<tr>
<th>Troublesome area</th>
<th>Why is it troublesome?</th>
<th>Excerpt of student’s writing</th>
</tr>
</thead>
</table>
| **Nature of Science:**  
Inability to differentiate between a scientific theory and an everyday guess | Alien concept Tacit | Student A:  
“Evolution provides something many other things don’t which is hard, cold evidence instead of theories and ideas that are spoken and never seen first-hand.” |
| **Evidence of Evolution:**  
Trouble accepting the scientific fact that fish have evolved from worm-like ancestors. | Overwhelming and therefore appears to be far-fetched | Student A:  
“This video makes me think just how weird this world is and how complex it is to understand. While ultimately this idea is not a 100% proven fact it is strongly supported and believable, but to think that things such as fish come from the likes of worm is an overwhelming statement and can make you wonder just how much of this world do we really understand; if anything at all.” |
| **NOMA:**  
Usage of the word “belief” in relation to evolution. | Tacit | Student I:  
“...scientific ideas and observation will not be able explain the existence of God. On the other hand, religious beliefs will not be able to prove science is wrong based on spiritual ideas or symbols. It was really interesting to learn that religious people can believe in evolution without interrupting their religious beliefs.” |
| **Evolution vs. Creationism:**  
Struggling with the idea of whether or not to include creationism in the classroom & **Nature of Science**  
Unable to differentiate between a scientific theory and a philosophical idea. | Learner Defended Alien concept | Student Q:  
With NOMA in mind, I think that there has to be a clear separation between science and religion... I don’t think that it would be good to limit children’s curiosity with only one theory but we need to mention the separation or difference between science and religion, just as NOMA suggests. I think that if I had a child studying in Dover I would vote in favor to have Intelligent Design mentioned in the science classroom as another theory BUT not taught in density as evolution should be. I remember when I was in high school [sic], my biology book had the creationism as another scientific theory of the origin of life. Even though, there was only a paragraph in creationism and a complete chapter in evolution. I think that was actually a very good and balanced way of presenting both points of view. For me I don’t think it would harm a child to know the theory of creationism as another theory. The problem is when professors are biased and don’t
know how to distinguish between a theory and a fact. Honestly, I don’t know if I consider Intelligent Design a scientific theory, because I don’t think there’s actually any scientific evidence to support it. The idea challenges me because I have always believed that creationism needs to be known. Anyways, I recognize that when talking about education, in science we need to leave our feelings outside and open our minds to the evidence.

A common misconception (Smith, 1994). An example of troublesomeness arising from the knowledge being overwhelming and therefore appearing to be far-fetched is clearly demonstrated in the writing of Student A. Acceptance of evolution can be an issue if the learner is “defended” by strong prior beliefs and ways of thinking. Student Q’s almost poignant reflection on the evolution versus creationism debate in Dover is a classic example of the struggle arising from the learner that remains defended. The student stays deeply engaged throughout and yet, is learner defended as demonstrated by the oscillation between moments of clarity and confusion.

A concept is transformational when it produces a paradigm shift resulting in new ways of thinking about something (Meyer & Land, 2003). Examples of transformative moments are shown in Table 5.

When the analyzed the reflections to gauge student responses to specific concepts that were presented, including the evidence for evolution, the evidence for human evolution, natural selection, common ancestry of extant species, and evolution generally. We reasoned that expression of positive views about these topics would, in itself, be a positive indicator of a move toward acceptance. We found a range of 85% (natural selection and the common ancestry of all living things) to 100% (the evidence for evolution) for students expressing positive views (Figure 2).

We then examined the reflections to gauge whether students understood two concepts in particular, the NOS and NOMA. We found that 70% of students displayed an understanding of the NOS (Figure 3A) and 75% evinced a comprehension of NOMA. (Figure 3B).

In the final reflection, which had an 85% response rate, students were asked to view “Judgment Day: Intelligent Design on Trial” from the PBS program NOVA, which explains the history of the Kitzmiller v. Dover Area School District lawsuit regarding the teaching of intelligent design (ID) in the science classroom. After viewing, students were asked a number of reflection questions (Table 2) including whether they would vote to allow ID to be taught in a science class, to which 73% (11/15) responded that they would vote against such a proposition (Figure 4A). When we aligned student responses to the ID question with their understanding of the NOS and NOMA we found a general concordance. 100% of students who displayed an understanding of both concepts voted against
Table 5: Transformative areas in the acceptance of evolutionary theory

<table>
<thead>
<tr>
<th>Transformative area</th>
<th>Excerpts of Student Writing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence of Evolution</td>
<td>Student D: “Having watched this video clip I now realize that when something doesn’t make sense evolution most likely can answer the question. This video makes me think evolution is everywhere”</td>
</tr>
<tr>
<td></td>
<td>Student K: Before I watched this video I never knew that the further we go back in time, the harder it should be to distinguish whales from normal land mammals. Having watched this video I now realize that thousands of observable facts, from completely different fields of study, have come together to tell us the same story. This video makes me feel that I have so many things to learn from theories and that there is plenty of evidence to evolution.</td>
</tr>
<tr>
<td>Human evolution</td>
<td>Student J: “For me the more meaningful aspect is that by pairing DNA sequence from different species we can obtain the relation proximity and know how long ago a common ancestor existed. Before I watched this presentation, I’ve always heard people claiming that humans evolved from Chimps. Now I clearly understand that, it is not that we evolved from chimps but that we are closely related by sharing a common ancestor”</td>
</tr>
<tr>
<td>Interconnectedness of life</td>
<td>Student Q: This video makes me think about the animal nature of humans. The reason I think about this is because of the similarities found between all mammals. I think people don’t like to imagine themselves as part of the animal kingdom because they think that would made them less capable of reason. In my opinion, it is actually exciting to think about me as part of the biggest family ever.</td>
</tr>
<tr>
<td>Integration of Evolution with personal beliefs</td>
<td>Student P: “Another interesting fact discussed in the video is that the first book of the Bible doesn’t really explain how exactly God created the substances with detail. In other words, there is no logical explanation... This caught my attention because I never really asked myself any of these questions of how things came to be; I just followed and believed my parents’ beliefs! I never knew there actually existed a legal battle between whether or not to teach evolution and Darwin’s origin of species! Having watched this video I now see how important it is for us to be open minded as human and be able to understand that one thing (science and evolution) doesn’t have to affect the way you view the other (theology and personal beliefs).”</td>
</tr>
<tr>
<td></td>
<td>Student I: “I was born and raised Muslim. It is still hard for me to believe that evolution is real. However, as a biology student and after reading and watching these videos about evolution I can comfortably agree with the idea.”</td>
</tr>
<tr>
<td></td>
<td>Student E: “This presentation was particularly interesting to me because I grew up in a very religious household. The idea that science and religion can coexist and the Catholic Church has accepted that idea is really amazing and new to me. Having the wisdom to understand that knowledge is important and not a threat to theology is very important. Before reading...”</td>
</tr>
</tbody>
</table>
this I never knew that it was in the 1950’s when the Catholic Church came out in acceptance of the theory of evolution. The most important part about this presentation is how it points out that science and theology, though they do help us understand very similar aspect of humanity, they don’t overlap.”

Figure 2. Percentage of students offering positive views on various topics related to evolution.

teaching ID in science class. Meanwhile, 80% of students who failed to understand either the NOS or NOMA (or both) voted to include ID instruction in the science classroom (Figure 4B).

Discussion

As in other studies (Wood, 2012), we found that the blog-as-liminal-space format served our students very well, based on the level of participation and the degree to which most students submitted thoughtful and well-developed reflections. We feel that it is critical to
The Blog as a Liminal Space

Figure 3. Student understanding of NOS and NOMA. Analysis revealed that 70% of students displayed an understanding of the NOS (A) while 75% submitted reflections that indicated an understanding of NOMA (B).

<table>
<thead>
<tr>
<th>Displays an understanding of the NOS</th>
<th>Fails to understand the NOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>No: 10</td>
<td>No: 1</td>
</tr>
<tr>
<td>Yes: 0</td>
<td>Yes: 1</td>
</tr>
</tbody>
</table>

Figure 4. The relationship between understanding of the NOS and NOMA and education policy decisions. In the final reflection, 73% (n = 15) of students voted to exclude ID from the science classroom (A). 100% of students who display an understanding of the NOS and NOMA voted to exclude intelligent design from the science classroom, while students displaying a lack of understanding of either or both are more likely to vote to include ID in the science classroom (B).

<table>
<thead>
<tr>
<th>Displays an understanding of NOMA</th>
<th>Fails to understand NOMA</th>
</tr>
</thead>
<tbody>
<tr>
<td>No: 0</td>
<td>No: 0</td>
</tr>
<tr>
<td>Yes: 2</td>
<td>Yes: 1</td>
</tr>
</tbody>
</table>

Should intelligent design be taught in the science classroom?

assess these types of assignments on participation only. The liminal journey is messy and involves excursions to new ideas and retreats to previously held, perhaps incorrect, notions. Therefore, students must not feel that they will be judged negatively for expressing these things. Using carefully designed reflection prompts on sequential topics can provide the instructor with a window into the student’s liminal experience. Straightforward tasks such as watching a short video clip coupled with specific prompts that are predictable from week to week (see Table 2) help to keep students not skilled in reflective writing
motivated and engaged in this process. Indeed, we found that it was relatively straightforward to observe students as they wrestled with the troublesome areas involved in the acceptance of evolutionary theory (Table 4). We were also able to observe when students experienced the sorts of transformations that occur when dealing with a threshold concept (Table 5).

We believe that the introduction of NOMA as one of the reflection topics may have assisted in this integration. The National Academy of Sciences essentially uses the concept to address the evolution versus creationism debate:

“Science and religion are based on different aspects of human experience. In science, explanations must be based on evidence drawn from examining the natural world. Scientifically based observations or experiments that conflict with an explanation eventually must lead to modification or even abandonment of that explanation. Religious faith, in contrast, does not depend only on empirical evidence, is not necessarily modified in the face of conflicting evidence, and typically involves supernatural forces or entities. Because they are not a part of nature, supernatural entities cannot be investigated by science. In this sense, science and religion are separate and address aspects of human understanding in different ways. Attempts to pit science and religion against each other create controversy where none needs to exist.” (Science, Evolution, and Creationism, 2008)

In consideration of the fact that the majority of our students come from religious backgrounds, we exposed them to the concept of NOMA and allowed them to explore its meaning and apply it to the specific situation of intelligent design in the classroom. They were asked to vote whether or not to keep include intelligent design in the classroom and explain their stance on this issue. Since this was the last reflection, only 15 out of 20 students submitted a response. 73% of these students voted to not include intelligent design in the science classroom and those that wanted to include intelligent design in the classroom had trouble with either their understanding of NOMA, the nature of science or both (see Figure 4).

Our data showing the correlation between understanding of the NOS and NOMA and the decision to keep ID out of the science classroom is noteworthy, though our small sample size requires further confirmation (Figure 4). We surmise that this finding points to the importance of understanding the NOS in order to differentiate evolution from non-scientific explanations. And thus, in order to apply NOMA to issues of creationism in the classroom, it is necessary for the student to understand the nature of science. Indeed, it has been shown that an understanding of NOS can increase the acceptance of evolutionary theory (Sinatra et al., 2003). This finding also makes it clear that our study could’ve benefitted from additional learning opportunities for the NOS, a concept that is troublesome because it is frequently alien to undergraduates and also heavily nuanced. (See Deng, Chen, Tsai, & Chai, (2011) for a recent review of the state of undergraduate conceptions of the NOS) This is an area that will be strengthened considerably in future semesters.
Our data recapitulate the common sense notion that not all students enter a classroom at the same stage of understanding, regardless of the course or topic at hand. Uneven development and student history ensures a wide range of starting points with a certain degree of pre-liminal variation (Jan Meyer & Land, 2006). The blog-as-liminal-space course design is well suited to this reality, as it allows students to move through the liminal space at their own pace, however imperfectly, confronting the aspects that they find troublesome.

The blog format was particularly effective in revealing weaknesses in student understanding that can be addressed via other types of interventions. For example, student reflections clearly showed us that in order to make an informed decision regarding intelligent design in the curriculum, they will have to demonstrate a firm understanding of both NOS and NOMA. A learning opportunity targeting the mastery of these two concepts with a benchmark of 90% would go a long way in ensuring that the student is well informed before making a decision. This is also an opportunity to teach students how to think about an issue and form an opinion based on fact. In future semesters, this intervention will be constructed such that students continue to feel comfortable explaining their vote on ID in the classroom in a fully supportive liminal environment.

Although this report is based on only one semester’s experience, we feel that using online tools such as blogs or discussion boards can be an extraordinarily useful tool for guiding students through the liminality of acceptance and appreciation of evolutionary theory.

References


Depicting the Suffering of Others

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Mount Royal University, Calgary Alberta, Canada

Abstract

This article offers a discussion about the depiction of traumatic materials to post-secondary human service students. Presently there is an on-going debate about trigger warnings and whether trigger warnings are necessary prior to engaging in materials that depict the suffering of others. Perhaps after depicting graphic images some teachers have seen students become active citizens. Conversely, teachers may have also seen students who tune out, or suffer themselves from these viewings; a concept known as secondary traumatic stress. If the purpose of depicting suffering is to encourage engaged caring citizenship, potentially, depicting images of suffering may not be enough to reach that outcome. These pages will challenge the notion of trigger warnings and ask teachers to look beyond this superficial behaviour and question their practices when depicting suffering. A set of questions teachers can ask themselves is included for consideration when depicting the suffering of others.

Keywords: Trauma, depiction, trigger warnings, compassion fatigue, vicarious trauma.

A trending topic in post-secondary teaching is whether or not to provide trigger warnings when graphic images or stories will be shared via course curriculum (Medina, 2014). At present, a debate about whether or not to provide warnings includes those in the professorate who think that forcing trigger warnings into course syllabi treats students as less intellectually than should be expected in a higher learning institute. These same professors argue that higher learning is meant to challenge the status quo and provide intellectual growth. According to Veraldi and Veraldi (2015) there is no need for trigger warnings since course curriculum would not meet the DSM-5 (American Psychiatric Association, 2013) criteria for Post-traumatic Stress Disorder (PTSD). Lukianoff and Haidt (2015) would agree stating that avoiding a stressor goes against typical anxiety reducing protocols; if anything exposure is more likely to be recommended.

Those on the side of the debate that think trigger warnings are important, maintain that respect for students and their autonomy over some areas of their learning is primary. If warnings are available students may have the opportunity to withdraw from the course, ask for alternative materials or mentally prepare for what might be encountered (studentvu.academia.ca). In particular, recognizing that there may be students previously diagnosed with PTSD, Shannon, Simmelink-McCleary, Im, Becher and Crook-Lyon (2014) suggested that, although trigger warnings may come across as anti-intellectual, in

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light of accommodations made for other post-secondary student mental health concerns, trigger warnings could be provided should there be students suffering from trauma related concerns. These same authors recognized that trauma exposure is not about PTSD rather is may be related to secondary trauma or compassion fatigue (Figley, 1995, 2002)

Behind the debate about trigger warnings is a long standing discussion about curricular materials that require a trigger warning in the first place. The rhetoric involved in this deeper discussion about the material itself relates to the importance of engaging in a world beyond oneself; to engage in critical dialogue about historical practices or present atrocities. Butler (2009) in *Frames of War* asked about the frames through which we have come to understand grievable and precarious lives. She asked us to consider how our boundedness with others makes all of our lives precarious. Teaching content that includes depicting the suffering of others can assist students in understanding their boundedness to others, which can be both rewarding but also potentially difficult. While Butler’s work highlights that each life is precarious and grievable; Butler’s work also reminds us that when teachers share materials in the classroom that represent pain and suffering, there are student in the room. These lives too are precarious and grievable.

There is some potential that depicting the suffering of others could lead students to experience a disturbance, that is, an experience similar to those individuals who are being depicted in the materials and feeling traumatized. When feeling emotionally overwhelmed, students may have great difficulty absorbing curricular materials, or they may become more attuned to the nature of such difficulties or struggles for others. There are constructs that exist related to Secondary Traumatic Stress and Vicarious Trauma (Figley, 1995; 2002; Pearlman & Saakvitne, 1995) that speak to the notion of secondary witness effect of the student population in particular (Carello & Butler, 2014; Graziano, 2001; Shannon et al., 2014; Spear, 2014). However, in an attempt to stay away from labelling students as potentially traumatized by witnessing the pain of others, rather, in this work, I questioned the practice by teachers of depicting the suffering of others and how they might do this well.

While gathering the literature on this topic, it becomes clear that there is a tendency to label students for the way they take up this material into binary positions, such as resilient or pathologized. What is important to consider, however, is the ways in which teachers respond to students and to the ways in which depictions of suffering live in the post-secondary classroom. While understanding the impact on witnessing suffering in a classroom is important and necessary, how and when students suffer due to that witnessing, may have something to do with the when and how of curricular delivery. For example, how do teachers in post-secondary human service programs frame the pedagogical purpose for using these materials; and how do teachers take up students responses, if at all. Teachers in post-secondary classrooms hold the balance of power in the classroom since it is they who choose the learning objects that assist in curriculum delivery (Kostouros, 2008, 2012).

Since teachers make the choice in materials used in their classes, a question is raised if delivering the course content takes priority over attending to students’ responses, particu-
larly for those students whose response does not create meaningful learning but instead impedes their learning. Teachers may play the odds and use numbers to perpetuate a stance, for example, if the majority of students take up this material and become more empathic then it is worth depicting the suffering of others in post-secondary education. If this is the case, then the one student who potentially experiences a deleterious effect may not matter; that is, his or her life is not grievable, and there is no regard for the individual case or exception (Jardine, 2006). Potentially, the instructional practice traumatizes students in the effort to learn about another’s trauma or suffering and teachers may frame the practice as necessary, thereby not recognizing they have perpetuated the notion that one person is more grievable than another.

An example of this concern can be found in an article written by Zembylas (2009) when he questioned the practice of cultivating mourning and pointed out some of the ways in which students might take up materials that depict the suffering of others. He described three student responses to these depictions those being: desensitization, resentment, and sentimentality. Accordingly, depending on how students take up the material, they potentially become labelled through one of the three categories. Therefore, if student responses did not match the intended use of the materials, for example, to mourn a grievable life (Butler, 2009), then it becomes the students’ own responsibility rather than being related to the way the practice unfolded. Labelling students may take the responsibility out of the hands of teachers and focuses instead on individual pathology. Certainly Brunzell, Waters and Stokes (2015) acknowledged that there are trauma affected student in classes and there may be opportunities to teach sensitively; in ways that tend more toward healing than hurting. Zembylas (2013) reminded us that some students “carry a traumatized past” (p. 179), given global knowledge and personal troubles. He suggested that critical pedagogy of the past remains embedded in binary positions and does not allow for more nuanced teaching practices. In other words, it may be time to move beyond the debate of giving trigger warnings or not, rather, teaching practice must consider the student in the room.

Having students witness suffering must serve a pedagogical purpose, for example, to assist in developing skills and knowledge as a professional or to evoke a new way of thinking and acting in the world. Some students may be emotionally challenged although not overwhelmed by the materials that depict the suffering of others and it may lead them to question their own world. For example, they may change their worldview and seek to understand more clearly how it is that our histories, social structures, and cultural beliefs, as noted by Spear (2014), allow one person to be more grievable than another (Butler, 2009). In this case, the material may create strong emotions but not emotions that are so overwhelming that the individual can no longer learn. Perhaps we are asking students to be addressed and engage in a life beyond them, to provoke an awakening, to provide the opportunity to remember themselves as being in a shared world. Perhaps the teacher is asking students to rethink their relationships to the other and to rethink how we are in a shared world. However, if an overwhelming emotional response that makes learning difficult occurs (Carello & Butler, 2104), then we may be beyond the limits of the intended purposes. When a disconnection from learning and the learning environment happens,
materials are no longer serving their intended purposes and the teacher’s responsibility may change.

**Depicting Trauma and the Impact on Learning**

Psychological literature pointed to the idea that there are bio-physiological processes at play when one experiences trauma (Porges, 2011), and potentially the witness of the trauma and suffering and that there may be a negative effect on an individual’s ability to process certain material and thereby learn while in a state of distress or traumatic stress. Figley’s (1995, 2002) concept of Secondary Traumatic Stress highlights the negative impact on individuals, albeit to a lesser degree, when secondarily witnessing trauma. While secondary witnessing may not have the same effect as a direct trauma (Valent, 2002) some literature has unearthed additional considerations as to this impact. For example, Carello and Butler (2014) shared examples provided by teachers in post-secondary humanities classes who “went too far” (p. 158). In particular, these same authors quoted examples about traumatizing students. Berman (as cited in Carello & Butler, 2014) “found that 14% of his 105 students who self-disclosed personal traumatic experiences reported feeling “anxious, panicky, depressed or suicidal-feeling serious enough to warrant clinical attention” (p. 158). It is possible then that students, due to the overwhelming nature of the depicted trauma or suffering, will have difficulty making meaning of the materials and potentially dissociating from the classroom context entirely. As a protective function, the ego needs a boundary otherwise “all we are left with are repetitions of suffering, a suffering unattached to thought” (Britzman, 2000, p. 50).

Even though Spear (2014) acknowledged the effect of students from witnessing suffering Spear (2014) also argued for the need to bear witness as an ethical responsibility to those who have endured historical trauma. While it is important to find ways to remember those who have suffered and find ways to not repeat similar horrors, it is also important to keep in mind that traumatic stress has physiological responses that are biological and neurological, not only psychological (Scaer, 2012). Since during a perceived trauma flight or fight mode is accessed, we may be working primarily in the brain’s survival functions, that is, the midbrain and limbic system, and not the neocortex. The neocortex, considered higher-level brain function forming the cognitive regions of the brain, is not being accessed during trauma since resources are dispatched to lower brain functions in order to help the individual to survive (Porges, 2011; Rothchild, 2011).

In the literature that deals with the discipline of education, there is confirmation in the purpose of using trauma depiction as an educative tool for social justice in particular (Dutro 2011). Certainly, students come to gain awareness about a shared global history. Britzman (2000) in particular, viewed the depiction of suffering in education as necessary and stated that there is an obligation in education to use historical trauma as a pedagogical tool and believed that depicting suffering would transform students’ awareness and empathy. In this regard, Spear (2014) claimed that reading trauma laden stories assists in healing both reader and author. Spear contended that healing has universal applications, and that “teachers and students are also wounded healers, albeit differently and to varying degrees. Furthermore, acknowledging a shared social responsibility of healers and others
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highlights agency for all and establishes purpose that transcends the course” (p. 68). Spear continued by also acknowledging that there are complications to asking both students and teachers to take the role of healer or being healed in the classroom.

I wonder, however, how we come to understand this transformation from wounded to healer, and if this does actually occur. As a counsellor who works with those having experienced trauma, I have developed a trained eye for affect and behaviour. Having worked in confined spaces with offenders, I also tend to have a certain vigilance toward the affect of others. My counsellor identity may even portray a certain empathic reaction and, therefore, a more cautious approach. I may actually know my way around (Gadamer, 2004), which could assist in recognizing responses to the depiction of another’s suffering. Understanding, according to Gadamer (2004), included a practical ability that is linked to both knowledge and “being well versed in something” (p. 251), and allows for “seeing connections and drawing conclusion” (p. 251). Britzman (2006), in her work in relation to understanding the use of what she coined ‘difficult materials,’ recognized that “it takes a great deal of time to actually notice students in the room” (p. 109). I wonder whether post-secondary teachers observe students closely enough to recognize transformation or responses other than what the teacher intended, particularly given the systemic issues related to the post-secondary system such as time, space and the focus on outcomes.

Significance of the Study

Human service programs, such as Nursing, Social Work, Counselling and Psychology, depict the suffering of others for various reasons. For example, Social Workers learn about the policy and/or social issues that maintain and perpetuate poverty and increase homelessness. These programs also use depictions of suffering to increase awareness for social justice advocacy. According to Jones (2002); Kostouros (2008); McCammon (1995); and O’Halloran and O’Halloran (2001), depicting the suffering of others will assist students with preparing for the reality of the work in their profession, for dealing with particular human service issues such as childhood abuse, to enlighten and increase empathy, and to bring statistics to life. However, authors are also concerned about the way in which depictions are used and the effect on students from that use (Black, 2006, 2008; Kostouros 2008, 2012; Shannon et al., 2014; Zembylas, 2013).

My desire in this study was to acknowledge the theoretical debates, and to remember that it underlies a human problem and is not simply a theoretical or pedagogical endeavour. Regardless of where teachers situate themselves in such debates, something happens for some students, and I wondered if the pedagogical response was to become sensitive to these potential outcomes, and, at times, perhaps re-think some of the choices in preparing and selecting curricular materials. In short, I was not questioning if we should use materials that depict the suffering of others, but rather my interest was in how can we use these materials well. In some cases, I also wondered about teachers’ ability to see beyond the boundaries of their classroom frames of reference—the lesson plans—and be attuned enough to the students’ needs in the classroom.
There is an aporia in this topic; that using materials that depict suffering could both enrich and impede learning. The practice of depicting the suffering of others may be fraught with representational challenges and this topic sits within a discourse that remains unresolved and contentious. On the one hand, it is necessary to help students, and ourselves, understand that we are connected to others, regardless of the global distance from the depicted trauma. In post-secondary education, we should analyze the political rhetoric related to the suffering of others and therefore, it is necessary to inform. On the other hand, if using materials that depict the suffering of others creates responses such as desensitization, resentment or sentimentality (Zembylas, 2009), or becoming voyeuristic (Brina, 2003) then are we honouring the lives that we hope will be made grievable in depicting that trauma.

A point made by Kostouros (2008, 2012) is the way in which students are considered to be a captive audience and, therefore, have little choice in the position as witness. Additionally, Carello and Butler (2014) recognized the potential to overwhelm students due to the nature of the subject. Not surprisingly, students have little choice in the position of witness when there are assignments or grades attached. Students may also have little choice in the meaning they make in relation to the materials, for example, having to get the right answer on an exam. Like trauma itself, there may be a loss of control since students may have limited input into the curricular and delivery decisions made by teachers in the post-secondary system.

I used to embed far more stories about the suffering of others in my curriculum when I first started teaching. Over time, I began to regard my responsibility to students differently. As a post-secondary teacher hired for content knowledge, I have come to understand that most post-secondary teachers are hired for their content knowledge and not for their pedagogical competence or knowledge about teaching. Palmer (2007) suggested that pedagogy is not something that one possesses, or that we do, but rather it is something that requires us to be reflective and sensitive and competent. I have found myself in the in-between of delivering and planning curriculum that includes the use of materials that depict the suffering of others. I have seen how encountering the suffering of others in learning can be difficult yet beneficial and sometimes taken up as traumatic. I have seen, through my work with clients in practice, that difficulty can propel necessary changes, and that with students’ difficulties can propel learning. However, I have also seen students whose response is more akin to a traumatic reaction, whereby the learning is no longer difficult but impossible, as if a rupture has occurred. I wonder how we might make a space in the post-secondary classroom to discuss materials that are used that depict the suffering of others.

**Methodology**

Recognizing the impasse and the ongoing debate, I believed that an interpretive approach was necessary. Interpretive hermeneutic inquiry provides a reflection of how a topic might present itself in the world. Hermeneutics is primarily concerned with understanding and interpreting meaning. This approach to research allows for deep probing of the topic through dialogue with participants, understanding the traditions that inform the topic.
ic by reviewing additional texts and interrupting the social and cultural meanings embedded in the topic. By weaving together various sources of data, for example, interview transcripts, field note journals, philosophical theory, and how the topic can be understood historically, we can learn how it is perceived in the world presently, and how it might be understood differently.

**Participants**

My approach therefore, was to understand the practice of using materials that depict the suffering of others in post-secondary human service teaching. In general, I was interested in understanding the intention, by post-secondary human service teachers, in using materials that depict the suffering of others, and how depicting the suffering of others is taken up in the post-secondary human service classroom. Therefore, I invited six post-secondary teachers from human service programs who use materials that depict suffering to dialogue about their practices. Since several of these teachers also talked about referring students to counselling, I invited a counsellor as well to act as a participant.

Although the broad overarching direction focused initially on the intent of the practice and response by the students, the hermeneutic approach allowed meaning to unfold as insights emerged. The participants assisted in opening up the topic, and they described pedagogical experiences that garnered my attention. True to hermeneutic work, what is offered herein is not about the participants but rather the topic. These pages speak to the aporia of using traumatic materials in post-secondary human service teaching, and include the complications related to teachers’ ethical responsibilities.

**Questions**

In this article, I share what I came to understand about the purpose of using these materials by post-secondary human service teachers. I wondered if delivering the course content, which includes depictions of suffering, takes priority over attending to students’ own responses, particularly for those students whose response does not create meaningful learning when depicted trauma is used, but instead it impedes their learning. Potentially, the instructional practice traumatizes a student in the effort to learn about the suffering of others and the teacher may frame the practice as necessary.

While I stopped short of providing an answer to the aporia of this topic, I do not answer if we should or should not use these materials rather, I offer an opportunity for post-secondary teachers to consider their own actions and their own responses to students who have suffered from encountering such materials.

**Findings and Practice Implications**

The results from researching this topic are framed below using the questions that emerged from the participants themselves about the practice of using materials that depict suffering. The teachers interviewed reflected on their own practice and considered the
lessons learned from the practice of depicting suffering in their post-secondary human service teaching.

**Teacher Reflections**

The following set of questions was generated by participants in their reflections related to their own experiences with having delivered materials that depict suffering. I have added this section as fodder for further considerations when readers are considering their own teaching practice and deciding about depicting the suffering of others in their curricular materials.

**Who is my audience?** This question came about after one participant described a turn of events after showing a film titled *Wetback: The undocumented documentary* (Torez, 2005) in a course that triggered two students with a similar refugee background. Initially, these students approached the teacher with thanks for sharing the harrowing story that was similar to their own experience of having to escape a war torn community. According to this teacher, the students believed others would now have a better understanding of the plight of refugees that come to North America. However, as weeks passed after the viewing of *Wetback* (Torez, 2005) the teacher noted that certain classroom peers treated these two students differently, as if they had become more fragile. The teacher had used the same film for several years without considering changes to the student audience. This teacher suggested that more consideration was needed for the individual students in the room and that a different but equally moving documentary could have been found.

The sharing of this example is not to suggest that we protect students from the realities of the world, or that sharing personal experiences cannot increase empathy and compassion for each other in the classroom. However, some students, particularly those with limited exposure to tragedy, may not know how to respond. Therefore, this teacher suggested that depictions must be given more thought and be considered in relation to the students in the classroom, which may mean that teachers cannot use the same material time after time or year after year. Additionally, this teacher suggested the need to consider what we expect from students after viewing the depiction in terms of their interactions with one another. This teacher stated that to some degree, if we are going to depict suffering, we may need to assist students to reflect on how they might respond to the material and to each other.

**What might be the limit of horror for this audience?** Many students come to post-secondary education with limited exposure to real world events. If, as several participants suggested, the teacher’s role is to expose and enlighten, then how can we do so in ways that allow learning and understanding to journey together. There is potential that teachers bombard students hoping to shock students into caring. However, we must find the balance between enhanced learning through depictions and depictions that potentially impede learning. As one participant mused during our interview, *I want them to know it’s out in the field, but some of that needs to happen out there. I don’t need to show them everything; there are some things that people just don’t need to know.* In other words,
the field itself will also act as a teacher. In addition, some students may not practice in the trauma arena; not everyone will do trauma work.

**Is this particular depiction necessary?** When I returned to two of my participants for second interviews, I heard from these teachers that they were more considerate about the depictions they chose after our first interview. Essentially, these participants had decided that they did not need to use the full-force of every depiction *I realized after we talked last that I didn’t need to use those particular photos or as many of them.* These teachers reflected on our discussion and came to realize that when they showed too many or too much of a particular visual aid, processing the intended lesson became difficult. The depiction became the lesson as opposed to the topic. For example, the lesson may be about how to recognize abuse, but with too many images or images that are too graphic, the lesson plan soon disintegrated into discussion about how to manage emotional responses. Certainly nurses, social workers, police, and counsellors, all need to know how to recognize intimate partner violence so they can respond accordingly. Helping students understand their own emotional response and how to contain emotion, for the sake of the client, is an important topic and should be discussed. However, these teachers noted that when they limited the use of depictions they were able to find an appropriate balance between the intended lesson and the living curriculum that bubbles up from these lesson plans. They also suggested that students were able to be more critical in their analysis of the systems and policies that effect the people they will work with in the future when they limited the number of depictions or the intensity of the graphic. In other words, the students were able to maintain a larger frame of reference, as opposed to turning inward and attending to their own emotional responses.

**What is my intention and can I get at that through other means?** In discussions with teachers in relation to the topic of depicting suffering, some teachers said that they are purposefully hoping to disturb students. For example, counting the number of crying students and wear this number like a badge of honour *I had five crying today. The entire class was in tears, it was great.* When I questioned whether this was a purposeful act or a consequence of the chosen depiction, I heard that for some teachers this is a purposeful act. In particular, one teacher said that in order to understand the suffering of others, the students must also suffer. When the action by the teacher is to cause suffering then that begs a question about one’s ethical stance.

For those who are not attempting to sting students there may be others ways to get at the intended outcome. Linking lesson objects to outcomes can be challenging particularly for teachers who do not have an education background. For example, one participant, who teaches a course on grief and loss, changed the curriculum in order to limit exposure to infant death. The teacher did not skim over this material or minimize the pain that goes along with such tragedy; rather this teacher realized that many of the students in this class were young females most likely in the dating-mating stage. Previously the material in this class focused more on infant death than was necessary. This teacher went back to the intended outcome of the course and individual lesson plans and found other means to get at the same outcome.
Did I prepare students for what they were about to witness? Most participants considered the preparation of students for what they are about to witness. While it may be impossible to prepare for some depictions, in particular with a trigger warning (Veraldi & Veraldi, 2015), there may be ways to be measured about the delivery of this material. Black (2006, 2008) suggested that teachers could use the technique of titration to create an incremental readiness for what will be witnessed. Certainly Spear (2014) described a similar process “when creating this course, I made sure that topics of healing were intertwined throughout the course structure” (p. 60). The concept of titration is used in trauma treatment and could be used to minimize the potential of secondary trauma of students.

If I use this depiction, what are the potential consequences, and am I prepared to respond? In my interview with a counsellor, I heard that students lined up outside the counsellor’s door after the viewing of a particular video, in a particular class, to talk about the content of the video. Apparently, this counsellor asked the teacher for a discussion about the impact of the video content. It was clear that the teacher was referring students to counselling after the viewing, which seems an appropriate response; until the counsellor explained that there may be others who were triggered that did not necessarily have an overt response to which the teacher could refer. In this case, the teacher had only considered one particular response as requiring an intervention, in the form of a counselling referral.

Some teachers, such as the one above referring students to counselling, may expect certain student responses and watch only for those reactions but student responses may not necessarily be predictable. The students who began to treat their classmates differently after the viewing of the documentary Wetback: The undocumented documentary (Torez, 2005) acts as an example of an unintended consequence. As Zembaylas (2009) has noted students may become desensitized, resentful and sentimental. Further questions emerged then about what are the student responses to which we attend. We certainly would not need to respond to every reaction but to focus on only one response may limit further musings about the suffering of others discourse teachers are attempting to highlight.

Do I have expectation that students respond in certain ways? One of the participants in this study suggested that a student who breaks down in response to a depiction of suffering may have unfinished business or may not be ready for the field. Some study participants recognized that if teachers are to let suffering live in the classroom, they have to assist the community of learners to understand that some responses to what is depicted should be disturbing. A degree of discomfort is to be expected, it would be abnormal if you’re totally comfortable with all of this. These participants understood that they may need to normalize when one is haunted. That’s normal and human. In describing what Brina (2003) had noticed with students while teaching about the Holocaust, students will often have unexpected responses, for example, laughing at horrific content. However, if teachers are to teach students to have critical thoughts and an understanding of the other who suffers, then according to Brina (2003), they must do so in an “academic environment that legitimizes feelings and allows for the expression of ‘weird thought’” (p. 527). Do we truncate dialogue that could lead to deeper understanding of the suffering of others by our own expectations of what is or is not an appropriate response to depictions of suf-
Depicting the Suffering of Others

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fering? On the other hand, when teachers have the power over marks and final grades students may respond accordingly, for example agreeing with the teacher, and if so, have we really influenced the student’s understanding and critical reflection of the suffering other.

Am I aware of the resources, on campus or off, should I need to refer a student? In my interviews with participants, there did not seem to be a universal response to suffering students. When students seemed to suffer themselves after witnessing suffering some teachers in this study stated, I help them get connected to counselling. If any student needs more support, then counselling is there. Other study participants seemed to take a more personal approach. If they want to speak to me afterwards, my email and my phone number are on the material, and I will stay for a half an hour or so afterwards. There did seem to be a universal understanding that when or if teachers notice students suffering, then there is a responsibility for the teacher to respond. We do have an obligation when the student is reacting to be able to support the student. However, as noted by the counsellor participant, we may be asking a traumatized person to step out of their trauma and find their way to the service they need. There seemed to be a heavy reliance on teachers themselves or counselling referrals that emerged in these interviews causing me to wonder if teachers thought that responses to depictions are always immediate. It is quite possible that students reflect later in the day and turn to other forms of relief such as drugs and alcohol.

These above questions assisted in opening up a new understanding of the assumptions we take up easily when we are teaching, and how such assumptions might affects students in our classes. It is my hope that opening up this topic for further discussions could bring about more informed and responsible teaching practices in the future when depicting the suffering of others in order to minimize secondary trauma.

Final Considerations

I thought that by researching this topic, I could come up with an answer—yes or no—as to whether we should depict the suffering of others, as if a dichotomous position would answer this complicated question. While finding a yes or no answer to depicting trauma and suffering may not have emerged in this research, some problematic practices and issues did come to the fore. My research brought up issues such as education in the post-secondary context, relationships between teachers and students, and the meaning and efficacy of preparation for professional practice.

When I began to look at this question in philosophical terms, particularly through an interpretive framework offered by hermeneutics, as well as my own discipline of an empirically-oriented psychology, I came to understand issues I encountered as an aporia; there is only an impasse, an in-between. When I accepted the aporetic nature of this topic, I thought there might be some best practices that teachers could follow when depicting the suffering of others. However, it was not long before this topic threw that thinking into a spin and I realized there are no simple guidelines for this practice. Much of what happens in classrooms will depend on the community that presents itself, or is based on what
is cultivated (Palmer, 2007). While competent teachers may use particular procedures in their practice, to relegate this topic to a set of techniques means I have disregarded teachers’ abilities to call up their own practical wisdom and use their authority well. My research has led me to understand differently, the need to respect students’ vulnerabilities in light of teacher positioning, and therefore, the precariousness of the teacher-student relationship.

There are some best practice guidelines particularly for elementary school and as we become more informed about trauma and its impact in the classroom for young students (Oehlberg, 2008). More insights are starting to emerge in the literature, for example, the International Society for Traumatic Stress Studies (ISTSS.org, n.d.), will be providing examples of syllabi that may speak to guidelines for teaching about trauma and encourages teachers to use a similar approach when teaching trauma in post-secondary settings. Shannon et al., (2014), discovered that exposure to traumatic content did indeed surface negative responses, and that over time most students were able to resolve their experiences. However, these authors also acknowledged that the students with a trauma history had far more difficulty. In particular, Shannon et al., noted that these students “have unique and sometimes more difficult reactions as their own trauma experiences may be triggered by course material” (p. 690). These same authors suggested that students could learn strategies for managing their responses prior to exposure. Finally, Black (2006; 2008) suggested that if we are going to expose students to materials that depict trauma and suffering we could do so in similar ways as clinicians do when working with clients using exposure techniques; safely and slowly.

**Teacher Responsibilities**

I think it is incumbent upon teachers to claim an ethical responsibility to each and every student in the room, by ensuring educational choices are pedagogically and ethically sound. I agree that materials depicting the suffering of others are important and necessary, but not at any cost; students who are invoked into an emotionally distressing place call for an ethical response from their teachers, perhaps as I have shown in this article, a central aspect of the pedagogy of professional preparation programs with which I am engaged. Teachers act responsibly when they are able to recognize the impact that depicting suffering has on students and are able to acknowledge that students responses are not strictly students’ alone, but an integral aspect of the pedagogical contexts. It is my hope that if teachers read this work then they will consider their understanding of the impact the practice of depicting suffering others has on students as an overall aspect of preparation for human service professional practice. It takes a certain amount of vulnerability to open up and truly engage with the other, when teachers desire to recognize student suffering, this can enhance their own pedagogical awareness and the meaning related to certain kinds of practices.

In the case of teachers who see every student as grievable, then they are more likely to remember that they work within a community of learners, and that they are teaching not only that which they are trying to have students remember, the past, but they are also hav-
ing students thinking about action and agency in the present. We are our actions and we have agency with and for others.

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Faculty Teaching Development: Using the Multidimensional Matrix of Teaching Development to Guide Teaching Improvement Activities

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Abstract

Higher education faculty learn how to teach through courses, seminars, or workshops during and after their doctoral program. Perhaps the more prevalent way faculty learn to teach is through observational and self-directed learning. In order to assist with self-directed teaching improvements we developed the Multidimensional Matrix of Teaching Development (MMTD) focusing on what dimension or component is being targeted for improvement, how to improve, and who can/should be used to assess the improvement. A facilitator or mentor could also use the MMTD in planning and guiding an individual in improving teaching, and, importantly, student learning. After explaining the MMTD we provide an example that illustrates how the matrix was used by one author as a tool to improve a targeted teaching component.

Keywords: Faculty development, guided, self-directed.

The lack of preparation of faculty in the service and teaching realms, relative to research, has been a concern for decades (Altany, 2011; Centra, 1978; Lewis, 1996; Sorcinelli, Austin, Eddy, & Beach, 2005; Young, 1987). Preparing Future Faculty (PFF) programs as well as teaching centers can be found in higher education institutions across the country, each seeking to assist faculty to succeed in all three areas (DeNeef, 2002; Gaff, 1994; Lang, 2008). However, questions remain as to how to best support faculty, particularly in the area of teaching. Arreola (2007) asserts the need for faculty to become well-versed in teaching as well as content, referring to the teaching role of higher education faculty as a meta-profession: “A profession that assumes content expertise as a foundation but requires professional-level performance in areas outside a faculty member’s recognized area of expertise” (p. XIX). Similarly, Young (1987) suggests that, “The key is a closer look at the ‘profession’ of college teaching- its mixed nature, its multiple features, and its necessary complexity. These are characteristics on which to build programs for faculty professional development.” (Young, 1987; p. 14)

In this manuscript we take the position that the teaching role of higher education is a meta-profession; one where higher education faculty have content expertise in some area(s) of their academic discipline. Regardless, however well-prepared faculty are concerning the content of a course, they may lack experience and/or knowledge of the processes of

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teaching and, importantly, student learning. Hence, we elaborate on teaching as a meta-profession and the need for faculty development in teaching as well as in research and service. We also recognize the numerous aspects and complexities associated with the profession of teaching, and that faculty develop at differing rates and times when learning to teach. Subsequently we discuss the multi-faceted nature of teaching and the need for faculty development in teaching to use a targeted but customized approach. We then discuss the processes needed to enhance teaching through faculty development, and ultimately present the Multidimensional Matrix of Teaching Development (MMTD) as a tool that can be used to guide faculty as they work to improve their teaching and, hence, student learning.

Teaching as a Meta-Profession

Teaching has been referred to as a meta-profession for most faculty in higher education (Arreola, Aleamoni, & Theall 2001). Faculty are routinely educated (e.g., classes, seminars, directed study) and trained (e.g., research techniques, statistics, clinical skills) in their “base profession” (e.g., chemistry, English, mathematics, business) but typically not in teaching (e.g., instructional design, delivery, assessment knowledge and skills). Hence, the notion of teaching as a meta-profession. In addition, higher education faculty normally go through various stages or phases in their careers, impacting teaching, research and service. Key elements that can be gleaned from this meta-profession perspective include:

- Faculty “learn” how to teach primarily through their individual experiences, observations, and self-directed learning. Formal courses and short courses/workshops can also stimulate faculty knowledge of teaching/learning, but without practice and feedback teaching performance will not improve. Similarly, mentors can be very helpful but, once again, only if the mentoring occurs with practice and feedback.
- Faculty evolve through various stages related to the phase in their career and/or their perspective on the practice of teaching/learning. At each stage faculty have different teaching developmental needs and may be better served with different methods, content, and mentors in gaining knowledge, practice, and feedback. Hence, those involved with faculty teaching development should plan programs and approaches based upon the stages rather than one “size” fits all.

“Learning” to Teach

There is an inherent assumption in hiring faculty that their content knowledge, practice/clinical skills, research skills, and any teaching experience they have had prepare them for teaching (Arreola, 2007). The research on faculty teaching performance, typically using students’ evaluations of teaching performance, suggests that this may not be the case (Aleamoni, 1999, Hattie & Marsh, 1996; Marsh & Hattie, 2002). The notion that content knowledge, although necessary, and experiences with teaching are sufficient to drive good teaching may be misguided and potentially “devalues” teaching (Chism, 2004; Weimer, 1997).
There are typically three ways that individuals, as adult learners, learn how to teach (Post, 2011). First, there are formal credit courses that doctoral students may take. These courses, however, may not be targeted toward teaching college students. Rather, they may be more focused on K-12 teacher credentialing. Second, individuals may learn to teach or improve their teaching through organized short courses, symposiums, colloquia, or workshops that address a particular teaching technique (e.g., interactive lecture, thinking aloud paired problem solving aka TAPPS), methods for improving and/or evaluating teaching (e.g., teaching portfolio, classroom observation checklist such as COPUS, Smith et al. 2013, or RTOP, Piburn et al. 20000), or use of technology (e.g., Blackboard or classroom response systems, aka clickers) in teaching. Formal credit courses, workshops, etc. can increase teaching knowledge. Regrettably, research has not supported a direct link between teaching knowledge and teaching performance unless the knowledge is directly applied into teaching practice (McAlpine & Weston, 2002; 2004). The third manner in which individuals learn to teach is through observational learning and modeling (Bandura, 1977), or other methods of self-directed learning. This third manner is the predominant manner in which individuals learn how to teach (Hativa 1997; Hativa, Bar-ak, & Simhi 2001; Post, 2011). Individuals utilize their observations and experiences from being students. As college students, undergraduate and graduate, they were exposed to many different faculty teaching in many different ways. In developing their own teaching “style” they borrow from their experiences those things they thought were good or effective based on their enjoyment and learning. As college faculty they then may adapt their approach to teaching in a trial and error fashion based on what was good, what “worked,” or what impacted their evaluations (Hativa et al., 2001). Then, based upon feedback from students and/or conversations with other faculty or administrators they might try some alternatives to improve their teaching and, hopefully, student learning.

In general, the consensus is that “University professors, not having received any systematic preparation for their teaching role, gain beliefs and knowledge about good pedagogy through trial-and-error in their work, reflection on student feedback, and by using self-evaluations” (Hativa et al., 2001, p. 700). Overall, collegiate “teaching is a lonely profession . . . [and] once the classroom door is closed . . . you are on your own” (Post, 2011, p. 32). Moreover, at various stages of their career, faculty may view teaching differently and, hence, have different teaching developmental needs (Diaz et al., 2009; Post, 2011).

**Teaching Stages**

While Diaz et al. (2009) focus on the amount of time faculty have been teaching when discussing levels of teaching expertise, Post’s (2011) research suggests that faculty go through various stages of teaching that may or may not relate to the number of years they have been teaching in higher education. Using narratives from twelve college professor participants/informants and a phenomenological approach, Post (2011) identified seven developmental stages of learning to teach in higher education: warming, forming, informing, storming, performing, reforming, and transforming (Figure 1). Individuals may not go through all the stages or at the same rate. Rather, they may settle in a particular stage and stay there or, possibly, regress to an earlier stage.
1. **Warming**
   Focus on early educational, social and cultural influences, economic status.
   Attitudes of parents, teachers and peers encourage development of positive attitudes toward learning and higher education.

2. **Forming**
   Focus on graduate school experience and coping with the pressure, isolation, humiliation, accepted “rites of passage.”
   Early trauma (or euphoria) of initial teaching experiences.
   “New identity” formed in relation to discipline.

3. **Informing**
   Focus on first real teaching experiences.
   Overwhelmed by need to inform and disseminate knowledge with compulsion to share everything in one semester.
   Overwhelmed by teaching load.

4. **Storming**
   Focus on future need to do research while still wrestling with teaching demands.
   First pangs of assessment angst.
   Feelings of responsibility toward students.

5. **Performing**
   Focus more on student needs.
   Concerns for “performance” in teaching.
   Need to maintain own enthusiasm and to increase student interest and attendance.
   Finding a compatible teaching style.

6. **Reforming**
   Focus on trying new teaching techniques and strategies. Burgeoning interest in pedagogy and how students learn.

7. **Transforming**
   Focus on finding teaching approach that encapsulates both teaching and learning activities, active involvement of students. Development of identity as the “self that teaches.”

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**Figure 1. Descriptions of Post’s Seven Stages of Learning to Teach.** Reprinted from “Trial by Hire: The Seven Stages of Learning to Teach in Higher Education,” by P. Post, 2011, Contemporary Issues in Education Research, 4(12), p. 32. Copyright 2011 by The Clute Institute.

As suggested by Post (2011), the warming stage is the time when an individual begins to develop an interest in higher education and the possibility of becoming a professor or lecturer, while the forming stage is when individuals begin developing the tools and knowledge necessary for the academy. It is during the forming stage when faculty have initial experiences, positive and negative, with teaching (e.g., teaching assistant, guest lecturer, instructor with full course responsibility). This is also when individuals learn about teaching by watching the teaching behaviors of others. However, it isn’t until the informing stage that individuals have the first real teaching responsibility and begin to develop a teaching style, many times basing his or her style upon what has been previously modeled. The storming stage is a period of angst for faculty as they experience the teaching versus research tension, but they return to a teaching focus during the subsequent performing stage when they spend more time and energy on planning their courses and the accompanying activities. This leads to the reforming stage when faculty begin to study how students’ learn and make adjustments in their classes accordingly. Both the performing and reforming stages involve a lot of self-directed learning, as faculty attempt...
to improve their teaching, and hence, student learning. Lastly, faculty who enter the transforming stage continue to work on improving their teaching, but they also serve as models for others and disseminate knowledge about the teaching/learning dependency (Post, 2011).

As with other areas of academic responsibility (e.g., research, service), it is paramount for higher education faculty to continuously improve their knowledge of teaching/learning, teaching skills, and teaching ability/practice. Professional development in teaching/learning, whether self-directed or facilitated by others, can connect faculty from different disciplines and career/perspective stages in addition to being a central part of the dissemination of knowledge and practice (Altany, 2011).

The Multidimensional Matrix of Teaching Development: What, How, and Who

As previously stated, faculty tend to learn about teaching through their experiences, observations, and self-directed learning and/or with the help of others whether in workshops, courses or mentoring. At different stages, faculty may have different goals, knowledge, and practical experiences which can guide them in their efforts to improve as teachers. However, in several stages faculty may lack the knowledge necessary to fully understand what and how they can improve. This can lead the utilization of a “shotgun” approach by faculty when making efforts to enhance their teaching performance. In this regard, we propose that if faculty are provided a framework that directs them toward specific areas of teaching they may consider for improvement, they can target these areas and systematically improve as professional teachers. Toward this end, we suggest that there are essential dimensions and components of teaching that can be targeted, and a framework that facilitates such targeting can serve as a useful guide to faculty of all stages.

Creating a common set of dimensions and components should aid faculty, mentors, and instructors with a common nomenclature for targeting and measuring the various aspects of teaching, aspects that can be improved systematically. In the remainder of this paper we present the Multidimensional Matrix of Teaching Development (MMTD). The MMTD is a framework that consists of a set of five dimensions, each containing six components (sub-dimensions). We refer to these dimensions and components as “what” should be considered when faculty target teaching elements for improvement. We follow the introduction of the dimensions and components of the MMTD with a description of “how” performance within these areas may be assessed, and by “whom.” We conclude by providing an example of how the MMTD framework was used by a faculty member to improve a targeted teaching behavior.

Dimensions (What)

Teaching is multidimensional (Abrami & d’Apollonia, 1991; Cashin & Downey, 1992; Feldman, 1997; Feldman, 2007; Marsh 2007; Marsh & Roche, 1993). Teaching is not a
single activity but is comprised of content knowledge/expertise plus a set of activities or skills necessary to facilitate and assess student learning. When considering how to deconstruct teaching to identify specific dimensions we first examined the work that has been done in the area of students’ evaluations of teaching (SETs). While the teaching constructs identified in SETs are cogent, the focus of SETs is as much on identifying dimensions of teaching that can be effectively assessed by students as on identifying teaching dimensions themselves. Much of the SETs research has been focused on determining what students can accurately judge (e.g., Feldman, 2007; Marsh, 2007; Theall & Feldman, 2007), with less concentration on determining if the judged dimensions of teaching can assist faculty in improving teaching practices. Consequently, to broaden the notion of teaching beyond SETs and utilize dimensions that have been employed during the improvement of teaching practices, our MMTD framework adopts the five broad dimensions of teaching identified by Arreola (2007): content knowledge/expertise, instructional design, instructional delivery, instructional assessment, and course management.

The first dimension, content knowledge/expertise, is an area that most faculty in higher education are well prepared for through their graduate education, experiences, and ongoing scholarly/professional activities. Some faculty may, however, be asked to teach in an area in which they are not an expert per se but, rather, one in which they have enough knowledge and/or know where to get the knowledge needed.

Instructional design is the second major dimension. Instructional design entails the planning and sequencing of the elements, events, and experiences students will be exposed to in a course that stimulates learning. The design dimension also involves the creation or discovery of materials (e.g., syllabus, handouts, and videos) and activities, as well as plans for using those materials and activities.

Instructional delivery is the dimension that many, and especially students, interpret as being teaching. The delivery dimension involves the faculty member’s communication, both written and oral, with the students individually and collectively. It also entails the creation of a classroom atmosphere in which students interact with each other and with the instructor. It is during the delivery that the instructor can show excitement and enthusiasm for the material or come across as bored and unenthusiastic. As illustrated in the classic Dr. Fox effect study (Ware & Williams, 1975), a person with good presentation and communications skills, with or without content knowledge, can develop an atmosphere that is conducive to learning.

At some point faculty need to assess student learning, which occurs in the instructional assessment dimension. Traditionally this has entailed the use of written exams, multiple choice and/or essay questions, term papers, etc. Alternatively, tests may consist of performance tests of skills learned that are utilized in practice. These tests may be entirely behavioral or be in the form of scenarios with answers being given both orally and in practice situations. Regardless of the assessment, there is an inherent assumption that the assessment is valid and reliable; that is, that it is measuring learning/performance and could be replicated in another situation for another faculty member, etc.
The final dimension, course management, involves all the activities necessary to make the class as smooth and seamless as possible. Course management entails having the right equipment available; arranging field trips; securing and scheduling guest lecturers; timely administration and grading of homework, exams, and papers; flexibility in making changes that may be necessary; starting and ending a class session on time; being available for students outside the classroom for clarifying course content and practices; and a variety of other tasks necessary for the operation of the course.

Components (What)

The five broad dimensions of teaching (Arreola, 2007), content knowledge/expertise, instructional design, instructional delivery, instructional assessment, and course management, although very beneficial, do not provide enough specificity to guide faculty as they seek to improve aspects of their teaching. Hence, it was necessary to identify subdimensions or components of each teaching dimension within the MMTD framework. As with the dimensions, it was desirable to go beyond dimensions/sub-dimensions of SETs. Thus, the components identified by Hildebrand, Wilson, & Dienst (1971) were adapted for use in the MMTD framework. For each of the five dimensions, six different components were identified. The five dimensions and six components in the MMTD are described in Figure 2.

Although there are six components per dimension, there is some redundancy. For example, “appropriateness” appears for content (i.e., appropriate content), instructional design (appropriate methods), and twice for instructional assessment (i.e., appropriate methods, appropriate level). Clarity, another component, falls under instructional design (i.e., clarity of goals or objectives), delivery (i.e., clarity of delivery), and assessment (i.e., clarity of criteria) as well as under course management (i.e., clarity of management). Other components are unique to a particular dimension (e.g., curricular alignment in content, sequence in instructional design).

Additionally, the components are not meant to be exhaustive. Rather, there may be many other components that are specific to a dimension (e.g., use of technology in instructional design and/or delivery) or that cut across dimensions (e.g., organization). However, those that are included offer faculty a solid starting point or framework and allow each faculty member to further define the component in relation to his/her teaching context as he or she works toward the self-directed improvement of teaching.

Assessing Performance (How & Who)

The teaching dimensions and components are the cornerstone of the framework and assist faculty in determining what aspect of their teaching they want to improve. The next step would naturally be to determine the steps and processes they would go through to improve that aspect. Those steps and processes vary based upon context, the particular component, and the experience/knowledge of the faculty member. The faculty member might want to seek the assistance of a colleague, mentor, or, when available, an on-
campus teaching center and its staff and resources. Part of the process would entail how
to measure performance and who would have the ability to judge the performance.

Adding the how and who (Figure 3) to the what (dimensions and components) completes
the Multidimensional Matrix of Teaching Development framework and encourages self-
directed faculty to gather the feedback needed to successfully inform their teaching de-
velopment. As can be seen in Figure 3, one needs to determine who can and should eval-
uate teaching performance on any dimension and component, and the method that should
be used, or the how. Faculty using the MMTD framework are guided to consider who is
capable of evaluating the various aspects of teaching by marking Y or N (yes or no) un-
der each potential who relative to the specific dimensions and components. Once they
identify who is capable of evaluating them in specific areas, the framework also prompts
them to identify the method(s) that will be used during this evaluation. This can broaden
a faculty member’s perspective to the processes of obtaining the feedback they need rela-
tive to instructional adjustments they may make. It also encourages faculty to gather
multiple forms of data and resources that can be used not only to inform future teach-
ing practice, but that may also be included in yearly faculty evaluations.

As an example of how the prompts within the MMTD framework can be helpful, when
considering who should evaluate their teaching, most faculty default to or rely solely up-
on students and the student evaluation system (SETs). However, for some dimensions
and/or components (e.g., currency of content), students and SETs questions may not be
appropriate to provide the feedback needed by the faculty member. In these situations
peers/colleagues, a department chair/head, a mentor, or maybe even an outside source
may be in a better position to judge the effectiveness of that teaching component. Thus,
the MMTD framework encourages faculty to be more deliberate and thoughtful when
considering who and how to evaluate their attempts to improve teaching and learning. A
ready-to-use blank version of the full MMTD may be found in Figure 4, and the example
that follows offers an illustration of how faculty may utilize the Multidimensional Matrix
of Teaching Development.

**Example**

One of the current authors was teaching a junior/senior class with approximately 135 stu-
dents. Most of the students were required to take the course either for their major or mi-
nor. After consulting the MMTD framework, one targeted teaching goal identified by
this author was to make the class content more relevant to the students (dimension = con-
tent, component = relevancy). Once the dimension and component were selected, rele-
vancy had to be more precisely defined to make this targeted component specific to the
context of the course. In this situation, relevancy was defined as being contemporary
(e.g., up-to-date examples), in line with subsequent coursework, and allowing students to
relate course content to their current lives as well as see the usefulness in the future pro-
cessional work. To this end, the current author planned numerous teaching and content
modifications for the course with the specific aim of improving relevancy.
<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Components</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Content</strong></td>
<td>currency</td>
<td>Content is current and up-to-date</td>
</tr>
<tr>
<td></td>
<td>relevance</td>
<td>Content is relevant to students</td>
</tr>
<tr>
<td></td>
<td>accuracy</td>
<td>Content is accurate within the discipline</td>
</tr>
<tr>
<td></td>
<td>appropriateness</td>
<td>Content is appropriate for the course and student level</td>
</tr>
<tr>
<td></td>
<td>thoroughness</td>
<td>Content is thorough in its coverage of key concepts</td>
</tr>
<tr>
<td></td>
<td>curricular alignment</td>
<td>Content is aligned with other courses in the curriculum</td>
</tr>
<tr>
<td><strong>Instructional Design</strong></td>
<td>clarity of goals</td>
<td>Goals are clear and pursued within the design of the course</td>
</tr>
<tr>
<td></td>
<td>interactivity</td>
<td>Interactivity is included within the design of the course</td>
</tr>
<tr>
<td></td>
<td>attractiveness</td>
<td>The design of the course and/or materials is attractive</td>
</tr>
<tr>
<td></td>
<td>sequence</td>
<td>The topics of the course are designed to follow a logical sequence</td>
</tr>
<tr>
<td></td>
<td>appropriate methods</td>
<td>Appropriate instructional methods are chosen and used</td>
</tr>
<tr>
<td></td>
<td>worthwhile activities</td>
<td>Meaningful activities are designed and utilized</td>
</tr>
<tr>
<td><strong>Instructional Delivery</strong></td>
<td>suitable</td>
<td>The instructional delivery is suitable for students and the content</td>
</tr>
<tr>
<td></td>
<td>functional</td>
<td>Delivery methods function and work well in the class location</td>
</tr>
<tr>
<td></td>
<td>attractive</td>
<td>Content is delivered in an attractive format</td>
</tr>
<tr>
<td></td>
<td>accessible</td>
<td>Learners can easily access instructional content and materials</td>
</tr>
<tr>
<td></td>
<td>clarity</td>
<td>Content is delivered in a clear and understandable manner</td>
</tr>
<tr>
<td></td>
<td>accommodating</td>
<td>Delivery of content accommodates all learners</td>
</tr>
<tr>
<td><strong>Instructional Assessment</strong></td>
<td>appropriate method</td>
<td>Appropriate instructional assessments are chosen and used</td>
</tr>
<tr>
<td></td>
<td>alignment with goals</td>
<td>Assessments align with course and lesson goals and objectives</td>
</tr>
<tr>
<td></td>
<td>clarity of criteria</td>
<td>Clear instructions and criteria are provided for all assessments</td>
</tr>
<tr>
<td></td>
<td>appropriate level</td>
<td>Assessments target appropriate levels of learning</td>
</tr>
<tr>
<td></td>
<td>reasonable</td>
<td>Assessments are reasonable given content, course, and learner constraints</td>
</tr>
<tr>
<td></td>
<td>feedback</td>
<td>Assessments provide feedback to learners and the instructor</td>
</tr>
<tr>
<td><strong>Course Management</strong></td>
<td>responsive</td>
<td>Instructor is responsive to course and student needs</td>
</tr>
<tr>
<td></td>
<td>accessible</td>
<td>Instructor is accessible to students in and outside of class</td>
</tr>
<tr>
<td></td>
<td>rapport</td>
<td>Instructor builds rapport with students</td>
</tr>
<tr>
<td></td>
<td>timely</td>
<td>Instructor is prompt and timely in providing information to students</td>
</tr>
<tr>
<td></td>
<td>clarity</td>
<td>Instructor provides clear direction, guidance, and policies</td>
</tr>
<tr>
<td></td>
<td>respect</td>
<td>Instructor demonstrates respect to students and earns student respect</td>
</tr>
</tbody>
</table>

Figure 2. Dimensions and components of the Multidimensional Matrix of Teaching Development. This figure also includes a brief description for each dimension and component.
The MMTD framework then prompted this author to determine who could judge the relevancy of the material (as defined above) and how it was presented. This author determined that several potential evaluators listed in the matrix could judge the relevancy including students, peers, self, and a content-focused advisory board (Figure 5). Since a key goal was for students’ to see the relevance, they were selected as the main evaluators. However, it was recognized that in order to be effective evaluators, students would have to attend class to judge the relevance of the material. Also, it was recognized that the advisory board would be qualified to discuss career relevance, while peers could judge relevancy related to other coursework and current events. Conversely, these last two groups were considered to be limited in their abilities to judge relevance to students.

Once this author determined who could evaluate the various aspects of the relevancy component, the manner of evaluation for each “Yes” group was considered. Based on the desire to use all students within the course as evaluators, three items were added to the end of the semester students’ evaluations of the teacher/course (SETs). These items, as well as all the other items on the evaluation, were also asked of the students during a midcourse evaluation. The three items included:

- My instructor attempts to relate my present learning to work in my future profession;
- My instructor incorporates current developments in the field; and
- My instructor makes course material relevant to me.

Rather than rely only on the midterm or end-of-semester evaluations, and to account for the need of students to attend class in order to evaluate relevancy, daily feedback was also solicited from a “panel” of students. For the panel, students were randomly assigned to class dates such that there were 4-6 panel students in any given class. Students were not required to serve on the panel and provide the instructor with feedback. However, if they did participate they received extra credit points. For the panel students were asked

---

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Components</th>
<th>Students</th>
<th>Peers</th>
<th>Dept. Chair</th>
<th>Mentor</th>
<th>Self</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
<td>Y/N</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Method</td>
<td>Method</td>
<td>Method</td>
<td>Method</td>
<td>Method</td>
<td>Method</td>
</tr>
</tbody>
</table>

**Figure 3. Performance Assessment within the Multidimensional Matrix of Teaching Development.** This figure demonstrates the addition of who (students, peers, etc.) and how (method) for the evaluation of the Content dimensions and its components.

The three items included:

- My instructor attempts to relate my present learning to work in my future profession;
- My instructor incorporates current developments in the field; and
- My instructor makes course material relevant to me.
Figure 4. The full Multidimensional Matrix of Teaching Development. This figure offers a full view of the MMTD that may be used by faculty or faculty developers.²

Figure 5. Example of author’s use of the MMTD to improve content relevance.

² See [http://www.uncw.edu/jet/articles/Vol16_2/Murphy.html](http://www.uncw.edu/jet/articles/Vol16_2/Murphy.html) for details in Figures 4 and 5.
to answer questions about the relevance of that particular class session’s content to their lives, current events, other classes, etc. They completed these evaluations independently and emailed them to this author within 24 hours. The two methods that were chosen to gain student evaluations of relevancy provided both daily and long-term feedback to this author.

In addition to the use of student evaluations, the methods chosen for peer evaluations included one-on-one discussions with other faculty members and a request for a peer to examine the syllabus and course materials (news clips, videos, etc. used in class) to determine thoughts about the relevancy of the course. During the discussions other faculty were asked about the materials needed for subsequent courses, and thoughts about the current events that should be included within the course. The data gathered from peers provided this author with feedback from the view of fellow teachers, which differed from the feedback received from students.

A third source of data came from the advisory board. During a meeting this author asked the advisory board to weigh in on their perceptions regarding the things most relevant to student career expectations and success. As with student and peer data, this feedback was very helpful in the external evaluation of the teaching updates that were made to increase relevancy within the course.

Lastly, this author performed an internal (i.e., self) evaluation of the relevancy component. Self-reflection techniques included the logging of new materials and methods, observations of how these were received by students, and perceived relevance of the updates to other courses within the academic program. These data were useful in rounding out the overall evaluation of the instructional improvements that were made to increase the relevancy component of the content dimension of teaching.

By following the MMTD framework, this author was able to identify and target a teaching component for improvement, and determine an evaluation strategy to assess the teaching updates that were made regarding the targeted teaching behavior. The MMTD provided structured guidance that prompted this author to consider dimensions, components, evaluators, and evaluation methods. However, it was also flexible enough that it allowed the user to determine the appropriate context and depth of the instructional intervention, subsequently meeting this author’s teaching development needs.

**Limitation**

Although the aforementioned example provides an illustration of how one of the current authors was guided through a teaching improvement process by the MMTD, this exercise also helped us recognize that a key faculty element is necessary to the successful use of this tool. Faculty members who utilize the MMTD must have the motivation (internal or external) to improve their teaching practices. The author discussed in the example above was self-motivated to improve teaching practices, which provided a strong impetus to go through each of the steps and utilize the tool as intended. However, without the internal motivation to improve, other faculty members may not be willing to exert the energy and effort necessary to implement the tool and improve teaching practices. Similarly, if the
motivation for using the MMTD is external (i.e. faculty are told they must improve their teaching), faculty may not have the personal drive to implement all steps within the MMTD, which could short-cut the process and thereby diminish some of the inherent benefits afforded by this tool. This has led us to suggest that, in cases where faculty lack internal motivation to improve upon their teaching, it may be necessary for a mentor or member of a teaching support center to assist faculty in the appropriate and full implementation of the MMTD tool.

**Conclusion**

As Arreola (2007) asserts, we must not assume that faculty come to universities as seasoned teaching professionals. Rather, most faculty are not prepared within their doctoral studies for their roles as teachers and must work once they become faculty to evolve into experts in this area (Altany, 2011). Post (2011) suggests faculty evolve through various developmental stages of teaching, and the primary methods by which faculty learn and grow as teachers are through self-directed learning, observation, and feedback. In other words, faculty often learn about and improve their teaching through trial and error which often involves observations, experiences, and feedback. In some cases this trial and error may involve a “shotgun” approach, which is untargeted and often not evaluated for effectiveness.

To provide faculty with a framework they can use to identify and target key teaching dimensions, the Multidimensional Matrix of Teaching Development has been developed. The structured MMTD framework gives faculty in all stages the ability to identify and target a specific component of teaching, and to create a plan to improve and assess that component through experience and feedback. The MMTD helps faculty think about the areas in which they can potentially improve and lets them bring their own context to the best practices of teaching and learning while developing their teaching using evidence based teaching practices.

In using the MMTD framework, the evaluation aspect prompts faculty to examine who is qualified to evaluate specific aspects of teaching and encourages them to connect with others, including peers and mentors, for specific feedback concerning teaching improvements. The MMTD framework also encourages even the most novice of faculty to participate in SoTL (scholarship of teaching and learning) activities by providing a structure the faculty member can use to plan and evaluate targeted teaching interventions. This can lead to the provision of specific evidences associated with teaching improvement that can be used by faculty in yearly evaluations and promotion and tenure documentation.

To conclude, the use of the MMTD framework gives faculty of all stages structured guidance in identifying and targeting specific teaching behaviors. It also prompts them to test these interventions, and assess the effectiveness of the interventions via multiple forms of feedback.
References


Facilitating Successful Online Discussions

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Abstract

As online course offerings continue to evolve, researchers have examined many strategies for improving the online learning experience for both the instructor and the student. Asynchronous, online discussions are one of the most common components of online courses. This article provides information about the best practices for facilitating successful online discussions. The suggested best practices include several strategies for increasing student engagement through online discussions, grading and providing feedback for online discussions, and overcoming specific challenges in facilitating online course discussions. The application of these best practices will enable online educators to improve discussions in online courses.

Keywords: Online discussion, online learning, student engagement, providing feedback.

As online education has grown in the last two decades, so has the body of research surrounding best practices for instructors of online courses. Required online discussions are some of the most common assignments in any online course. Maddix (2012) states, “Effective online courses are highly dependent on the success of online discussion” (p. 382) and stresses that “effective online discussion can create a dynamic learning context that fosters learning, growth, and community among students and the teacher” (p. 373).

Not only are online discussions some of the most common assignments, but also they are one of the principle benefits of online education. Hall (2016) explains that face-to-face discussions are often controlled by few extroverted students, while asynchronous discussions allow all students, including introverted learners, enough time to think about questions and formulate responses before participating in discussion online. On the other hand, massive open online courses (MOOCs) are encountering converse results related to discussions. Hew and Cheung (2014) found that instructors of MOOCs report lack of student response in online discussions as a major challenge. Perhaps this is due to the fact that several hundred students could be enrolled in a particular MOOC at the same time, and a discussion thread with that many participants could quickly become overwhelming and impersonal. While discussion is an important component of any course regardless of how many students are enrolled or the setting, the challenges and benefits of discussion in each setting are unique and therefore traditional online courses are the focus of this article.

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In online courses, instructors have been trying new methods of structuring and delivering discussion questions to increase participation and student engagement for years. Chang, Chen, and Hsu (2011) emphasize that the most important role for an online course instructor is to ensure the participation of students online, because student participation promotes their active involvement in learning processes. Researchers have suggested many different ways of communicating with students in various online course discussions, and many of these ideas are examined in this article.

**Increasing Student Engagement**

**Designing Discussion Questions**

Since online courses began, instructors have looked for ways to increase student involvement and participation as they seek to replace the traditional face-to-face interactions experienced in classrooms with electronic interactions. Instructors generally structure courses around a textbook, and it is tempting to utilize the discussion questions that are printed in the textbooks when planning a course. Some researchers suggest that instructors remain open to taking the discussions in a more flexible direction that is led by students instead of publishers. Rao (2010) reported that students in online courses appreciated the instances in which course content was made relevant to their local scenarios. In this study, student engagement was increased by bringing local topics and current events into the discussions. Powell and Murray (2012) and Mills (2015) reported an increase in engagement when asking students to provide personal examples that helped to explain the course concept to others, and supported the idea that connecting course concepts to “real-life” makes learning more meaningful for students. Similary, Paff (2015) suggested that instructors should enable students to select discussion topics or identify issues for exploration. This researcher found that discussion topics that were personal, timely, and relevant promoted more robust scholarly discourse. He also suggested that providing choice of discussion topics for students increased their sense of ownership for learning.

In addition to relevance, students value discussion questions that are interesting. Du and Xu (2010) found that a student’s level of interest in the discussion topic is a predictor of the quality of online discussion. The more interested a student is in a topic, the higher the quality of their discussion. Cheung, Hew, and Ng (2008) reported that the main reason students do not participate in an online discussion (87 percent of the time) is because they do not feel knowledgeable about the subject or topic. In the same study, 60 percent of the students said they chose to participate in a particular topic because it was interesting to them. This data suggests that instructors should be willing to ask students what they want to discuss, or even ask that students submit their ideas for discussion questions that align with course material.

Dennen (2005) reports that relevant, goal-based discussion topics will attract participation if both the relevance and learning objectives are made explicit to the students. This research implies that students will be more engaged in discussions in which the instructor has communicated the learning objectives prior to the beginning of the discussion.
students want to know why they are required to participate in a discussion, and what type of knowledge they will gain from participating.

If participation and engagement seem low at the beginning of a course, an instructor could also apply concepts recommended by Schellens and Valcke (2005). These researchers found that students who did not have much knowledge on a topic coming in to the course were more engaged with discussion topics that built on each other throughout the course instead of jumping from topic to topic each week. They determined that if each discussion theme is built on a new body of knowledge, little transfer of knowledge from a former discussion could occur. Stephens (2015) suggested beginning each online course with a discussion that asks students a series of open-ended questions based on the course content, allowing the instructor to assess student readiness and content knowledge, and students to participate in an active learning activity and increase their sense of community.

The results of all of these studies imply that instructors should be willing to update the discussion questions as the course moves forward, rather than setting the discussion questions when the course begins. The research suggests that creating a flexible model for the incorporation of different types of discussion questions will allow instructors to utilize the method that will be most beneficial to their particular subject, course, or group of students (see Figure 1).

![Figure 1. Considerations When Creating Discussion Questions.](image)

**Combatting Procrastination**

Procrastination is the propensity to delay beginning or completing tasks (Lay, 1986), or to defer tasks to the point of distress (Solomon & Rothblum, 1984). Researchers suggest that students who procrastinate are often less academically successful in online discussions because they interact less with their classmates, regardless of the types of discussion questions used. Not only do they interact less than their non-procrastinating peers, but when they do interact, they are doing so later and thus missing out on course related dialogue. This tendency to interact late or not at all has a detrimental effect on academic performance (Michinov, et al., 2011).
In order to prevent or stop procrastination, several strategies have been suggested, including using motivational approaches (Tuckman, 2003), scaffolding (Elvers et al., 2003; Tuckman, 2005; Tuckman, 2007), establishing regular deadlines (Ariely & Wertenbroch, 2002), giving regular feedback (Doherty, 2006), utilizing authentic topics (Rovai, 2007; Worley, 2015), and centering discussion questions on a course project or paper (Rovai, 2007). Motivational strategies can be used at the beginning of the online course to encourage potential procrastinators to participate early and often. For instance, the instructor might provide students with feedback about performance as it relates to course grades. He/she might also ask students to compare their level of participation with that of their classmates (Michinov & Primois, 2005; Michinov et al., 2011). Finally, group work can be used to foster collaboration and responsibility among students, particularly when pairing students who do procrastinate with those who do not (Michinov et al., 2011).

Scaffolding (the modeling of the desired outcome by the teacher which is then gradually shifted to the student; Tuckman, 2005) can be used to coach procrastinators and provide them with additional learning assistance via guided discussions, time released course information with regular deadlines (Ariely & Wertenbroch, 2002), and consistently provided feedback (Doherty, 2006) in the form of guided synchronous and asynchronous discussion. As student motivation increases and procrastination decreases, instructors can gradually withdraw the additional assistance (Tuckman, 2007).

As discussed above, utilizing authentic discussion topics also may decrease procrastination among online learners due to the potential to increase intrinsic motivation. Authentic discussion topics have been shown to have meaning and relevance to students because students believe they are discussing something they need to succeed in the course and in life (Rovai, 2007; Worley, 2015). Instructors may consider utilizing current events, news stories, real-life case studies, etc. to develop authentic discussion topics that make a connection between course concepts and real practice. Another way to increase authenticity of discussions and decrease procrastination is to center discussion questions around a large project/paper that is authentic in nature (Rovai, 2007). Discussion questions can provide students with regular check points during the semester to ensure they are meeting time-related deadlines and understanding course concepts. As a result students will be required to work on large projects in smaller increments throughout the semester instead of waiting until the last minute.

Results of these studies emphasize the importance of combatting procrastination at the beginning of the course. Several approaches can be used to address procrastination including offering motivational techniques, establishing deadlines, providing prompt feedback, and centering discussion questions on interesting topics or large projects. If implemented appropriately, research indicates these approaches will keep students actively involved in discussions early and often, thus improving their academic success in the course.
Incorporating Reflective Assignments

In addition to combatting procrastination via online discussions, reflection through discussion can be used to increase student learning in online courses. Reflection is the ability to connect new information with personal meaning or past experiences (Gardner, 2001) and create new understanding based on that connection (Morley, 2008). Reflection typically occurs individually or between only the student and instructor, but research shows that reflection through online discussions can make for a more interactive, shared process, which may better facilitate knowledge acquisition. One study found that students who participated in online reflections via discussion reported higher levels of mastery of course objectives (Bye, Smith, & Rallis, 2009).

However, MacKnight (2000) suggests that students will not be able to engage in online reflection unless they have developed the skills and practiced them beforehand. Thus, it is essential for the instructor to facilitate the skill of reflection before the online discussion begins. One suggestion for doing this is to assign an offline reflective activity early in the term. In addition to this, instructors must support the online reflection process by focusing the discussions, asking probing questions and holding students accountable for their responses, and among others, periodically summarizing the discussion (MacKnight, 2000).

Types of discussion questions asked are also essential to facilitating reflection. Bloom’s Taxonomy provides the instructor with six domains from which to develop discussion questions: knowledge, comprehension, application, analysis, synthesis, and evaluation. While the lower level domains (i.e. knowledge domain) elicit basic concepts with no requirement of reflection, the higher level domains require making judgments and reflecting on quality of information (Bloom, 1984). These thought provoking questions are essential to reflection, and instructors should consider developing thoughtful, higher level focus questions from which to center the discussion. King (1995) found that by asking higher level questions and providing feedback and guidance during the discussion, learning is boosted (see Table 1 for an example of a reflective question posed in an online discussion by one of the authors).

Finally, the format of the discussion can also be used to improve reflection in the online learning environment. MacKnight (2000) suggests the use of collaborative activities such as small group discussions, case study discussions with complex problems for analysis, and mock trials where students are provided a trial identity to carry out. One university faculty used a unique reflection approach by assigning students to write online letters to a critical friend that revealed lessons learned, connection of knowledge learned, and new knowledge created. These letters were posted and shared to the discussion forum throughout the term, and allowed for open communication about shared experiences, ideas, and implications for practice (Rocco, 2010). Another group of researchers asked students to self-reflect on the act of collaborating in group discussions (Xu, Du, & Fan, 2015).
Table 1. Sample Reflective Question and Student Response.

| Sample reflection question: | “Reflect on what you have learned so far in class. Don’t simply describe what you have learned, but reflect on it by explaining a personal meaning or a new understanding that has impacted your life in some way.” |
| Sample student response: | “…Whenever I used to think about cocaine users, I thought of addicts who just want to get high. I learned that cocaine is actually used in this day and age in nose and throat surgeries as an anesthetic. This is important for me to remember, because I always think of drugs as just: BAD. Like we learned earlier, drugs are neither good nor bad…” |

This research suggests that instructors can foster the skill of reflection by developing higher level focus questions, guiding students in reflective practice at the beginning of the course, and utilizing a variety of discussion formats to illicit not only reflection but critical thinking and thoughtful interaction as well. If done properly, students will leave the course with a good grade and a mastery of course concepts.

**Grading Discussions**

Another way to improve the quality of online learning, and particularly online discussions, is to provide timely, meaningful feedback to students. Many times during online courses it can be easy to allow students to complete much work before providing them with any type of response informing them of their performance level. However, this may not be beneficial to students because they will not learn without constructive communication from the instructor. Feedback is essential to learning and improvement, especially in an online course where students do not get informal feedback during a class period. Several researchers have published advice for instructors on how to provide feedback in the most meaningful way.

During online discussions, MacKnight (2000) has found that providing daily feedback is essential. She recommends instructors post at least one message per day to suggest discussion posts are being read. However, she warns instructors not to post too soon or too often because it is essential to allow students time for reflecting on and responding to their peers’ posts. Additionally, she suggests that when providing feedback it should be in the form of thought provoking questions that require students to critically think about the discussion topic.

In addition to providing thought provoking feedback to students, instructors might consider delivering accurate, but reassuring feedback to students to encourage them to continue to communicate rather than deterring them from communicating with criticizing.
feedback (Rovai, 2007; Xie, 2013). Xie postulates that specific, encouraging feedback will help students develop reasonable efficacy beliefs.

Edwards (2005) agrees that positive feedback is essential in online discussions, but further develops this recommendation by providing a seven-step process for online instructors:

1. Start positive (e.g. this post was excellent);
2. Provide the grade with a rationale (e.g. this post scored an 80% because you followed 4 of the 5 discussion guidelines);
3. Provide a correction as a reminder or recommendation (e.g. remember, it is important to use APA formatting when citing references);
4. Provide an example or tip to make the correction (e.g. students find it helpful to use the formatting guide posted on the course page);
5. State the expectation (e.g. to raise your grade next week, try using the guide to reference your sources);
6. State you will help students (e.g. I am here to help you, so don’t hesitate to email or call with questions); and
7. End with a motivational statement (e.g. only one discussion left – keep up the good work!).

Instructors may find it helpful to utilize a grading rubric to accompany their discussion feedback as well (see Figure 2 for a sample rubric utilized by one of the authors). Utilizing a grading rubric is an effective way to maintain consistency when grading while providing specific guidelines to students about the explicit criteria essential for each post. Vidmar (2004) suggests developing rubrics that require posts to be concise, limiting a comment to one or two points and explaining the logic of those points. He also recommends stressing punctuality, proper grammar, and quality of content in the rubric. Further, interaction is an essential discussion criterion, and should be added to the rubric (Heflin, n.d.; Kent, Laslo, & Rafaeli, 2016). To increase interaction, instructors might consider requiring two separate deadlines. The first mid week deadline includes the initial post responding to a question posed by the instructor, and the second deadline entails responding to at least two other students (Heflin, n.d.). Another approach to discussion forums is to assign a reading and have each student post an open-ended question about the reading for the first deadline. Then, the second deadline entails responding to each others’ questions, and finally, a third deadline could be added asking students to end each response with another question in order to facilitate higher level thinking (Vidmar, 2004).

Grading rubrics also provide a means to allocate a course grade for discussions. For example, discussions counting for 10-20 percent of the total grade in a course have been found to be most effective at increasing communication, number of messages posted, and online classroom community (Rovai, 2007). Additionally, including a rubric item that requires 5-6 posts throughout the discussion period has been proven to influence meaningful discourse (Gilbert & Dabbagh, 2005). Meaningful discourse is the ability of learners to demonstrate critical thinking by relating content to prior knowledge and experienc-
es, interpreting content through analysis, synthesis, and evaluation, and making inferences (Jonassen et al., 1995; Gilbert & Dabbagh, 2005).

A final approach using grading rubrics is to increase student responsibility and self-awareness by providing examples of previous posts to students and asking them to distinguish between high quality and low quality posts based on grading rubric criteria (Vidmar, 2004). This approach allows students to perform an assessment of others’ posts and then transfer that process into one of a self-grading experience (see Table 2).

This research concludes that it is essential to provide positive, immediate, and detailed feedback to facilitate learning. Additionally, grading rubrics can accompany feedback and add consistency and transparently posted expectations to an instructor’s grading process while allowing students to more easily identify the criteria for quality discussions and thusly grade themselves.

<table>
<thead>
<tr>
<th>Discussion Forum Initial Response</th>
<th>Unacceptable</th>
<th>Acceptable</th>
<th>Accomplished</th>
</tr>
</thead>
<tbody>
<tr>
<td>Makes little or no effort to analyze issues.</td>
<td>Uses somewhat developed ideas to analyze issues.</td>
<td>Makes significant effort to analyze issues with developed ideas.</td>
<td></td>
</tr>
<tr>
<td>Not completed, or late.</td>
<td>Within documented time frame.</td>
<td>Within documented time frame.</td>
<td></td>
</tr>
<tr>
<td>Less than two postings; feedback lacked insight/constructivism.</td>
<td>Two or more postings and created responses accordingly; feedback lacked insight/constructivism.</td>
<td>Two or more postings and created responses accordingly; provided constructive feedback to classmates, and raised opposing views.</td>
<td></td>
</tr>
<tr>
<td>Not completed, or late.</td>
<td>Within documented time frame.</td>
<td>Within documented time frame.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Discussion Forum Responses to Classmates</th>
<th>Unacceptable</th>
<th>Acceptable</th>
<th>Accomplished</th>
</tr>
</thead>
<tbody>
<tr>
<td>Makes little or no effort to respond to classmates’ questions/comments.</td>
<td>Uses somewhat developed ideas to respond.</td>
<td>Makes significant effort to analyze issues and answer questions in response.</td>
<td></td>
</tr>
<tr>
<td>Not completed, or late.</td>
<td>Within documented time frame.</td>
<td>Within documented time frame.</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 2. Sample Grading Rubric.**
Table 2. Self-Grading Question and Sample Student Response.

Self-grading question:

“Please perform an analysis and self-assessment of the discussion posts from last week. Take two of the best posts you read (copy and paste them into the discussion thread – they can be your own) and explain why you think they are high quality based on the grading rubric for discussions (see the syllabus).”

Sample student response:

“…Based on the rubric, I believe that those are my best posts because I analyzed all the issues that were listed and I responded with feedback that would engage conversation. These two posts show that I thought thoroughly about the topic, I was knowledgeable of the information discussed, and I used sources to back up my arguments.”

Overcoming Challenges in Online Discussions

Large Class Sizes

Instructors have faced challenges with managing online discussions when they have a large number of students enrolled in a course. Naturally, reading through the posts, redirecting students, and grading the discussion posts will take more time with more students.

Kelly (2015) states that the “norm” for responding to students is 24 hours, and for grading work, seven days is the longest faculty should wait. These guidelines may seem unattainable for instructors, depending on their work loads. Students have their own set of negative perceptions about discussions in large online courses as well.

Lorenzetti (2010) conducted a study in which she found that larger class enrollments are negatively correlated with faculty participation in the online discussion, and therefore lead to lower student satisfaction with the discussion. The researcher recommends that 14 – 20 students in a discussion group is ideal. Similarly, Salmon (2003) asserts that good e-moderating always includes summarizing and feedback, which can be difficult to do with more than 20 active participants. She found that 8 – 12 students per course or learning group was ideal for the students to benefit from each other’s posting and for the instructor to be able to manage the discussion. Sullivan and Freishtat (2013) found that students preferred being split up into small groups of four to six when participating in online discussions, rather than to remain in one large group. They found this model to be less overwhelming and easier to conduct a meaningful conversation with their peers. Jones, Ravid, and Rafaeli (2004) also found that students were more likely to stop partic-
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ipating in discussions with too many participants as the overloading of mass interaction increases.

Another alternative was explored by Baran and Correia (2009). These researchers allowed students to volunteer to be the facilitators for the discussions in their online course. The instructor modeled facilitation in the first few weeks of class, and provided each student facilitator with some guidelines for conducting their discussion. In these situations, the instructor contributed to the discussions as a participant rather than the facilitator. Different students used different techniques during their week to lead the discussion, but all were found to have produced high levels of participation with quality dialogue. “Findings in this study indicate that peer-facilitation strategies can help generate innovative ideas, motivate students to participate actively in the discussions, and provide an atmosphere for involvement and commitment” (p. 357). Rourke and Anderson (2002) conducted a similar study and also found that students valued the experience of leading discussions, and preferred peer facilitation to instructor facilitation.

The increasing popularity of Massive Open Online Courses (MOOCs) has afforded new ways for learners to consume information, often at no (or very low) cost. These online courses may seem daunting to faculty who are considering developing their own MOOC and offering it through a popular MOOC provider, based on the number of students expected to enroll in the course averaging around 43,000 (Ferenstein, 2014; Jordan, 2014). Since a course can only have a small number of instructors and teaching assistants assigned (compared to the volume of students), researchers suggest shifting the responsibility of leading discussions to students, or creating smaller localized groups of students, and allowing an instructor or content expert in the physical area of that learning community to lead the discussion (Jacobs, 2013; Kulkarni, Cambre, Kotturi, Bernstein, & Klemmer, 2015). Others suggest that instructors of MOOCs simply set the expectation that they will only answer the most popular questions posed by students in the discussion forums (Suen, 2014). This could be determined by reading through all posts in the discussion, or by utilizing an up-voting and down-voting system designed to allow students to vote on posts they found to be most (or least) interesting or relevant.

Small Class Sizes

Challenges are also present for students and instructors when an online class has low enrollment. Hew and Cheung (2011) found a significant positive correlation between group size and the frequency of higher level knowledge construction occurrences in online discussions. This suggests that more high-level knowledge construction tends to occur in larger discussion groups. Since instructors generally cannot control the number of students who enroll in their courses, it is important to become familiar with different strategies to manage discussions in both large and small online classes.

Land, Choi, and Ge (2007) found that in small courses, delayed postings became an obstacle for students to meet the required number of postings and maximize learning stemming from observing their classmates’ opinions, ideas, and experiences. They report “it is important to apply a variety of procedural requirements to facilitate students to partici-
pate in discussions in a meaningful and timely manner” (p.414). In these situations, the researchers found that having students follow very structured timeframes for postings was essential for success. As mentioned previously, instructors could create rubrics that require the students to create their initial post during the first half of the week or module, so that everyone will have posts to read and respond to.

Alternatively, Du, Havard, and Li (2005) propose that faculty employ a model for online discussions in which “continuous peer review of posted responses to items challenges each student to provide their best input to the learning community created through dynamic discussion” (p.216). In this model, students are required to choose one (of two) discussion question, and post their response to the question. Additionally, students must also critique one other student’s response. This highly structured model pushes students to become more engaged in the discussions. These researchers also noted that when students are given discussion questions that relate to a course project, engagement is increased.

Peer-led discussions are another alternative for combatting the lack of discussion participation in small courses. Cheung et al. (2008) found that in peer-led discussions, eighty percent of the students feel more motivated when the forum owner acknowledges their posting. This causes them to want to post even more in the thread. The same study found that many students feel discouraged after they find that others have already posted similar ideas to what they wanted to post. In these cases, it could be helpful for instructors to employ a feature of the course management system in which the students cannot see each other’s posts before they answer the initial discussion question. Park, et al. (2015) also supported this practice when they found that levels of participation in online discussions remained stable when led by students rather than instructors.

This research concludes that instructors should pay special attention to class size as they plan their online discussions. Different techniques designed to maintain the value of participation or increase the level of student engagement may be helpful when a class is especially small or large. Applying these techniques requires instructors to be flexible with discussion techniques based on course enrollments.

Inexperienced Online Learners

A final challenge for instructors and students regarding online discussions is a general unfamiliarity with online courses. Tyler-Smith (2006) found that many students who are new to online learning drop out in their first semester due to various challenges that combine to make the student feel so uncomfortable that they cannot move forward. Some of these challenges include negotiating the required technology and course management system, negotiating the course content, and interacting with peers via asynchronous discussions. He suggests that instructors simply tell learners about the common struggles that new online learners face at the beginning of a program to make them feel more at ease. In addition, he suggests that instructors directly contact students who seem uncomfortable with the technology and/or course participation, or those who do not post to the discussion board during the first course module, to provide direct support and encouragement.
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Similarly, Carr (2014) asserted that instructors should never assume that students in online courses are familiar with the technology used to deliver course materials, and should make an effort to contact students via email before the course begins to offer instructions for accessing the course and any other helpful resources that the student may need when getting started.

St. Clair (2015) and Brinthaupt, Fisher, Gardner, Raffo and Woodard (2011) suggest that instructors start each online course with a “check-in quiz”, designed to introduce students to the online course format in a simple, low-pressure way. Students are asked to find each element in the course that will be important for their learning (content, discussion requirements, due dates, grading procedures, assignment submission requirements, etc.), and students will naturally become more familiar with these elements as they complete the quiz. The quiz should be set up in the same format as an exam for the course. These quizzes can help relieve some of the anxiety that first-time online students often feel when entering the course, which may lead to higher grades and rates of success. This could be especially useful when requirements for participation in an online course discussion vary from instructor to instructor.

Salmon (2003) notes that a certain amount of “lurking” or reading others’ comments without participating should be allowed at the beginning of a course for new learners. She reports that online students will start to participate only when they feel ‘at home’ in the online culture and with the technology that is being used. She also suggests that instructors in online courses should try to connect students who have the same interests, to encourage a sense of community and belonging. It is important to note that these actions can only be completed if instructors are willing to read the comments from their students and then act on the information in those comments.

Students who are new to online learning may also benefit from bringing the offline world into the online course. Bull (2014) suggests adding an element to online courses in which students are required to conduct an activity, and then discuss the results. Suggestions for these activities include face-to-face interviews with professionals in a relevant industry, observations of actions in the natural world or a professional environment, service learning activities, and capturing and sharing relevant photo and video footage from their area. These suggested activities would be ideal for new online learners, as they could bridge the gap between hands-on, traditional learning and e-learning.

This body of research suggests that instructors should actively seek out students who are new to the online environment in the beginning of each term. This task may seem overwhelming, especially for instructors with large courses, but thoughtful planning combined with some of the techniques mentioned could reduce the time instructors spend assisting students with navigating the course delivery system or familiarizing themselves with online course structures.
Conclusions

There are many strategies educators can use to increase student engagement in online discussions. The results of the studies analyzed imply that instructors should be willing to create a flexible model for the incorporation of different types of discussion questions, rather than relying on pre-printed discussion questions listed in the textbook (Cheung, et al., 2008; Dennen, 2005; Du & Xu, 2010; Paff, 2015; Rao, 2010; Schellens & Valcke, 2005). Several approaches can be used to address procrastination including offering motivational techniques (Tuckman, 2003), scaffolding (Elvers et al., 2003; Tuckman, 2005; Tuckman, 2007) establishing deadlines (Ariely & Wertenbroch, 2002), providing prompt feedback (Doherty, 2006), and centering discussion questions on interesting topics or large projects (Rovai, 2007). Research also suggests that instructors can foster the skill of reflection by developing higher level focus questions (King, 1995), guiding students in reflective practice at the beginning of the course (MacKnight, 2000), and utilizing a variety of discussion formats to illicit not only reflection but critical thinking and thoughtful interaction as well (Rocco, 2010).

Instructors can also improve online discussions by providing positive, immediate, and detailed feedback to facilitate learning (MacKnight, 2000; Rovai, 2007; Xie, 2013). Additionally, grading rubrics can accompany feedback and add consistency and transparently posted expectations to an instructor’s grading process while allowing students to more easily identify the criteria for quality discussions and thusly grade themselves (Gilbert & Dabbagh, 2005; Rovai, 2007; Vidmar, 2004).

Researchers have found that instructors should pay special attention to class size as they plan their online discussions. Discussion facilitators may benefit from creating smaller groups of students to facilitate more manageable discussion threads (Jones, et al., 2004; Sullivan & Freishtat, 2013), assigning students as facilitators or peer-reviewers (Baran & Correia, 2009; Cheung, et al., 2008; Du, et al., 2005; Rourke & Anderson, 2002), and/or adjusting the timeframe for participation (Land, et al., 2007). Researchers also suggest that instructors should actively seek out students who are new to the online environment in the beginning of each term (Tyler-Smith, 2006), provide a course check-in quiz (Brinthaupt, et al., 2011; St. Clair, 2015), and allow special accommodations for new online learners (Bull, 2014; Salmon, 2003).

Online education continues to grow, and these evidence-based best practices grounded in five central ideas (designing discussion questions; combatting procrastination; incorporating reflective assignments; utilizing appropriate grading procedures; and overcoming challenges in large classes, small classes, and with inexperienced learners) can assist faculty as they prepare to facilitate successful discussions in online courses.
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Pedagogical Considerations for Effectively Teaching Qualitative Research to Students in an Online Environment

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Abstract

Qualitative research aims to understand both individual meaning as well as complex systemic interactions as they apply to social problems or individual experiences. This method of research is both inductive and flexible, allowing for a holistic approach that facilitates a rich understanding of the content examined. Past research identifies a number of challenges associated with teaching qualitative methodology to undergraduate students, including: the research skills and values maintained by the instructor, the prestige associated with qualitative research in particular, as well as a number of other interpersonal and environmental factors. These challenges are further complicated, it seems, when extended into the online learning environment. This paper explores the factors related to the instruction of qualitative research in an online environment and provides recommendations for best practices in teaching.

Keywords: xxxx.

Within academia, numerical data and analysis are often valued over other forms of research; thus resulting in the marginalization of qualitative research efforts (Breuer & Schreirer, 2007). Consequently, priority is often placed on teaching students how to interpret and conduct quantitative research over that which is qualitative. While quantitative research has value across disciplines, qualitative strategies are important as well. Qualitative research, whether it be conducted on an independent basis or combined with quantitative strategies via mixed methods designs, brings an added dimension to the research process by allowing researchers the means to explore the impact of context as it applies to a particular phenomenon. Whereas quantitative research provides insight into the types and strengths of relationships amongst variables, qualitative research may afford a better understanding regarding the nature of those relationships. Given the complex dynamics that exist within interpersonal relationships, relying solely on quantitative data may lead to an incomplete understanding of the human experience. Qualitative methods allow for the exploration of questions regarding experience and personal perspective, two factors that are often overlooked or too generalized in quantitative research. With this in mind, students seeking a well-rounded liberal arts education should be instructed regarding how to interpret, design, and conduct research utilizing both quantitative and qualitative approaches.

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The inductive nature of qualitative research is often a difficult concept for students to understand. They frequently struggle with the idea of serving as the primary instrument within the research process. Consequently, instructors teaching qualitative research are not only tasked with teaching students about basic methodologies, but must also introduce students to a revised philosophical paradigm pertaining to research as well. Often, such instructional objectives are achieved via class conversations, modeling, and interactive application activities. Given the lack of shared physical space that is common to online learning, instructors do not have access to the nonverbal cues that accompany traditional face-to-face learning. Consequently, online instructors teaching qualitative research may need to employ non-traditional teaching approaches and assessment strategies.

Online Learning

Over 5.8 million students accessed online courses in 2015. This number represents 28.4% of all college enrollments (Allen & Seaman, 2016). The numerous benefits of online distance learning are well-documented. Engaging in online courses allows for great flexibility in one’s academic schedule, tends to be less costly, requires less travel and research time, is said to facilitate greater opportunities for group learning amongst highly-motivated students, and may allow students increased access to a more diverse pool of faculty (Bowen, Chingos, Lack, & Nygren, 2014; Crowell & McCarragher, 2007; Kim, 2008; Pape, 2010; Thomson, 2010). Participation in online communication may also aid in building students’ interpersonal skills and decrease their anxiety as well, thus promoting a sense psychological safety, which encourages more creative thinking and mastery of course materials (Clingerman & Bernard, 2004; Kim, 2008; Rovai, 2002).

Despite its known benefits, online learning is also criticized due its inability to customize learning experiences to the needs of each student (Crowell & McCarragher, 2007). Some critics suggest that the lack of non-verbal communication that accompanies many online classes may also impact students’ learning experiences as may the inability to stimulate hands-on or lab work that is found in a traditional classroom environment. Muilenburg and Berge (2005) further indicated that online learning may contribute to student isolation, which could have a negative effect on student success (Glazer & Wanstre, 2011). Limitations aside, evidence suggests that online learning is here to stay. In fact, 70.8% of Chief Academic Officers acknowledge online education as being a key component to their long-term growth strategy (Allen & Seaman, 2016). With these circumstances in mind, it is incumbent upon instructors to determine how to best present their course materials via the online platform in a manner that facilitates authentic learning.

The Role and Key Characteristics of Qualitative Research

Qualitative methods allow researchers to provide rich multi-layered analyses and are particularly warranted when there is a problem or issue that needs to be explored on an in-depth level or when a complex explanation is needed. They may also be appropriate when the researcher wishes to empower individuals or write in a flexible style that conveys a story. Qualitative research is also merited when context needs to be explored,
when the researcher desires to follow-up on quantitative research in an effort to explain mechanisms, when the researcher wishes to develop comprehensive explanations when inadequate theories exist, or when quantitative methodology simply does not fit the problem being studied (Creswell, 2012).

Qualitative research makes use of many sources of data, including: interviews, videos, direct observation, and various forms of records, amongst others. Of these, the most valuable source of information may be the personal interview (Barbour, 2014). Perhaps the most significant step toward ensuring the accuracy of one’s data is to conduct thorough, quality interviews that accurately encapsulate participants’ experiences. As the primary instrument in qualitative efforts, the researcher is tasked with cultivating a relationship with the participant that elicits information representative of that individual’s experience. Due to the complex interactions that take place within the context of an interview, as well as the vulnerability often experienced by the participant, qualitative interviewing must be completed with great care and intention. The researcher must demonstrate effective interpersonal skills in which he or she successfully builds rapport, gains the participant’s trust, provides the participant with the space to describe his or her experience, and then co-constructs the data in a manner that is meaningful and reflective of the participant’s perspective (Brinkman, & Kvale, 2015; Creswell, 2012; Whiting, 2008).

Qualitative researchers must also be aware of their own responses to participants’ expressed experiences and understand how such reactions may influence the dynamics within the interview, the participants’ reactions to such responses, as well as all subsequent analysis efforts. Such reflexivity allows the qualitative researcher the ability to determine how his or her personal perspective influences the data and to evaluate the research process (Corbin & Strauss, 2014). By becoming aware of one’s personal biases and how they may influence the data, the qualitative researcher is empowered to reconsider the obtained data in a manner that is better reflective of participants’ experiences.

A Qualitative Curriculum

Rather than pursue a narrow research question that seeks a conclusive answer regarding the accuracy of a pre-determined hypothesis, qualitative researchers instead take an exploratory approach geared towards understanding the whole picture. To facilitate the shift in rationale, the student must be immersed in a curriculum that includes instruction regarding qualitative design and methods while simultaneously facilitating opportunities for self-reflection and cultivating passion. This remains true whether the student studies qualitative research in-person or online.

Corbin and Strauss (2014) emphasize that the qualitative researcher must engage in much training and practice to develop effective interviewing and observational skills. Typically, students have the opportunity to sit in the classroom and witness several interviews take place and then engage in mock interviews of their own in which they may practice active listening, open body language, and reflective language. By participating in and recording live mock interviews, students are able to capture participant interviewees’ responses to their questions. From those recordings, students may transcribe the data for
subsequent analysis. Taking notes regarding their experiences within their interviews also allows students the opportunity to engage in the process of reflexivity as they consider their own interpretations of participants’ responses as they relate to the greater context. After transcribing their transcripts, students may engage in the process of memorizing and building themes based on the data before them (McAllister & Rowe, 2003).

Another core skill associated with qualitative research is the ability to write well. Qualitative researchers must provide their readers with in-depth descriptions of various phenomena and experiences that convey not only the participants’ experiences, but also the context in which those experiences occur. As such, students should receive opportunities to draft their own descriptions of various phenomena whether these reflect their own research obtained via observations and interviews or from other sources (Brinkman, & Kvale, 2015; McAllister & Rowe, 2003).

While cultural competence and ethical adherence should be evident in all research efforts, such conduct is particularly critical in qualitative research. Given the intimate relationship that forms via the interviewing process coupled with the natural power differential that emerges, participants are put in a vulnerable position as they explain their own experiences to shed light on a larger phenomenon. Within this context, qualitative researchers must not only adhere to the ethical standards dictated by federal and state laws, professional expectations, and institutional practices, but must also take great care to understand the participant’s perspective as it fits into the larger context of the phenomenon studied. Cultural and ethical competence is typically taught via lecture, reviews of past cases, class discussions, and in-depth introductions of professional and institutional codes of ethics (Lewis, 2015).

**Challenges Teaching Qualitative Methodology Online**

Due to the fact that most online courses are asynchronous in nature, students and faculty are rarely online simultaneously. With limited synchronous time, if any, it is often difficult for faculty to model appropriate research practices and techniques. It may also be challenging to assess students’ mastery of concepts and skills as well. Typically, faculty and student must rely on video to demonstrate skills and techniques. While this method provides access to one another’s work, it does not allow for the provision of live feedback as would occur in a more traditional learning environment. Further, the lack of access to nonverbal communication within the online setting seems contrary to the typical qualitative mindset, which emphasizes the proximity characteristic rather than support via a distance. Finally, the online medium provides limited ability to facilitate other experiential learning opportunities.

**Practical Solutions**

Despite some of the challenges the online environment may pose, it is possible to teach students about qualitative methodology effectively via this environment. Instructors, of course, must be aware of differences that exist between the traditional and online classroom settings and then accommodate their course design and delivery to overcome these
variations. Specifically, the online instructor must work to: reduce the effects of distance, make assignments meaningful, and minimize student anxiety.

*Reduce the effects of distance.* Given the personal nature of qualitative research, it is especially important that students feel engaged and supported. Perhaps the most effective way to minimize the impact of a lack of a shared physical environment is to increase the instructor’s telepresence; allowing students the sense that they are interacting with a real person rather than participating in a course that is preloaded into a learning management system. The online instructor may increase his or her telepresence by actively engaging in discussion board conversations, via the posting of frequent announcements or updates within the course, thru answering questions promptly, and by actively taking an interest in students’ comments throughout the course. Additionally, the inclusion of a profile picture and biographical information within the course further strengthens students’ ability to gain a better understanding of the instructor as a whole person, as does access to the instructor’s personal webpage, social media streams, etc. By providing students’ with insight into the instructor’s personality, these efforts may also help to facilitate more comprehensive interpersonal interactions between a faculty member and his or her pupils, which should contribute to more authentic learning experiences (Bender & Dickenson, 2016; Cleaveland-Innes & Campbell, 2012; Kozan & Richard, 2014). Faculty may use social media management programs such as Buffer, Hootsuite, and Edgar to manage several social media streams/platforms simultaneously thus saving them time and effort. Via these programs, faculty may pre-schedule course announcements, bookmark relevant resources on the Internet, etc. to be disseminated to students when it aligns with the course schedule. Further, faculty is also able to monitor and respond to student comments via a singular portal via such a program rather than maintaining several different forums thus increasing faculty engagement without any additional work.

The literature reveals that one common grievance amongst online students is a static learning environment (Carr-Chellman & Duchastel, 2000). In an effort to provide students with the most robust learning experience possible, online instructors should create a blended learning environment that addresses multiple learning styles; thus engaging students into a dynamic learning process. Faculty teaching online qualitative research courses should consider providing students with opportunities to engage in live interactions with others within the course whenever possible, including informal synchronous meetings in which students may ask questions to clarify concepts and seek additional instruction and support. On a more formal level, faculty may use such meetings to model how to engage in the process of active inquiry via live demonstrations of interviewing techniques and similar activities. Of course, not all students may have the ability to join such meetings or benefit from conversational tasks. With that, faculty should present course information via other modalities as well. For example, the use of narrated slide lectures may emulate a typical course lecture allowing students who prefer traditional learning methods or identify as visual or audio learners access to the materials. Another way to provide students with visible examples of concepts reviewed in the course is to embed multimedia resources throughout the course, including video clips, links to external audio lectures, etc. The use of collaborative learning tools outside of the learning management system is another strategy likely to enhance the teaching of qualitative
methods within online courses. Web-based applications (such as Google docs) that allow students to generate content and share it with their peers may be used, for example, to allow students to collaborate in the creation of a research proposal. In a similar vein, students may also share transcripts of interviews via this method, allowing co-researchers/peers the ability to code data using the same documents (Bender & Dicken-son, 2016).

The inclusion of other social media may also be of benefit in teaching qualitative methods online. Faculty may use Facebook, for example, to create a class ‘page’ to supplement the course. Here, students and faculty could engage in informal discussion of class concepts and students may ask questions, seek support from one another, etc. (Green & Bailey, 2010; Wang, Woo, Quek, Yang, & Liu, 2012). Similarly, faculty may choose to leverage a site such a Pinterest to provide students with access to other supplemental materials. For example, the instructor may consider creating boards dedicated to specific concepts unique to qualitative research, including: interviewing techniques, coding, theme development, etc. Also, boards dedicated to each major qualitative method may also be created. By actively engaging in the course and providing students the opportunity to engage with course materials in a variety of ways, instructors may reduce the effects of the physical separation between the student and the institution thus minimizing the effects of the learning environment and highlighting the course content (Bender & Dicken-son, 2016).

Make It Meaningful. The ability to fully understand qualitative research seems dependent on experiential learning opportunities (Kolb, 2015). One common criticism of many online courses is their propensity to feel more like one-way correspondence courses rather than dynamic learning experiences. Instructors must, therefore, design collaborative learning communities in which students are engaged, challenged, and able to explore course concepts while simultaneously practicing new skills.

One of the key characteristics of qualitative inquiry is its consideration of multiple perspectives. One strategy that provides online students with the ability to interact with their peers while being exposed to varying perceptions is the utilization of asynchronous online discussions. Qualitative research instructors may keep their courses vibrant by offering students current and relevant discussion prompts that include course concepts in action. For example, instructors may engage students in discussions regarding how qualitative research may be used to better-understand current real-world events. During election periods, for instance, a worthy exercise may be for online instructors to discuss with their students how they would go about understanding voters’ decision-making processes when determining for whom to vote based on interviews provided by the media and similar sources. Similarly, after a notable event (natural disaster, an act of violence, etc.), students may benefit from a dialog regarding how qualitative inquiry may best be leveraged to understand people’s psychological reaction to that phenomenon.

As with most assignments, the value of asynchronous discussion board exercises within an online research course is often dependent on the structure placed upon the activity. Instructors are therefore encouraged to actively engage students into meaningful discus-
sions rather than having the online classroom serve merely as an ‘answer board’. The most effective online classroom discussions are those in which the instructor remains highly participatory, modeling appropriate content, format, and synthesis while promoting additional critical thought via the use of open-ended questions (Comer & Leneghan, 2013). Instructors should aim their efforts within online forums to clarify concepts, probe students’ assumptions, and question their perspectives with the intention of promoting critical thinking and fostering reflexivity (Astleitner, 2002). The utilization of teaching assistants within discussion forums is also desirable as it serves as a form of telementoring, which engages students with additional opportunities for collaboration and facilitates the process of cognitive scaffolding (Kaczynski & Kelly, 2004). Online instructors may ensure more robust conversations by developing a rubric that not only requires students to consider course materials on a critical level, but also encourages substantive contributions by all class members throughout the duration of a lesson. For example, here is a sample rubric likely to keep students engaged in a class discussion throughout a lesson:

<table>
<thead>
<tr>
<th>Element</th>
<th>Points Possible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student provides an initial post that serves as evidence of his or her mastery of course concepts as demonstrated via the synthesis of personal experience with course materials.</td>
<td>1 point</td>
</tr>
<tr>
<td>Student provides substantive feedback in response to at least two peers’ initial posts. Responses should be crafted in a manner that is likely to encourage additional critical thought and discussion.</td>
<td>2 points</td>
</tr>
<tr>
<td>Student provides substantive responses to at least two inquiries from other students and/or faculty made in response to his or her initial post.</td>
<td>2 points</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5 points</strong></td>
</tr>
</tbody>
</table>

Note that students’ participation is dependent on their interactions with others in the class thus encouraging additional engagement.

Kaczynski and Kelly (2004) developed a specific discussion board assignment that further highlights the importance of navigating multiple perspectives and the influence of the same on qualitative research. They created the ‘Multiple Meanings’ exercise, in which the instructor posts a relatively ambiguous photograph and requests students to comment on what that photograph means to them. After all of the students comment on the picture, each student is tasked with reading everyone’s comments on the discussion board and coding the same. From that, students are encouraged to develop themes and compare those themes to their initial comments. Similarly, More and Janzen (2012) suggest an activity in which students track an issue in media and summarize the context regarding the same. Based on their notes, and those of their peers, students are then tasked with writing a story based upon those notes. Activities such as these not only lend stu-
dents insight into others’ perspectives, but also highlight how others’ interpretations may influence their own research process, despite any pre-existing thoughts they may have.

Another interesting activity likely to increase online students’ qualitative research skills is to have students find transcripts associated with famous case studies or well-known profiles. Students studying abnormal psychology, for example, may enjoy reviewing the transcripts of Ted Bundy’s final interview. In this interview, Bundy hypothesized the likely contributing factors to his crime sprees. By reviewing, memoing, and coding these transcripts, students may gain practical experience regarding the interpretation of an interview while simultaneously gaining insight into the nature of psychopathy. This activity, of course, could be tailored to fit almost any field of study.

Students must also learn to engage in reflexivity, as it is a cornerstone to qualitative inquiry. They should be taught to consider their understanding of truth and to question their ‘conceptual baggage’ (Kirby & McKenna, 1989), including their preconceptions regarding the phenomenon to be studied, the research process, and the emerging themes in a study. These considerations should provide student researchers with the ability to better understand their processes of meaning-making as well as to appreciate how the phenomenon studied fits into the larger context while simultaneously reducing the potential for excessive bias, poor-quality interviews, questionable data, and problematic conclusions.

There are several strategies that may be implemented within an online environment to encourage students’ reflexivity. First, instructors may require students to maintain an online journal or blog where they document their perceptions regarding the research process. Similarly, students may create an online portfolio in which they respond to specific case samples created by the instructor. A more immersive technique to teach this skill would be to have students fully design a qualitative study, memoing their thoughts throughout the process. Other online activities that require less direct participation from the instructor may also be effective in teaching qualitative research concepts as well. For example, faculty may leverage social media to increase students’ familiarity with class concepts. One example of such a strategy would be to have students maintain a class wiki regarding topics and resources related to psychological concepts and qualitative research. Similarly, social networking sites such as Pinterest would allow students to meet the same objective with students creating virtual bulletin boards of course-related materials. More formally, online tutorials and supplemental videos coupled with online quizzing may serve to confirm that students are aware of professional and institutional ethical standards. Also, independent assignments in which students must view a pre-designated stimulus (interview, video, etc.) and describe the same may provide the online student with additional practice in writing rich, think descriptions (Bender & Dickenson, 2016). More complex assignments may be used to promote student-to-student interactions within the online classroom to teach qualitative strategies as well. For example, instructors may pair students to interview each other regarding a particular experience common to all students within the course (majors in, for example) and then have them analyze the data from that activity. Depending on the particular learning management system (LMS) used, instructors may be able to provide student pairs their own breakout room in which to conduct and record their interviews, and then meet for follow-up member check activities. A supplemental
assignment may be for students to review their own videos, or those of their peers, to critique interviewing techniques and to review study conclusions, as a form of peer review.  

**Adhere to student anxiety.** One factor that seems to greatly impact online students’ satisfaction with online courses and mastery of course materials is their anxiety (Wang, Shannon & Ross, 2013). Given the great variability amongst students’ familiarity with distance learning and technological skills, instructors of online courses should orient the student to the basic tenants associated with online learning, the intricacies of the specific learning management system utilized, as well as the expectations of the course in particular. This may be achieved by the presentation of an orientation module and/or video as well as a list of resources available to the student for additional support. The course syllabus should also explicitly address all policies associated with the online class. By providing students with clear expectations regarding online classroom behavior, including adherence to basic netiquette, the instructor communicates to the class that he or she is committed to the course and invested in its students. In view of the personal nature of the qualitative researcher serving as the primary research instrument and the responsibility this brings, instructors may want to address issues of confidence in providing the student with the skills and knowledge needed to effectively serve in this role in spite of the class modality. At the same time, faculty should directly address any resistance students may have to online learning and assure them that online learning may not only be comparable to face-to-face learning, but in some cases, actually far exceeds it (Allen & Seaman, 2016; Bowen, Chingos, Lack, & Hygren, 2012).

To further alleviate anxiety associated with taking a course in qualitative methods online, instructors should provide clear assignment instructions and rubrics to their class. Additionally, instructors may serve their students well by providing increased resources to their students via the provision of quality articles, assignment exemplars, recorded lectures, and any other resources one may provide in a traditional qualitative methods course. Scaffolding assignments upon one another allows students to master one concept and feel confident in their abilities before progressing to the next layer of the research process. As mentioned previously, the instructor’s active participation within the course is likely to build classroom morale and contribute to students’ mastery of course concepts as well.

**Conclusion**

Given the lack of proximity between students and their instructors within the online environment, courses pertaining to qualitative methodology may be particularly challenging to develop and teach. This is especially true at institutions in which instructors are held to pre-defined curriculum and assignments. Despite these circumstances, faculty are able to transcend the online environment to provide rich and meaningful learning experiences that allow students to master qualitative design while cultivating skills appropriate for this type of research. Faculty are encouraged to utilize a variety of tools to create robust materials to serve as the foundation of their courses, or to supplement those previously developed by their institution. Creating materials such as narrated slide shows to serve as lectures, or videos modeling interview techniques serve as formal efforts to deliver students with course materials whereas the maintenance of various social media platforms...
may serve as less formal activities to keep students engaged and to create an environment of collaboration and providing a number of experiential opportunities.

References


