This Super Summary Search was conducted using EBSCOhost and GoogleScholar online research databases to look within peer-reviewed journals published between 2008 to 2013 for articles that describe creative ways to convey anatomy content to students. My intention was to investigate techniques that differ from the traditional lecture, computer, and laboratory dissection based approaches. I was able to divide the strategies that I did find into three main categories: Peer teaching, Live models, and Team based learning. They are predominantly collaborative strategies but all incorporate a bit of critical thinking, creativity, and motivation depending on how the techniques are approached and explained to students by the instructors.

Category 1: Peer teaching


Abstract: Reciprocal peer teaching occurs when students alternate the roles of teacher and learner. When used in the gross lab, no significant differences were found in student learning outcomes but most students agreed that the exercises were beneficial and would like to do them again. It is therefore stated that with slight revisions this is a good thing to implement and may greatly benefit large, diverse student populations.


Abstract: Reviews the benefits and downfalls of self-guided learning. Use as a guide to making groups and peer learning exercises, in that the instructor needs to give feedback. They need to provide support and guidance but let students do the actual learning process on their own and make small mistakes before interfering.


Abstract: Peer teaching is shown to enhance communication because they are familiar with one another and know levels. Near-peer teaching is more specific in that the more experienced students serve as the instructors. This study used fourth year medical students to teach gross anatomy to first and second years. The fourth years reported deeper learning of anatomy after teaching and the younger students liked it too.

Abstract: Post-intervention assessments were given to see effectiveness of peer-assisted learning using student teachers to teach the skills needed to interpret ultrasound images. The student teachers showed better results overall, though the was staff rated higher. Student teachers still face prejudice from students in doubts of competency.


Abstract: To understand the experience of peers teaching each other in a supplemental peer teaching program by second years. Valued the experience because of recent experience with materials and their ability to understand the struggles of medical school.


Abstract: Using patient cases and scenarios, discussed via data supported by independent research and learning (in reverse). Students in teams told to create a case using their clinical skills and reasoning. Benefit future patient interactions, communication, and teamwork. Good way to how that gross anatomy can influence patient write-ups and presentations.


Abstract: Near-peer teaching is better than peer teaching because eliminates competition, is more achievable and is easy to replicate because the instructor is closer to students, more trustworthy than faculty and can facilitate self-disclosure of ignorance and misconception. Also helps with faculty shortage.


Abstract: Past research has not described from the viewpoint of the peer teacher. Second year students had a positive impact on first year students. Teachers gave a packet of diagrams, fill-in-the-blank questions, and helpful mnemonic devices. Great for understanding of anatomical relationships. Teachers developed good teaching, academic, organizational, and time management skills.
Category 2: Live models


Abstract: Peer physical examination useful to develop clinical skills and professional attitudes when dealing with patients. Most made more comfortable with nudity and even more said it helped them develop good professional attitudes in patient encounters.


Abstract: Looked at one year of first and second year medical school living anatomy classes by observation and interviews with the students, staff, and live models outside of class. Contrary to tradition, the living models were active participants in the class and they served to not only guide in content, but also offer feedback and reinforce the humanistic aspects of gross anatomy by their personal histories and experiences.


Abstract: Body painting is seen as a highly motivating exercise due to its novelty. Focus groups found that body painting used in conjunction with traditional anatomical teaching methods promoted retention of knowledge, enhanced peer interactions, and provided a base of empathy with the vulnerability that their patients face.


Abstract: Live models have been considered to replace cadavers. They are useful because students need a sound foundation of 3D anatomy (surface anatomy, medical imaging, surgical procedures). With decreasing hours, medical curriculums need to be creative (dissections may not be financially or time-wise feasible anymore).


Abstract: Found differences in preference to familiarity (some preferred friends and some preferred strangers). Staff embarrassment factored as inhibiting student participation. Whenever possible allow students to select their own environment and partners, as is valuable in terms of clinical skills and future practices.

**Abstract:** Body painting was used where students served as both painters and models. Evaluations were given at the end of the class to gauge usefulness. It found that body painting decreases student fears about patient examinations, increases engagement in the class, and served as a unique kinesthetic experience.

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**Category 3: Team based learning**


**Abstract:** This altered the typical TBL format by starting with normal TBL and then breaking out to individuals, who then checked back in with the group. Individuals make their own concept maps and then reconvene. Students found this useful, especially the concept map, in mastery of the topics. Instructors reviewed and answered questions after the TBL.


**Abstract:** Shortage of faculty led to TBLs being used because requires less faculty preparation and more material can be covered quickly. Concluded was effective and efficient in the laboratory.


**Abstract:** Students were forced to assume responsibility for their own learning when contact hours were cut. TBLs resulted in no real changes to student grades except everyone passed the course, which indicates that the lower portion of the class does better and benefits most from TBLs.


**Abstract:** Students had a preference for lectures over TBLs. Over this three year study there were positive perceptions of TBLs, which indicates that time is needed for students to get used to TBLs and defeat the knee jerk reaction of dislike.


**Abstract:** TBL uses self managed learning teams but this too broad. These authors formulated guidelines for TBLs, their evaluation and reports. The seven core design elements are: team formation, readiness assurance tests, immediate feedback, sequence of in-class problem solving, significance and similar problems, incentive structure (grade for the team to enhance collaboration), and peer review.


**Abstract:** If more schools are to implement TBLs, need evidence of its effectiveness ad positive learning outcomes. In this pathology course TBL improved mean student exam scores, benefitting students in the lowest quartile the most.


**Abstract:** The goal was to improve clinical reasoning in fourth year medical students so they will be better able to handle decision making processes in a group setting with feedback from a specialist. Students exposed to PBLs did better in TBLs and on clinical problems.


**Abstract:** Independent class preparation was combined with in class small group discussion. Lectures were replaced with required preclass readings, self-assessment quizzes, small group discussions of assignments, and groups retaking the quizzes for deeper learning. The higher achieving students liked TBLs more, but were overall positive from everyone. Medical students view TBLs favorably irrespective of their grades.


**Abstract:** Students were given assigned readings at the beginning of the semester and content specific discussion topics based on the dissections and readings. Exams were based entirely on clinical cases. Found gradual improvements in all classes that integrated TBLs. Lower achieving students improved most due to the opportunity to solidify information that stresses application and not memorization.
**Summaries of four pertinent articles and their impact on my field**


This article caught my attention because I am an Associate Instructor (A.I.) in IUB’s Medical Sciences department for the Gross Anatomy course, and this year we implemented reciprocal peer teaching for the first time. I had my doubts about it, but it seems to be a very beneficial activity. The students are more responsible for completing and understanding their dissections since they have to teach the other half of their group. The authors of this article felt the same way – although the students were hesitant at first and grades showed no significant difference with or without reciprocal peer teaching, at the end the majority of students agreed it was a positive format and would like to continue it. Those that are not in favor of continuing reciprocal peer teaching are mostly because they only have half the amount of dissection time they would otherwise. There has to be a happy medium somewhere, and I would like to be able to continue these author’s work and find that balance here at IUB.


Near-peer teaching occurs when more experienced students act as tutors to pass on their knowledge and experience to younger students. In this instance it was fourth year medical students teaching first and second years. I think this could be implemented at IUB because in a recent curriculum change, medical students will stay in Bloomington for all four years, doing their rotations at the IU Health Bloomington Hospital. It would be great to do a near-peer teaching and mentoring program here not only in gross anatomy but with other medical science subjects. The teachers would act similar to A.I.s, but perhaps be matched with an individual student rather than being responsible for a group or the whole class. In this study the fourth year students’ main motivations were to reinforce their anatomy knowledge and develop teaching skills useful for their future practices. Therefore, this type of activity could serve a role in the professional development competencies the medical students must complete.


One of the largest problems facing the implementation of TBLs is that there are currently no rules or guidelines governing how they are to be held and reported, so it is difficult to judge merit and reproduce experiments. These authors gave a brief overview of the TBL method and identified seven core design elements that they propose all TBLs should include: team formation, readiness assurance tests, immediate feedback, sequence of in-class problem solving,
significance and similar problems, incentive structure (grade for the team to enhance collaboration), and peer review. A more uniform understanding of what TBLs are and what they are intended to do will hopefully increase the use of this very useful tool in the medical sciences. At IUB we face a lot of resistance from students because many of them prefer the more passive lecture-based class format. TBLs are unfamiliar and often seem disorganized to students who do not understand their purposes. If these authors succeed in their proposals gaining more popularity it will benefit all instructors who desire to use TBLs but are unsure of how to evaluate and report their effectiveness.


These authors utilized an extreme form of TBL learning after the cutting of contact hours at the medical school necessitated such measures. Students were made more responsible for readings assigned at the beginning of the semester and usually engaged in discussions and active learning techniques during the few class meetings. They were able to be given immediate feedback from instructors at all times other than during them exams. The exams were entirely based on clinical cases and scenarios, which mimics the real activities of a physician much better than multiple choice exams. I found this article to be extremely relevant to issues encountered at IUB’s medical school. Students argue that TBLs are not in a format that will help them pass their board and shelf exams, which are in a multiple choice format. However, their patients will not give them multiple choice questions and answers and so the TBL and exam format outlined by the authors is a much better way to gauge student knowledge and readiness to practice medicine.