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## How Team-Based Learning Fosters Student Well-Being in Higher Education

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HOW TEAM-BASED LEARNING FOSTERS STUDENT WELL-BEING IN HIGHER EDUCATION

An Honors Thesis Presented

By

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Approved as to style and content by:

Caryn J Brause

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Chair

## ABSTRACT

Background: Team-based learning (TBL) was developed in the 1970s to improve student engagement in college courses. TBL, which promotes active learning through four key components (1) carefully formed and managed teams (2) frequent and timely feedback (3) student peer evaluation and (4) problem solving, stems from an earlier model, Adult Learning Theory (ALT). Implemented into higher education in 1968, ALT emphasized the importance of keeping adult learners engaged because adults learn 80% of what they discover for themselves. The findings of three theorists in the fields of public health and psychology support active modes of learning; Dr. Dan Gerber, and psychologists Alexander W. Astin and Terrell Strayhorn. The academic benefit of team-based learning is already documented with statistically significant data through a variety of cohort studies and empirical analyses. This thesis aims to investigate the health and well-being benefits of TBL in higher education. It will analyze these perceived benefits relating to ideas introduced by the three theorists through original survey data. Methods: Original data was collected through a descriptive research study consisting of ranking and short answer questions about student experiences in both TBL and lecture style courses. All data was considered to draw insights and suggest implications for future TBL practice. Hypothesis: UMass students who engage in team-based learning environments will self-report higher levels of social, emotional and intellectual well-being compared to those enrolled in lecture based learning.

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## **Introduction**

Developed throughout the 1970s and 80s, team-based learning (TBL) is an active mode of learning centered around small group instruction. Originally designed by Professor Larry Michaelsen at the University of Central Missouri, team-based learning was developed as an alternative style of education for courses that were significantly over enrolled. Michaelsen was concerned with the lack of student engagement and overall effectiveness delivering material. He aimed to redesign his course for improved decision making, ability to receive constant feedback and more frequent student discussions and interactions (Burgess, 2020). Since its initial development nearly fifty years ago, team-based learning has continued to expand in higher education.

## **Background**

### *Adult Learning Theory*

Prior to team-based learning, many higher education institutes implemented a set of processes called adult learning theory and dialogue education, which similarly to TBL, were made up of four key principles (1) Respect (2) Immediacy (3) Experience and (4) the idea that adults learn 20% of what they hear, 40% of what they hear and see and 80% of what they discover for themselves (Gerber, 2015). Introduced in 1968 by American educator Malcolm Knowles, adult learning theory is the basis of the TBL concept. Knowles' research originally stemmed from andragogy (the method and practice of teaching adult learners), which later determined that the adult brain begins to get lazy around the age of 25 (Bouchrika, 2022). This implies that adults need certain forms of engagement to continue to learn and think creatively. Those include respect, immediacy, experience and self-discovery, as discussed above. As a major influence for the concept of team-based learning, many of these ideas of engagement carry over into TBL style instruction. Andragogy and adult learning theory are still referenced by major thinkers in the field of TBL to this day.

However, the majority of higher education courses are still taught in large-scale, lecture style environments. Lecture style instruction is commonly

criticized by students and educators alike, as it results in a lack of student-faculty engagement and student focus. The anonymity students feel in many of these courses allows them to frequently skip class sessions, missing out on crucial course material (Cole, 2010). These actions can quickly turn into habits that negatively impact the overall academic performance and well-being of students. Professors have experimented with new engaging methods including the use of in class surveys using devices such as iClickers or Kahoot quizzes, though that only works if students are all participating or even showing up to class in the first place. At large state schools, some lectures can hold over 500 students at a time. In discussions with peers across UMass, freshmen taking their first collegiate chemistry or calculus course were constantly finding themselves struggling to grasp the material or even ask questions. For many courses in higher education, lecture style learning is outdated and alternatives must be considered.

#### *Team-Based Learning*

Consisting of four primary components (1) carefully formed and managed teams (2) frequent and timely feedback (3) student peer evaluation and (4) problem solving, team-based learning is a constantly evolving and popularizing teaching method in higher education across the country (Burgess, 2020). (Figure 1).



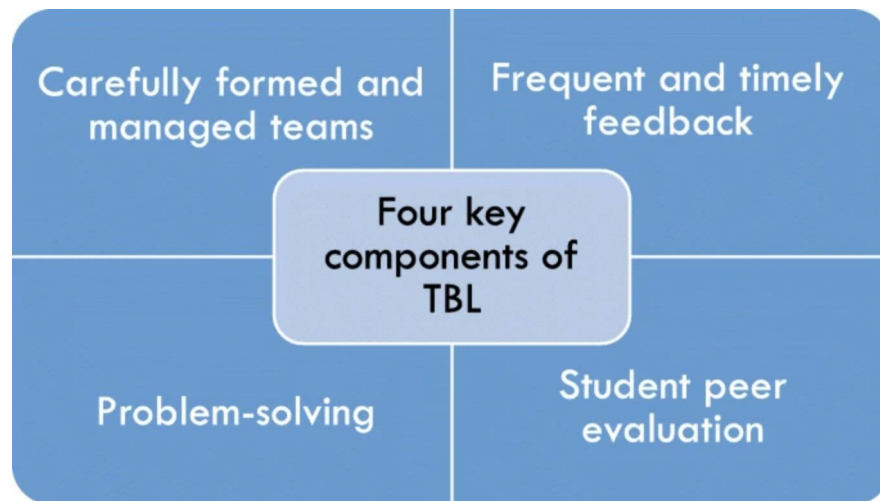


Figure 1: Four key components of TBL, (Burgess 2020).

The first phase of implementing TBL is constructing carefully formed and managed teams. Here the instructor decides on team composition requirements (Brickell, 1994). These requirements typically focus on diversity between student backgrounds and learning styles to allow for the most potential for learning and growth. Groups are then sorted based on a short questionnaire regarding the predetermined group composition requirements. Once teams are formed, each group creates a plan (typically through a team contract) to prepare to work together and respond to challenges as they arise (Brickell, 1994).

Second, frequent and timely feedback is a key component of team-based learning. People improve dramatically quicker if they know what they've done well, and where they have room to grow. Because of this, feedback is crucial to

content retainment in TBL settings (Michaelsen, 2008). This feedback, which comes from a combination of professors and teaching assistants, also impacts group development, as flushing out areas of misunderstanding can lead to strengthened bonds and abilities to collaborate.

The third component of team-based learning, student-peer evaluation, is a continuation of the second component. Peer evaluation holds members of the group accountable for their actions (or inaction), and can serve as a form of motivation for students to get back on track. Finally, problem solving is the key to all academic success. Through the utilization of the previous components of TBL, groups work towards applying their knowledge to find solutions to a problem. The problems vary between courses and professors, but the end goal of nearly all courses in academia is ultimately to solve a problem.

Team-based learning is utilized by hundreds of colleges and universities across the country - but, in most places, it is only used in a select number of programs or departments. As TBL is a commonly proposed alternative to traditional lecturing in college courses. Research on TBL has demonstrated the academic benefits such as increased knowledge retention, higher classroom engagement, improved problem solving skills and heightened student confidence. These benefits were uncovered and proven by statistically significant data from studies on higher education campuses across the United

States and internationally, to be discussed later. Less explored is the relationship between TBL and dimensions of student well-being including social and emotional well-being. This thesis aims to uncover the positive correlation between team-based learning and these additional dimensions of wellness, as social, emotional and academic well-being that are the roots to developing a sense of belonging on campus, which is crucial to undergraduate success.

## **Key Theorists**

The benefits of an active mode of education like team-based learning are best understood through the lens of student learning theories from authors and professors in disciplines of public health and psychology. Three major thinkers influencing the importance and benefit of team-based learning and similar concepts include psychologists Dr. Alexander W. Astin and Dr. Terrell Strayhorn, each of whom worked in higher education, as well as Dr. Dan Gerber of the UMass Amherst School of Public Health.

### *Dr. Alexander W. Astin*

Dr. Alexander W. Astin emphasized the importance of involvement for both academic and personal development in the undergraduate experience. In his early research, Astin developed the involvement theory, which stated that “for maximum growth and learning to occur, the student must be actively engaged on their campus” (Astin, 1984). After further research years later, Astin deemed the peer group “the single most powerful source of influence” above any academic, extracurricular or personal resource (Astin, 1993). A peer group is a group of people with a common interest, goal or characteristic. In higher education, peer groups can be academic or extracurricular. Team-based learning classrooms promote the development of peer groups through sitting

in groups that constantly converse and collaborate about academic interests through course material.

*Dr. Terrell Strayhorn*

Dr. Terrell Strayhorn highlighted a similar concept in his research - the importance of student-faculty relationships as a key to educational success and developing a sense of belonging (Strayhorn, 2019). In his book titled “*College Students’ Sense of Belonging: A Key to Educational Success for All Students*”, Strayhorn describes an encounter that embodies the importance of showing up to class, a key component of active TBL instruction. He explained that while exploring a college campus as part of a research study, a student frantically rushed to catch an elevator to make it to class on time. When Strayhorn prompted the student about why they were so adamant about being on time, rather than discuss how strict the professor's consequences for being tardy were, the student said that they didn’t want to disappoint the professor. As the short, 16-floor long conversation progressed, the student explained that the professor’s course was engaging and enabled students to partake in discussion and demonstrations (Strayhorn, 2019). Because of the mutual benefit and strong sense of belonging built between the two, the student-faculty relationship quickly became one of Strayhorn’s main arguments for keys to educational success. Team-based learning allows students to have direct

interaction with faculty, building a relationship of trust and resourcefulness. Strayhorn's research on the development of such trust with faculty exemplifies a key aspect of TBL, which is that every person's contributions are necessary to success.

*Dr. Dan Gerber*

Dr. Gerber was a primary advocate for the implementation of team-based learning at the University of Massachusetts. In his 2004 publication titled *Demonstrating Excellence in Practice-Based Teaching in Public Health*, Gerber discussed four principles to adult learning theory, with the take home point being that "Adults learn 80% of what they discover for themselves" (Gerber, 2004). That considered, active modes of higher education enable young adults to bounce ideas off one another and collaborate to reach a significantly higher ceiling in their learning. In March of 2012, the University of Massachusetts Amherst began building a 93 million dollar *Integrated Learning Center* containing their interpretation of team-based learning spaces. These classrooms, lounges and laboratories were called technology-enabled active learning, or TEAL spaces, in which the newest learning technologies were built into rooms with traditional TBL layouts. Dr. Gerber's primary courses of instruction, *My Body My Health* and *Community Health Education* are both taught in these classrooms that best cater to his active teaching style. The combination

of the newly built Integrated Learning Center and Dr. Gerber's published works on adult learning theory and team-based learning have inspired numerous professors to restructure the delivery of their courses.

## **Well-Being Frameworks**

### *Academic Well-Being*

Academic well-being is defined as performing highly in an academic setting, receiving high marks and attaining educational goals. These goals are typically evaluated by grades (GPA). Notions of academic well-being extends this definition, with the addition of finding satisfaction in the work one does, making them always want to learn more. Academic performance and well-being through team-based learning has primarily been studied in graduate programs, as well as in the pre-medical and nursing fields.

A 2017 study titled “*Evaluating Self-Efficacy After a Team-Based Learning Activity*” evaluated the effectiveness of team-based learning on students enrolled in the University of Texas Austin’s graduate school of medicine, specifically within the Physician Assistant program (Loftin, 2017). This pretest-posttest two group study design compared students’ academic performance and critical thinking skills after completion of either a standard lecture-style course, or a team-based learning alternative course. The study group consisted of 87 students, and all evaluations were conducted online (Loftin, 2017).

The results showed that there was a statistically significant increase in confidence levels of managing patients by PA students who took team-based



learning courses. It was also determined that the team-based learning fostered much higher confidence in critical thinking, problem solving and ability to succeed with course material. Because of the improvement in these core skills, Physician Assistant students in the TBL group ended the study with higher scores at the conclusion of their courses.

A 2015 study from Park and a team of doctors and registered nurses from Ajou University College of Nursing in Suwon, South Korea titled “*Effects of team-based learning on perceived teamwork and academic performance in a health assessment subject*” evaluated the health effects of team-based learning curriculum in nursing school, another specific department within higher education. This prospective cohort study utilized a sample of 74 nursing students in Korea, one group of which was taught their material through team-based learning, and another group who was taught through the standard lecture-style curriculum. In addition to evaluating the impact of incorporating TBL on test scores and final course grades, the study also aimed to measure the students’ abilities to work together in a healthcare setting after graduation. That portion of the study was measured through team-efficacy during clinical hours (Park, 2015).

Results of this study showed that there were significantly higher test scores coming from students who were enrolled in the TBL courses.

Additionally, nurses who later entered the workforce from the team-based learning group of this cohort were determined to have higher-team efficacy, interpersonal skills and adaptability on the hospital floor. Again, this study shows the statistically significant improvement of academic performance from team-based learning instruction.

### *Social Well-Being*

Social well-being is the development of relationships and interactions with people around you. These could be with friends, family, members of your community or complete strangers. Social well-being has been primarily studied in team-based learning MBA programs, through both in-person and remote formats. Social well-being contributes directly to Strayhorn's concepts of a sense of belonging, and the idea that everybody's contributions are necessary for success.

A 1997 study by Baldwin of Indiana University at Bloomington titled "*The Social Fabric of a Team-Based M.B.A. Program: Network Effects on Student Satisfaction and Performance*" evaluated the social satisfaction benefits of students enrolled in a team-based learning course. This empirical analysis used online networks to measure the social relationships between students with regards to attitudinal and academic performance outcomes. The study group of 250 students was split into 62 small groups to be analyzed via online

questionnaires (Baldwin, 1997). Results from nearly all students in the study had shared feelings of friendship, communication and significantly more positive relationships between one another compared to at the start of the study. The same positive outcomes were true in regard to academic performance, as the positive sense of social well-being led to team-effectiveness, ultimately resulting in objectively higher grades for participants across the board (Baldwin, 1997).

A 2021 study from Shimizu titled “*Perceived Positive Social Interdependence in Online Versus Face-to-Face Team-Based Learning Styles of Collaborative Learning: A Randomized, Controlled, Mixed-Methods Study*” aimed to evaluate the social implications of team-based learning at both fully remote and in-person learning environments. In this crossover controlled cohort study, a group of 124 participants were assigned to either a fully remote cohort, or an in-person cohort for a clinical reasoning course. Halfway through the course, participants swapped cohorts. The study design is shown below (Figure 2). Both before and after completing the course, every participant completed a survey that evaluated their social interdependence in collaborative learning (SOCS) and scores were later compared to determine results (Shimizu, 2022).

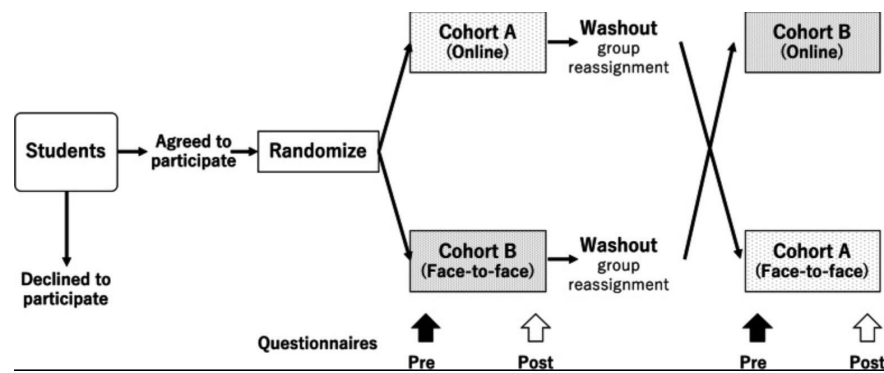


Fig. 2 diagrams the crossover controlled cohort study on social implications of TBL in “Perceived Positive Social Interdependence in Online Versus Face-to-Face Team-Based Learning Styles of Collaborative Learning: A Randomized, Controlled, Mixed-Methods Study” (Shimizu, 2022)

Results of this study were evaluated after each subjects’ pre and post-cohort tests were matched and compared. In both study groups, there was an improvement in SOCS scores, regardless of which cohort participants were assigned to. Data showed higher boundary and means interdependence among nearly all participants in both groups. Boundary interdependence was defined as “discontinuities among individuals” and means interdependence as “resources, roles and tasks” (Shimizu, 2022). Outcome interdependence, which is essentially final goals and end points, only showed slight improvement among the online cohort. This study highlights that team-based learning is effective both in-person and online, and also leads to significant improvement in different forms of social well-being, regardless of the mode of instruction.

### Emotional Well-Being

Emotional well-being is the ability to feel a range of emotions and handle them appropriately. Life is filled with challenges, and one of the most difficult is overcoming various emotions. Emotional well-being also involves recognizing emotions that others are facing, and serving as a resource for them as well. The impact of team-based learning on emotional well-being has been studied across both undergraduate and graduate programs in the United States.

A 2009 study from Borges and Dartmouth College's Geisel School of Medicine in Hanover, New Hampshire titled "Development of Emotional Intelligence in a Team-Based Learning Internal Medicine Clerkship" aimed to be the first to explore emotional intelligence and well-being as a result of team-based learning. Borges and her team collected original data through an IRB approved survey for the 2009-2010 academic year, where they evaluated students in a third year clerkship, a specific program within the Geisel School of Medicine in which courses were taught primarily through TBL strategies. All 105 students in the program (100%), participated in the study, a prospective-retrospective cohort study. Each student was evaluated through a "Workgroup Emotional Intelligence Profile-Short Version" (WEIP-S) at the start and end of their TBL focused semester (Borges, 2012).

The data from both surveys was compiled and analyzed by the biostatistics department, where it was determined that emotional intelligence and well-being significantly increased throughout the course of the semester. Paired t-tests showed improvement in three of four major categories including 1. Awareness of own emotions ( $p = 0.018$ ) 2. Recognizing emotions in others ( $p = 0.031$ ) and 3. Ability to manage others emotions ( $p = 0.013$ ). The only area of emotion that did not change from start to finish was the participants' ability to control their own emotions ( $p = 0.0570$ ) (Borges, 2012). This data proves that the implementation of team-based learning has a statistically significant positive impact on emotional well-being within higher education.

A 2015 study from Finch titled "*Managing Emotions: A Case Study Exploring the Relationship Between Experiential Learning, Emotions and Student Performance*" worked to analyze the benefits of experiential learning methods such as team-based learning. Part of this case study analyzed reflective journal entries from undergraduate business students being taught through a team-based learning curriculum for the first time. Finch and his team hypothesized that team-based experiential learning would trigger a range of emotional responses due to the need to depend on others in group-focused activities (Finch, 2015). It was expected that some students would become frustrated with the lack of effort put in by their group members, while others would feel gratitude for the

friends and team effort they uncover.

Results for this study were expressed differently from most case-studies. Rather than list the emotions reported by students or evaluate the response data numerically, researchers focused on students' goals and how those shaped their emotional responses to team-based learning. Depending on their journal responses, students were either placed in a "mastery orientation" or "performance orientation" group (Finch, 2015). Those in the mastery orientation group approached the TBL course with the mindset of mastering the material, regardless of their final grade. The performance orientation group approached the TBL course with the intention of getting an A, rather than focusing on retaining the course content. Both groups were then placed on two axes that showed each group's likelihood to be able to regulate their emotions and tone they use in a collaborative environment. After approximately 1500 journal entries, Finch and his team developed the chart seen below (Figure 3).

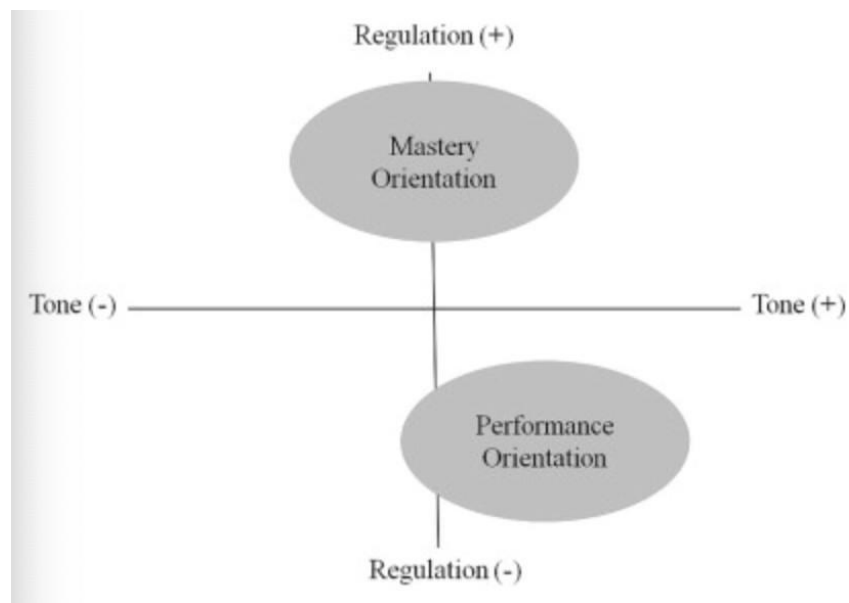


Fig. 3 shows the tone and regulation results chart from “*Managing Emotions: A Case Study Exploring the Relationship Between Experiential Learning, Emotions and Student Performance*” study (Finch, 2015)

This fascinatingly uncovers that, in certain cases, the effectiveness of team-based learning on a student’s emotional well-being is dependent on their mindset towards the course itself. Those who choose to put the material first tend to have more regulation of the emotions they expressed, while also retaining a neutral tone towards others. Students who put their personal grades first are far less likely to regulate their negative emotions towards their group members, and speak in stronger tones. While this does not discredit team-based learning as a concept, it does put into perspective its situational effectiveness.



## **Methods**

Research was conducted using a descriptive survey consisting of 5 point Likert scale and short answer questions. The survey used key words relating to dimensions of well-being such as connection, support and intellectual freedom. The Likert scale questions gave students the ability to rate their experiences on a range from strongly positive to strongly negative, while the short answer questions gave participants an opportunity to use three words to describe their respective experiences. A survey was the strongest research method to evaluate this research question, as it allowed for responses to be both anonymous and comparable, with everyone being asked the same scaled and short answer questions. These short responses would allow data to be collected and analyzed within a limited time frame.

### *Data Collection*

The inclusion criteria for participation in the survey were that participants must have been students currently enrolled at the University of Massachusetts, Amherst who had previously completed a team-based learning course, or were currently enrolled in a team-based learning course during the Spring 2023 semester. These criteria ensured the data was based on either current or recent experiences, and that it was related to the investigation of TBL benefits. The expected number of responses was 40-60 students. The survey was

sent to six current class sections, reaching approximately 600 students; 40-60 participants would yield an approximately 10% response rate. This number of responses is consistent with many of the studies on the academic benefits of TBL (Loftin, 2017, Park, 2015), as those had between 40 and 90 participants and their results were reported as being statistically significant.

### Survey Instrument

Recruitment was conducted primarily through an email via the UMass School of Public Health and Health Sciences with two professors forwarding the recruitment email to three team-based learning courses of approximately 100 students. The same recruitment email was later sent to students enrolled in additional disciplines including STEM, Engineering and Business via other students and teaching assistants. The email contained a link to an anonymous Google Form survey. A brief description of the purpose of the study was provided at the top of the survey, and respondents were apprised that the survey was expected to take less than 10 minutes to complete. It was anticipated that, by keeping questions concise, more people would be willing to participate in the survey. The survey concluded with three demographic questions about grade, gender and ethnicity. These questions allowed for the analysis of trends between different demographics while still maintaining anonymity.

Survey questions employed a five point Likert scale to capture participants' experiences in TBL and lecture classes with regards to social, emotional, and intellectual well-being with each dimension of well-being defined by the University of Massachusetts Amherst's "BeWell" student well-being campaign. Responses to the short answer questions ("three words") were analyzed thematically by considering the most commonly used words to describe student experiences in each academic environment. Analysis was conducted through a WordCloud visualization tool, where the more frequently occurring words appear larger in the visual.

#### Demographics

After opening the survey to students across various academic disciplines including public health, engineering, business and STEM for ten days, a total of 43 responses were collected, which was deemed significant as it was statistically in-line with prior studies on the academic benefits of team-based learning.

Of these responses, the majority were first year students (15 participants, 34.9% of total responses), followed by sophomores (10 participants, 23.3% of total responses), then juniors and seniors (9 participants each, 20.9% of total responses each). No graduate students participated in the survey. Respondents were primarily male identifying (26 males, 60.5% of total responses), and the

remaining respondents were female identifying (17 females, 39.5% of total responses). No participants were gender nonconforming or unwilling to answer. (Figure 4)

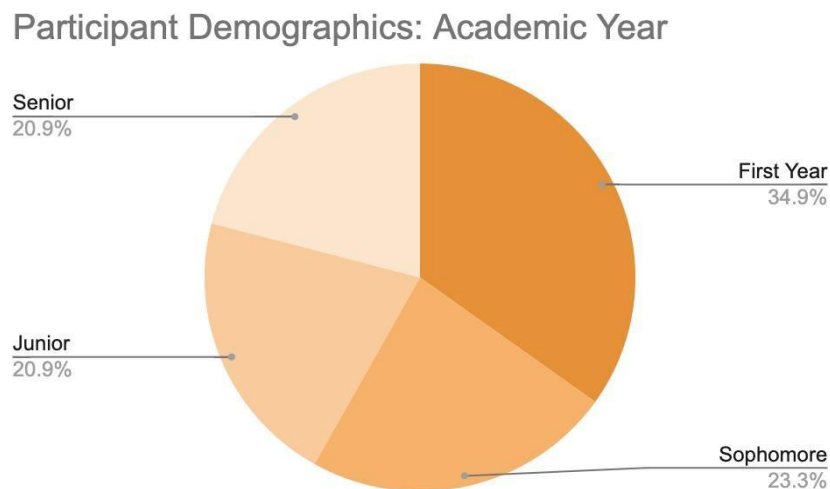


Figure 4: Participant demographics by academic year, 2023

In regards to ethnicities, 35 of 43 (81.4%) of respondents self-reported themselves as white. 5 respondents, or 11.6% self-reported as Asian, 4 or 9.3% of participants self-reported Hispanic/Latino and the remaining two participants reported as mixed (1 participant, 2.3% of total responses) and other (1 participant, 2.3% of total responses). The tally of ethnicities did add up to greater than 43, as some participants reported multiple ethnicities. (Figure 5).

### Participant Demographics: Ethnicity

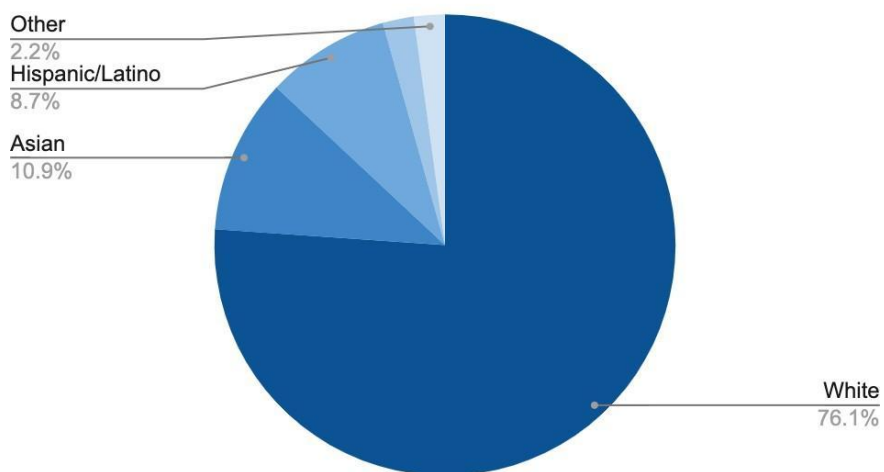


Figure 5: Participant demographics by ethnicity, 2023

## Results

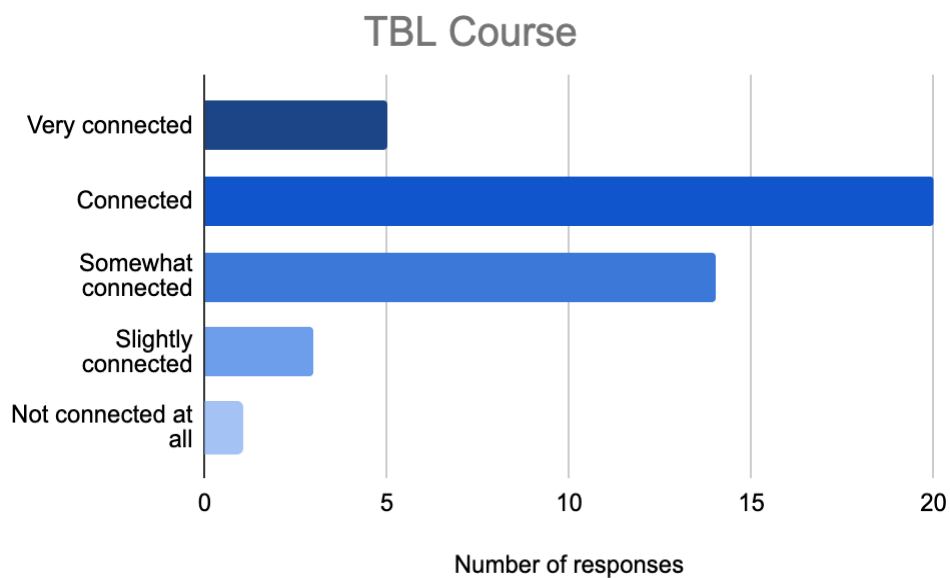
The results of the survey were then analyzed with respect to the University of Massachusetts Amherst's Dimensions of Well-being.

### Social Well-Being

The “BeWell” campaign defines social well-being as being “created by connecting to friends, community and support systems” (UMass BeWell, 2023). To evaluate how TBL courses contribute to this dimension of well-being, survey participants were asked how connected they felt to their peers in both team-based learning courses and lecture courses. Participants were asked to rate their level of connection to their peers on a Likert scale of “not connected at all” to “very connected”.

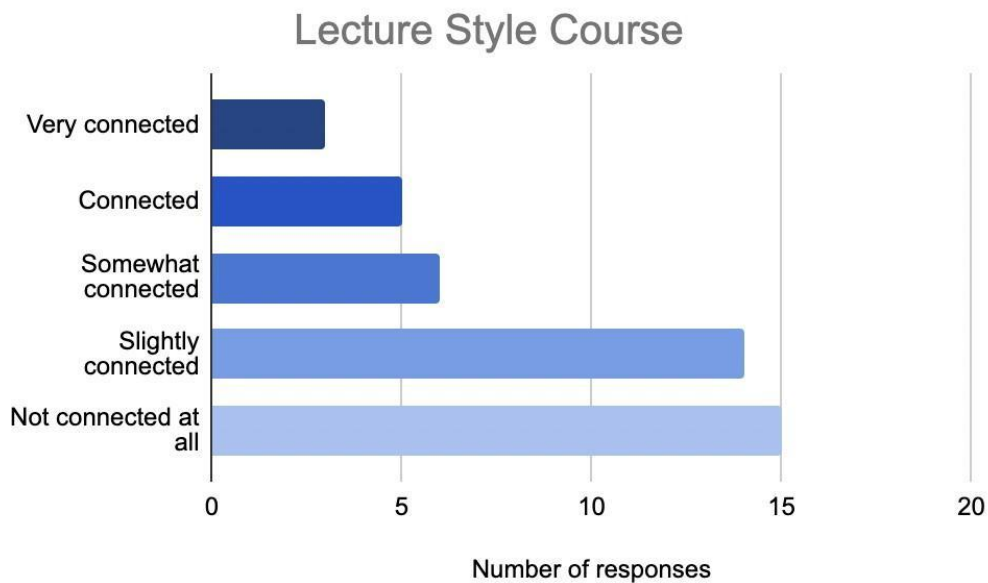
For this survey question, the majority of student participants self-reported that they felt either *connected* (46.5%) or *very connected* (11.6%) to their peers in a team-based learning environment. By contrast, responses were dissimilar regarding peer connection in lecture style courses, as most students reported that they felt either *slightly connected* (32.6%) or *not connected at all* (34.9%) to their peers.

*“How connected do you feel to your peers in your (TBL/Lecture Style) course?”*



(6)

Figure 6: Student attitudes toward connection to peers - TBL course, 2023



(7)

Figure 7: Student attitudes toward connection to peers - Lecture style course, 2023

These responses were likely due to a combination of the classroom layout and the curriculum/syllabi of TBL style courses in comparison to lectures. Team-based learning classrooms at UMass are typically comprised of ten to twelve round tables with approximately eight students sitting at each. (Figure 8) Working in these environments increases peer interaction during class periods and therefore better social well-being.



Figure 8: Team-based learning classroom in UMass Integrated Learning Center, Designed by Saam

Architecture, 2014



As opposed to TBL courses, lecture style courses are taught in large halls of more than 400 students sitting in rows, and usually have curriculums that heavily weigh independent examinations. When attending a lecture in a crowded auditorium students are shoulder to shoulder note taking, completely lacking the ability to discuss thoughts and ideas with one another (Figure 9). Exams in these courses are to be completed independently, even further limiting the ability for peer connection.



Figure 9: Typical crowded lecture course, U.S. News, 2022

This survey data begins to show that students are more connected to their peers in TBL courses, therefore cultivating stronger social well-being.

Participants were also asked to describe their connection to their peers in each environment using three words. The most common responses for team-based learning environments were *friendly* (12 responses), *helpful* (6 responses), *fun* (6 responses), and *engaging* (6 responses) (Figure 10). These responses all reinforce the idea that TBL environments are conducive to social well-being. As compared to TBL classes, peer connections in lecture style courses were most commonly described by students as *distant* (8 responses), *not connected* (4 responses) and *independent* (3 responses) (Figure 11).



### Emotional Well-Being

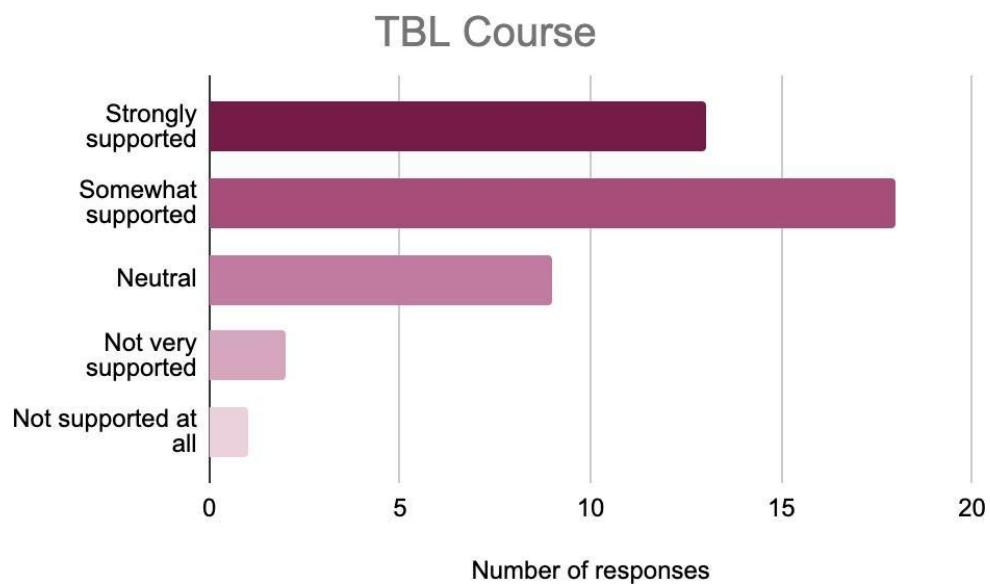
The “BeWell” campaign defines emotional well-being as “coping effectively with life and creating positive relationships” (UMass BeWell, 2023). To evaluate this, survey participants were asked how supported they felt by both their peers and professors in team-based learning and lecture courses. Participants were to rate their level of support on a Likert scale of “not supported at all” to “strongly supported”.

Nearly three quarters of the student participants self-reported that they felt either *strongly supported* (30.2%) or *somewhat supported* (41.9%) by their peers in a team-based learning environment. As with social well-being, responses were very different regarding peer support in lecture style courses, as more than half of students reported that they felt either *not very supported* (30.2%) or *not supported at all* (25.6%) by their peers.

Nearly all of the student participants self-reported that they felt either *strongly supported* (41.9%) or *somewhat supported* (51.2%) by their professors in a team-based learning environment. While responses were more similar regarding professor support compared to peer support, very few students felt as strongly supported by their professors in lecture courses. A few students felt *strongly supported* by their professors in lecture style courses (14%), but

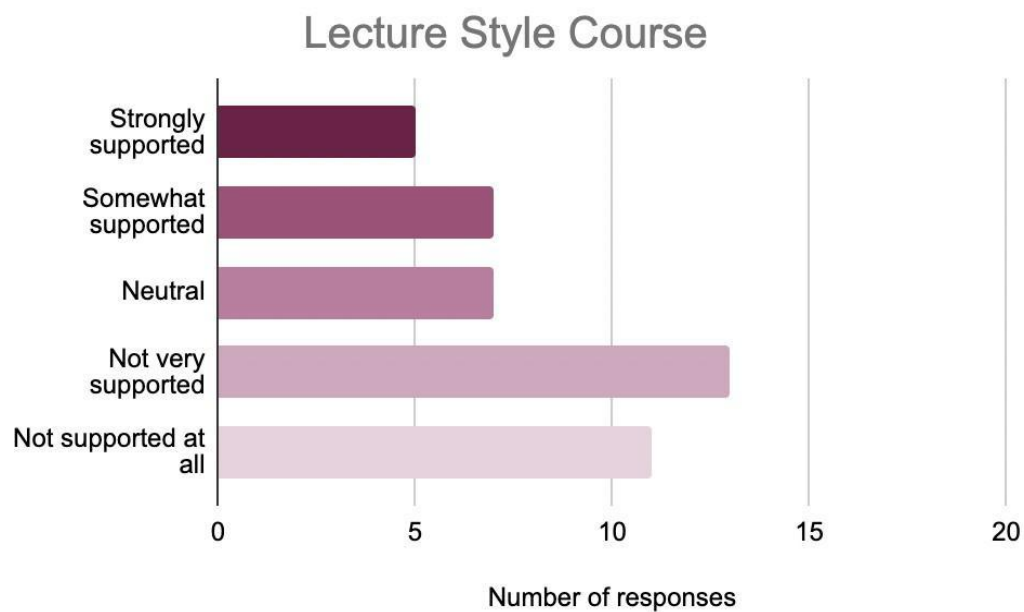
most only felt *somewhat supported* (39.5%) or *neutral* (37.2%) as to the support they received from their professor in a lecture course.

*“How supported do you feel by your peers in your (TBL/Lecture Style) course?”*



(12)

Figure 12: Student attitudes toward support from peers - TBL course, 2023



(13)

Figure 13: Student attitudes toward support from peers - Lecture style course, 2023

*“How supported do you feel by your professors in your (TBL/Lecture Style) course?”*

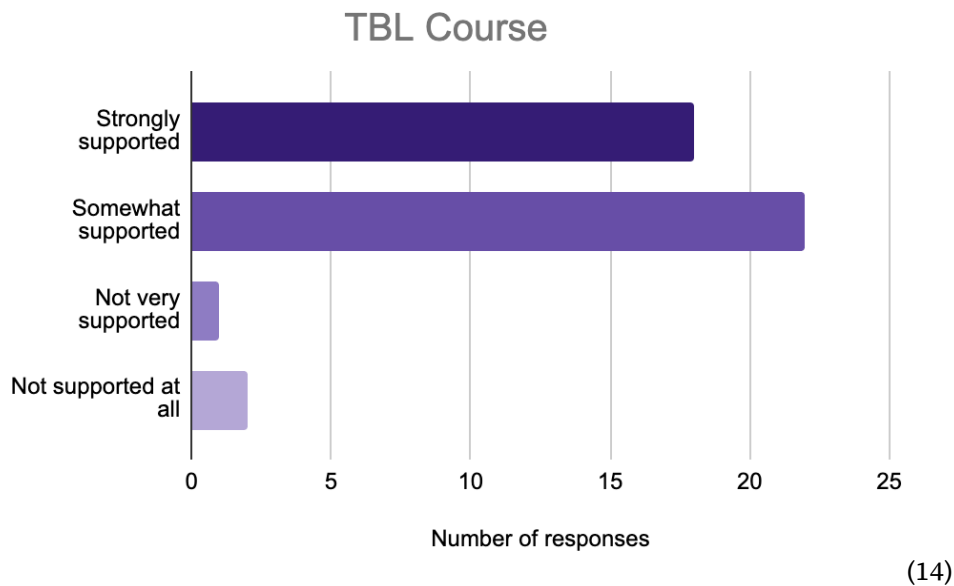


Figure 14: Student attitudes toward support from professors - TBL course, 2023

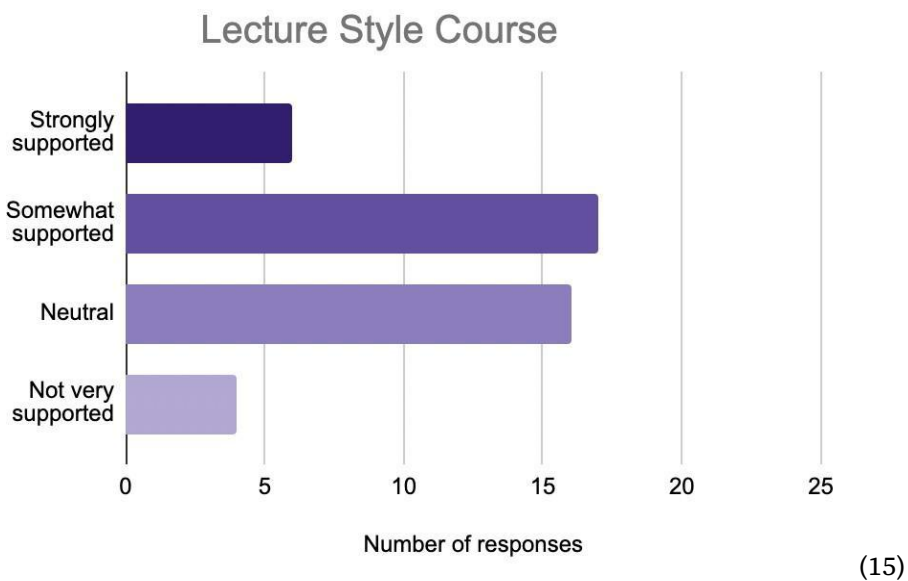


Figure 15: Student attitudes toward support from professors - Lecture style course, 2023

Participants were also asked to describe their levels of support in each environment using three words. The most common responses for team-based learning environments were *helpful* (5 responses), *supported* (4 responses), *heard* (3 responses) and *teamwork* (3 responses) (Figure 16). With students and professors so easily accessible at all times throughout the course, responses were overwhelmingly positive regarding support in team-based learning courses. These responses all positively reinforce the idea that TBL environments foster emotional well-being.

As opposed to TBL classes, lecture style courses were most commonly described by students as *not supported* (5 responses), *less connected* (4 responses), *somewhat supported* (4 responses) and *distant* (3 responses) (Figure 17). In these large lectures, there is typically a chain of command to receive support starting with undergraduate TAs, then graduate TAs and eventually the professor. Many students avoid seeking the support they need as they do not want to jump through hoops to reach someone, or would prefer working with their professor directly. Again, the majority of responses determined team-based learning environments as far more supportive.



*Team-Based Learning*

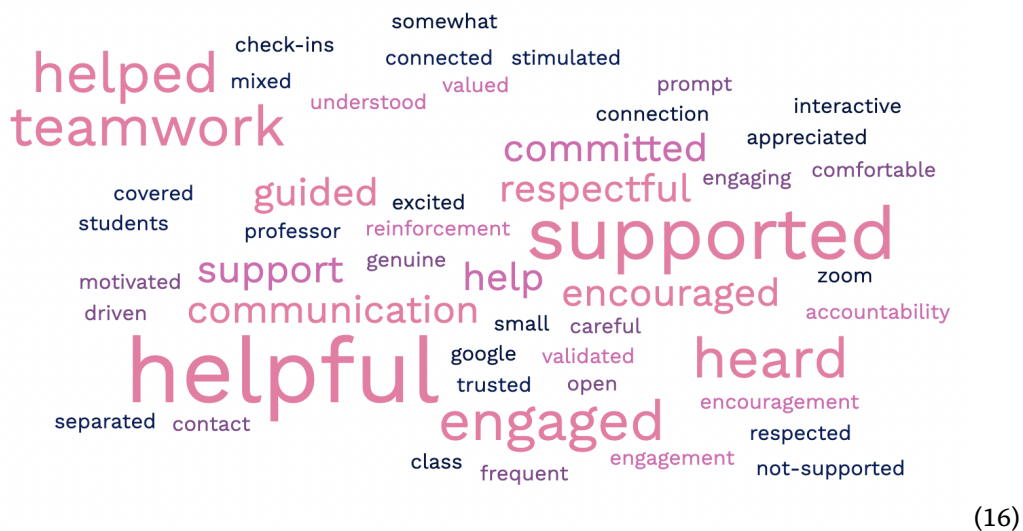


Figure 16: Student descriptions of support from peers/professors - TBL course, 2023

*Lecture Style Course*

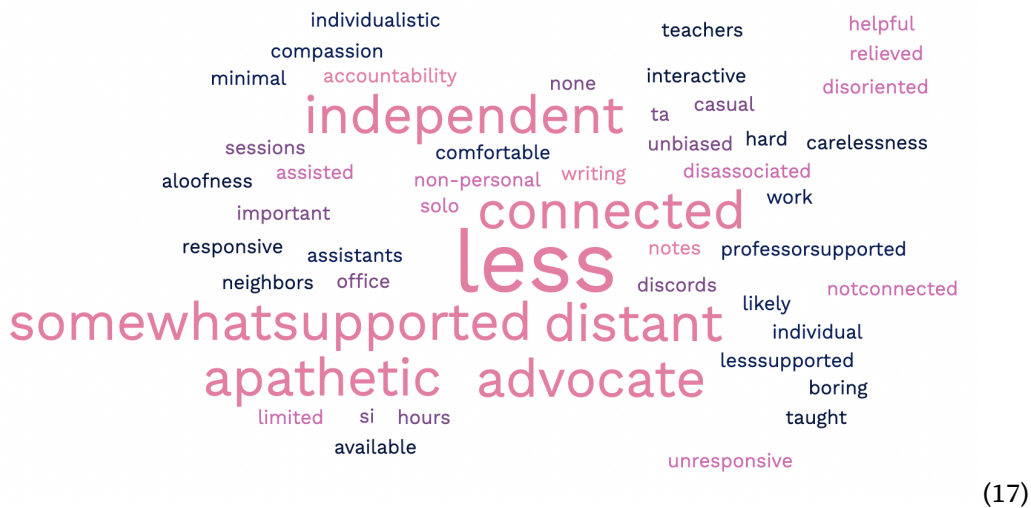


Figure 17: Student descriptions of support from peers/professors - Lecture style course, 2023

### Intellectual Well-Being

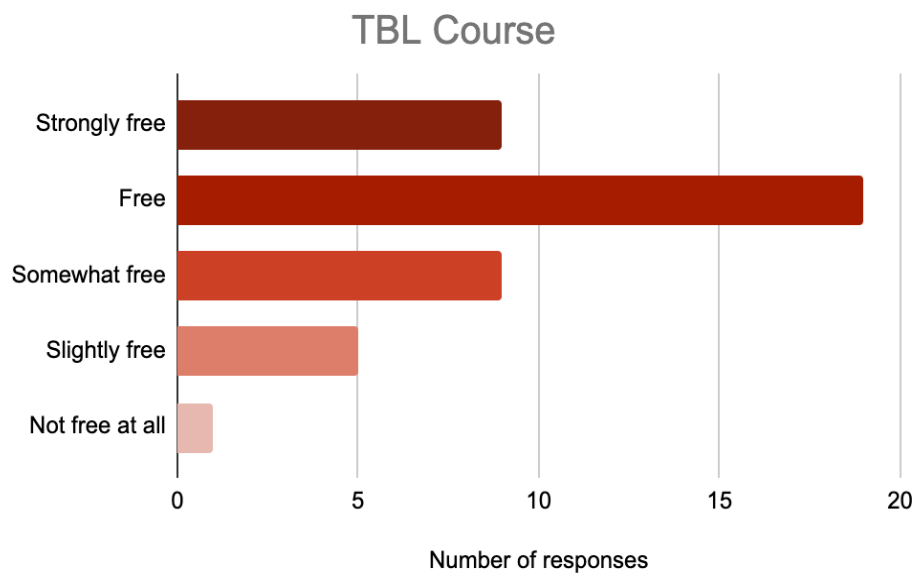
The “BeWell” campaign defines intellectual well-being as “exercising your creativity, expanding your skills and providing opportunities to learn new things” (UMass BeWell, 2023). To evaluate this, survey participants were asked to rate their intellectual freedom in team-based learning courses as well as lecture style courses. Participants were to rate their level of intellectual freedom on a Likert scale of “not free at all” to “strongly free” The results from those questions were split into percentages and compared between TBL and lecture style courses.

Nearly two thirds of the student participants self-reported their levels of intellectual freedom as *strongly free* (20.9%) or *free* (44.2%) in a team-based learning environment. This is due to the open ended curriculum that many team-based learning courses offer. As briefly discussed above, as opposed to exams, TBL courses give students the ability to showcase their knowledge through active projects such as presentations and videos. Students like to express their creative ideas, and team-based learning curriculum enables them to do so. This data starts to show the intellectual well-being benefit of TBL courses in higher education.

Responses were much different describing intellectual freedom in

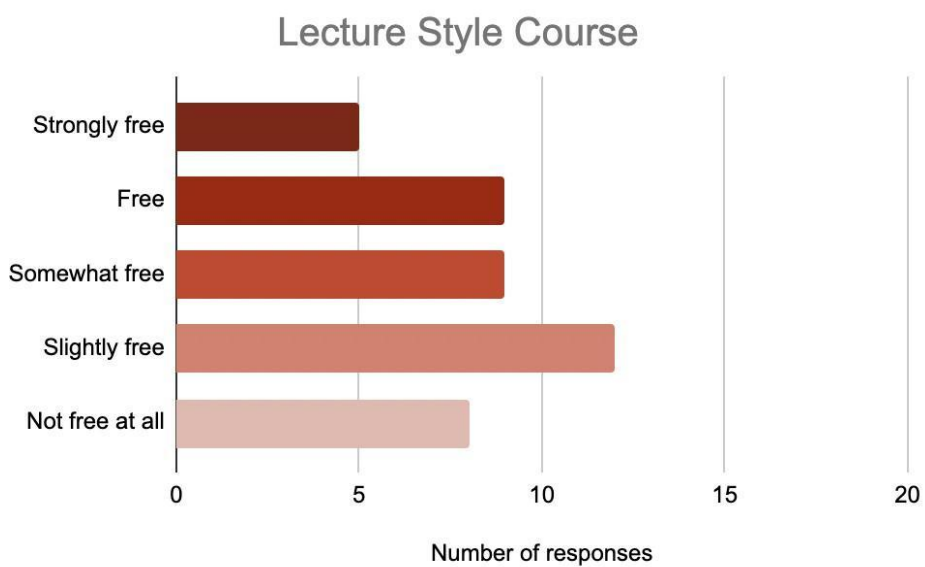
lecture style courses, as nearly half of students reported their levels of intellectual freedom as *slightly free* (27.9%) or *not free at all* (18.6%) in lectures.

*“How would you rate your intellectual freedom in your (TBL/Lecture Style) course?”*



(18)

Figure 18: Student opinions on intellectual freedom - TBL course, 2023



(19)

Figure 19: Student opinions on intellectual freedom - Lecture style course, 2023

The open ended short answer questions provide more nuance to student experiences concerning intellectual well-being. Participants were also asked to describe their intellectual freedom in each environment using three words. The most common responses for team-based learning environments were *creative* (8 responses), *free* (6 responses), *open* (5 responses) and *innovative* (4 responses), all of which supports the claim that TBL environments promote intellectual well-being (Figure 20). The Likert scale question pertaining to intellectual well-being asked students to rate their levels of creativity and freedom to learn, so responses of *creative* and *free* reiterate the positive responses from the question above.

Lecture style courses were most commonly described by students as *not free* (7 responses), *open* (5 responses), *limited* (4 responses) and *structured* (3 responses) (Figure 21). These responses were directly in line with the standard lecture style course curriculum, which is very structured and limited as to how students can learn. While some students did describe both the TBL and lecture experiences as open, the majority of responses signified team-based learning environments as superior in terms of allowing intellectual freedom.

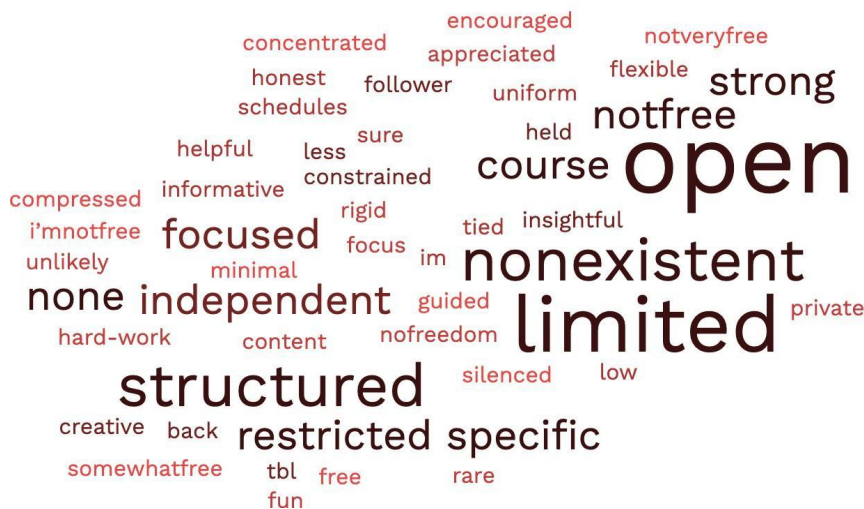
Team-Based Learning



(20)

Figure 20: Student descriptions of intellectual freedom - TBL course, 2023

Lecture Style Course



(21)

Figure 21: Student descriptions of intellectual freedom - Lecture Style course, 2023

## Discussion

### Summary of Findings



Social Well-being: Throughout the survey data shared above, students were significantly more connected to their peers in team-based learning environments as opposed to lecture style courses. The curriculum of TBL courses is a likely cause for high peer connection. Team-based learning courses typically do not have exams, rather they have group projects and papers. Syllabi made up of these types of assignments fosters more collaboration than it does independent work, which can lead to improved social well-being. This result can also be attributed to the course expectations. Team-based learning courses are graded heavily on attendance and participation within your group. Team members fill out peer feedback forms that are considered when determining the final course grade, so everyone makes an effort to take the course seriously and support one another in their work. Many large lectures do not even take attendance due to the magnitude of students in the lecture halls at a given time, therefore peer support does not extend beyond sharing notes to an absent classmate or studying for an exam together.

Student participants also used far more positive words to describe their experiences. Positive words like these may be a direct result of active learning, demonstrated by the layout of TBL classrooms and course curricula, as well as

the engaging curriculum that is full of group activities, discussions and projects. Without an ability to connect with peers surrounding them, and by having to follow a more structured curriculum, students severely lack peer connections in lecture courses. This supports Dr. Alexander W. Astin's claim that the peer group is the most important source of involvement on the college campus (Astin, 1993). And while these experiences are not necessarily representative of all students in each environment, students expressed they felt the benefit to their social well-being was more favorable in team-based learning courses.



*Emotional Well-being:* Greater than 50% of students felt unsupported by their peers in lecture style courses, whereas less than 10% of students lacked peer support in their team-based learning course. This may be due to the fact that TBL courses are typically graded in large part due to attendance, participation and peer feedback, all of which influenced students to work together and to support one another. A similar trend appeared in regard to professor support between the two courses. Students felt overwhelmingly more supported by their professors in TBL courses compared to lecture style courses. This may be because in one course the professor engages students and their groups throughout the class period and, in the



other course, the professor lectures to students the entire time. Students still reported a reasonable level of support from their professors in lecture courses, which can be attributed to the professor's ability to answer questions and prepare students for what is to be expected on course deliverables. However, due to the active and engaging nature of the TBL course, students reported a stronger level of support from their professors, reiterating the idea that TBL environments foster emotional well-being. These findings build on Dr. Terrell Strayhorn's argument that student-faculty relationships are a key to educational success (Strayhorn, 2019). Strayhorn's theory asserts that when students feel that their presence in class matters, they have a greater sense of belonging. The survey findings extend Strayhorn's claim of the importance of student-faculty relationships to emotional well-being.



*Intellectual Well-being:* Students reported much more freedom in their team-based learning course across all survey questions. This may be due to how open ended the curriculum is in the TBL courses compared to the standardized lecture course plan. All lecture style courses follow a very similar structured curriculum of showing up, listening to a lecture, and the final course grade is comprised of 3-4 exam grades and a combination of small quizzes

and/or in-class assignments. Students lack the opportunity for creativity, and find themselves relying on memorization over long-term knowledge retainment. The ability to opt for a project, presentation or research paper instead of an exam in TBL classes allows students to better display their knowledge and foster better social and emotional connection. These findings support Dr. Dan Gerber's research and emphasis on the fourth adult-learning theory principle, that "adults learn 80% of what they discover for themselves" (Gerber, 2004). The results show a clear preference for adult student-learners to partake in research and creative curricula rather than those where they are passive recipients of lectures.

#### *Significance of Findings*

The academic benefits of team-based learning have been previously examined with multiple benefits identified, such as higher knowledge retention, improved classroom engagement, better problem solving skills and heightened confidence outside of the course (Loftin, 2017, Park, 2015). The current findings are significant as the social, emotional, and intellectual well-being benefits of active modes of learning have not been examined much in prior research. The findings from the current study bolster the argument for wider implementation of team-based learning in a greater number of disciplines and across more types of coursework. Moreover, this study suggests that further research is warranted.

Another significant finding from this data was that each dimension of well-being reinforced other dimensions. For example, freedom in the course curriculum influenced students to connect with one another, which ultimately led students to support each other. Because students were expected to complete tasks together in TBL courses, they connected with each other at the start of each team-based learning course. Throughout the course, this enabled students to build trust with one another, and collectively support their group in manifold ways. By contrast, the teaching methods, project formats, and learning styles of lecture style courses did not formally set up such student-centered networks. As originally hypothesized, team-based learning methods and practices supported all three dimensions of well-being.

#### *Limitations of Study*

While the data collected in this study did back the thesis claim and was statistically in-line with prior research, the study has some limitations. The first limitation of this study was the sample size. Though the expected number of responses was achieved, a larger sample size would certainly be more representative of the team-based learning experience. The majority of studies on academic well-being had closer to 100 participants, so receiving only 43 responses limited the amount of data to be analyzed. This was partially due to

time constraints, another limitation of the study. Data collection was open for 10 days; if the survey had been able to be open for longer, more responses could have been collected, leading to a wider range of data to analyze.

Another limitation was ethnic diversity. In the demographic section of the survey, 35 of 43 (81.4%) of respondents self-identified themselves as white, which limits understanding of the experiences of students who hold different social identities. An additional limitation that hindered the ability to draw conclusions was not knowing the distribution of majors/disciplines of study participants. The survey was originally aimed solely at Public Health students; however, after an initial lack of responses it was necessary to pivot and reach out across additional disciplines including STEM, Engineering and Business. Since the survey was initially for Public Health students, a question about majors was not included in the demographic section. As the number of responses tripled after expanding this survey outside of Public Health, it would have been beneficial to have known the breakdown between majors to make additional conclusions.

As a descriptive survey, this study had additional bias limitations. One commonly occurring bias in surveys is recall bias. In the case of this study, participants may have taken one or both styles of classes in a previous semester. With their experiences not as fresh in their memories, survey

responses may not have been as representative of their actual experiences in the courses. Another common bias that could have occurred in this study is attribution bias. Students may have attributed their experiences to themselves or an outside factor rather than either of the courses, which would also skew the data. One additional bias could exist based on the type of course offered. For example, a student comparing a team-based public health course to a lecture style calculus course may have different factors influencing their experience such as their attitudes toward each subject.

Final limitations for this study were participants' misunderstanding of the term "intellectual freedom", and a lack of prior research on the topic. For intellectual freedom, though in the survey it was defined in parentheses as (creativity, opportunities to learn), participants reached out to me for clarification on what intellectual freedom meant. Though only two or three participants asked, others may have also been confused on that question and therefore not given a truly representative answer. Lastly, because there was little to no previous research on TBL's benefit to social, emotional and intellectual well-being, it was both difficult to develop representative questions and make comparisons to existing, or not yet existing, data. This certainly limited the analysis, but was also the impetus for developing this thesis study.

### Implications for Future Research

This study suggests exciting opportunities to further expand our understanding of the well-being benefits of team-based learning. A next step future researchers could take is work to expand on these findings and continue to uncover the well-being benefits of implementing team-based learning in higher education. Four specific implications that should be studied as an expansion of this research include:

- Impact of team-based learning on well-being across majors/disciplines.
  - Now that there is baseline data to suggest the overall benefit of team-based learning on dimensions of well-being, more specific research can be done to determine differences between majors. Maybe there is a reason certain disciplines like Public Health have more team-based learning curriculum than others such as Computer Science or Psychology?
- Impact of team-based learning on well-being across a more diverse population.
  - This was a major limitation of the study, as more than 80% of participants reported themselves as white. With access to a more diverse population, researchers could learn more about the impact of team-based learning among students of different

social identities.

- Impact of team-based learning on well-being beyond the classroom.
  - One of the main documented benefits of the impact team-based learning has on students' academic well-being is a heightened confidence with material outside of the classroom. Researching if students who have primarily TBL courses on their schedule have better social, emotional or intellectual well-being outside of the classroom could lead to fascinating findings. This could be assessed based on whether or not students socialize with their classmates outside of the course, and if they stay friends beyond the semester in which they took the class together.
- Study students taking the same course taught in team-based and lecture style.
  - As discussed above, a limitation to the data were underlying biases comparing TBL and lecture style courses taught on different subjects. Regardless of the subject itself, teaching the exact same material using the two different methods of learning would allow for researchers to make strong conclusions as to the effectiveness of each teaching style.

These future implications could be studied using a variety of different methods. A prospective cohort study would best suit these future studies. Many of the successful studies on academic well-being were conducted using variations of cohort studies, and a prospective cohort would allow researchers to observe students throughout the course of their semesters in both team-based learning and lecture style classes.



### **Conclusion**

There is significant literature to suggest that team-based learning fosters better academic performance and well-being compared to lecture style courses. However, prior research has not yet investigated the social, emotional and intellectual well-being benefits of team-based courses in higher education. This study explored the experiences of students in TBL courses by considering how team-based learning addresses their social, emotional and intellectual well-being. The study found that TBL does foster better social, emotional and intellectual well-being in higher education. These results suggest the opportunity for further research on the subject, and further implementation of the concept across higher education.

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## Appendix

### Your Team-Based Learning Experience

Hello! Thank you for taking the time to take my survey, which will contribute to an Honors thesis. As a student who has experienced team based learning, your input is greatly appreciated.

In this survey you will be asked to complete a descriptive questionnaire about your experience with team-based learning. The same questions will be asked about your experience with lecture-style courses. You should be able to complete the survey in less than 10 minutes.

The survey data will be completely anonymous, mitigating the risk of breach of confidentiality which exists with any online project. Data will be organized in a password protected spreadsheet. All data will be erased from the drive at the end of the semester.

While there is no direct benefit to you, the findings from this study will hopefully inform higher education professors and administrators about student experiences with team-based learning. There is no compensation for doing the survey.

You may quit the survey at any time. If you have questions, you can reach out to PD Ben MacKinnon at [bnmackinnon@umass.edu](mailto:bnmackinnon@umass.edu) or PD Caryn Brause at [cjbrause@umass.edu](mailto:cjbrause@umass.edu) or contact the Human Research Protection Office at (413) 545-3428 or [humansubjects@ora.umass.edu](mailto:humansubjects@ora.umass.edu).

By clicking "I agree" below you are indicating that you are at least 18 years old, have read this consent form and agree to participate in this research study. You are free to skip any question that you choose. Please print a copy of this page for your records.

[bnmackinnon@umass.edu](mailto:bnmackinnon@umass.edu) [Switch account](#)



Not shared

\* Indicates required question

Do you agree to participate in this survey? \*

Yes

No

## Your Team-Based Learning Experience

How connected do you feel to your peers in your TBL course? \*

- Very connected
- Connected
- Somewhat connected
- Slightly connected
- Not connected at all

What are three words you would use to describe the connection you have with your peers in your TBL course? \*

Your answer \_\_\_\_\_

How supported do you feel by your peers in your TBL course? \*

- Strongly supported
- Somewhat supported
- Neutral
- Not very supported
- Not supported at all

How supported do you feel by your professor in your TBL course? \*

- Strongly supported
- Somewhat supported
- Neutral
- Not very supported
- Not supported at all

What are three words you would use to describe how you feel supported in the TBL course? \*

Your answer \_\_\_\_\_

How would you rate your intellectual freedom (creativity, opportunities to learn) in your TBL course? \*

- Strongly free
- Free
- Somewhat free
- Slightly free
- Not free at all



What are three words you would use to describe your intellectual freedom in the TBL course? \*

Your answer \_\_\_\_\_

How connected do you feel to your peers in your lecture style classes? \*

- Very connected
- Connected
- Somewhat connected
- Slightly connected
- Not connected at all

What are three words you would use to describe the connection you have with your peers in your lecture style classes? \*

Your answer \_\_\_\_\_

How supported do you feel by your peers in your lecture style classes? \*

- Strongly supported
- Somewhat supported
- Neutral
- Not very supported
- Not supported at all

How supported do you feel by your professors in your lecture style classes? \*

- Strongly supported
- Somewhat supported
- Neutral
- Not very supported
- Not supported at all

What are three words you would use to describe how you feel supported your lecture style classes? \*

Your answer \_\_\_\_\_

How would you rate your intellectual freedom (creativity, opportunities to learn) in your lecture style classes? \*

- Strongly free
- Free
- Somewhat free
- Slightly free
- Not free at all

What are three words you would use to describe your intellectual freedom in your lecture style classes? \*

Your answer \_\_\_\_\_

What year of school were you when you took a TBL course? \*

- First year
- Sophomore
- Junior
- Senior
- Graduate student

Do you identify as? \*

- Male
- Female
- Gender nonconforming
- Prefer not to answer

Please identify your race/ethnicity. Select all that apply \*

- American Indian/Alaskan Native
- Black/African American
- Hispanic/Latino/a
- Native American
- Native Hawaiian/Pacific Islander
- White
- Other: \_\_\_\_\_