

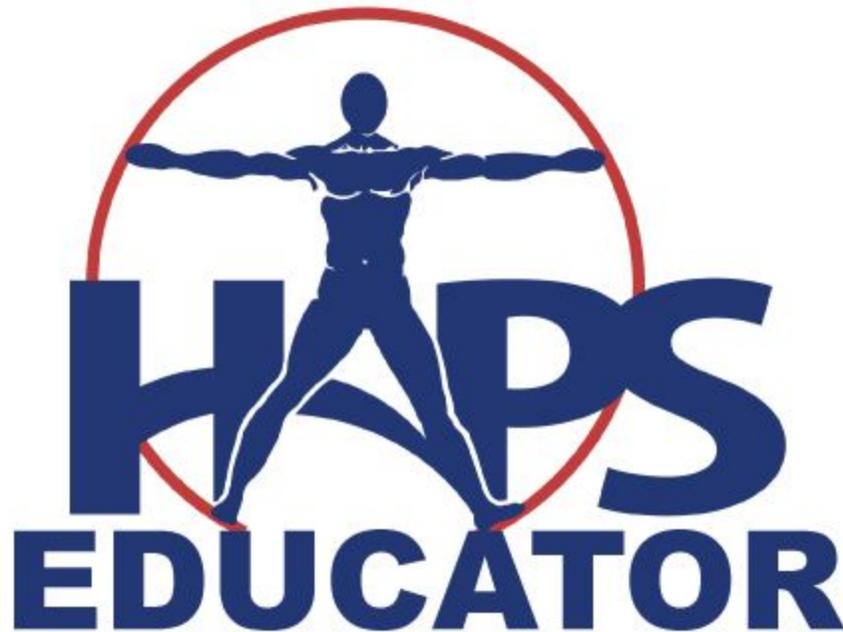
**Teaching Assistants in Human Anatomy and Physiology:
Their Prevalence, Recruitment Strategies, Funding,
Retention, and Training**

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Teaching Assistants in Human Anatomy and Physiology: Their Prevalence, Recruitment Strategies, Funding, Retention, and Training

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Abstract

Studies show teaching assistants (TAs) can positively influence the learning environment by increasing student comprehension and retention and impacting students' choices of academic and career paths. However, use of TAs in higher education is not universal. Following a fruitful panel discussion at the 2017 HAPS Conference, we conducted a survey to assess the prevalence of undergraduate and graduate TAs in human anatomy and physiology courses across a range of institutions and to evaluate how TAs are recruited, trained and compensated. Data from 329 respondents who used TAs, indicate most institutions use a formal application process, training procedures vary, and most TAs are compensated financially through hourly wages, stipends, or tuition credit. However, some TAs are unpaid but receive course credit as compensation. We highlight one of the more successful recruiting and training programs, where paid master TAs mentor unpaid apprentice TAs. This tiered training program excites and motivates student leadership, maintains high academic standards, and alleviates the lead instructor from continually training novice TAs. <https://doi.org/10.21692/haps.2019.015>

Key words: teaching assistant, anatomy, physiology, laboratory, education

Introduction

Teaching assistants (TAs) have, of necessity, been part of science laboratory course instruction for more than four decades in North America. For example, use of TAs offers many benefits including freeing up faculty time for research; staffing teaching labs and recitations associated with large enrollment undergraduate lecture courses; and providing teaching apprenticeship experiences along with financial support for student TAs (Park 2004). TAs gain methodological research skills in the process (Feldon et al. 2011, Schalk et al. 2009). Having additional instructional personnel also facilitates implementation of active learning, particularly inquiry-based laboratory lessons (Hughes and Ellefson 2013). More studies focus on graduate TAs rather than undergraduate TAs. However, it is known that peer-to-peer instruction positively impacts student learning by removing student hesitation to approach the lead instructor (Wheeler et al. 2017) and improves student retention in STEM fields (O'Neal et al. 2007).

The purpose of this study was to assess the extent to which lead Human Anatomy and Physiology instructors utilize TAs, and if their experiences reflect the benefits reported in previous studies for general science courses. Because Anatomy and Physiology is taught at a variety of institutions from small two-year community colleges to large doctoral degree granting research institutions, we sought to develop a comprehensive

picture about how TAs in Anatomy and Physiology were being trained, compensated, utilized (lecture, lab, or online; teaching or grading), and their perceived impact. Training is paramount, especially for undergraduate TAs, as their role shifts from learner to a guide, mentor, and facilitator. The content load of an Anatomy and Physiology course is extensive and training graduate TAs who have not previously taken the course is time consuming and reduces the amount of time available for teaching students enrolled in the courses. With this nationwide study we hope to identify unifying training components like Family Educational Rights and Privacy Act (FERPA), lab safety, and pedagogy, and provide insight about concerns lead instructors have about their own time commitment to the process, which in some cases is neither compensated nor considered part of their teaching load.

The authors have had a combined experience of 120 years of supervising TAs and wanted to share their insight on the best practices for building a successful TA program. This study may initiate establishing guidelines regarding criteria for supervising and utilizing TAs as well as future scholarship of teaching and learning projects, both of which will ultimately influence student success.

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Materials and Methods

After a successful panel discussion on *Effective Recruitment, Retention and Training for Teaching Assistants in Anatomy and Physiology* at the HAPS 2017 conference, the authors designed a survey to assess TA use in Human Anatomy and Physiology courses. The survey was developed and administered via Qualtrics survey software with the text and flow sequence of survey questions listed in Appendix A. Subjects were recruited through email announcements distributed via the Human Anatomy and Physiology Society (HAPS) listserv from 24 October 2017 to 15 November 2017. Upon completion of the anonymous survey, respondents were given the option to enter a raffle for one of five Amazon gift cards funded by HAPS, one for \$100 and four for \$50, in appreciation for completing the survey. Winners of the raffle were randomly selected on 16 November 2017 and gift cards were distributed in January 2018. This study (Protocol #18x-061) was reviewed by The University of Mississippi's Institutional Review Board (IRB) and was approved as Exempt under 45 CFR 46.101(b) (#2).

Survey responses were coded by institution type, e.g., 2-year community/technical college; 4-year private, non-profit; 4-year public, non-profit; for profit; and other, prior to statistical analyses. Numerical and text responses to select questions from 338 respondents are presented in the areas of: respondent profiles; reasons for using TAs; reasons for not using TAs; selection and training of TAs; compensation for TAs; benefits and drawbacks to TAs in the laboratory classroom; and future issues regarding TA involvement in Human Anatomy and Physiology courses. Where respondents could enter a numerical response rather than select a categorical response, descriptive statistics such as mean and standard error were calculated to inform the reader of variation across the survey responses.

Results

Survey participants

A total of 338 educators participated in our survey. Out of the 338 respondents, nine participants were excluded from the rest of the study because they reported that colleagues used TAs, but they themselves did not, and therefore were not able to answer subsequent questions about how TAs are selected, trained, utilized, and compensated. Responses were received mostly from the United States, but there were a few (<10) from Canada, Africa, and Australia. Survey results were compiled based on public vs. private institutions as well as four-year vs. two-year colleges and community colleges. Most participants taught either at a two-year community/technical school (41.34%) or a four-year public, nonprofit institution (36.78%; Table 1). Individuals who identified as teaching in the "other" category provided responses that included government, graduate programs or graduate allied health programs, as well as public high schools, and branch campuses of larger institutions.

Institution	Participant number (%)
2-year community/technical	136 (41.34%)
4-year private, nonprofit	58 (17.63%)
4-year public, nonprofit	121 (36.78%)
For profit	3 (0.91%)
Other	11 (3.34%)
Total	329 (100%)

Table 1. Number of survey participants by institution type.

All institutions reported offering less than 20 Anatomy and Physiology lecture sections during a typical semester with the number of students per lecture varying by institution type (Figure 1). In general, the number of Anatomy and Physiology lectures ranged from five sections in private institutions to 19 sections in two-year community/technical schools. Four-year non-profit institutions had the highest mean number of students per lecture (170), while two-year community/technical schools, which offered the largest number of Anatomy and Physiology sections, had a mean of 37 students per class (Figure 1). The number of Anatomy and Physiology lab sections did not differ as much by institution. Both four-year public, nonprofit and two-year community colleges offered an average of 22 to 24 lab sections, ranging between 37-42 students per section. Four-year private, nonprofit institutions had approximately 13 sections with 46 students per section on average, and for-profit institutions have up to six lab sections. Schools that classified themselves in the "other category" did not report teaching Anatomy and Physiology labs (Figure 2).

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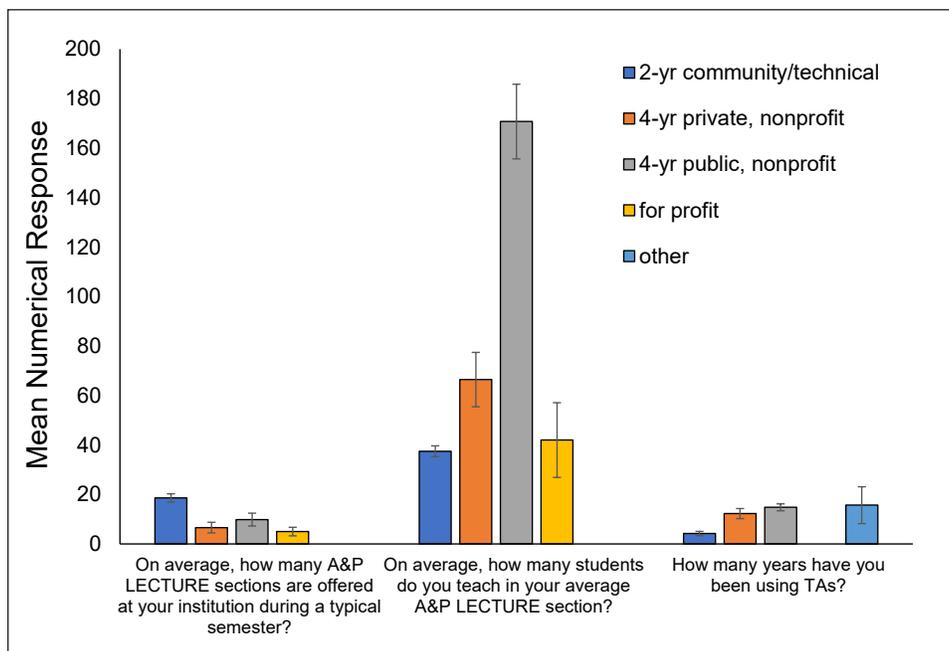


Figure 1. Respondent profile of Human Anatomy and Physiology lecture offerings, student enrollment in offered sections, and number of years using TAs. Columns represent the mean numerical response across institution type with error bars representing ± 1 standard error around the mean.

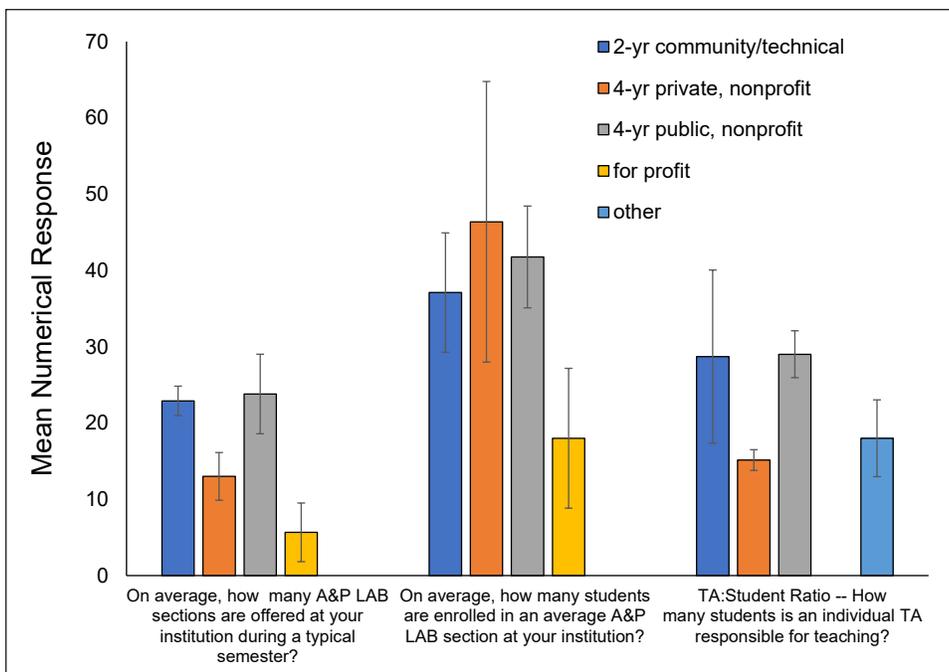


Figure 2. Respondent profile of Human Anatomy and Physiology lab offerings, student enrollment in offered sections, historical use of teaching assistants, and teaching assistant to student ratios. Columns represent the mean numerical response across institution type with error bars representing ± 1 standard error around the mean.

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Use of Teaching Assistants

All institutions, except for-profit institutions, reported using TAs in their Anatomy and Physiology courses in some capacity (Figure 1). Instructors that chose not to use TAs reported budget and funding limitations as their main reasons in the two-year community/technical schools, followed by fill-in responses that ranged from administrative expectations that only faculty or graduate students (in the four-year public, nonprofit institutions) teach, and lack of necessity for given class sizes (Figure 3). Other reasons for not utilizing TAs included lack of desire, concerns about having undergraduate students have access to grades, and perceived lack of TA quality.

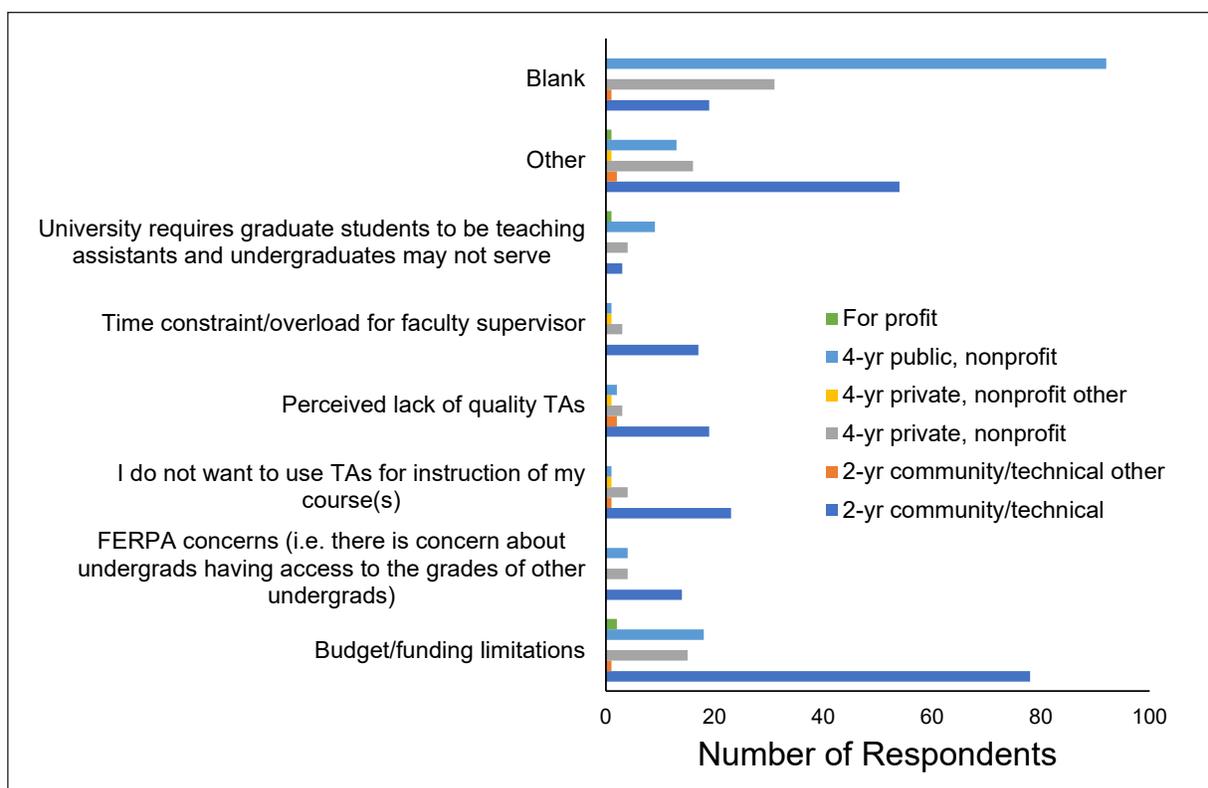


Figure 3. Survey respondents who said they did not use TAs were directed to questions regarding their reasons for not using TAs. Respondents could select multiple reasons. The “Blank” respondents use TAs and skipped this question. Four-yr public, nonprofit and four-yr private, nonprofit are the leading users of TAs per this survey question. For two-yr community/technical college respondents, budget/funding was a chief reason for not using TAs. The write-in responses (other) for two-yr college respondents indicated that class sizes were small and only the faculty were expected to teach, high turnover or TAs expected, and comments alluding to budget limitations.

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The TAs in four-year institutions are generally a mix of undergraduate and graduate students, primarily graduate students. In the two-year community/technical schools, TAs are mainly undergraduate students and rarely adjuncts (Table 2).

Teaching assistants are utilized in different capacities and diverse classrooms. For example, TAs are primarily used in four-year public, non-profit institutions, to lead group discussion and to help students during active learning activities. They are used mostly in the labs and sometimes in the lecture class, as well as offering open labs and helping professors with preparation. To a much lesser extent, TAs are utilized in hybrid and online courses by two-year community/technical, and the four-year institutions (Table 2). In four-year institutions (Table 2), TAs typically teach content either as the sole instructors in the lab room, primarily in four-year public nonprofit institutions, or alongside other instructors or TAs, in both public and private four-year institutions.

	Categorical response	2-yr community/ technical	4-yr private, nonprofit other	4-yr public, nonprofit	for profit	other
Classification of teaching assistants	Both undergraduate and graduate students	0	8	33	0	1
	Graduate students	0	1	27	0	0
	Undergraduate students	10	20	16	0	2
	Adjunct	1	0	1	0	0
Teaching assistant autonomy	TAs teach without an instructor in the room	3	5	46	0	1
	TAs assist alongside lab instructors (or additional TAs) who are always in the room	5	22	24	0	1
	Other	2	2	5	0	0
Course format	Face-to-face lab	6	26	73	0	3
	Face-to-face lecture	5	8	30	0	0
	Hybrid lecture	2	3	4	0	0
	Online lecture	2	0	3	0	0
	Other	2	0	3	0	1
	Hybrid lab	0	0	1	0	0
	Online lab	0	0	0	0	0

Table 2. Classification and autonomy of teaching assistants in anatomy and physiology classes, and course format, by institution type. Respondents were able to select more than one answer. Categorical responses are ranked by number of responses (from high to low) at four-year public, nonprofit institutions (i.e., the institution category with the highest response rate to these questions on the survey).

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In addition to active laboratory instruction, TAs participate in a range of course activities, during class time and outside of class (Table 3). During class, TAs help the instructor address student questions and guide students through active learning exercises. They participate in station work, proctor exams, and run errands. Outside of class, TAs offer tutoring and host open labs, as well as setup and breakdown labs, and prepare reagents (Table 3).

	Categorical responses	2-yr community/ technical	4-yr private, nonprofit other	4-yr public, nonprofit	for profit	other
Student interactions	Station work	7	20	50	0	2
	Staff open lab times	6	20	46	0	1
	Help the lead lab instructor during the lab whenever students need help	6	26	41	0	1
	Conduct practice lab practicals	0	1	36	0	1
	Other	1	1	27	0	1
Additional responsibilities	Clean up lab	4	25	46	0	1
	Set up lab	3	26	46	0	2
	Guide students through active learning exercises	6	12	42	0	2
	Running errands	2	9	18	0	0
	Prepare chemical reagents	1	14	15	0	1
	Other	4	2	9	0	0
	None of these are done by my TAs	2	1	9	0	0

Table 3. Student interaction opportunities and additional responsibilities of teaching assistants in anatomy and physiology classes by institution type. Categorical responses are ranked by number of responses (from high to low) at four-year public, nonprofit institutions (i.e., the institution category with the highest response rate to these questions on the survey). Respondents were able to select more than one answer.

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Due to institutional policies, graduate TAs have the greatest latitude in grading and undergraduate TAs the least. Grading is primarily observed in the four-year institutions, where TAs may write and grade lab quizzes and practicals, as well as enter the grades into the learning management system (Figure 4). Out of all participants, approximately 25% report having TAs actively involved in creating assessments (quizzes, practicals, exams) and 45% report having TAs participate in some form of grading. Teaching assistants grade primarily multiple choice,

short answer, and labeling questions (Figure 5). 7.73% of participants do not assign grading responsibilities to their TAs. In addition to formal grading, 5.5% of participants report having their TAs grade assignments and check homework or lab reports. The decision to allow TAs to grade appears dependent on institutional policies, and undergraduate TAs at many institutions are not allowed to participate in any form of grading.

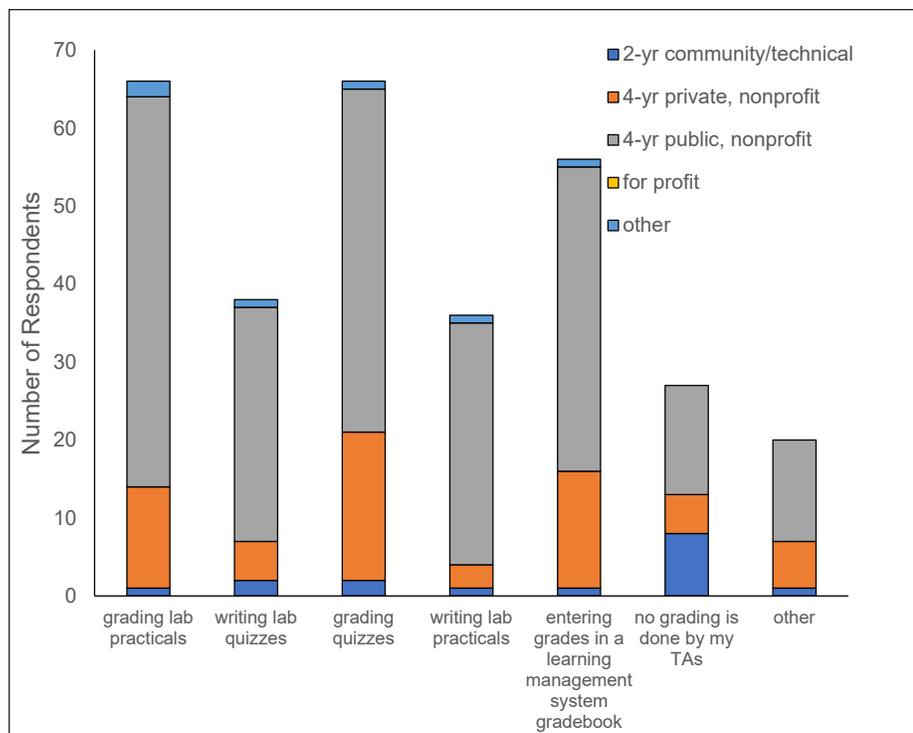


Figure 4. Grading responsibilities of teaching assistants in anatomy and physiology laboratory classrooms. Respondents were able to select more than one answer. Where an institution category appears in the figure legend but does not show in the stacked columns, there were no selections from respondents at that type of institution for this question.

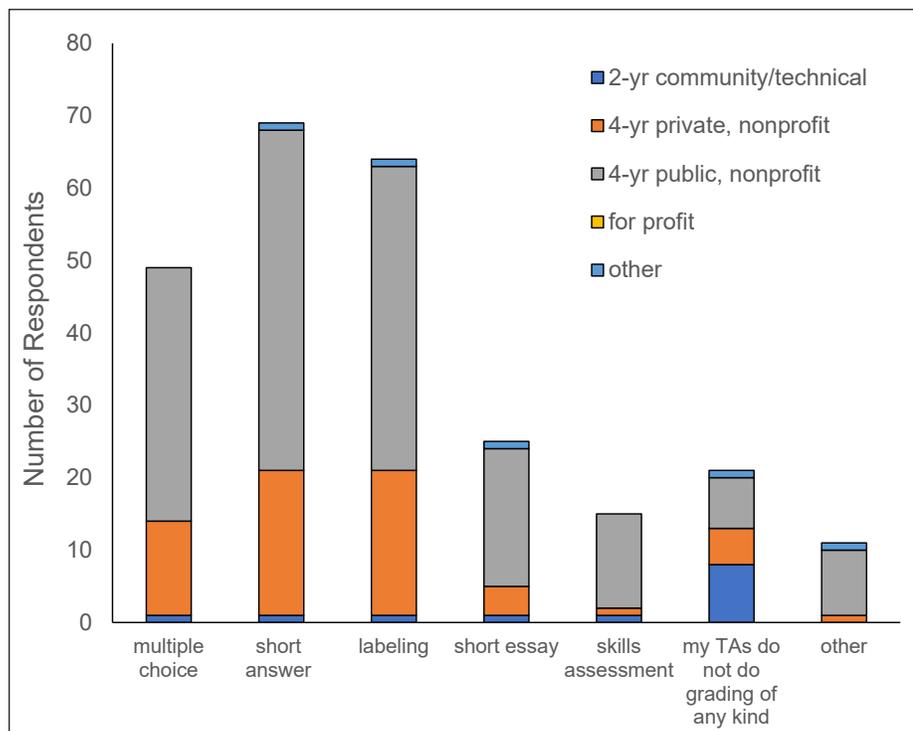


Figure 5. Question types graded by teaching assistants in anatomy and physiology laboratory classrooms. Respondents were able to select more than one answer. Where an institution category appears in the figure legend but does not show in the stacked columns, there were no selections from respondents at that type of institution for this question.

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TA selection, training, and compensation

Teaching assistants are typically selected based on multiple criteria. All respondents that use TAs report criteria of a formal application, academic success, and/or observations of the applicant in an Anatomy and Physiology course while a student, as well as interviews and references (Table 4). In addition, participants who chose "Other" reported hiring decisions based on completion of a Bachelor's degree (or teaching internship) or appointment decisions made by graduate program directors, TA coordinators, or graduate committees. Selection of graduate TAs seems to be based more on the need for the TAs to acquire teaching experience as part of their graduate education than their background in human anatomy and physiology.

	2-yr community/ technical	4-yr private, nonprofit other	4-yr public, nonprofit	for profit	other
Application	5	10	40	0	3
High grade in the course	7	18	39	0	2
Observations of positive behavior by the student when they were taking the course	8	22	33	0	1
Interview	4	7	24	0	1
Other	3	7	24	0	1
References	5	6	20	0	0

Table 4. Selection and hiring procedures for teaching assistants in anatomy and physiology classes by institution type. Responses are ranked by number of responses (from high to low) at four-year public, nonprofit institutions (i.e., the institution category with the highest response rate to this question on the survey). Respondents were able to select more than one answer.

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Once hired, 65% of TAs receive training either directly from the instructor (44%) or via a formal training course (21%). 24.6% of TAs do not receive any training, or training is conducted through the institution, by more senior TAs, or a TA coordinator (10%), (Table 5). The three main topics covered through formal training include FERPA, lab safety, and pedagogy (Table 5). Other topics include Title IX training, instruction on how to help students learn, and observations of teaching labs. Training can also occur through TA meetings held with variable regularity among institutions.

	Categorical response	2-yr community/ technical	4-yr private, nonprofit other	4-yr public, nonprofit	for profit	other
Formal training programs	Yes, I train them myself (no course for TAs)	3	13	35	0	1
	Yes, there is a formal course for training TAs	5	2	17	0	1
	No	1	12	14	0	1
	Other	0	2	10	0	0
Training procedures	Lab Safety	7	13	51	0	2
	Pedagogy	6	8	41	0	2
	FERPA student data privacy issues	4	8	37	0	2
	Mentors and apprentices	3	6	32	0	2
	Other	1	1	6	0	0
	Academic credit training course	2	2	3	0	1

Table 5. Components of formal training programs and training procedures for teaching assistant compensation in anatomy and physiology classes by institution type. Categorical responses are ranked by number of responses (from high to low) at four-year public, nonprofit institutions (i.e., the institution category with the highest response rate to these questions on the survey).

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Compensation

Compensation for TA (Figure 6). In some cases, undergraduate TAs might receive course credit for being a TA (Figure 7), but that seems to be very rare.

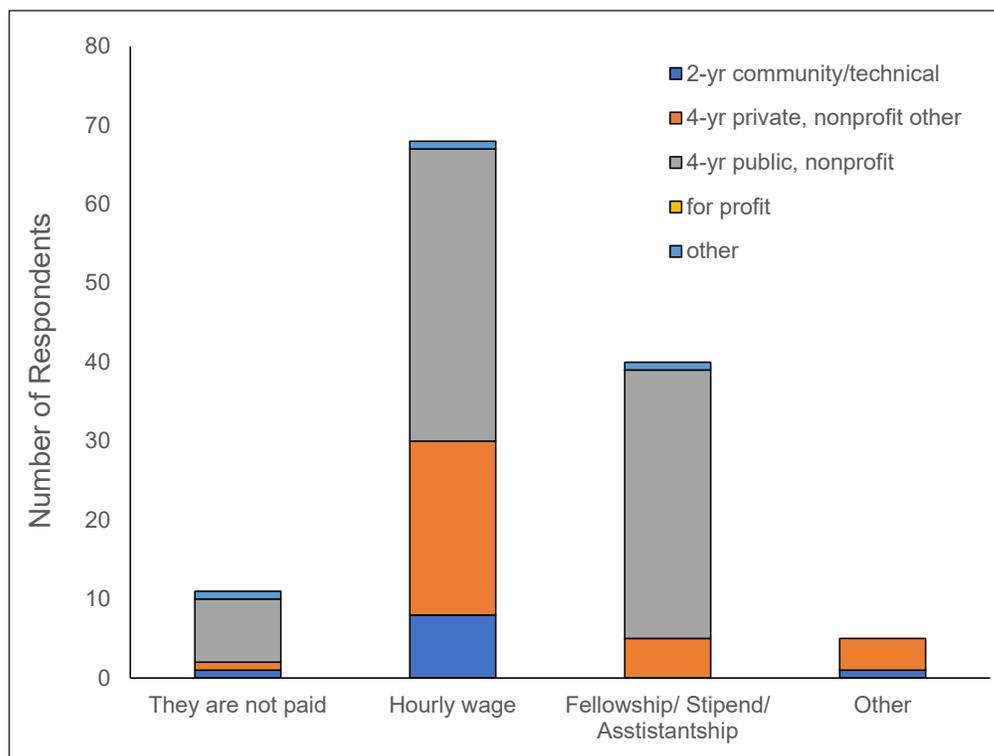


Figure 6. Financial compensation for teaching assistants in anatomy and physiology classes. Where an institution category appears in the figure legend but does not show in the stacked columns, there were no selections from respondents at that type of institution for this question.

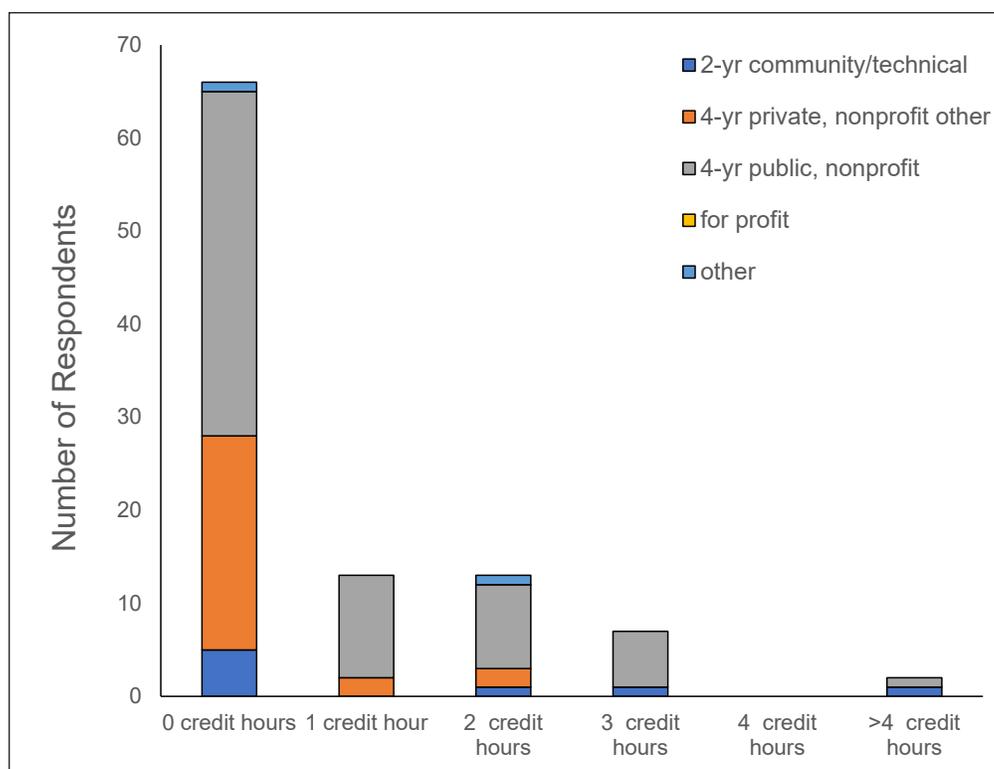


Figure 7. Course credit-based compensation for teaching assistants in anatomy and physiology classes. Where an institution category appears in the figure legend but does not show in the stacked columns, there were no selections from respondents at that type of institution for this question.

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Discussion

The aim of this study was to assess the prevalence and extent of TA use in Human Anatomy and Physiology courses. Thirty-nine percent of our participants use TAs in their Anatomy and Physiology courses. Of the 149 participants (59%) that do not utilize TAs, but also clarified that they 'would like to do so' or 'do not wish to have TAs', 76 reported wanting to be able to use TAs. For many participants in this latter category, their inability to use TAs was mainly due to budgetary constraints and lack of administrative support. Where TAs are part of the course structure, the TA composition, responsibilities, training and compensation vary, presenting multiple opportunities and challenges to incorporation of TAs into the classroom. The authors of this paper assert that TAs add value to Anatomy and Physiology instruction and offer solutions to the presumed barriers to implementation.

Value of TAs to Instruction

Teaching assistants contribute in multiple ways to course organization and instruction. Our survey showed that instructors utilize TAs outside of class to help prepare materials for labs and clean up after lab, grade various aspects of assessments, help tutor, and hold open labs. Being able to rely on responsible, well-trained TAs to help manage a course, especially in institutions with high enrollment, can improve

the types of learning experiences the instructors can offer. For example, where TAs participate in course instruction, it is possible to divide a large class into smaller groups using a station-based approach (Goldina and Barattini 2019; Springer et al. 1999, Whelan et al. 2016), which is used by many instructors in four-year institutions.

In the classroom, TAs can be extremely useful in helping students receive individualized attention and decreasing the length of time students must wait for assistance. In institutions where TAs were used, regardless of institution type, instructors noted that TAs spent most of their time engaging with students (Table 6), which can be beneficial on many levels. Giving students the opportunity to interact with TAs, who are often much closer in age to the students, decreases intimidation that students often feel towards their professors, and empowers students by providing them with positive role models and behaviors to emulate (Eagleton 2015; Lockspeiser et al. 2008). This is especially relevant in institutions where undergraduate students can apply to become TAs, and are assessed using multiple criteria, including previous academic success in the course and positive behavior when taking the course.

	2-yr community/ technical	4-yr private, nonprofit other	4-yr public, nonprofit	for profit	other
Most of the time	7	20	20	0	3
Always	1	4	4	0	0
Sometimes	1	3	3	0	0
About half the time	1	2	2	0	0
Never	0	0	0	0	0

Table 6. Perceived level of student engagement with teaching assistants in anatomy and physiology classes by institution type. Categorical responses are ranked by number of responses (from high to low) at four-year public and private, nonprofit institutions (i.e., the institution category with the highest response rate to this question on the survey).

In addition to the potential benefits to the students and the instructors, the TAs themselves receive benefits (Lachman et al. 2013). These benefits, beyond the obvious monetary compensation, may include improved, more in-depth knowledge of course material, increased capacity to communicate technical material effectively, and the opportunity to develop leadership skills. Finally, if the TAs are undergraduate students, the experience they gain can set them apart when applying to graduate schools, and the positive relationship they build with the course instructor can help them earn strong letters of recommendation for future endeavors.

Potential challenges to using TAs

While there are many benefits to having TAs in an Anatomy and Physiology course, these benefits are dependent on extensive training and oversight by the instructor, especially in the initial stages. If the selection criteria used by most instructors who participated in this survey are effective, the instructor has already chosen highly qualified, motivated individuals who are enthusiastic about teaching. However, that does not completely apply to graduate TAs who might be assigned to teach an Anatomy and Physiology lab because it is part of their graduate contract. Further study is required to determine the effect of TA assignment (i.e., competitive selection versus graduate assignment) on the engagement and success of students enrolled in Anatomy and Physiology. However, in all cases, a significant amount of time and training must be initially invested in order to have strong and competent TAs. Based on the results of the survey, formal training courses including knowledge of FERPA regulations, lab safety, and pedagogy are mainly conducted in four-year public institutions, and to a lesser degree in the four-year private institutions. In addition to formal courses, most instructors invest their own time in training TAs. This significant, and regular time investment can be potentially prohibitive, since it is likely not part of the instructor's teaching load. The current survey did not ask how their respective departments view TA training. For example, does TA training count towards departmental service or teaching load? Once training is completed, most instructors reported having regular TA meetings throughout the semester, which is also time consuming.

Another potential difficulty is compensation. In fact, budgetary constraints were the main reason for instructors not to have TAs. The main form of compensation for institutions that utilize TAs was monetary, either through hourly wages or some form of fellowship. Justifying allocation of funds towards a TA system might not be feasible for all institutions. This seems especially relevant in community colleges, where funds are already limited, and the focus is on keeping tuition affordable for the students. However, another possibility for institutions interested in having TAs is to allow TAs to receive course credit for their work. Twenty two percent of the survey reported offering course credit to TAs as a form of

compensation. Another possibility, as reported by the study participants, is offering tuition waivers.

Case Study of a Successful TA Program with Minimal Funding

One member of the present author group (Nielsen) has developed and sustained a minimally funded, but highly successful TA program that is crucial to the success of the course that reaches 500 students per semester. Attendees to the 2017 Annual Conference of the Human Anatomy and Physiology Society at the University of Utah in Salt Lake City were able to experience first-hand top-notch gross anatomy hourly workshops that were taught entirely by the undergraduate TAs of Dr. Mark Nielsen. Many faculty in attendance marveled at the preparedness of the TAs as much as the fine detail of the dissections.

In Nielsen's course there are two large lecture sections and 12 lab sections. Thirty-six undergraduate TAs teach the labs, which constitutes an eight-to-one ratio of students to TAs. Two thirds (24) of the TAs are unpaid apprentice TAs who earned their position by being in the top five percent of the class and meeting other selection criteria. The volunteer apprentice TAs can earn course credit for the semester they teach. One third (12) of the TAs are paid, and function as experienced TAs and mentors to apprentice TAs. Graduate students requesting a TA assignment to the course must pass the same selection criteria as an undergraduate TA. The tiered structure of paid mentor and unpaid apprentice TAs not only addresses the budgetary challenge of paying large numbers of TAs, but also sustainability of training new TAs during the course as well as future course offerings. Quality teaching is maintained through an extensive, rigorous training regime that utilizes frequent meetings of mentors with apprentices. For example, if an apprentice is not prepared to teach, they will have additional meetings with their mentor. Longevity of the TA program (33 years) and the number of interested applicants each year (90-100) indicate that the program is successful. Instructor commitment to recruiting, training, and cultivating a volunteer-to-mentor TA pipeline is critical to program viability, but Nielsen credits the mentors with helping facilitate the process.

Conclusion

Considering the many benefits and challenges associated with having TAs in the Anatomy and Physiology, using TAs should be an important consideration in designing a new course or considering curriculum changes to an existing course. We hope the results of this survey provide a better perspective on how Anatomy and Physiology instructors, from a range of institution types, view the role of TAs in their classrooms and labs. Furthermore, we provide a summary of a highly respected TA system developed to address the challenges of compensation for TAs and facilitating the time-consuming training process for instructors.

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Appendix A

Survey Questions for the HAPS Assessment of Teaching Assistant use in Anatomy and Physiology Courses.

Survey Flow

Description

This survey is intended to provide the members of the Human Anatomy and Physiology Society (HAPS) several key pieces of data regarding the use of teaching assistants (TAs) for the instruction of Anatomy and Physiology. We encourage HAPS members to use this data when working with their institutions to propose, develop, and cultivate programs for training TAs for quality instruction in the Anatomy and Physiology curriculum.

Cost and Payments

We estimate that it will take you approximately 15-20 minutes to complete this survey. Upon completion you may enter a raffle for one of five Amazon gift cards, one for \$100 and four for \$50, as our thanks for completing the survey. Winners of the raffle will be selected on November 15, 2017.

Risks and Benefits

We do not think that there are any risks to completing this survey. We anticipate publishing the results of this survey in the society's journal, *HAPS Educator*, so that all members can use this information in the development and instruction of Anatomy and Physiology courses at their home institutions.

Confidentiality

No identifiable information will be recorded from the first portion of the survey. If participants wish to be entered into a raffle for one of five Amazon gift cards, one for \$100 and four for \$50, they will be automatically redirected to a new link to enter their email address. Participants' email addresses will not be stored with, or linked to, responses to the first portion of the survey.

Right to Withdraw

You do not have to take part in this survey and you may stop participation at any time. If you start the survey and decide that you do not want to finish, all you have to do is to exit the survey.

IRB Approval

This study (Protocol #18x-061) has been reviewed by The University of Mississippi's Institutional Review Board (IRB) and has been approved as Exempt under 45 CFR 46.101(b) (#2). If you have any questions, concerns, or reports regarding your rights as a participant of research, please contact the IRB at (662) 915-7482 or irb@olemiss.edu.

Statement of Consent I have read and understand the above information. By completing the survey, I consent to participate in the study.

By checking this button, I certify that I am 18 years of age or older.

Your institution is classified as a:

- 2-yr community/technical
- 4-yr private, nonprofit
- 4-yr public, nonprofit
- for profit
- Other

On average, how many Anatomy and Physiology LECTURE sections are offered at your institution during a typical semester? Please enter a whole number rather than a range.

On average, how many students do you teach in your average Anatomy and Physiology LECTURE section? Please enter a whole number rather than a range.

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On average, how many Anatomy and Physiology LAB sections are offered at your institution during a typical semester? Please enter a whole number rather than a range.

On average, how many students are enrolled in an average Anatomy and Physiology LAB section at your institution? Please enter a whole number rather than a range.

Do you use teaching assistants for Anatomy and Physiology instruction? If you select "yes", you will be redirected to remaining questions in the survey for individuals who use TAs. If you select "No ..." or "Other", you will be redirected to a remaining question for individuals who do not use TAs.

- Yes
- No, but I would like to do so.
- No and I do not wish to have TAs.
- No, but other colleagues in my department have TAs.
- Other

If you do not use teaching assistants, what is the reason? Select all that apply. After you submit your answer, you have finished the content questions and will be **automatically be redirected** to the end of the survey where you will find a link to enter the raffle for one of five Amazon gift cards, one for \$100 and four for \$50.

- I do not want to use TAs for instruction of my course(s)
- Budget/funding limitations
- FERPA concerns (i.e. there is concern about undergrads having access to the grades of other undergrads)
- University requires graduate students to be teaching assistants and undergraduates may not serve
- Perceived lack of quality TAs
- Time constraint/overload for faculty supervisor
- Other

How many years have you been using TAs? Please enter a whole number rather than a range. Please enter a whole number.

Your teaching assistants are:

- undergraduate students
- graduate students
- both undergraduate and graduate students
- Other

In which course format(s) do you use TAs? Select all that apply.

- face-to-face lecture
- hybrid lecture
- online lecture
- face-to-face lab
- hybrid lab
- online lab
- Other

How much course credit do your TAs receive per academic term?

- 0 credit hours
- 1 credit hour
- 2 credit hours
- 3 credit hours
- 4 credit hours
- Other

How are your TAs paid?

- They are not paid.
- Hourly wage.
- Fellowship (in the beginning/end of the semester)
- Other

TA/Student Ratio -- How many students is an individual TA responsible for teaching? If you have one TA for every 5 students, enter 5. Please enter a whole number rather than a range.

What is your hiring procedure? Select all that apply.

- application
- high grade in the course
- interview
- observations of positive behavior by the student when they were taking the course
- references
- Other

Do you have a formal training program for your TAs?

- yes, there is a formal course for training TAs
- yes, I train them myself (no course for TAs)
- no
- Other

If you have a formal training program, which of the elements below are part of your program? Mark all that apply.

- FERPA student data privacy issues
- Lab Safety
- Pedagogy
- Mentors and apprentices (experienced and novice TA structure)
- Students must complete a training course for academic credit
- Other

Do you feel that your students connect academically with your TAs?

- Always
- Most of the time
- About half the time
- Sometimes
- Never

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How do your TAs interact with students? Select all that apply.

- station work
- help the lead lab instructor during the lab whenever students need help
- staff open lab times
- tutoring sessions
- conduct practice lab practicals
- Other

What assessment related responsibilities do your TAs have? Select all that apply.

- writing lab quizzes
- grading quizzes
- writing exams or parts of exams
- grading exams or parts of exams
- writing lab practicals
- grading lab practicals
- entering grades in a learning management system gradebook
- no grading is done by my TAs
- Other

If your TAs do grading, what types of questions? Select all that apply.

- multiple choice
- short answer
- labeling
- short essay
- skills assessment
- my TAs do not do grading of any kind
- Other

How autonomous are your TAs?

- TAs assist alongside lab instructors (or additional TAs) who are always in the room
- TAs teach without an instructor in the room
- Other

What other types of responsibilities do your TAs have? Select all that apply. Upon submission of your response, you will be **automatically redirected** to the end of the survey where you will find a link to enter the raffle for one of five Amazon gift cards, one for \$100 and four for \$50.

- set up lab
- prepare chemical reagents (ex. measuring involved)
- clean up lab
- guide students through active learning exercises in lecture
- running errands (ex. pick up supplies at stockroom or local store)
- none of these are done by my TAs
- Other

