



Article

Using Team-Based Learning in an Online, Asynchronous Information Literacy Course

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Abstract

Making information literacy instruction engaging to learners can be a challenge. Making it engaging in an online, asynchronous setting can be even more daunting. As students seek more opportunities for online learning, it's becoming increasingly important to develop information literacy instruction that will promote engagement and enhance learning in the online environment. Team-Based Learning is a method of instruction that has transformed the atmosphere of a face-to-face information literacy course. This article explores the design and implementation of an online version of the same course where many of the benefits of Team-Based Learning were successfully transferred to the online setting.

Engaging students as they learn to find, evaluate, and use information effectively can be challenging, whether they are learning in a virtual environment or in a physical one. Group work and active learning can move students away from passively absorbing information into activities that give them hands-on experience with the concepts and skills they are learning.

Team-Based Learning (TBL) is a collaborative learning method that was developed by Larry Michaelsen during his time teaching at the University of Oklahoma. Team-Based Learning has been shown to transform the atmosphere of a traditional credit-bearing Information Literacy course at the University at Albany by giving students the opportunity to take responsibility for their learning through a process that places emphasis on accountability and application (Jacobson, 2011). Now that more students are beginning to seek opportunities for online learning, the challenge of adapting Team-Based Learning to an online, asynchronous version of the same course was taken up with the hope of transferring benefits seen in the classroom, including increased student engagement with each other and with the materials in the course (Jacobson, 2011).

This article will examine design and implementation issues encountered in adapting elements of Team-Based Learning for the online, asynchronous classroom through the lens of each of Team-Based Learning's three stages: preparation, application, and assessment (Fink, 2004). This design was implemented in fall 2012 for an online section of the University at Albany's Information Literacy course, UNL 205, which was taught through Blackboard Learn.

Team-Based Learning

When used in the face-to-face classroom, Team-Based Learning takes what is familiar about group work to a new level by applying a structured approach which has been shown to increase student engagement with the materials and with each other (Jacobson, 2011). Design principles of Team-Based Learning start with separating students into teams of 5-7 peers. The team selection process is conducted by the instructor on the first day of class with the goal of distributing skills and knowledge among the teams (Michaelsen, 2004). For example, taking UNL 205 is a requirement for students at the University at Albany but there is no requirement for when in their academic careers students should take the course, so there is often a mix of lowerclassmen and upperclassmen in the class. The instructor may attempt to construct the teams so that the upperclassmen, rather than ending up on the same team, will be on teams with less experienced students where they can better share their skills and be less likely to form alliances that would exclude their younger peers. In Team-Based Learning, the teams are permanent and all teamwork generally takes place in class unless teams choose to do otherwise (Michaelsen, 2004).

The design follows three stages: the preparation stage, the application stage, and the assessment stage, with the most class time spent on the application stage (Fink, 2004). As part of the preparation stage, students are required to complete readings and review other preparatory materials outside of class time. To ensure accountability for their preparation, students are given a readiness assessment test at the beginning of class, usually at the start of a new unit. Students complete this readiness assessment test first

as an individual and then complete the same test with their team. The individual test holds them accountable to the instructor for work done and the team test holds them accountable to their teammates. The team readiness assessment test (RAT) encourages discussion among teammates, especially when using the Immediate Feedback Assessment Technique in which a scratch-off card reveals a star if students have chosen the correct answer for the question. If students do not make the correct choice the first time, they have the opportunity to try again for fewer points. Scores on team readiness assessment tests are often higher than the readiness assessment test score of any individual on the team. The preparation stage ends with an appeals process through which students can appeal a question that they feel was unfair or inaccurate. Students can only appeal as a team and must use evidence from the reading to make their case. If an appeal is granted, the instructor may grant points back to the team or teams that submitted an appeal.

The application stage of Team-Based Learning is characterized by collaborative exercises that use what are known as the 4 S's: significant problem, same problem, specific choices, and simultaneous reporting. The activity should be designed so that teams are working on a problem that has immediate application to their learning and requires them to commit to an answer, which they then report in a simple form that gives them a framework for expressing their ideas (Parmelee & Michaelsen, 2010). An example of a 4 S application activity used in the traditional version of UNL 205 would be a lesson on finding and evaluating books where teams are given printouts of catalog records for a book owned by the library and an example research topic related to the book. The activity applies what students have learned from tutorials about the catalog watched outside of class and will become important to completing an assignment that requires them to cite and annotate a book on their team's topic (significant problem). Every team is given the same record for the same book and the same example research topic (same problem). The teams are asked to assign the book a grade based on how well they think it would support someone's research on the given topic (specific choice). Once teams have decided on a grade, they are given small marker boards on which to write the grades they came up with and all teams are asked to hold up their grades at the same time (simultaneous reporting). The instructor is then able to take advantage of any differences and ask teams why they chose the grade they did based on the information in the catalog record.

The advantages of following the 4 S structure are many. While the temptation in regular group work is to have each group working on a different piece of the same puzzle, having each team working on the same problem gives teams a reason to pay attention to each other's answers, since they'll want to compare it to their own. Asking teams to make a specific choice prevents non-answers while simultaneous reporting requires them to own the answers they came up with, rather than changing their answer based on what other teams have said.

The last stage of the Team-Based Learning model is the assessment stage where students show that they have mastered the skills they need before moving on to the next unit. In the traditional version of UNL 205, the culminating project is a research guide that is created as an online wiki. Formerly, this research guide was completed as

an individual project but was eventually transformed into a team project and presentation. Students were asked to cite and annotate different sources for weekly homework assignments. At the end of the course, they were expected to include improved versions of these same citations and annotations in the annotated bibliography part of the research guide. Other elements of the online research guide included an introduction to the topic and a glossary of search terms related to the topic. Using Team-Based Learning as part of the classroom experience for the face-to-face version of UNL 205 was a successful endeavor (Jacobson, 2011). Adapting the model to the asynchronous, online course was not without challenges.

Adapting the Preparation Stage

In an online course, a number of factors needed to be taken into consideration when adapting the preparation stage, including the dilation of time, the inherently open-book nature of online tests, accommodating student schedules for discussions, and the necessary shift from the “scratch-off” card approach for the team readiness assessment test (RAT) to an “all or nothing” model. Information that would be covered in a single class period of a face-to-face course had to be stretched over the length of a week to accommodate the asynchronous nature of the course. Weekends were designated as times for students to complete the required readings before the readiness assessment process began on Monday. The readiness assessment process, which would normally take about 20 minutes of a two-hour class period, now stretched out over several days at the beginning of the week-long module, overlapping on some days with the application stage (see Figure 1).

Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
Students complete assigned readings	Students complete assigned readings Individual RAT opens at 11:59 PM Individual assignment opens at 11:59 PM	Individual RAT due at 11:59 PM Team RAT Discussion opens at 11:59 PM Team RAT opens at 11:59 PM	Team RAT discussion time. Individual assignment work time.	Team RAT due at 11:59 PM Individual assignment due at 11:59 PM	Team application assignment discussion time.	Team application assignment due. Readings for new module open at 11:59 PM.

Figure 1. Outline of a Typical Learning Module

The individual readiness assessment test was given as a multiple choice quiz on Blackboard. The quiz opened at 11:59 PM on Sunday night and was open for 24 hours. Though readiness assessment tests are intended to be strictly closed-book tests, online tests are inherently open book, even when the instructor uses special software or timer options to prevent too much note-checking. The solution to this was to design online readiness assessment questions so that students would not be able to answer them simply by going back to the readings. This entailed attaching PDF files of catalog records or database searches to the test and asking students to make predictions based on what they had seen in the assigned readings rather than answer questions about the advantages or disadvantages of a given resource.

The release of the readiness assessment tests also needed to be timed in a precise way. The individual readiness assessment test was available only on Mondays to better prevent the possibility that students might share the questions with their peers. The test was set up so that students would not receive any feedback after completing the test and the column with the test's score was hidden in the grade center.

The team discussion on the readiness assessment test and the team readiness assessment test opened on the same day and at the same time only after the individual readiness assessment test was closed to all students. A copy of the readiness assessment questions were attached in the discussion area and a thread was created for students to discuss the test. The discussion areas had to be set up in such a way that students were prevented from accessing discussion areas that did not belong to their own team and thus checking on other teams' work. This meant each team had to have their own discussion area and that the discussion area had to be managed so that students' status was changed from the default "Participant" to "Blocked" on discussion areas that belonged to other teams.

In the team discussion, students were expected to share the answers they had chosen on the readiness assessment test and to defend those answers to any team members who did not agree with what they came up with. Once the team came to an agreement, one team member was nominated to submit the answers. The team readiness assessment test was set so that the student would automatically receive the score along with the correct answers as soon as the readiness assessment test was submitted. The appeals process was handled in an extra discussion area where teams had until the close of the module to submit an appeal to any question they felt had been unfair or was inaccurate.

An obvious difference between the team RAT in a traditional class and the team RAT in an online course is that at the time of the design and implementation, there was no electronic equivalent to the scratch-off card that would have allowed students to continue their discussion if the team got a question wrong on the first try. Each question became "all or nothing," which slightly diminished the quality of the discussion students were able to have with one another if there was a disagreement about which answer to choose.

It was also necessary to anticipate scenarios in which there was conflict about answers that had been submitted, such as if a team member submitted answers the rest of the

team did not agree with, whether by accident or by deliberate tampering. It was specified in the course information that the instructor would review the content of the discussions to determine what had happened and make a decision about whether to restore points based on that information. Students who did not participate in the readiness assessment test discussion did not get points for the team readiness assessment test.

Adapting the Application Stage

The majority of class time in a traditional classroom is spent on the application stage, where the main feature is application activities that are designed following the 4 S's: significant problem, same problem, specific choice, and simultaneous reporting.

In writing about Team-Based Learning, Parmelee and Michaelsen (2010) are adamant that when designing activities, the instructor should always follow all four elements in the 4 S structure because, "failing to do any one of the 4 S's substantially reduces both the intensity of class discussions and the resultant learning" (p.120). Preserving all four S's turned out to be particularly challenging given the asynchronous nature of the course.

Since it was anticipated that using Team-Based Learning for the course was already going to be a challenge to students new to online learning or used to seeing online courses taught a certain way, the decision was made to minimize potential confusion as much as possible by structuring the application activity in a way that was similar to the structure of the readiness assurance process, following a pattern of individual work followed by discussion followed by the submission of a team product.

In the traditional course, the application activities were followed by assignments where students would, as an individual, cite and annotate a certain type of source for homework. This followed from activities like the one described above where students were asked to evaluate example sources and articulate whether they thought a source was valuable for a given topic or not. The individual assignment would be completed before coming to class and students would then share their work with their teammates, who had also cited and annotated sources on the same topic. Students would be asked as a team to improve on each other's work and submit a single citation and annotation for a team grade. This pattern of completing assignments had the advantage of matching the desired structure for the online version of the readiness assessment process and so was re-purposed as an application activity for the online course. Students first submitted an individual citation and annotation assignment at the beginning of the module then discussed what they found with their team before deciding which (hopefully improved) citation and annotation to submit for a team grade.

In adapting Team-Based Learning for their technology course at the University of Texas at El Paso in 2007, Palsolé and Awalt (2008) followed a similar structure for their application activities, with an added layer of peer evaluation following each activity. They found that it was not entirely possible to completely replicate the 4 S structure in an online, asynchronous setting, leaving out both the "specific choice" elements and the "simultaneous reporting" elements in the initial incarnation of their course. A solution

suggested by the authors for incorporating “specific choice” would include modifying an assignment asking teams to choose from a list and defend their choice rather than asking an open-ended question (Palsolé & Awalt, 2008).

For UNL 205, there was a similar absence of simultaneous reporting made necessary by the asynchronous nature of the course. However, in submitting their individual assignments first, individual students were required to at least commit to an answer before consulting with their teammates. The other elements of the structure were in place. The significant problem was represented in the need to find and evaluate a source that was in line with the course goals and related to the final project. All students were asked to find the same type of source (book, article, website, etc.) and the source had to be on the topic assigned to their teams, which is close to the “same problem” aspect of the 4 S structure. Teams then made a specific choice by deciding which citation and annotation to submit for a team grade out of the pool of options made up by the work of each individual.

The grading for the application activity was such that students would receive 10 points for the individual work if the submitted work met the requirements for the assignment, 10 points for participating in the application activity discussion with their teammates, and 30 points plus detailed feedback on the work they submitted as a team. The expectation was that they would use the detailed feedback from the team assignment to make improvements for the final project, where their citations and annotations would become part of an annotated bibliography.

As with the readiness assessment process, it was necessary to anticipate scenarios in which a team member submitted work that was not representative of what the team wanted. The course information specified that in the event of conflict, the instructor would review the content of the discussion and make a decision to allow a re-submit based on that information. Students who did not participate in the team application activity discussion would not receive points for the team assignment.

Adapting the Assessment Stage

This research guide was the final assessment for the course and the same project was used for the online course, with the citation and annotation assignments being re-appropriated for the application activity. Teams built the annotated bibliography over the course of the class and were asked to create a wiki that would serve as a research guide on the assigned topic.

Students were first introduced to the final project in the second week of the course in the hopes that they would better understand how their homework assignments were meant to build toward the final project. Midway through the course, discussion areas were opened to allow teams to have necessary conversations about the completion of the project and decide who would be responsible for which piece. At the end, students submitted a link to their wiki to indicate that it was ready to be graded. Students were also asked to evaluate the work of other teams by filling out an evaluation form that asked them to discuss one thing they had learned from each team’s wiki and one thing they still had a question about. Students were graded as a team for the wiki. The grade

for the evaluation was based on the quality of the individual student's comments about other teams' work.

Implementation

The online, Team-Based Learning-enhanced version of UNL 205 was implemented in fall 2012. Students were introduced to the course and the concept of Team-Based Learning and how it would be used in the course through a presentation in the Icebreaker Module. At the start of the course, all 23 open seats were filled and a number of requests for permission numbers to join the course were received, of which 2 were granted. The class was made up entirely of upperclassmen predominantly majoring in science. Of the 21 students who completed the course, four students self-identified as first-time students in a fully online course. None shared whether they'd had past experience with Team-Based Learning.

Initial confusion associated with the design of the course was anticipated, but students seemed to take the format in stride more readily than expected. A few e-mails from students expressing anxiety about the course's structure were received during the first two to three weeks, but only three students dropped after the first week and one non-participating student withdrew midway through the course.

Most problems encountered were technical issues and glitches with Blackboard, many of which were timing issues for when different items were made available to the students. Students were understandably frustrated when items they were supposed to have access to were missing but eventually became familiar enough with the pattern of the course that they could alert the instructor to missing information. At times, a minor extension in a deadline was needed to make up for time lost.

The preparation stage.

The readiness assessment process inspired a higher level of engagement than any other activity in the course, likely because the quiz-like nature of the readiness assessment test led students to give it more weight than other assignments. The only known problems encountered during the individual readiness assessment test were on an individual basis, with students accidentally submitting the test or closing the test window before they were finished.

In the team readiness assessment test discussion that followed, some teams were more reticent than others, with individuals simply making lists of the letters corresponding to the answers they had chosen and not discussing any of the questions unless there was obvious disagreement. Other teams had members who included not just their answers but varying levels of detail as to why they had chosen the answer that they did. On one team in particular, members would challenge each other to make convincing cases for any questions on which there were differing opinions about the correct answer.

The appeals process and how it was handled was a weak point of the course. No teams took part in the appeals process for any of the readiness assessment tests and while this is not unusual from previous experience using Team-Based Learning in UNL 205, the design of the appeals process probably played a role in that the links to the appeals

discussion were in areas that were not obvious to students once their attention had shifted to other, required parts of the module. A better explained and better presented process for the appeals would be needed in future versions of the course.

In the classroom, it is possible for the instructor to catch bits and pieces of the discussions that go on as teams complete each readiness assessment test but one of the revelations of an online version of Team-Based Learning was having the opportunity to look more closely at students' reasoning for each choice and how they had engaged in the preparation process.

The application stage.

The application stage was the area of the most confusion for students. Individual assignments were generally submitted on time and were of a superior quality to assignments observed in a traditional course. On this level, students were able to successfully cite and annotate a variety of sources on an assigned topic. However, students seemed reluctant to participate in the team aspect of the activity and much less engagement was observed in the application activity discussion than in the readiness assessment discussion each week. Students lost steam after the busier first part of the module which may have contributed to less engagement during the discussion that was due at the end of the week. Another possibility is that students may have been unclear as to how to go about evaluating each other's work or were simply nervous about doing so in this context. Work submitted for the team assignment was often the result of superficial agreement rather than meaningful discussion. While the reason for this lack of engagement can only be speculated about, it should be noted that there was also difficulty in generating interest in collaborating on the citation and annotation assignments in the traditional classroom, where this assignment was used more as an assessment of student learning than as an application activity. Students did not show an inclination toward helping improve each other's work, even when these improvements could have had a positive effect on their own grade. A future iteration of the online course would benefit from a new application activity that increases student incentive for participation, leads to more meaningful instruction, and more closely follows Michaelsen's 4 S structure.

The assessment stage.

Though the final project was introduced early on in the course and was mentioned multiple times throughout, the discussion areas set aside for the project stayed quiet until less than a week before the project was due. In the last few days before the due date, the discussion threads lit up as teams made decisions about who would be responsible for which piece of the wiki, which consisted of an introduction, an annotated bibliography, a list of helpful search tools and search terms related to the assigned topic, and a list of credits for which team member was responsible for what work.

A main goal of Team-Based Learning is to avoid situations where students split up the work and complete it separately rather than as a team. In an online asynchronous environment, there is no way to prevent this and so the project was less collaborative than is generally seen in the traditional version of the course. However, at least one

team indicated in their credits that more than one team member had worked on the same section and collaboration was evident particularly in the introductions where students would add knowledge based on the sources with which they were most familiar. All teams showed a good understanding of their assigned topic.

For the annotated bibliography, improvement over the original drafts was a requirement for the grade to prevent simple copy and pasting and to assess whether students had learned to evaluate sources effectively. In most cases, changes had been made to the citations and annotations to improve them from the original, though in one team's case, many of the sources that appeared on the annotated bibliography were different from the ones submitted for homework.

By the time the final project was due, students were eager to be done with the course and so the work submitted for the wiki piece of the project was adequate without being extraordinary, matching the work of teams in past face-to-face courses in quality. It was in the evaluation part of the project that students submitted more impressive work with sometimes detailed comments about what they had learned by looking at other teams' wikis and where they still had questions. In some cases, the students shared honest criticism for inconsistencies they detected in other teams' work and in this way showed, whether they knew it or not, better evaluation of sources than was seen in the annotated bibliography section of their own wiki.

Conclusion

Adapting Team-Based Learning for an online, asynchronous Information Literacy course was a learning experience with many successes and some areas for improvement. Students were active in the course and, especially in the case of the readiness assessment tests, engaged with the material and each other in meaningful ways. They proved their learning through completion of a final project where they showed their understanding of evaluating sources through an annotated bibliography and by evaluating each other's work. While some rethinking would need to be done to stimulate more engagement with the application activities and generate better quality final projects, the overall design was successful and would be worth exploring further.

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