

Coaching Student Teams: Guiding Students Through Team-Based Learning Experiences

Many of my student's most impactful learning experiences aren't necessarily the ones that happen in the classroom, but rather the ones that build on those in-class experiences through team-based competitions. Not only do I form the strongest connections to the students that are on teams that I have coached, but it seems that those experiences stay with the students much longer than a typical class as well. From case study competitions to being on a livestock judging team, these experiences challenge students to apply concepts, make decisions, and to think on their feet, as well as develop communication and leadership skills. Competition against other university teams can be a very motivating experience for students, however successful management of those teams can help facilitate an even more impactful learning experience for students and help to develop self-efficacy skills that will be essential for them to become lifelong learners. The steps outlined below highlight my techniques for helping students to get the most out of their team based experience.

Develop a Strong Commitment Early

Regardless of the number of students interested in being on a team, making interested students work to show their commitment creates a strong buy-in from the beginning. Students on my teams apply for a spot on the team with a written application and then, if they make it past that round, have a scheduled try-out presentation and interview. The students that are awarded a spot on the team, have already showcased their willingness to put in effort to the team and, likely, feel proud of their accomplishment of making the team (even if only a small number of students apply to be on the team). This process creates buy-in from the beginning and contributes to the team's motivation.

Team Building

Once the team has been formed, I like to structure opportunities for the students to get to know the contest, their team members, and their own skill sets. By creating opportunities for students to assess where their skills may come in valuable, it also creates an opportunity for them to get to know each other better and value the individual contributions of each team member. Some

examples of the tools for assessing personal strengths I have used include Myers-Briggs, Strengths Finder, and the Fascination Advantage.

Identification of Learning Goals

As students get a little more comfortable with the project, the team, and their role, I ask them to identify at least five personal learning goals that they would like to personally accomplish through participating on this team. Establishing learning goals requires students to reflect on areas of weakness, as well as skill sets that are going to be valuable as they move into the real world. Through the metacognitive process of identifying learning goals, individual team members develop a clearer sense of what they are working towards, beyond just "winning" the competition.

Weekly Progress and Feedback

A critical part of becoming a lifelong learner is the ability to be self-regulated toward individual learning goals. By asking students to assess their progress toward their learning goals each week, the students are forced to go through a self-assessment process. In addition, as coach of the team, I gain a better sense of the efforts going into the project and an opportunity to provide personalized feedback to each student.

Reflection on Progress and Learning

Regardless of the outcome of the contest the team was preparing for, the process of reflecting on the experience and the student's progress to their learning goals, typically reveals significant learning. While often that learning occurs related to specific skills necessary for the nature of the competition (e.g. marketing, finance, livestock evaluation), perhaps even more significant is the learning related to the development of soft skills (e.g. communication, leadership, conflict management). In addition, by reflecting on how far they have come toward their learning goals (or in some cases, how far they still have to go to achieve their learning goals), students obtain a better sense their own self-efficacy.

Coaching student competition teams can take a lot of time but, for me, it is some of the most rewarding time invested in teaching. The growth and the skills

Teaching Tips/Notes

that the students gain through the team experience, is worth every minute spent invested in the experience. The process of building a strong foundation through commitment, team building, and goal setting, followed by active self-assessment and reflection on the growth seems to maximize the return on that investment for both the coach and the students as lifelong learners.

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Git 'er Done: Publish Those Dusty Papers

More often I hearing reports that contemporaries of mine are changing jobs or retiring. Much of this is due to age, but some of the career volatility is due to a lack of funding to keep a viable research program alive at an academic institution. In many cases, it is easier to become an administrator--or, to simply retire, and a significant number of meat scientists/muscle growth biologists (and likely others in different fields) are fading away, and their scientific voices are becoming quiet.

I have heard some say that if they cannot keep a grant funded, then they are a failure. Wow! Really? I have written numerous articles for this (and other) journals suggesting that academic institutions are broken [1,2], that faculty members are the institution (college or university) banker [1], and that there are other ways to accomplish research goals [3], or to be happy in an academic situation even in light of dismal funding success [4]. Lack of funding is a universal problem, right now, but there are many things we still need to do right [5] in order for students [6] to have a successful academic experience.

With these things in mind, and considering that once diverted into a different area (administration or retirement) your scientific presence [7] will begin to diminish. Your residual discoveries may fade and whatever you have not published [8] will (likely) not be published by others. So, as an offering from someone that has been in academia for 30 years--please publish residual, partial, semi-completed papers prior to leaving your position. Why? No one will ever remember how much grant dollars that you generated in your lifetime of academic struggles. People will remember teaching, advising, learning, career, scientific and other papers that you published. Your final offerings may excite someone else to enter the field, or to make a career decision. One does not know. However, finishing this kind of work will allow you to leave on your terms--knowing that you left it all (at work). Consequently, it is my advice to Git 'er Done: Publish those dusty papers.

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Communicating Expectations

Reviewing end-of-term student evaluation comments called into question my tried and true method of one-way communication of course expectations. When a dozen students, over ten percent of one class, submitted a comment indicating instructions were not clear on one or more of the activities or products on which they were evaluated, I initially was puzzled. It is rare when I cannot answer a student's query or claim regarding unclear expectations with a quick reference to the syllabus or other written instructions. And, students have traditionally been satisfied by my reminder reference to where they can find the instructions we have previously covered.

I expect accountability of students, but I also put considerable value in the concept that if the student is not learning, the instructor is not teaching. I had to work to facilitate student-accountability for course expectations. I have long made available to students in writing my detailed expectations. I needed to make sure they were motivated to access, understand, and follow them. I have had success in doing so using three methods.

First, I spent considerable time explaining the source of my expectations in the hope understanding the purpose of an assignment, requirement or course rule will better motivate them to do their best to complete or follow it.

Second, I test students over my expectations. Students take a quiz over the contents of the course syllabus. To successfully complete the quiz, students must conduct a careful review of the key expectations and procedures of the class, both covered in detail in the syllabus. Currently, I ask detailed questions and therefore allow students to use the syllabus while taking the quiz, but one might also offer an unaided test of their understanding.

Third, I have students grade examples of the products they will submit. In one class, I require two papers, each of which comes with a specific grading rubric designed to test their ability to translate an assigned experience in the context of course material. Prior to this exercise, students not following formatting or content instructions would often explain that they did not know about or understand them. Grading a paper based on their assignment prior to submitting their own helps empower them with the knowledge and an understanding of my exacting expectations.

While some have questioned the value of the last two activities, student work has benefited from including them in my class and student frustration with the level of detailed guidance I provide has decreased. The students benefit when I ask them not only to listen to or read my expectations but to recall and translate them in the context of their application. Even in teaching, perhaps especially in teaching, leadership is stronger with two-way communication.

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The Golden Ticket: A Strategy for Time Management and Decision-Making

Introduction

Time management and decision-making are life skills that instructors encourage in students to make the most of their college experience and prepare for the demands of new careers. Developing time saving and decision-making strategies can be easier for students if they have options to help them as they consider priorities and time allotment for classes and projects. I encourage students in my landscape design class to plan their semester work schedules as much as possible in advance, including establishing pre-deadline due dates and accounting for outside activities that may conflict with their course work schedule. To help them, the course syllabus includes a “golden ticket” that students can use as a time management/decision-making tool.

Procedure

The golden ticket—a form printed on gold colored paper—can be used to request additional time to complete any one of the required class projects, with the exception of the last project of the semester. If a student needs more time to complete a project they can fill out the ticket to request a later due date. However, the ticket can only be used one time, so students must give serious deliberation and consider the possible need for the ticket in the future. The request must be made no later than the class period before the project is due. For example, my class meets on Mondays and Wednesdays and projects are due on Wednesdays, so they must present their ticket for approval no later than the Monday before the Wednesday due date. Once the ticket request has been approved, they have until the next class period, on Monday, to turn in the project with no penalties.

To make a request the student must bring the golden ticket form to class and ask for the deferred date in person. The instructor notes the revised due date on the form and the student and instructor both sign the form. Signatures go on the top and bottom of the form and the instructor keeps the bottom half of the ticket for their records. It is important to keep the bottom half of the ticket for proof that the student has already used a ticket, which will deter them from borrowing another student’s ticket to make a second request. The students are encouraged to review their semester class schedule and save the ticket to use when they might need it most - - when multiple assignments are due at the same time in their classes, when the big game is coming up, or simply because they want more time to work on the project – the ticket can be used for any reason, no questions asked.

Assessment

Some students plan ahead and know exactly when they will use the ticket, saving it for a particularly busy time in the semester, which is typically around mid-term exam time. Others simply save it as an emergency back-up in case the need comes up; however, most students never use it. As the instructor I have recommended to students on a few occasions to consider using their ticket for additional time (usually over the weekend) to work on their project and improve it. Most students will take my recommendation if they have time- knowing that their grade will probably improve- while others choose to save it or simply don’t have the time to work on the project. For some students it’s a point of pride to not use the ticket, but all students, even if they don’t use the ticket, say it’s nice to know they have the option if they need it.

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A Resourceful and Interactive Method to Teach Students about Cell Division

Cell division is a biological process that is covered in a multitude of science courses, from the introductory to the advanced levels. Classes often cover different aspects of cell division at multiple levels, including mitosis and meiosis. Despite continued exposure and repetition to the topic of cell division during students' academic careers, they continue to trivialize the process. Anecdotal observations indicate that a large proportion of undergraduate students find cell division a mundane, unimportant and obsolete topic. Perhaps students perceive cell division in a negative connotation because it continues to be a difficult concept to understand despite repetitive exposure to the topic. When discussing mitosis or meiosis with an undergraduate student, it is often quickly apparent that they are insecure about the mechanisms of the process. Rather than trying to improve their understanding by increasing the frequency of teaching mitosis and meiosis during their education, perhaps the way in which cell division is taught should be reevaluated.

Creating multiple ways in which students can connect with the material being presented increases the understanding and retention of the material. Howard Gardner (1993) identified the different intelligences that can be stimulated during learning to increase understanding. Having students recreate or demonstrate biological mechanisms through in-class guided performances or skits, targets the visual-spatial and bodily-kinesthetic intelligences.

Recreating complex processes using students and props during class can be used as a vehicle for learning in multiple instances in numerous courses. This teaching tip will explain how learning mitosis through active movements was implemented in an introductory animal science course in an effort to improve students' understanding of the basic mechanisms of mitosis. Students enrolled in the course are traditionally first semester freshman; however this method could be utilized in any course with minor modifications.

Procedure

Prior to the activity, 1.8 meter long polyethylene foam cylinders (swim or pool "noodles") of various colors are cut in half. Each cylinder represents a chromosome. Depending on the number of different colors you can find will determine the number of chromosomes that can be implemented. There must be four cylinders for each color. Name tags that are color coded and labeled as "maternal/paternal" or "dam/sire" are useful when teaching about or tracking ancestry and/or heredity. Finally, an assortment of different color elastic hair bands are used to represent different genes, which can be placed on the cylinders at specific locations to illustrate the concept of loci.

After first discussing DNA replication and cell division at a level the teacher believes necessary for the

specific class, two cylinders of each color are randomly passed out to students. The class is then guided through the understanding that each cylinder is a specific chromosome and each pair of same colored cylinders is a maternal and paternal set, at which time the students receive their appropriate name tags. Based on time and course content, genes and loci could be introduced at this time by the placing of the elastic hair bands on the cylinders. In this specific introductory course, this is delayed until the genetics lecture. The student chromosomes are then encouraged to wander in front of the class until DNA replication takes place, at which point the additional pair of color-coded cylinders appear and are distributed to other students in the class. Finally, cell division can be demonstrated and the students can form two daughter cells or four germ cells. Depending on the time allotted for this method and topic, the process could be replicated again without the teacher's input which causes the class to teach themselves about cell division through common consensus.

Assessment

There was no empirical assessment conducted to evaluate if students increased their understanding and knowledge of cell division based on this interactive method in the classroom. Based on personal observation, the students appear more engaged during the lecture when using this method compared to previous semesters or upper level courses where I used handouts and traditional lecture pedagogy. This should not be unexpected, since based on a scale where 1 = strongly disagree and 10 = strongly agree, undergraduate students enrolled in my classes ($n=47$) want (8.89 ± 1.44) and prefer (9.25 ± 0.79) classes to utilize active learning experiences.

Based on the feedback from students and colleagues, implementing active learning methods to illustrate and explain complex biological concepts improves students understanding of the concept and willingness to be an active participant in the learning process. Active learning methods can be a high-impact strategy that carries little risk to the teacher or student if planned and organized ahead of time.

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