THE USE OF GUIDED SOCIAL MEDIA TO ENABLE CRITICAL THINKING

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ABSTRACT

Critical thinking is an important skill. Many universities are increasingly incorporating Critical Thinking and Writing (CTW) or similar course in their curriculum. These courses seek to increase baccalaureate students' capacity for critical thinking as evidenced in their major field of study. It is not surprising that pedagogical interest in developing critical thinking in students has been an important concern in theory and in practice. Yet, the challenge as to how to effectively teach learners how to think critically remains unanswered. In this paper, we contribute to (1) the critical thinking pedagogy literature by proposing a Teaching Critical Thinking Methodology (TCTM) that helps with the above challenge; (2) to further contribute by implementing TCTM in a real course and sharing our experience and the resulting modifications that ensued to make the methodology feasible; (3) To collect and report evidence and test whether TCTM actually improves critical thinking. Early results indicate that TCTM is feasible to implement, and as the future unfolds we wish to test whether it is effective in improving students critical thinking skills.

Keywords: Social Media, Critical Thinking, Rubrics, Divergent, Convergent

INTRODUCTION

Critical thinking is an important skill. Drath (1990) proposed that in order for leaders to be effective they need to have a full scope of leadership attributes and that higher cognitive processing is an important attribute. Flores, Matkin and Burbach (2012) examined the implications on leadership of students graduating with deficient critical thinking skills. They postulated that “the ability to make meaning in more complex ways is directly related to one’s developmental stage. At higher levels of meaning-making, leaders become more effective. When leaders are more effective, organizations perform better.”

The above theoretical proposition that critical thinking is an important skill is also empirically supported. For instance, in surveys conducted by the Business Roundtable and the Wall Street Journal, employers have identified critical thinking as an important set of skills for students to develop (Arum & Roksa, 2011). In a survey conducted by the Conference Board (2006), 68.4% of respondents thought it was the responsibility of four-year colleges and universities to prepare
the next generation of leaders with critical thinking skills. Critical thinking is among the top ten most popular learning goals adopted by Association to Advance Collegiate Schools of Business (AACSB) accredited business schools (AACSB, 2007).

In an effort to address the identified need, many universities, in recent times, have been introducing courses that directly invest in developing critical thinking among students. For example, a premier university in a major city in the south-eastern United States as part of the 2008 Southern Association of Colleges and Schools (SACS) reaccreditation process developed Critical Thinking through Writing (CTW) courses as part of a Quality Enhancement Plan (QEP). Many universities increasingly incorporating CTW or similar courses into their curricula. CTW or similar courses seek to increase baccalaureate students’ capacity for critical thinking as evidenced in their major field of study. It is not surprising that pedagogical interests in developing critical thinking in students has been an important concern in theory and in practice. Yet, the challenge as to how to effectively teach learners how to think critically remains. Some specific challenges identified include the need: (1) to develop systematic and generalizable approaches that enhance critical thinking skills, and (2) to collect evidence and validate that critical thinking skills actually improve. In this paper, our research objectives are to contribute to (1) the critical thinking pedagogy literature by proposing a Teaching Critical Thinking Methodology (TCTM) that helps with these challenges; (2) to further contribute by implementing TCTM in a real course and sharing our experience and the resulting modifications that ensued to make the methodology feasible. (3) To collect and report evidence and test whether TCTM actually improves critical thinking.

LITERATURE REVIEW

In his work on Creating Significant Learning Experiences Fink (2003) showed that in order to be significant a learning process needs to be engaging and involve high energy levels. Processes that exhibit these characteristics result in significant and lasting change and have the potential of being of high value in the lives of the students beyond the course. Both of these characteristics also describe the social media activity of many students. The question is how one can use the engagement and high energy in social media activity to create significant learning experiences and how to accurately assess the learning outcomes.

Teaching Critical Thinking

The literature suggests specific guidance in how pedagogically we can improve critical thinking skills of a learner (Barkley, 2010; King & Kitchener, 1994). Halpern (2003) showed that critical thinking skills can be learned, practiced, and transferred but that explicit instruction is important in this learning process. Van Gelder, Bissett & Cumming (2004) extended this finding by delineating ways to achieve such explicit instruction: focused, structured and repeated practices are important in facilitating acquisition of critical thinking skills. Additionally, the value of using real-world or simulated real-world experiences appear to enhance the acquisition of thinking skills (Staib 2003). What is further important is that learners have the opportunity to engage in discussion of the challenges in these real-world or simulated scenarios. Staib’s literature review suggested that student real-life role-play, group discussion of the scenarios combined with
student-instructor interaction foster the most effective environment for developing critical thinking skills.

Halpern (1998) suggested a four-part model for teaching critical thinking skills that includes: (a) modeling critical thinking and actively engaging in thoughtful responses; (b) an instructional module on critical thinking skills followed by practice; (c) course activities that facilitate the use of the skills across different contexts; and (d) discussion of the process of thinking by students.

The above approaches all made an important contribution to the critical thinking pedagogy by establishing the importance of explicit teaching of critical thinking, the value of repeated practice in various forms, the value of real-life scenarios as well as the need to reflect on the process of thinking. These approaches are generally applicable in the teaching of survey courses as well as subject matter courses. The challenge of applying these approaches in ambiguous contexts rich with nuances and diverse actors remains by and large unchanged.

Various authors have proposed and implemented creative approaches to these more dynamic contexts. The U-shaped discussion strategy (Balcaen 2011) is an alternative to the traditional adversarial debate where instead students are encouraged to delineate initial positions along a continuum and then discuss the nuances of their respective positions with the result that students assess a variety of positions during the learning process and as their perspectives develop they defend different positions from the ones they held initially.

Another approach mainly proposes for allowing for a dual thinking process that encourages divergence and convergence in thinking while finding, framing and formulating and solving problems (Nickerson, 2012). This approach suggests that during earlier stages of problem solving divergent views and approaches should be encouraged to generate a larger set of ideas about a problem. Divergence here means that while some relation to the context should be established, students are encouraged to be “creative” or “think outside the box.” Typically some level of guidance is required to get students to establish contextual relevance and rubrics offer a framework within which that guidance is provided. During later stages, after a decision is made about the definition of the problem, and a diverse set of solutions is identified, the thinking should converge on a preferred solution to the defined problem.

Traditional classroom assignments by requiring students to provide a solution to a problem emphasize convergence. Set class hours and limited interactions with faculty and with other students constrain a student’s ability to explore divergent ideas, thoughts and approaches for problem solving. As a result, the classroom medium is limited in its provision for divergent thinking and collaboration that can result in idea generation stage.

In contrast social media offer the following capabilities that can enable critical analyses and deliberation during a problem solving process:

- Limitless, unstructured and sometimes chaotic idea generation thereby stimulating thought divergence
- Facilities for systematic recording and iteration, commenting and collaboration
- Facilities for obtaining feedbacks, acceptance or rejection of ideas, and a process of convergence to a solution
It is important to emphasize the change in the learning paradigm over the past few decades with increased emphasis of experiential learning that is either problem-based, case-based or reality-based (McKeachie, Svinicki, et al., 2006). Social media offers an opportunity to bring the “real” world of the student’s life into the learning experience in a unique and constructive way. Our TCTM uses social media to benefit from the above capabilities.

However, the use of social media by the nature of its design can be very unstructured. For its use in a goal seeking learning environment such as in a course, however, the challenge is to devise and impose a structure that can be embedded for guiding collaboration, coordination and achieving a possible convergence so that the learning objectives of the course can be achieved. The TCTM approach proposed by the authors here is a careful fusion of in-class instructions with social media support for divergence in students exploration of ideas and for convergence in their solution forming process to effectuate and instill critical thinking ability in students.

**Need for Performance Assessment**

Having proposed a systematic and generalizable approach that enhances critical thinking skills of students there remains the task to collect evidence and validate that critical thinking skills actually improve.

Assessing student learning is an essential element of the teaching task. Traditional assessment emphasizes the testing of student learning with significant emphasis on grades. However, questions about what students actually are learning has placed increased emphasis on classroom assessment as critical to teaching. Classroom assessment emphasizes learner-centered, teacher-directed activity that is mutually beneficial, formative, context-specific, ongoing and rooted in good practice (Angelo & Cross, 1993). Classroom assessment techniques (CATs) for use in the classroom have been studied extensively and catalogued. These assessment techniques can in some cases be used in online and hybrid courses as developed for classroom use. However, as teaching media and approaches develop several new considerations need to be taken into account. We are specifically interested in how the use of social media will impact traditional CATs.

The changes in learning paradigms described by William Campbell & Karl Smith (1997) specifically address the change in assessment from norm-referenced to criterion-referenced where grading is done against predefined standards. Assessment becomes a part of learning where students receive feedback that guides them in their learning. It is in this context that classroom assessment techniques (CATs) pay an important role.

When evaluating students it is appropriate to assess performance on assigned tasks as long as we use criterion referenced tools. Rubrics have been identified as an appropriate instrument for this purpose (Perlman. 2003).

Others have explored the use of rubrics in the assessment of critical thinking. The Critical Thinking Assessment test (CAT) was developed by faculty from a number of institutions and
disciplines and validated (Stein & Haynes, 2011). Terry (2012) used a rubric to assess the critical thinking skills of science students using articles from the popular press.

Saxton, Belanger & Becker, (2012) showed that for example the Critical Thinking Analytic Rubric (CTAR) can be used by raters to score student work in a consistent manner. Rubrics do offer an approach for guiding and assessing the social media contributions of students and specifically the extent to which the students engage in critical thinking. However, assessing the total impact of a critical thinking pedagogical approach requires that students are assessed in their ability to think critically outside the context of the pedagogy used to teach the same critical thinking skills. To this effect it is necessary to test the critical thinking skills of the students using a separate instrument and to perform this test before the students take the course and again after they have been exposed to the critical thinking pedagogy. The gold standard for assessment of critical thinking is the California Critical Thinking Skills Test. This assessment is commercially available from Insight Assessment (http://www.insightassessment.com). However, the cost of assessment using this approach for the purposes of this research was prohibitive. As reported in the next section our TCTM implementation resulted in creation of a rubric to assess students’ participation in Facebook (FB) based social process of divergence and convergence process.

RESEARCH DESIGN

Our research design has two elements:

(1) The first element involves choosing a target learner body on which the TCTM can be applied and sufficient data can be collected in a controllable way to run suitable statistical tests to analyze the data to support our research objectives. To this end we selected an undergraduate junior level course offered regularly in several sections at a university in the southeastern United States in which one of the authors regularly teaches one or more sections each semester. The typical classroom has between 35 and 45 students. This supports all three of our research objectives as written earlier in the paper.

(2) To the second element is the selection of appropriate critical thinking teaching pedagogy specifically in relation to research objective 2, and to the extent the TCTM is using convergent/divergent processes, our research design should allow for implementing a method that makes sure both divergent and convergent thinking has taken place. In the traditional classroom students may achieve divergence of ideas, perspectives, approaches, content and solutions but the challenge is to get students to participate fully given the need to reach solutions in the amount of classroom time available. TCTM uses social media to support the learning process and to be successful it is important that the approach should generate at least as much but preferably more divergent thinking than can be achieved in a traditional classroom.

Convergence is typically relatively easy to achieve in a classroom since the instructor often facilitates the application of approaches incorporated into the lesson plan. This often happens sooner rather than later and thereby truncates the divergence. It is anticipated that in TCTM students may achieve divergence of ideas, perspectives, approaches, content and solutions in the context of social media participation. The challenge in the context of social media is that the
process should allow students to at some point select a problem definition and for the students to develop a solution, preferably without the (premature) interjection of the instructor.

In order to facilitate the convergence an instructional module on critical thinking was developed for use in TCTM in conjunction with a series of focused, structured and repeated practice opportunities required for students to develop the necessary skills. Social media is rich with real-world examples and cases and in TCTM these are combined with the student-instructor interaction needed to create the most effective environment for developing critical thinking skills. Students also are given the opportunity in class to describe and discuss the thinking processes they use during the social media activities.

To specifically support our research objective 3, to the extent of assessment we will implement a pre- and post-test design, which means students abilities will be observed and recorded before critical thinking methods are introduced and after a time of exposure (end of semester) a post assessment will be done and results compared.

IMPLEMENTING TCTM AND EARLY RESULTS

During the summer break of 2012 we determined to use social media in three sections of the core junior level undergraduate course for a total of 125 students selected for the purpose of this study. All three sections had the same instructor, which enables controlling for instructor variance in the results, with two of 45 students each on the same campus and a third section with 35 students on a satellite campus. While there are limited variability between the population of the main campus and the satellite campus, the course structure for the two populations are kept the same. With a target student body selected we set out to determine how social media would function in the context of this class.

During the Fall 2012 semester we introduced use of social media, i.e., Facebook (FB) to the students and to determine if students would adopt it as an augmentation of in-class participation and to determine how social media would work in a class setting. We were especially interested to see if the use of social media, when combined with a convergence-divergence approach, would work to generate divergence as students applied concepts learned in class to real world situations.

During this semester we observed lots of participation on the social media. The instructor posted content relevant to the course and to course assignments on a daily basis without providing any guidance on the relevance, purpose, context or application. On an average calendar day during the semester there were 122 unique views of the posts by the instructor to the Facebook page for the course with as many as 197 unique views on some days. A total of 667 unique users (other than the instructor) engaged with the content of the course Facebook page, with a mean number of 6 unique users engaging per calendar day and 4 users typically per calendar day. These engagements included comments on posts by the instructor, new posts by students, comments by students on posts by other students or students responding to comments or questions about their own posts. All users posting the course Facebook page during this semester were students registered for the course during the same semester. The overall usage indicated that students engaged significantly using Facebook as a social media platform. Early indications are that
participation appears to be skewed with some students engaging often and repeatedly while others appear to engage only to the extent that they needed to in order to meet their grade objectives. It is important to note that students were not required to use social media in this course but that students did earn credit for participating on Facebook as they would during regular class discussion. Further examination of student usage patterns and learning styles might offer insight into the role that social media may play in addressing learning style needs of students.

First Result

Notable was the high degree of divergence of ideas, opinions, perspectives and content contributed in these social media posts; however, it would be fair to say that no convergence could be observed. Students were actively engaging but they were not showing much critical reflection and the conversation would never return to focus on conclusions or problem solution. Examples of divergence included stories about companies using outsourcing to reduce cost, working conditions in factories where significant outsourcing occurs, child labor, the use of technology by companies to expand international reach, stories about the European debt crisis, exchange rate fluctuations and the prices of commodities. Students could identify the tension between some of these stories and material covered in the course but could, for example, not develop coherent assessment of the overall value or impact of outsourcing or the implications of exchange rate fluctuations or commodity price swings. Limited convergence typically only occurred when prompted by questions by the instructor to posts by students or when prompted by the instructor in original posts to the course page.

Based on the findings from the Fall 2012 semester a literature search was conducted to explore ways to take advantage of the promising levels of student engagement. Three areas of exploration were pursued: (a) methods for improving the levels of critical engagement by students, (b) search for tools that are effective in achieving guided convergence and (c) approaches to assessment of student contributions. The literature (Barkley, 2010; King & Kitchener, 1994; Halpern (2003); Van Gelder, Bissett & Cumming (2004), Staib (2003)) emphasized explicit instruction and focused, structured and repeated practice using real-world examples combined with student-instructor interaction foster the most effective environment for developing critical thinking skills. The value of discussion of the process of thinking by students was also identified as important. Based on what we observed with students’ unstructured use of social media and on what the literature suggests how to implement a structure, our implementation of TCTM resulted into constructing a rubric. Specifically, a rubric was created that provides guidance on goal setting and assessment of critical thinking. We elected rubrics (Stevens & Levi, 2005) as an appropriate method for guiding divergence-convergence while also allowing for assessment of student activity at the same time. The rubric is presented below as Table 1.

The rubric was designed to encourage and reward students at all levels for generating divergence as all criteria at all levels offer points for simply generating social media contributions. This can be seen in the types of activity described in levels 1 and 2. The Collaboration and Critical Thinking criteria reward students with higher points on contributions that further increases

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divergence as it encourages students to elicit responses from and respond to contribution from others and also encourages additional perspectives to the discussions.

For the criteria Social Media Value and Relevance to the Course students earn more points for engaging critically with their contributions in ways that bring the discussion back to the course content, thereby stimulating convergence in thinking, problem definition and solution.

Further Implementation

During the Spring 2013 semester the use of social media with application of the rubric was used in two sections of the same core junior level undergraduate course as in the Fall 2012 semester, this time for a total of 65 students. Both sections had the same instructor as in Fall 2012 with one of 45 students on the main campus and a second section with 20 students on the satellite campus. With a target student body selected we set out to determine how social media would function in the context of this class.
Table 1: Result from First Implementation of TCTM - Rubric

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Level 4 4 points</th>
<th>Level 3 3 points</th>
<th>Level 2 2 points</th>
<th>Level 1 1 point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Media Value</td>
<td>Carefully selected contribution with <em>directly relevant linked content</em></td>
<td>Carefully selected contribution with <em>appropriate linked content</em></td>
<td>Carefully selected contribution with <em>linked content</em></td>
<td>Coherent contribution</td>
</tr>
<tr>
<td>Relevance to Course</td>
<td>Clearly identifies relevance to the BUSA3000 course with explicit reference to EITHER: (1) a specific topic in course OR (2) relates to general theme in international business/globalization</td>
<td>Describes relevance to the BUSA3000 course with <em>general reference</em> to EITHER: (1) a <em>specific topic</em> in course OR (2) relates to *general theme in international business/globalization</td>
<td>Relevance to the BUSA3000 course with reference to international business/globalization</td>
<td>Limited relevance to the course in general</td>
</tr>
<tr>
<td>Collaboration</td>
<td>(a) <em>Original</em> post that elicits response by at least 5 contributors (other than instructor) OR (b) <em>Response</em> to post that elicits discussion by at least 5 other contributors (other than instructor)</td>
<td>(a) <em>Original</em> post that elicits response by at least 3 contributors (other than instructor) OR (b) <em>Response</em> to post that elicits discussion by at least 3 other contributors (other than instructor)</td>
<td><em>Original</em> post that elicits response by at least 2 contributors</td>
<td><em>Response</em> to post</td>
</tr>
<tr>
<td>Critical Thinking</td>
<td>Identifies the point of view in the linked content AND <em>evaluates</em> view critically AND presents an alternative perspective</td>
<td>Identifies the point of view in the linked content AND presents an alternative perspective</td>
<td>Identifies the point of view in the linked content OR presents an alternative perspective</td>
<td>Some indication of points of view</td>
</tr>
<tr>
<td>Overall Score</td>
<td>Level 4 15 or more</td>
<td>Level 3 11 or more</td>
<td>Level 2 7 or more</td>
<td>Level 1 0 or more</td>
</tr>
</tbody>
</table>
During the Spring 2013 semester the use of social media was structured as follows:

1. Week 1 of course: Offered all students the opportunity to earn participation points equal to in-class participation for contributions to the course Facebook page.
2. Week 2 of course: Instructor introduced the concept of critical thinking, lectured on critical thinking and gave examples of divergent and convergent thinking and comments on how these facilitate critical thinking.
3. Week 3 of course: Introduced students to rubric with 4 criteria (Social Media Value, Relevance to Course, Collaboration and Critical Thinking) each assessed using 4 levels.
4. Week 4 – week 12 of the course: Instructor modeled addressing of assignment problems using Facebook as idea generating and collaboration medium.
5. At 4 intervals during semester: instructor asked students to self-report on activity-to-date using social media and by in-class participation; instructor applied rubric to student contributions and posts results in course management system.
6. Semester end: assignments were collected, data for Facebook participation archived and nature of participation (divergent and/or convergent contributions) noted.

At the time of this writing, early data indicates that the rubric combined with in-class instruction, modeling and repeated practice are successful in effectuating convergence in student critical thinking to the point that they are producing concrete solutions to the problems. This suggests that students successfully execute the process of convergence resulting in concrete solutions to the problems assigned. Complete data will be available at semester end.

Future Implementation and tests

However, the question remains as to the extent to which the learning environment effectuates the acquisition of critical thinking skills by students. During the Fall 2013 semester a before-and-after experiment will be devised to test if student critical thinking capability improves based on implementing the divergence-convergence process to enhance critical thinking. The experiment described below will be used in two sections of the same core junior level undergraduate course as in the Fall 2012 semester. A total of 90 students in two sections will have the same instructor as in Fall 2012 and Spring 2013, each section with an enrollment of 45 students on the main campus.

A suitable instrument for measurement of critical thinking in order to assess student critical thinking will be selected. The instrument will be adapted to create two instruments for use as before and after assessment.

Approach:

1. Week 1 of course: the first version of the instrument will be administered to all students.
2. Week 1 of course: Instructor will offer all students the opportunity to earn participation points equal to in class participation for contributions to the course Facebook page.
3. Week 2 of course: Instructor will introduce the concept of critical thinking, lectures on critical thinking and gives examples of divergent and convergent thinking and comments on how these facilitate critical thinking.
4. Week 3 of course: Introduce students to rubric with 4 criteria (Social Media Value, Relevance to Course, Collaboration and Critical Thinking) each assessed using 4 levels.

5. Week 4 – week 12 of the course: Instructor will model addressing of assignment problems using Facebook as idea generating and collaboration medium.

6. At 4 intervals during semester: instructor asks students to self-report on activity-to-date using social media and by in-class participation; instructor applies rubric to student contributions and posts results in course management system.

7. Final week of semester: As an after phase students will be given the second critical thinking assessment during week prior to final exams.

8. Semester end: assignments are collected, data for Facebook participation archived and nature of participation (divergent and/or convergent contributions) noted.

Statistical assessment and tests will be used to evaluate the before-and-after assessment results to validate the use of the divergent -convergent approach in social media to support critical thinking in class.

**SUMMARY AND CONCLUSIONS**

Table 2 below summarizes the implementation of TCTM so far and its results.

As we mentioned in the Introduction section of this paper, our three research objectives were to contribute to (1) the critical thinking pedagogy literature by proposing a Teaching Critical Thinking Methodology (TCTM) that helps with these challenges; (2) to further contribute by implementing TCTM in a real course and sharing our experience and the resulting modifications that ensued to make the methodology feasible. (3) To collect and report evidence and test whether TCTM actually improves critical thinking.

In essence, we have already been successful in achieving above objective (1). This is because we already have early results that a divergence and convergence of thinking process has been effectuated by using social media as a part of our TCTM method. Objective (2) has been achieved to the extent of implementing TCTM in a real course and a rubric has been created and applied to make TCTM feasible. Objective (3) will be achieved when our data from the proposed before and after assessment come in and we run a means tests to compare students’ performance to check whether there has been an enhancement in their critical thinking ability. We wish to report this in our conference ready version of this manuscript in November, 2013.
Table 2. Research Design Implementation Matrix

<table>
<thead>
<tr>
<th>Type of Critical Thinking Processes and Assessment</th>
<th>Implementation Phases</th>
<th>Pilot Rubric Integration</th>
<th>Proposed Experiment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Divergence in students’ idea generation etc.</td>
<td>Present. (Students actually was creating multiple ideas, revising them, cooperating and coordination on social media )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Convergence in students’ problem solution creation</td>
<td>Absent. (There was a lull in the social media when time came to discuss the divergent ideas and vet them to form a solution to the class assignment)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observation of students’ performance &amp; Assessment</td>
<td>Absent.</td>
<td>Present.</td>
<td>Will be done in Fall of 2013.</td>
</tr>
<tr>
<td>Learning from the Research implementation phase</td>
<td>Design research apparatus that will ensure convergence A rubric was designed and adopted for the purpose</td>
<td>Early Results indicate a good degree of divergence and convergence. Will have complete data by May 2013. Difficult to observe and assess levels critical thinking learning</td>
<td>Final Assessment Results (will be available in the Fall of 2013)</td>
</tr>
</tbody>
</table>

REFERENCES


