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Enhancing Learning in an Advanced Analysis Course: the Flipped Model, Peer Learning, and the Mode Effect

BY BRENDA RAVENSCROFT AND VICTORIA CHEN

Traditionally, the analysis of music is a solitary activity, completed by individual theorists, performers, or conductors before their interpretations are disseminated through writing, presentation, or performance. A similar model is often used for teaching analysis: students are given the context in which a piece was composed, taught the most appropriate analytical approaches—and then asked to complete their analyses on their own, usually outside of class time as a homework assignment.

However, recent research into cognitive science has found that students learn better in groups than individually, coining the concept “collective general intelligence” to describe a group’s ability to perform better on complex tasks such as solving puzzles, making moral judgments, and brainstorming.¹ In education fields, this concept has been applied to “peer learning”—where students learn from other students by participating in communal activities, discussions, and tasks—and this has also been shown to result in more effective learning than traditional solitary methods of learning.² These more active and collaborative forms of learning enable better conceptual understanding and long-term knowledge retention because students are placed at the center of their own learning.³

¹ Anita Williams Woolley, Christopher F. Chabris, Alex Pentland, Nada Hashmi, and Thomas W. Malone, “Evidence for a Collective Intelligence Factor in the Performance of Human Groups,” *Science* 330, no. 6004 (2010): 686–88, http://www.sebbm.es/archivos_tinymce/woolley2010.pdf.

² Peer learning trends in higher education and methods for developing more effective peer learning approaches are discussed in *Peer Learning in Higher Education: Learning From and With Each Other*, ed. David Boud, Ruth Cohen, and Jane Sampson (New York: Routledge, 2014).

³ Joel Michael gives an overview of how active learning has been adopted across disciplines in science, psychology, and education in

While few similar studies exist in the field of music theory, there is growing interest in adopting active and student-centered learning approaches in fundamental music theory courses. Recent journal articles have examined issues on how to engage students through effective questioning in the classroom, while a rich web-based resource, *Engaging Students: Essays in Music Pedagogy*, established in 2013, offers short, open-access essays focused on a variety of student-centered learning topics.⁴ In particular, music theory instructors have started experimenting with the “flipped” classroom model, referring to any approach in which students do preparatory work before coming to class and engaging in activities during class.⁵ Studies examining the flipped classroom model have suggested learning is more efficient for students than traditional lectures because students are exposed to the content and theories before class through readings or watching video-recorded lectures, and come to class ready to process the information by participating in problem solving activities, analyzing data or text, and contributing to discussions.⁶ These in-class activities allow students to apply the knowledge from their solitary preparation and receive support and immediate feedback from peers and the instructor on their performance.

“Where’s the Evidence that Active Learning Works?,” *Advances in Physiology Education* 30, no. 4 (2006): 159–67.

⁴ Scott Dirkse focuses on pedagogical strategy rather than curricular content in “Effective Questioning Strategies for the Music Theory Classroom,” *Journal of Music Theory Pedagogy* 28 (2014): 69–84. The online journal *Engaging Students* developed from the eponymous annual gathering (formerly *FlipCamp*), which the organizers describe as “an unconference on classroom music pedagogy” (see <http://flipcamp.org/>).

⁵ Kris Shaffer and Bryn Hughes present three pedagogical models associated with the flipped classroom in “Flipping the Classroom: Three Methods,” *Engaging Students: Essays in Music Pedagogy* (2013), <http://flipcamp.org/engagingstudents/shafferintro.html>, while Jan Miyake offers insights into using podcasts in “A Mini-Flip of the Music Theory Classroom,” *Engaging Students: Essays in Music Pedagogy* (2014), <http://flipcamp.org/engagingstudents2/essays/miyake1.html>.

⁶ Linda C. Hodges describes the three phases of learning and how flipped classroom models maximize students’ achievement in these phases compared to traditional lecture teaching in “Making Our Teaching Efficient: Flipping the Classroom,” *The National Teaching & Learning Forum* 24, no. 5 (2015): 1–4.

In the case of the flipped music theory classroom, the application of knowledge often takes the form of analytical or model composition activities. For example, Shaffer describes a flipped species counterpoint class in which students complete a short reading about contrapuntal rules and watch a video demonstration by the instructor before coming to class and working on species counterpoint exercises.⁷ In a course focused on more complex music, Hughes found that by having students listen to a piece and complete a fundamental analysis outside class, class time could then be used to focus on “close analysis of the most interesting and difficult passages.”⁸

The move towards engaging students in the application of theoretical concepts during class time has driven a demand for different teaching spaces, and the reconfiguration of classroom spaces into “active learning classrooms” (ALCs) is a growing trend in higher education across North America.⁹ Although there is no single model for an ALC, and technology can play a large role or not be present at all, ALCs share a common design focus on facilitating student interaction and group learning. One popular format combines group work with technology by allowing students to sit in groups at circular tables and work collaboratively on large interactive whiteboards adjacent to each table. Students have the space to work individually or as a group without needing to physically reconfigure the classroom space. The size of these classrooms can vary from 20 to 200 students, but even at the higher end of enrollment, students and instructors have stated that active learning classrooms feel smaller than other classrooms that hold the same number of students because the configuration “creates opportunities for impromptu conversations.”¹⁰ Furthermore, in

⁷ Kris Shaffer, “The Basic Flip,” *Engaging Students: Essays in Music Pedagogy* (2013), <http://flipcamp.org/engagingstudents/shafferpt1.html>.

⁸ Bryn Hughes, “Just-in-Time Teaching and Peer Instruction,” *Engaging Students: Essays in Music Pedagogy* (2013), <http://flipcamp.org/engagingstudents/hughes.html>.

⁹ The website SCALE-UP (“Student-Centered Active Learning Environment with Upside-down Pedagogies,” 2011) hosts research-based information on learning space design, instructional approaches and learning materials (<http://scaleup.ncsu.edu>).

¹⁰ Paul Baepler and J. D. Walker describe how learning spaces can change interpersonal relationships in the classroom in “Active Learning

a series of surveys and interviews with students from various undergraduate disciplines using the ALCs, students overwhelmingly agreed that the learning environment was more welcoming and comfortable than lecture halls, allowing them to form better relationships not only with peers but also with the instructor.¹¹

The increased interaction successfully facilitated by the configuration of ALCs raises questions about whether the technology is truly needed in an ALC and what difference it may make to students' learning. Could the same information be presented on paper and still lead to the same type of learning? Or does the mode of presentation affect learning? The "mode effect" has been examined most closely in studies on test taking, with results suggesting that identical computerized and paper-and-pencil tests do not produce equivalent test-taker performance.¹² Possible contributing factors to the difference in performance include content familiarity and differing cognitive load demands in the different modes.¹³ However, little research has examined how peer learning contributes to the mode effect, and whether differences in learning may occur in different modes.

Present Study

This case study presents an example of the flipped learning model being used in upper-year course, Advanced Analysis of Post-tonal Music, with several unique features.

First, the piece being studied, Elliott Carter's song cycle *What are Years* (settings of five poems by American Modernist poet

Classrooms and Educational Alliances: Changing Relationships to Improve Learning," *New Directions for Teaching and Learning* 2014, no. 137 (2014): 27–40.

¹¹ Victoria Chen, Annie Riel, and Andy Leger, "Overlooked and Underestimated: The Impact of Physical and Mental Well-Being in Learning in Higher Education Classrooms" (paper presented at the annual meeting of the Canadian Society for the Study of Higher Education Conference, Ottawa, ON, May 30–June 5, 2015).

¹² Heidi V. Leeson, "The Mode Effect: A Literature Review of Human and Technological Issues in Computerized Testing," *International Journal of Testing* 6, no. 1 (2006): 1–24.

¹³ Jan Noyes, Kate Garland, and Liz Robbins, "Paper-Based Versus Computer-Based Assessment: Is Workload Another Test Mode Effect?," *British Journal of Educational Technology* 35, no. 1 (2004): 111–113.

Marianne Moore), was composed in 2009, challenging students to grapple with very recent music about which there is little existing analytical literature. Furthermore, Carter's late music demands the use of sophisticated analytical tools: fluency with pitch-class set theory and an understanding of Carter's harmonic system are needed to decode pitch structures, and knowledge of Carter's unique rhythmic language and system of stratified pulse streams is required to successfully analyze his rhythmic organization. In contrast to most courses, where the instructor is already very familiar with the music being taught and has often previously analyzed or consulted published analyses of the pieces, in this case the instructor (the first co-author) deliberately chose a piece with which she was unfamiliar (although the instructor is an expert in Carter's late style and compositional techniques). As a result, the standard instructor-student hierarchy was disrupted, and the process of discovery pervaded the course for both students and instructor.

Second, in addition to flipping the traditional teaching model by making analysis the central classroom activity, the course was structured with a strong focus on peer learning, following a team-based learning (TBL) approach. TBL embodies four "essential elements": (1) groups—groups must be properly formed and managed; (2) accountability—students must be accountable for the quality of both their individual and group work; (3) feedback—students must receive frequent and timely feedback; and (4) assignment design—group assignments must promote both learning and team development.¹⁴ Students in the advanced analysis course were assigned to small groups by the instructor at the start of the term, and completed analytical tasks almost exclusively with their assigned group for its duration, both in and outside of the classroom. (Each student, however, completed an individual interpretation—the final "analysis"—of the data gathered through group work.)

Finally, unlike the flipped model usually adopted in theory courses, classroom technology was integral to analytical activities during class. The ALC selected by the instructor for this course

¹⁴ Larry K. Michaelsen and Michael Sweet discuss the basic tenets of TBL in their introductory chapter, "The Essential Elements of Team-Based Learning," in *Team-Based Learning: Small Group Learning's Next Big Step*, ed. Larry K. Michaelsen, Michael Sweet, and Dean X. Parmelee, *New Directions in Teaching and Learning* (San Francisco: Jossey-Bass, 2008), 7–27.

conformed to the model described above, with separate round tables, each with its own interactive whiteboard (with internet access), and a central console for the instructor. This configuration enabled the instructor to show short videos and give occasional demonstrations, and, most significantly, allowed each group to project their score onto their own screen and to make annotations on the interactive whiteboard as they analyzed the music during class time. A second mode for score analysis was also available to students in the form of conventional paper photocopies.

This article will present the pedagogical and musical rationales for the course structure, explaining how the flipped model supported the course objectives and student learning goals. An overview of in-class and out-of-class activities will lead to a detailed discussion of the group analytical activities, focusing on the mode effect and team-based learning. The effectiveness of the flipped model to teach the analysis of new music will be supported by analysis of video footage from the class, and by the results of a pre-post study conducted via student questionnaires. To conclude, a critical reflection on the flipped course will be presented in the form of lessons learned.

The Flipped Music Analysis Course

Two of the primary motivations for adopting the flipped model were (1) to enable students to experience the exhilaration of analytical discovery together in the classroom; and (2) to ensure that students could benefit from the advantages of peer instruction and group work, with the goal of having them attain similar levels of mastery over the material regardless of their individual strengths. In comparable advanced analysis courses taught using a traditional approach, where class time was largely spent covering analytical approaches and the students completed their analyses on their own outside the classroom, the excitement of communal discovery was rarely present, and the disparity in student skill levels meant that those with weaker backgrounds and abilities fell behind and were often not able to accumulate the detailed and accurate analytical data necessary for an appropriately sophisticated interpretation of the piece. It was anticipated that these drawbacks of a traditional approach potentially would be exacerbated by the repertoire selected for the course—due to the newness and unfamiliarity of the music, the complexity of Carter’s compositional practice, and

the added dimension of text setting. Having students working in groups offered a solution to what might otherwise have been an overwhelming task for some individuals.

The flipped model encourages students to take ownership of their learning by requiring them to complete work independently outside class, often in the form of readings and short activities to consolidate fundamental information, and by engaging them in self-directed activities in the classroom. The emphasis on student autonomy and responsibility engendered by the structure of the flipped course helped the instructor to achieve one of her main objectives for the course, which was for students to acquire the confidence and technical skills to analyze unfamiliar post-tonal music in order to inform their performance, conducting, or teaching activities. Other objectives were also realized through flipping the course: the inquiry-based and discovery learning that characterized this implementation facilitated the students' development of transferable skills such as critical thinking and problem solving, while engaging students in peer instruction and peer evaluation enabled the development of important collaborative skills that could be applied in other contexts.

The class of nineteen senior undergraduate music students met weekly in three-hour sessions over a twelve-week term. While not all were theory majors, the students were either in the Bachelor of Music or the Bachelor of Arts Honors music concentration program, and the course allowed them to fulfill their required upper-year credits in music theory. Students were assigned to three groups of five and one of four, and worked on a single song from Carter's cycle throughout the course. Much of the first class was spent orienting the students to the flipped model (with which few were familiar) and to the rationale for the design of the course, as well as to Carter's late music in general. Because of the importance of group work, students were also encouraged to participate in a facilitated discussion about their responsibilities as team members and desirable attributes for contributing positively to group interactions.

The framework for the course comprised a series of alternating in-class and out-of-class activities, scaffolded so that students were gradually prepared for their culminating activity: to create an individual analytical interpretation of one of the songs—presented in the form of an essay—by drawing on the analytical data gathered throughout the term. Within this structure, the content sequenced

through different aspects of the music before integrating them: analysis of the poems (two weeks), pitch structure (four weeks), rhythmic structure (four weeks), and synthesis of all aspects into a text-music analysis of the song (two weeks). Appendix A presents an overview of the timeline for the course, clearly indicating which activities took place in class and which were completed outside of class. (The timeline was available to students on the course website, housed on the university's learning management system, from the beginning of the term.)¹⁵ Appendix B shows the weekly template used to give students details about their upcoming activities and the intended learning outcomes for that week (the third week).

In general, tasks assigned for completion outside class time were intended to provide students with the appropriate background (such as researching Moore's poetry and analyzing the poems), and to help them develop the required technical skills (such as reviewing set class theory and learning about Carter's unique approach to set class usage). While they were expected to do this work independently, incentives were provided and the value of the work to activities in the next class was always clarified. For instance, after doing a required reading, students had to take a short online comprehension quiz prior to class (worth a few points). Using the quiz data and following a "just-in-time" approach, the instructor would then start the next class by expanding on the topics in which most students had experienced challenges, before directing the students to apply the insights gained from the reading to their ongoing analyses.¹⁶ A few group activities also took place out of

¹⁵ The website was a critical tool in the course. All materials were posted to the website, it housed resources such as scores, e-readings, and links to recordings and videos, and hosted the comprehension quizzes and grades. The website also facilitated communication between the instructor and the students: assignments were submitted and returned via the website, and two days after each weekly class the instructor posted an encouraging reflection on the students' progress. In order to ensure that all students were comfortable with the website's content and structure, the instructor devised a "scavenger hunt" for the first class, in which student groups competed to see which group could navigate their way to locate certain website features first. The exercise also helped familiarize students with the classroom technology by projecting the course website onto each group's interactive whiteboard and requiring them to engage with the interactive whiteboard's tools.

¹⁶ For a description of this method see Hughes, "Just-in-time Teaching and Peer Instruction."

class, usually in the form of preparing class presentations. Student groups gave presentations on Moore's poetry at the beginning of the term, and, after learning about Carter's methods for organizing rhythm, composed and performed a percussion piece in class to demonstrate particular techniques.

Class time was focused on the application of skills, and on consolidating and extending background learning through the analysis of Carter's music. Students worked in their groups almost exclusively in class, analyzing their songs from the perspective currently being studied by annotating the scores projected onto their interactive whiteboards as well as working on paper scores.¹⁷ The instructor roamed through the class to listen, verify information, and prompt students with guiding questions. Consistent with the flipped model, very little class time was devoted to the transmission of information, other than to reinforce concepts or knowledge as needed based on quiz results or in response to a repeated question from multiple student groups.

Student-centered approaches like the flipped model and TBL emphasize the need for frequent assessment, both formative and summative. In this course, students were assessed as groups and individually, and, to signal the value of all of the course activities, the instructor assigned points to every component no matter how small. Students received group grades for the data that they gathered through analysis, and for group presentations. They also engaged in peer evaluation, where each student evaluated the others in their team in terms of their group contributions. Individual assessments included online comprehension quizzes, in-class tests to demonstrate mastery of analytical approaches (graded in class for immediate feedback), formative writing assignments, and the final analytical essay, which was worth 22% of the course grade.

Mode Effect

During two class sessions, spaced about six weeks apart in weeks three and nine, three groups of students were video recorded as they engaged in group analysis of the Carter songs they had

¹⁷ At the end of each class students downloaded their annotated scores onto the website so that they could continue their analyses between classes.

been assigned.¹⁸ Thematic analysis was used to analyze the video recorded sessions noting instances of peer discussions and type of mode used. After the initial analysis, the following codes were generated to further distinguish the type of modes, analyses, and interactions:

- the type of mode used: paper copy or interactive whiteboard electronic copy of the music
- the type of analyses occurring: micro-level (sections of the piece), or macro-level (relations between sections of the piece and piece as a whole)
- the type of interactions: working individually or as a group

A combination of componential analysis and constant comparison analysis was used to uncover relationships between codes and to understand the data set as a whole. Componential analysis uncovers relationships between codes (for example, comparing the uses of the modes, analyses, and interactions), while constant comparison analysis examines relationships between the comparisons discovered through the componential analysis to unveil a greater understanding of the data as a whole (for example, how do the different modes relate to the types of analysis, how do different interactions relate to the types of analysis).¹⁹ The resulting interpretation of the findings is depicted graphically in Figure 1.

¹⁸ In the fourth group one student did not give permission to be videotaped and therefore this group was excluded.

¹⁹ Nancy L. Leech and Anthony J. Onwuegbuzie suggest using at least two types of data analysis tools to improve rigor. Each analytic tool has its own strengths and offers a slightly different vantage point that allows the researcher to extract more meaning from the same data set ("An Array of Qualitative Data Analysis Tools: A Call for Data Analysis Triangulation," *School Psychology Quarterly* 22, no. 4 (2007): 557).

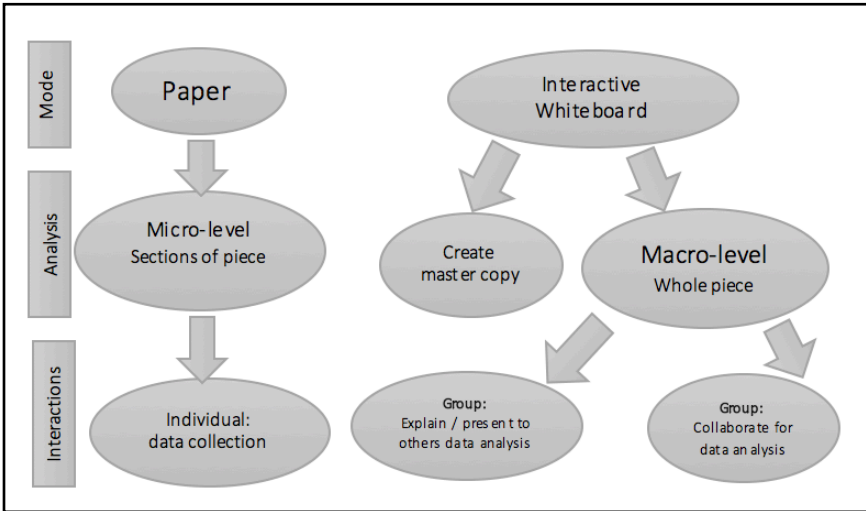


Figure 1. Visual Representation of Mode Effect in the study

All students in the class had paper copies of the scores for their songs. They were told to devise their own way of distributing the work among group members, but the groups gravitated towards the same solution and decided to assign specific sections of their piece to each member to analyze. During the first videotaped session, most students spent the class time individually “micro-analyzing” their sections of the music working from the paper score, as can be seen in the still frames from the video in Figure 2.

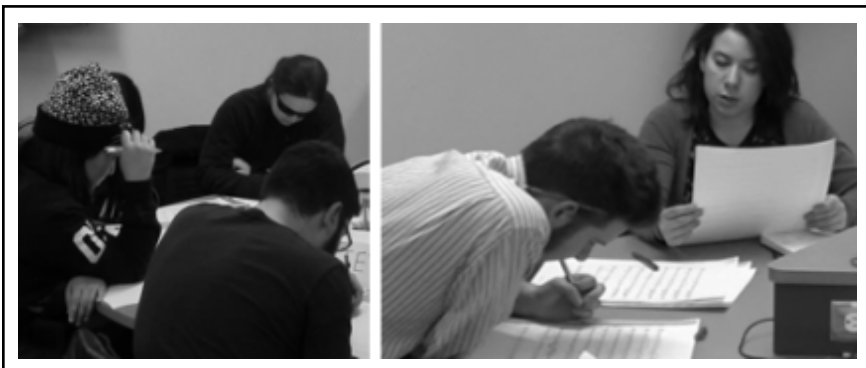


Figure 2. Students working on individual sections of music on paper

When students had completed their micro-analyses of their sections, they contemplated the best way to record all of their

individual findings into one copy. It was agreed by all groups that the best strategy was to record their analyses on the electronic copy of the music by using the writing functions of the interactive whiteboard. Within each group they proceeded to record their analyses on the electronic copy on the interactive whiteboard one at a time to create a single, combined copy, as shown by the still frames derived from videos in Figure 3.

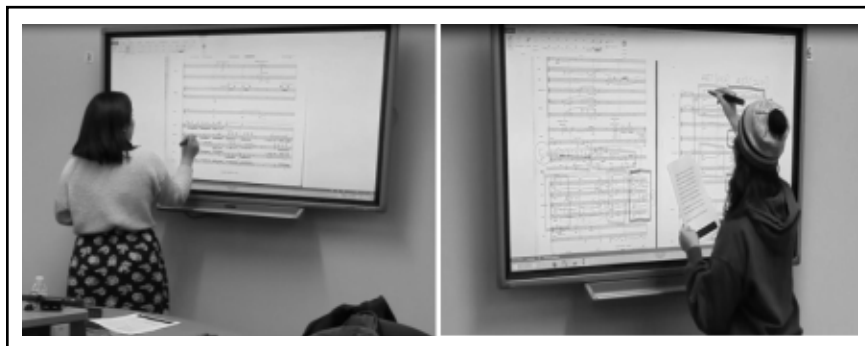


Figure 3. Students inputting their analyses into a single, combined copy

Although the recording of the micro-analyses was done independently, the shift to group interaction occurred when students looked at their peers' analyses on the interactive whiteboard and noticed similar patterns to those in their own sections of the same song (see Figure 4). This generated conversations among group members with lots of pointing to specific areas of the piece on the interactive whiteboard, and caused some members to return to their paper scores to reanalyze their sections, looking for these patterns.

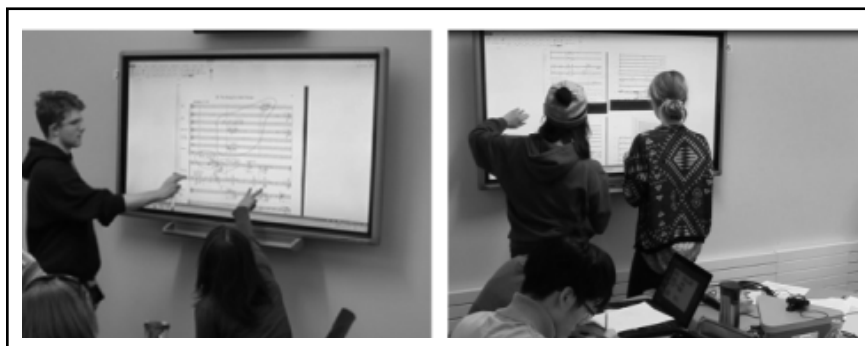


Figure 4. Students discussing connections between sections of the music on the interactive whiteboard

For the second videotaped session, students spent a majority of their time at the interactive whiteboards, either making connections

between sections of the music or looking through the entire song to find larger patterns of meaning in the piece—in other words, conducting “macro-analyses” (see Figure 5). Students took turns taking the lead at the interactive whiteboard in order to explain or present what they had noticed to others in their group. This generated discussion among group members, with students asking their peers to go back to earlier sections, causing the group to re-analyze previously identified patterns together, and begin to make notes about their overall findings. Some students presented their findings the same way to the instructor, using the interactive whiteboard and gesturing to the links and patterns they saw in the music.



Figure 5. Students presenting information on interactive whiteboards and finding larger patterns of meaning in the piece

The mode effect was thus clearly demonstrated through having the scores available in both paper (score) and electronic (interactive whiteboard) forms: students used the different modes for different purposes. The paper copy of the music allowed for students to divide the piece into manageable sections and have each member of the group complete a very close and detailed analysis of their assigned section (i.e., micro-level analysis). Individual analyses were recorded on paper, and later transferred to a single, combined copy on the interactive whiteboard. The interactive whiteboard allowed all group members to see the larger patterns in the music among the sections of the piece, be able to effectively communicate their findings to group members and the instructor, and ultimately understand the piece as a whole (i.e., macro-level analysis).

Team-Based Learning

Team-based learning emphasizes the need for diversity in groups in order for them to function effectively and to develop as a peer learning team.²⁰ “Diversity” is understood to refer both to students’ academic ability and level of relevant experience, and demographic characteristics such as gender. Prior to establishing the groups for the advanced analysis course, the instructor received the student grades from the prerequisite post-tonal theory course, which most students had completed in the previous term, as well as helpful insights from the instructor of the prerequisite course concerning individual behavioral characteristics such as individual comfort levels with speaking in class. In creating the groups for the course, an attempt was made to achieve diversity in ability/experience (as reflected in grades), gender, and social characteristics. While some students were disappointed about not being given free rein in forming their own groups, Michaelson and Sweet point out that self-selection inevitably leads to potentially disruptive coalitions within groups as people seek out those similar to themselves.²¹

Although students were oriented to strategies and personal attributes for effective group work in the first class through the informal discussion mentioned earlier, many of them had never worked in heterogeneous groups before and it took some time for the groups to coalesce. Students were encouraged to decide as a group how to divide up work for tasks, and having them working on a group project (preparing a group presentation) from the first day forced group members to grapple with this issue immediately. The instructor observed that students quickly devised ways to distribute tasks, not least because the songs themselves were long and complicated and beyond the analytical means of a single group member. Students also took on roles within their groups that suited

²⁰ Michaelson and Sweet, “The Essential Elements of Team-Based Learning,” 9.

²¹ *Ibid.*, 10–11. Despite a few initial expressions of dismay about not being paired with friends, the students accepted the rationale of the TBL model. As the course progressed, the contrast between completing analytical tasks in their assigned heterogeneous groups and mingling freely during mid-point “health breaks” helped to differentiate these activities. As a result students appeared to be very focused when working in their groups, and relaxed and enjoying the freedom of wandering around and chatting during the breaks.

their individual strengths and interests. For example, in one group a more introverted student with language challenges but excellent technical skills chose to navigate and annotate the scores projected onto the interactive whiteboard, while fellow group members took on more vocal roles. Inevitably leaders emerged in groups, although this also caused friction at times when group members felt a leader was not engaging them sufficiently in consultation.

A peer evaluation exercise occurred twice during the course, and both highlighted those aspects of peer interaction that were working and revealed some gaps and unresolved issues in group communication. Halfway through the course, students completed the first, formative peer evaluations of their group members (and themselves) with the explicit goal of helping their teammates improve. Each student was asked to assign a score for each group member to reflect the extent to which they felt the other group member had contributed to their learning so far in the course. Students were told to consider their teammates' preparation (having done the analysis, readings, research, thought about the issues, posed questions), contribution (attendance, ideas), and their respect for, and encouragement of, others' opinions and ideas. Each group member had 50 points to distribute amongst the five members, and they were told they had to assign at least one score of 11 and one of 9 (to prevent a reflexive assignment of 10 for every group member). They were also asked to write at least one thing that each group member did that helped the evaluator or the team learn, and one thing that they would like to see more of from the group member. The points were then averaged and the anonymous feedback aggregated by the instructor, and this feedback was given to each student. The second peer evaluation exercise took place at the end of the term. This time in addition to assigning points to group members, each student had to write a short reflection about how they had used the formative feedback they had received midterm, and the assigned points generated a summative mark that contributed to the final grade.

In most cases, students found the formative feedback valuable and they enjoyed the positive reinforcement from their peers. In a few instances, the feedback brought to light simmering tensions that could then be addressed more openly. For example, after the midterm evaluations the instructor was contacted by one student who felt so hurt by the feedback he'd received that he was uncomfortable coming to class. Since the underlying issue was

one of cultural norms for communication (he was an international student), as well as advising the student, the instructor took the opportunity to lead a discussion with the entire class in which cultural sensitivity and acceptance of diversity were explored. The student was reassured, and group interactions improved. The students were less satisfied by the second round of peer evaluation and were particularly uneasy about bearing the responsibility for assigning a component of their peers' final grades.

As a way to gain insight into how student attitudes towards music theory and pedagogical approaches changed over the twelve-week term, the instructor designed a pre-post research study in the form of a questionnaire that was completed anonymously by students in the first class and again in the last. Twenty-one students completed the first questionnaire (two later dropped the course) and nineteen completed the second. Comprising seventeen statements describing beliefs about music theory, analysis, and learning, respondents rated their agreement with each statement on a 5-point scale: strongly disagree, disagree, neutral, agree, and strongly agree. The survey included two statements about group work: "I feel comfortable in a group doing music analysis," and "Doing music analysis on your own yields better results than doing it as a group." In the graphs in Figure 6 and Figure 7, the scores have been aggregated for each question, with graphs showing percentage responses comparing the first class with the last class. Although the numbers of respondents is too low to be statistically significant, it is interesting nonetheless to see how the attitudes of this class shifted over time.

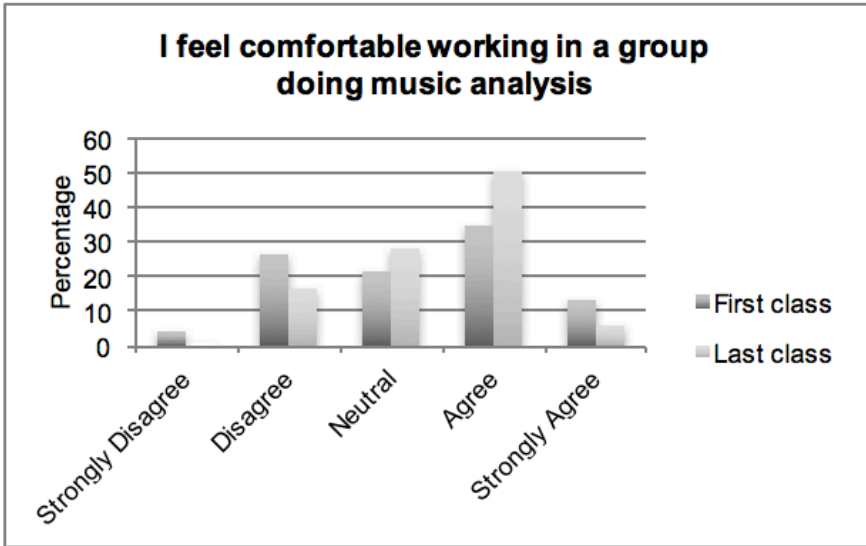


Figure 6. Aggregated student responses to comfort with group work

In terms of their comfort level with group work, Figure 6 shows a shift to the more positive side of the scale, suggesting that constructive development took place through intra-group student interactions over the term. This interpretation is consistent with the instructor’s observations and the videotaped footage from the classes.

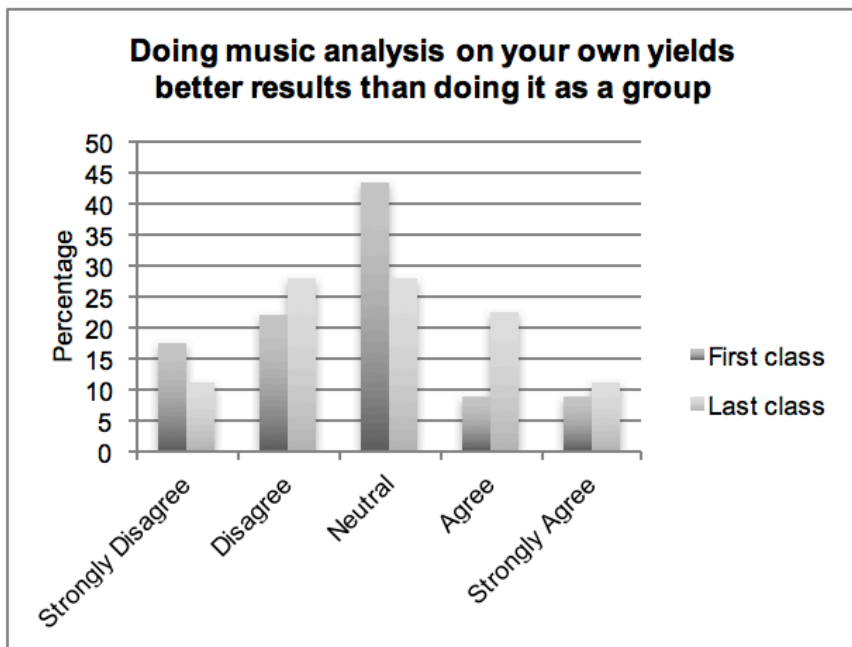


Figure 7. Aggregated student responses to efficacy of group work

On the other hand, Figure 7 shows that while nearly 50 percent of students started with neutral feelings about how the quality of analytical results would be affected by working individually or in a group, by the end of the course there was a more even distribution across the scale: through experience, previously neutral students formed an opinion about the statement. The higher response rate on the positive side at the end of the class (i.e., by students who felt that doing analysis on their own would yield better results than in a group), does not resonate with the results of the video analysis, nor with the instructor's perspective on the quality of the work produced by the students. In the instructor's experience with other similar courses, taught without the focus on peer interaction, the level of work in the flipped course was far more consistent, with final essays ranging from good to excellent. Although there was variation in the quality of writing, none of the final analyses were weak. External validation came after the course when one of the essays won the music department's prize for the "best essay in music theory, analysis, or musicology."

Group interaction and effective collaborative work practices were facilitated through the classroom technology, as verified by analysis

of the videotaped classes. Indeed, in addition to becoming more at ease with group work as the course progressed, as discussed above, students also indicated being increasingly comfortable with using technology in their learning (see Figure 8). The flipped classroom model forced students to use the course website because it was an integral part of their weekly learning in the course, while the video footage showed that students used the classroom interactive whiteboards much more frequently in the second filmed session than in the first.

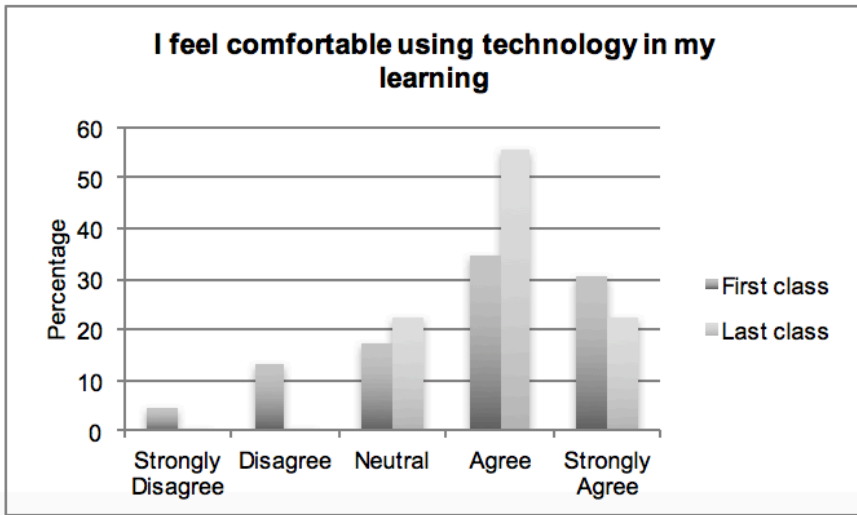


Figure 8. Aggregated student responses to comfort with technology

Lessons Learned

Using the flipped model for the first time in an advanced analysis course undoubtedly carried some risk for both the students and the instructor, and there were aspects that could be revised and improved. Overall, however, student feedback and performance on assessments confirm that the model effectively supported the desired learning outcomes for the course, which included the ability to

- articulate common organizational features in Carter's music;
- describe the process to follow when researching unfamiliar music;
- apply relevant analytical tools to conduct original research into organization in post-tonal music;
- integrate and select data to support an interpretation of a piece;
- write about music using a style appropriate to theoretical analysis; and
- demonstrate the communication and collaboration skills needed for successful group work.

While only the last learning outcome speaks specifically to the flipped model and TBL, we would argue that the extraordinary level of student engagement generated by the model was a critical factor in helping all of the students to achieve these outcomes, regardless of their skill level, background experience, or interest in the subject matter. Attendance remained unusually high throughout the course and students often stayed longer than the scheduled three hours (on a Monday night!). On occasion, class members brought other music student friends to class, for no apparent reason beyond that it was an interesting place to be. In the standard student satisfaction survey administered at the end of the term, the course components that were most often cited as being valuable to their learning were group work, technology, and health breaks (mid-class, fifteen-minute movement and nutrition breaks that were led each week by a different student group). In their feedback, students mentioned how much they enjoyed doing primary research and being the first people to analyze these recent songs. They also commented on the value of the group work: "the group work aspect was very interesting and well implemented—it really allowed for the learning to be student-oriented as we learned

through actually doing the work”; and on the course format: “I like the blended learning style in that it allowed more class time to work with our groups and ask questions instead of just being lectured at.” Several students complained about having to sing the vocal line of their songs in class, but they also acknowledged the value of doing so. As discussed earlier, there was a relatively high level of discomfort with contributing to the final grades of classmates through the summative peer evaluation; most students would have preferred only to use this evaluation in a formative way.

Developing a flipped format course required a tremendous amount of thought, planning, and preparation of materials on the part of the instructor prior to the start of the course. In this case, the instructor was fortunate to have access to expert assistance from teaching and learning specialists as well as instructional technology support. Teaching and learning specialists advised on pedagogical issues such as optimal group sizes and effective ways to use TBL, how to design multiple choice questions to require higher order thinking skills, and how to use peer evaluation effectively, while the instructional technologist helped with aspects of the course website (such as setting up automatic grading of online quizzes) and with the interaction between classroom technology and the website (for example, how to download an annotated score from the interactive whiteboard onto the website so that students could access it later). The university’s copyright librarian also assisted with setting up e-reserves on the course website. These resources were essential to the success of the course. Although the workload was very heavy for the instructor prior to the start of the course, once the semester started, far less preparation was needed than in a traditional course and it flowed relatively effortlessly. Most of the course format could be retained for another offering of the course, but new music would need to be selected in order to preserve the focus on original inquiry, necessitating another investment of time and effort on the part of the instructor.

Some aspects of the flipped format presented challenges that could be addressed in future offerings of this or similar courses.

The focus on group work meant that there were very few activities in which the whole class participated or that involved interaction between the groups, other than a “jigsaw” activity near the end of term where students from one group taught their piece to students in other groups. A better sense of class cohesiveness would be fostered through more of these activities. Finally, it is important to understand and accommodate the level of student preparedness for an innovative teaching approach. The students in this course were unaccustomed to group work, a factor that likely played a significant role in their perception that doing analysis independently would have produced better results. With fewer peer experiences, the negative experiences (e.g., social loafing in which peers may not pull their weight in the activities) tend to be more prominent than the positive experiences (e.g., higher order thinking and personal growth), causing students to be more cautious about stating that they prefer peer learning to independent learning.²² Furthermore, students who have not have worked with their particular group members before may find it difficult to establish relationships with new peers in a short period of time.²³ In future flipped offerings, the instructor plans to adopt the strategies suggested by Shimazoe and Aldrich to help establish positive perceptions of group work: incorporating more activities at the start of the course to help students develop essential skills for working with peers, addressing concerns about their resistance to working with peers, and perhaps even providing visual tasks for students to see their group’s progression, such as using handouts to record the group’s accomplishments each class.²⁴

For the instructor, the flipped class exceeded expectations and stood out as a highly rewarding teaching experience. Not only was the instructor satisfied with the level of analytical insight and the parity among students, but it was also liberating to set aside the role of “all-knowing expert” in favor of applying experience and expertise to guide students through a process of collaborative discovery. By avoiding the traditional expert-novice dichotomy, communication between the students and instructor occurred in a

²² Junko Shimazoe and Howard Aldrich, “Group Work Can be Gratifying: Understanding & Overcoming Resistance to Cooperative Learning,” *College Teaching* 58, no. 2 (2010): 52–53.

²³ *Ibid.*, 53.

²⁴ *Ibid.*, 53–55.

more natural and open way, facilitating informal interactions about important issues such as the relevance of music theory to the world, the role of classical music in twenty-first century culture, and their career possibilities.

Appendix A: Course Timeline

Weeks	Topic	In-class activities	Out-of-class activities
Week 1 5-11 January	Text	<ul style="list-style-type: none"> • Introductory activities and orientation around course goals, structure and content • Begin group analysis of your poem/song 	<ul style="list-style-type: none"> • Out-of-class activities • Research your poetry topic and prepare group Poetry Presentation using PowerPoint slides (Assignment #1) • Submit PowerPoint slides via Moodle by Sunday 11 January 11:55 pm • Practice singing vocal line of your song
Week 2 12-18 January	Pitch	<ul style="list-style-type: none"> • Group Poetry Presentations (Assignment #1) • Begin group pitch analysis of your song 	<ul style="list-style-type: none"> • Review and practice set class analysis (see Straus Ch. 2) in preparation for Test #1 • Prepare to sing vocal line as group
Week 3 19-25 January	Pitch	<ul style="list-style-type: none"> • Test #1: set class analysis • Sing vocal line of your song as a group • Continue group pitch analysis of your song 	<ul style="list-style-type: none"> • Read Boland article and complete Online Quiz #1 by Sat. 24 January 11:55 pm • Continue pitch analysis of your song

Appendix A: Course Timeline *(continued)*

<p>Week 4 26 Jan–1 Feb</p>	<p>Pitch</p>	<ul style="list-style-type: none"> Continue group pitch analysis of your song 	<ul style="list-style-type: none"> Write an individual summary of pitch organization in your song following Pitch Analysis Summary guidelines
<p>Week 5 2–8 February</p>	<p>Pitch</p>	<ul style="list-style-type: none"> Bring individual pitch analysis summaries to class and integrate into a group Pitch Analysis Summary (Assignment #2) for your song, to be submitted via Moodle by Wed. 4 February 11:55 pm 	<ul style="list-style-type: none"> Graded group Pitch Analysis Summaries (Assignment #2) will be returned to you before class
<p>Week 6 9–15 February</p>	<p>Pitch Rhythm</p>	<ul style="list-style-type: none"> Extend pitch analysis of your song in response to feedback from group Pitch Analysis Summary Start writing Individual Pitch Analysis Paragraph (Assignment #3) following guidelines Complete peer evaluation 	<ul style="list-style-type: none"> Individual Pitch Analysis Paragraph (Assignment #3) to be submitted via Moodle by Fri. 13 February 11:55 pm Read Bernard article and practice rhythmic exercises in preparation for Test #2
<p>Week 7 23 Feb–1 March</p>	<p>Rhythm</p>	<ul style="list-style-type: none"> Test #2: rhythm - based on Bernard article Begin group rhythmic analysis of your song 	<ul style="list-style-type: none"> Prepare group Percussion Competition (Assignment #4) Continue rhythmic analysis of your song

Appendix B: Sample weekly schedule

Week 3: 19–25 January

In the third week of this course we will focus on pitch analysis. You will write the set class analysis test, analyze the vocal line of your song, and read an analysis of “harmonic flow” in similar music by Carter. You will also sing the vocal line!

Learning Outcomes

On successful completion of this week’s activities, you will be able to:

- Identify some features of pitch organization in your song
- Sing the vocal line of your song
- Articulate the main points of Boland’s article
- Explain the all-trichord hexachord

In class activities

The set class analysis test will allow you to evaluate your fluency with set class analysis and identify any weaknesses. We’ll grade it in class and if you don’t pass, you will need to retake the test until you do. Each group will sing the vocal line of their song – with the aid of a soft instrument if necessary. You will spend the majority of class time working on a set class analysis of the vocal line of your song.

Our Health Break will be led by Group B

Out of class activities

In addition to continuing your pitch analysis of your song (which you should return to in small chunks whenever you can), you will read Marguerite Boland’s article on “harmonic flow” in Carter’s *Con Leggerezza Pensosa*, and complete the online comprehension quiz on the reading before midnight on Saturday 24 January.

Reading Guide:

- Listen to this short piece – different recordings are available on YouTube
- Read the article twice
- Make sure you know what the “ATH” is (see p.33), but otherwise you can skim through the introduction up to p. 36

- Give the rest of the article, especially p. 36-top of p. 42, a close reading, making sure you study the annotated musical examples so that you understand the text. It's dense! But this is how one writes an analysis and Boland's language is simple and clear. Look up any technical words you don't understand. Note the distinction between pitch and pitch class elements.
- You don't need to remember any particular details about this piece, but knowing more about how Carter organizes pitch will be very useful to you.

Readings and viewings

Marguerite Boland, "'Linking' and 'Morphing': Harmonic Flow in Elliott Carter's *Con Leggerzza Pensosa*," *Tempo* Vol. 60, No. 237 (July 2006): 33–43.

What are Years (https://www.youtube.com/watch?v=ZtxE9Q_ie2k)

