JAVTE

JOURNAL OF THE ASSOCIATION OF VETERINARY TECHNICIAN EDUCATORS

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Journal of the Association of Veterinary Technician Educators (JAVTE)

The Journal of the Association of Veterinary Technician Educators (JAVTE), a peer-reviewed, scholarly journal, is the official publication of the Association of Veterinary Technician Educators (AVTE). Its purpose is to act as a publication for disseminating evidence-based research to people working as educators in the field of veterinary technology. The journal's emphasis is on encouraging collaboration among veterinary technology educators through scholarly inquiry relating to the understanding and/or improvement of educational processes and outcomes, organizational issues in education, concepts of teaching and learning, and student engagement based upon research, observations, and experience relevant to the field.

Submission Process and Deadlines
Papers will be reviewed using the JAVTE double-blind peer-review process and should be prepared using the JAVTE author guidelines (see Editorial Policies and Peer Review Process). Submission of papers is the author's acknowledgment of and agreement to JAVTE's ethical duties of the author policy.

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Letter from the President of the Association of Veterinary Technician Educators

Jennifer Serling, CVT, RVT, BVSc, AAS
AVTE President

I am so excited to be welcoming you all to the 2023 Conference. For me, it is just an amazing time of fellowship, learning, and recharging for the upcoming semester. It is truly what drives me for the remainder of the year. This year we are definitely shaking things up a bit after receiving feedback from you all as to what YOU wanted to experience during the conference. I hope that your experiences at the conference are just as rewarding. Please come introduce yourself and say hi as I love meeting new colleagues!!!

There are many new things on the horizon for AVTE. At this conference, we are hosting the first-ever stakeholders meeting prior to the conference to discuss pertinent matters relating to veterinary technology education with several associations such as AAVMC and NAVTA just to name a couple. More on that outcome in the future!!! We are continuing to record our podcast and are always looking for guests if you have an idea to share please let me know!! We will also be launching our well-being initiative at the conference which was developed from feedback from the recent survey many of you completed.

I would like to take the opportunity to thank Laurie Lobdell for an amazing job as our treasurer. Laurie and her husband recently welcomed a beautiful new grandson and are enjoying this new phase in life. With that unplanned vacancy, we appointed Dr. Stacey Benton from the board to fill this position and she will do a fantastic job!!! We also look forward to welcoming new directors to the board at the conference!

I sound like a broken record because I always say this, but this association exists because of its members and we can't function without the hard work of many, many volunteers. I encourage you to get involved. There are several opportunities to serve AVTE that don't require a huge time suck. It's really a great way to give back. 😊

I look forward to one more year as president before handing over the reins to Trish Gorham. I am always here for any suggestions or questions you might have, so please feel free to reach out to me!! My email is president@avte.net

Teaching Tips & Tricks

Ten Tips to Rock Your Externships!
Maranda Carter, RVT
WSU Tech

The AVMA requires that an accredited veterinary technology program includes "practical veterinary experience". This extremely valuable experience is usually termed an externship, internship, or practicum, etc. These externships should be a minimum of 240 hours. Many programs have students complete the hours between two different sites. While at externships, students can expect to gain hands-on clinical experience while working to complete their Essential and Recommended Skills List. For some students, this is the first time they have ever been in the back of a veterinary clinic and it can be nerve wrecking for many students to come into a completely new environment with an already established hierarchy and culture. The following are my tips for not only surviving your externship(s), but making the most out of them.

1. Treat it like a real job.
While many externships are unpaid; you should still treat your experience like a real job. That includes your personal appearance and professionalism. Make sure you are ON TIME. Showcase your work ethic by not sitting around during slower time. Stay off your phone. You might not be a "real employee" (yet), but you should be acting like one in many ways.

2. Be teachable
This one is HUGE and I have seen it first hand in many students. If you come across as a "know it all", people can often shut down to helping you or teaching you anything they know. Remember that everyone knows something you don't. Likewise, if you come across as overly sensitive or standoffish every time you get feedback or instruction.. In either scenario, you will miss out. I would also avoid discussions about title protection and any sense of superiority to assistants or OTJ technicians. You will make enemies doing this and miss out.

3. Stay busy!
This one goes along with treating it like a real job. This is a great handout that has so many things that can be done during downtime, and it may give you ideas on things you can do when you feel like you are just standing there. You can also always ask your supervisor or other staff what you can best do to help them get caught up or knock out. Definitely be sure you know where the cleaning supplies are and how and where to run laundry. I am an RVT, and I still clean. No one is above cleaning. https://www.dvm360.com/view/veterinary-team-handout-things-do-down-time

4. Ask questions
You will learn more if you ask questions, simple. Just try to be mindful about certain questions in front of clients, if someone is really concentrating on a given task, or during an active emergency, it might be more appropriate to save the question for later.

5. Remember that sometimes, textbook =/= real life
I was always told "there is a thousand ways to skin a cat", which may be the most gruesome saying ever, but different hospitals and clinicians are going to do similar things completely differently, and sometimes there are many "right" ways to do something. Do not quote the textbook and tell someone they are doing something wrong. Along with this, "not every dog reads the book", sometimes the animal is not going to follow whatever criteria we might expect based on literature. The animals do not care about what literature says.

6. Be confident!
I know it can be scary but you got this! Be yourself, many people who come into veterinary medicine are like minded individuals (for the most part), be kind, and keep these tips in mind and you should do great!

7. Burnout prevention, from day 1
Almost every single person I know who has experienced feelings of burnout and either had to take a break from the field or completely left veterinary medicine didn't feel like burn out was going to affect them. I have experienced burnout myself, you will likely experience it too. To combat this, learn about burnout and burnout prevention strategies from the get go. There is so much out there on this. Prevention is going to look different for different people. To take care of these animals, we have to be taking care of ourselves.

8. Take notes & bring resources
Bring a little notebook that fits in your scrub top pocket, theres are pocket books like Mosby's PDQ that can be found on Amazon and other retailers. Taking notes while someone is going over a task with you, like how to run bloodwork on the machines they have. Doing this will also show that person/team that you really care and want to learn. No one should have to go over the relatively simple concepts

with you several times, so if you find you keep having to ask someone how to do something, WRITE IT DOWN. Step by step.

9. Not everyone is going to be your best friend
There will be people and clinics you just don't jive or fit with. And that's okay. There are some toxic cultures in this industry (and in all industries). If someone doesn't like you, don't take it personal. You can also help be the change for a more positive clinic culture. If YOU don't like someone, so what? Play nice and work as a team regardless. Be respectful of differences. Don't gossip.

10. Ultimately your success is up to you, not your site
This experience is what you make of it. If you feel like you aren't getting to do or learn anything, try to ask "hey, can I do xyz on a pet during their dental?" etc. There will be many situations where it is not feasible or logical for you to "practice", but if you just sit around on your phone, no one is going to even ask you for help or if you want to learn or practice a skill.

Self-Graded Assignments
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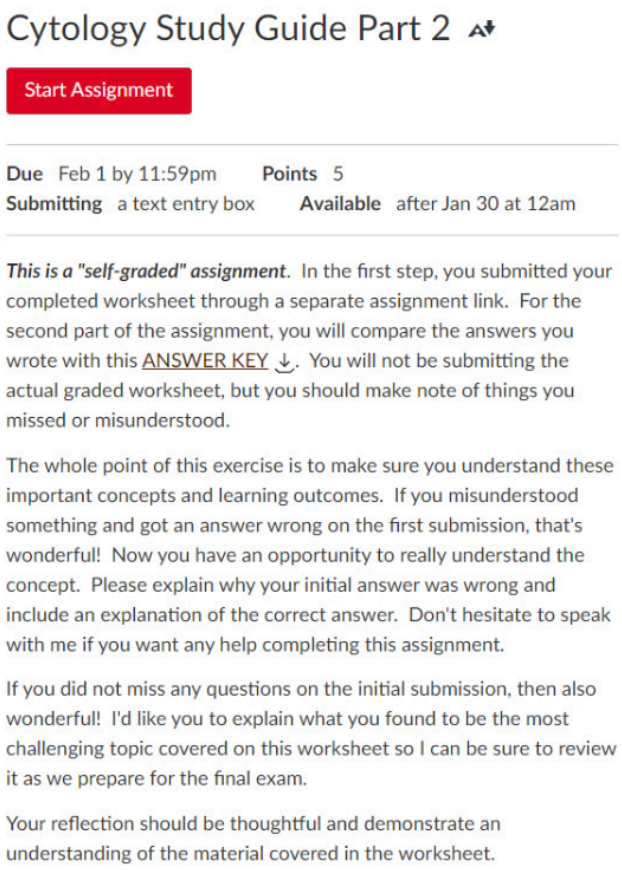
I use self-graded assignments in my lab procedures courses. Students complete study-guide worksheets throughout the three semester course series that are designed to help them organize the material, make connections to the learning outcomes, and apply new knowledge to clinical situations. Historically, I provided extensive feedback that was largely ignored. Students would repeat their mistakes on exams and admit afterwards that they did not review my feedback. To remedy this missed learning opportunity, I introduced self-graded assignments that require students to provide their own feedback.

The assignments consist of two parts. In part one, students complete the study guide and receive full points if it's filled out completely. I post an answer key in part two, and students compare their answers to mine. This provides a second opportunity to review the concepts in the study guide, but the real value of these self-graded assignments comes from the required reflection. Any misunderstood concepts are identified, and students must demonstrate comprehension in their reflection. If the study guide was completed correctly, students must share the concepts they found most challenging, which helps me identify topics to revisit with the entire class. Overall feedback has been quite positive with students commenting that they developed a deeper understanding of the material and its clinical application; "I did enjoy this assignment in the sense it really made me think about our new material and how to apply the material to situations presented. The clinical application practice is greatly appreciated because that is what all of this is about and what it is we are supposed to be doing for our patients: helping them get better."

An example of a self-graded assignment.



Cytology Study Guide Part 2

Start Assignment

Due Feb 1 by 11:59pm **Points** 5
Submitting a text entry box **Available** after Jan 30 at 12am

This is a "self-graded" assignment. In the first step, you submitted your completed worksheet through a separate assignment link. For the second part of the assignment, you will compare the answers you wrote with this ANSWER KEY. You will not be submitting the actual graded worksheet, but you should make note of things you missed or misunderstood.

The whole point of this exercise is to make sure you understand these important concepts and learning outcomes. If you misunderstood something and got an answer wrong on the first submission, that's wonderful! Now you have an opportunity to really understand the concept. Please explain why your initial answer was wrong and include an explanation of the correct answer. Don't hesitate to speak with me if you want any help completing this assignment.

If you did not miss any questions on the initial submission, then also wonderful! I'd like you to explain what you found to be the most challenging topic covered on this worksheet so I can be sure to review it as we prepare for the final exam.

Your reflection should be thoughtful and demonstrate an understanding of the material covered in the worksheet.

Book Review:
Lavin's Radiography for Veterinary Technicians, 7th Edition
By Marg Brown and Lois Brown

Review by **Clint Avry**, DVM, The University of Tennessee at Martin

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The book is well organized and covers all the necessary diagnostic imaging and radiographic positioning topics. Learning objectives are laid out at the beginning of each chapter which is useful for instructors when dealing with assessment. The chapters are full of images and illustrations to help the reader better understand what is being discussed. Application tips are included to show how the information is useful for real-world situations.

This book has individual chapters dedicated to the various forms of specialized imaging. In some other books, these are grouped together in one chapter or a short section with very little explanation given. Considering how little film is used now and how many clinics are incorporating these other forms of imaging this is a better approach to prepare future technicians.

The chapters on radiographic positioning, dental, and special procedures are very well done. For many positions three different images are included to help the student understand the view and how to position the animal. These include an illustration showing the anatomy, a picture of a real animal properly positioned with the use of positioning aids, and a radiograph of the desired view. This is a superior layout compared to other books and include the correct views and collimation borders which cannot be said for other texts. The special procedures chapter provides detailed instructions on how to carry out each contrast procedure. These chapters give this book a lot of value not just for teaching but as something students can reference later in their career.
The book comes with digital resources that can be incorporated into learning management software. The instructor resources include images, PowerPoint slides, a test bank, and an answer key to the chapter review questions. The PowerPoint slides are just text arranged in bullet points with no images so be prepared to do some work to make them lecture ready. The student resources are mostly radiographic anatomy overviews.

Despite this being a quality text there are areas to be improved. The chapters sometimes contain background or historical information that could probably be omitted. At times, the text is overly repetitive and becomes confusing by restating statistics or concepts in different ways than originally given. Most of the review questions are helpful but there are some that are difficult to understand or do not have the correct answers. An instructor should work through these before assigning them to students.

This textbook is outstanding for students especially those who like a lot of visuals. It covers topics thoroughly and leaves readers with a much better understanding instead of more questions. It is essential for helping students grasp the concepts of diagnostic imaging required for successfully passing the board exam.

One Health and Veterinary Technology Education

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INTRODUCTION

The One Health framework centers on the connection between humans, animals, and the environment, and emphasizes the need for interdisciplinary collaboration (Gyles 2016). While considerable gains have been made in regards to developing One Health competencies and establishing career trajectories for Doctors of Veterinary Medicine (DVMs), little has been done to formally integrate One Health education into veterinary technology programs (Hoque et al. 2022). Credentialed Veterinary Technicians (CVTs) are graduates of American Veterinary Medical Association (AVMA) or Canadian Veterinary Medical Association (CVMA) accredited programs in veterinary technology, and are essential members of the veterinary healthcare team.

The identification of existing and emerging One Health educational opportunities for CVTs could have a variety of benefits. Integrating One Health into veterinary technology education capitalizes on the critical link between CVTs and patients. CVTs often spend more time interacting with animals and their owners/ caretakers than veterinarians. CVTs with demonstrable knowledge, skills, and abilities (i.e., competencies) in One Health might also have enhanced opportunities to pursue work outside of a traditional veterinary practice. Additionally, enhanced educational pathways may lessen the burdens of burnout and turnover, allowing for the development of an established, satisfied, and highly-skilled workforce (Fults et al. 2021).

There is a paucity of research that considers the potential that One Health has to expand the scope and direction of veterinary technology education and career pathways. The purpose of this study was to learn how CVTs are contributing to various aspects of One Health, and what specific educational opportunities may need to be created for existing and emerging professional competencies and career paths for CVTs related to One Health.

MATERIALS AND METHODS

A survey was sent via a convenience sampling method in July 2022 using Qualtrics. The survey was sent to a population of veterinary medical professionals using listservs, email, and social media. The targeted populations in this convenience sampling method included veterinary medical educators (both in DVM and Veterinary Technology education programs), veterinarians and veterinary technicians working in private clinical practice, veterinary technology students, members of national veterinary technology organizations, and members of national veterinary medical academic organizations. The study was evaluated and considered to be exempt for human subjects research from the Appalachian State University Institutional Review Board (IRB) #: HS-22-53.

RESULTS

A majority of respondents (111/170, or 65.3%) indicated that their role on the veterinary healthcare team was a CVT. The remainder consisted of veterinarians (41/170, or 24.1%), veterinary assistants (7/170, or 4.12%) and other (11/170, or 6.5%). Most respondents were employed in either companion animal exclusive practice (64/167, or 38.32%) or academia (78/ 167, or 46.7%). Roughly two-thirds of respondents had been employed in the field of veterinary medicine for over ten years (107/167, or 64%). A majority of respondents who reported that they held a degree in Veterinary Technology held an AAS degree (95/114, or 83.3%) compared to respondents holding a BS degree (19/119, or 16%).

Understanding of One Health within this survey was determined through the: 1) presence of the terms “human(s),” “animal(s),” and “planet” or “environment,” either separately or concurrently within a participants’ written response, and 2) acknowledgment of the interconnectedness of these factors.

Generally, respondents with a higher education tended to have a higher understanding of One Health. Respondents with an Associate’s degree demonstrated a lack of overall and/or specific knowledge about the definition of One Health - either entirely unsure, or lacking one or more of the components. Respondents with an educational background

outside of veterinary medicine also demonstrated a lack of knowledge. There was a significant difference in understanding between those holding a technical degree versus those with a graduate degree, even when the graduate degree was not related to Veterinary Medicine. Respondents holding a Bachelor's degree in Veterinary Technology had a significantly higher understanding of One Health than those with an Associate's degree.

CVT respondents were asked to select what, if any, courses related to various aspects of One Health were offered through the Veterinary Technology program that they attended. Courses related to animal health, such as Lab Animal/Research, Exotics/Wildlife, and Herd Health were among the most frequently reported. Courses on the Human-Animal Bond were also highly reported, although at a lesser frequency. Respondents also reported course offerings in Public Health and Epidemiology, although it was not possible to determine participants' enrollment in any of these courses during their education. Fewer respondents reported course offerings on Environmental/Ecosystem Health and Conservation Medicine. Overall, the results indicated that respondents did not believe that current Veterinary Technology programs were adequate in preparing graduates for professional competencies and/or career paths in One Health.

Respondents were then asked to identify how CVTs might be contributing to One Health through an open response. Thematic analysis of this qualitative data emphasized the role of CVTs as public educators, the importance of specific job functions (including laboratory testing, providing medical care, and creating treatment plans) and the potential for collaborative work within or outside of a traditional veterinary practice (i.e., in disease control, emergency preparedness, commercial animal production, etc.). Several respondents indicated the importance of increasing awareness of One Health and its connection to veterinary medicine within the field and beyond. Many respondents indicated the need for increased education on One Health, either through expanding program coursework or developing specific degree programs at the undergraduate level. A number of respondents indicated a desire for increased clinical and research opportunities within One Health. Respondents also emphasized the importance of developing career pathways for CVTs, including opportunities related to Veterinary Social Work.

DISCUSSION

Currently, there are significant gaps in the literature dedicated to the intersection of CVTs, veterinary technology education, and One Health. However, the need and desire for increased education and career opportunities for CVTs is clear. It is critical for veterinary medical education and the veterinary profession to continue to find ways to optimize the expertise of CVTs to meet current workforce and access to care demands, including researching existing and emerging One Health career pathways and developing opportunities for specialized One Health education and training.

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TABLES ON FOLLOWING PAGE.

TABLES: ONE HEALTH AND VETERINARY TECHNOLOGY EDUCATION (QUALITATIVE DATA)

Q7: How would you define One Health as it relates to veterinary medicine?	
Theme: Human, Animal, and Planet	"A global concept that incorporates many arms of public health including veterinary medicine, with a core foundation that the health of people, animals and the planet are interconnected." "Involving human and veterinary medicine as to how they are reliant on each other for environmental, public, [and] mental health for all." "One Health encompasses all aspects of health across humans, animals, and ecosystems that affect each other. Within veterinary medicine, One Health includes the whole family for companion animals, the environments (both indoor and outdoor) that impact animals, and disease concerns that go between humans and animals."

Q9: What contributions do you think that the veterinary technology profession can make in One Health?	
Role of CVTs as public educators	"They [CVTs] can be helpful messengers about the whole [...] health approach and how much is inter-connected. In addition to highlighting disease concerns, technicians can speak to [the] human-animal bond, environmental concerns and toxicants, and how to advise veterinarians on better sustainable approaches." "[CVTs] communicate directly with the clients all the time, so they need to have the same training in public health as veterinarians." "I think education to the general public about zoonotic diseases, exposure to wildlife, and that the health of pet[s] can be extended are crucial. Your dog can give you Lyme [disease], and Leptospirosis [...] Educating parents of small children about behavior and hygiene when cats and dog[s] are in their homes could save lives." "Veterinary technicians and office staff spend so much more time face to face with clients and the public than veterinarians do. This facilitates a huge opportunity for them to actively promote and educate others on One Health topics. Veterinary Technology is also critical to the roles of research and is an often overlooked area of veterinary and public health medicine."
Utilization of clinical skills	"[CVTs can perform] laboratory tests like [urinalysis], decals, [and] cytology." "We [CVTs] are the on the ground workers [of veterinary medicine] in many instances. Veterinary nurses are the ones completing the tasks planned by veterinarians and oftentimes we are initiating or suggesting the best plan of action."
Expanding work settings and roles	"[CVTs could] provide knowledge through education [on] zoonotic diseases and prevention of those diseases as well as being utilized in safety for food and production animals both on the animal side for humane treatment and on the human consumption to make sure that the animals are of high quality." "Global awareness and service work— zoonotic illnesses and community health. We also need to do a better job of educating about career options. [Veterinary Technology] education is still highly skewed towards private practice." "Conservation of all species, including human, improving herd health, [and] to a limited extent, preservation of the natural environment." "It is important for us as veterinary technicians to be available to increase our knowledge of how veterinary medicine impacts the world that we live in. Degrees for veterinary technicians in public health could help with educating technicians."

Creating A Classroom That Fosters Self-Efficacy

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Self-efficacy theory was introduced by Bandura in 1977 and is the self-belief or personal judgment in a student's capabilities to fulfill a future performance based on past performances.[1] In the educational context, students' perceived self-efficacy is believed to influence the choice of tasks, the level of task performance, the amount of effort put into performing chosen tasks, and how they will persevere to complete the task.[4] Self-efficacy is a vital part of whether or not a student will accomplish their goals, and the students' self-efficacy and classroom engagement contribute to their academic success.[2] Study findings show that autonomous motivation enhances intellectual and peer engagement, which interacts positively with a student's self-efficacy; since engagement is stressful for most students, providing opportunities and resources to help students improve in this area is crucial to student success.[3] The isolation of the pandemic has contributed to this issue, and we as teachers need to find ways to help students work collaboratively and engage with classmates in face-to-face instruction. The instructor's involvement is a critical factor in students' success and allows the students to gain the self-efficacy needed to complete the required tasks and be successful.

What can educators do to promote self-efficacy in our students? Surprisingly small things can make a big difference in our student's success. Instructors can start by learning their names and one small piece of information about each student. Something as simple as the number of siblings they have, or their favorite food or candy can have a lasting effect on a student. Studies have shown that getting to know students better creates more supportive instructors and fosters motivation and achievement in all areas of learning.[4]

Instructors can ensure that students have clear expectations and guidelines to complete tasks and skills. Ensuring that students are given clear, explicit, and detailed instructions and given guidance throughout the lessons can give students the support they need.[4] Rue has pointed out that with all of the information surrounding students, they "operate with filters going constantly—Do I need to know this? Does it affect me? Why should I care?".[5] Pointing out to students how this will affect their daily lives in the future and why it is essential to learn can help them retain the information and appreciate its relevance.

Providing positive and constructive feedback is another way to help support our students. Giving feedback such as, "you did great on this task because..., and I'm sure you will do great on the next one", provides them with the emotional support needed to help them succeed. Even offering students the opportunity to see another classmate succeed on a task can positively affect their belief that they can also complete the task.[3] Knowing that others have completed the task successfully can be very motivating and provides them an opportunity to receive positive motivation from their classmates. Creating a positive classroom environment where students help build one another up is vitally important to a sense of teamwork and engagement.

By forming solid and stable professional relationships with our students, we show them we commit to their learning. Studies suggest that involvement by showing interest, showing empathy, modeling proper behaviors, promoting pro-social classroom activities, and being available to students supports engagement and self-efficacy.[4] Instructors can create a learning environment within any course that shows passion for the subject, creates a shared vision, is rigorous, and by being a positive role model, being respectful, empathetic, and encouraging with students.[2] Creating meaningful and focused activities and providing opportunities for growth in the classroom can also benefit a student's sense of self-efficacy in a laboratory setting. As educators, we must provide our students with opportunities to improve their sense of self-efficacy, offer support, and let them know that we are there to help them and are interested in their education and success.

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The Value of Teaching Veterinary Technology Students How to Leverage Their Skills for Profit & Higher Quality, Safer Care in Practice

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CURRENT ISSUES

Optimal utilization of veterinary technicians to enhance patient care and increase efficiency and profitability of clinical practice is a topic currently discussed and written about in a variety of formats and platforms. A simple Google search of the terms 'veterinary technician utilization' alone yields over a million results. Understanding what it means to 'optimize the utilization of veterinary technicians' is necessary to address dynamics in a veterinary practice that support veterinary technician use and job satisfaction and increase clinic profitability while continually improving patient care and the safety and culture of the practice. Building within veterinary leadership a thorough understanding of what veterinary technicians are trained to do and how to effectively leverage that scope of duty, could drive a more profitable, sustainable, and innovative veterinary practice model.

Too many states still do not officially recognize the value of credentialed veterinary technicians with 31 states currently offering no title protection. State associations in those states are expending tremendous efforts to get past this very basic hurdle that has been overcome by our human counterparts. For example, a registered nurse in every state in the union is called a registered nurse, while veterinary technicians are recognized by a variety of titles that vary from state to state. A licensed veterinary technician in Maine who transfers their credential to Massachusetts becomes a certified veterinary technician, and if they move to another state, they may find themselves with the title of registered or certified veterinary technician. To end title confusion the single title of registered veterinary nurse (RVN) was presented through the Veterinary Nurse Initiative (VNI) put forth by the National Association of Veterinary Technicians of America (NAVTA). While several states were chosen to serve as pilot states, the initiative was unsuccessful primarily due to roadblocks from the human nursing industry who objected to sharing the title of nurse. While state nursing associations claim the term 'nurse' specifically refers to care of humans, it is worth noting that in the UK and Australia, as well as other countries globally, veterinary technicians are referred to as veterinary nurses (Wuest, 2019). Another factor that contributed to the failure of the VNI was that there is a contingency of veterinary technicians who do not feel this was a good use of the NAVTA's resources.

Current shortages of veterinary team members challenge the primary goal of veterinary medicine to provide access to care for clients and their pets. Job satisfaction for veterinary technicians is a major factor that can cause qualified employees to leave the profession. A primary driver for improving job satisfaction for veterinary technicians is their optimal utilization. Once a candidate for a veterinary technician position completes their educational process, it can be discouraging to find themselves working in a practice where they are primarily functioning as a receptionist, kennel attendant, or in general facing no opportunity to engage with the higher level, technical skills they worked to learn and planned to perform. This leads to a dynamic that can result in unsatisfied employees, toxic team environments, and high turnover rates.

Conversations about how to address shortages of qualified veterinary team members have led to informative, yet often heated, discussions about creating a 'mid-level' position modeled after the nurse practitioner in human medicine. Lincoln Memorial University created a master's degree in Veterinary Clinical Care which could potentially prepare veterinary technicians for this new level position. This model would also address the concern of many highly accomplished veterinary technicians that there are no opportunities for advancement within the profession (Wogan, 2021). The main concern with this proposal is whether the industry can support and utilize a new 'mid-level' position while optimizing the use of the veterinary technician position in current practice dynamics. But while this concept, like the Veterinary Nurse Initiative, both address concerns that are important to the industry and will improve access to care and an

understanding of the veterinary technician's role, it is difficult to imagine this forward movement happening before there is a shared, clear understanding of what veterinary technicians are currently trained to do.

Full recognition and implementation of veterinary technician skills is a critical step in retaining current credentialed veterinary technicians and attracting others to the industry to fill the shortage. Securing title protection in all 50 states and making sure that veterinary leadership, including veterinarians and practice managers, understand how credentialed veterinary technician skills can be used to support optimal flow, efficiency, and quality of care in the veterinary practice is the first step in achieving this goal. For the betterment of the veterinary profession, it is imperative to educate veterinary employers about the skill set veterinary technicians have and what they can legally perform in a clinical setting to ensure their full engagement in providing optimal patient care and improving the veterinary culture within their working environment.

THE EDUCATION OF VETERINARY TECHNICIANS

The AVMA established and maintains oversight groups for the educational requirements for both veterinarians and veterinary technicians. These groups include the Council on Education (COE) who defines veterinary medical educational requirements, and the Committee on Veterinary Technician Education and Activities (CVTEA) who defines veterinary technician educational requirements (AVMA, 2023). CVTEA has been accrediting veterinary technology programs for over 50 years providing Standards of accreditation that oversee multiple facets of the educational process to help educational institutions produce entry-level graduates.
While the COE curriculum Standards appear to be rather general, the CVTEA Standards for curriculum are very specific and useful in creating job descriptions, workflows, and how to optimize the profitability of task assignment. As veterinary technology instructors know, a thorough list of what the AVMA's CVTEA considers to be the 'Essential Skills', the skills veterinary technician graduates must successfully complete prior to graduation can be found on the AVMA's website located at:
https://www.avma.org/education/center-for-veterinary-accreditation/committee-veterinary-technician-education-activities/cvtea-accreditation-policies-and-procedures-appendix-h

In addition to learning and performing the required essential skills, veterinary technicians develop decision-making skills in these areas. For example, in the husbandry task of patient care (in the nursing category) the veterinary technician will implement appropriate husbandry techniques to enhance wellness and reduce risk of disease, injury, and stress when given the characteristics of the patient. The decision-making skills veterinary technician students learn make them valuable members of the veterinary team.

In order to assure that veterinary technicians can participate fully in the job that they have been trained to do, and for practices to benefit from those skills, it is necessary to make certain that those involved in the management of veterinary practice teams are fully aware of what is included in that curricula. There are several ways that this information can and should be brought to the attention of practice owners and managers. National organizations such as the AVMA, with oversight groups for both veterinary and veterinary technician education, can provide their members and with state veterinary medical associations links to educational requirements. State veterinary medical associations should also regularly provide information about what it means to fully utilize the skills of veterinary technicians including sharing links to the AVMA CVTEA essential skills, Appendix H, as shared above. In veterinary medical educational programs, clear information about CVTEA requirements and full utilization of veterinary technicians should be made a part of the curriculum. Veterinary practice managers should receive training in this area upon hiring. These efforts should be formalized so that the understanding of what veterinary technicians can do becomes more commonly understood. Additionally, all professional organizations should engage in the sharing of business models that make full utilization of veterinary technician skills an integral part of the structure for building a profitable menu of services and for improving the ability for all practices to provide high quality care for animal patients.

CURRENT EDUCATION

Veterinary technician educational programs are developed and maintained by hiring and retaining qualified faculty and creating curricula that meet benchmarks set forth by organizations within the profession. Veterinary technician educators, similar to those engaged in preparing human healthcare workers, want to prepare their graduates with the knowledge, skills, and attitudes necessary to pass certification examinations and be successful entry-level veterinary technicians. To meet these goals, faculty develop curricula taught in content-specific, sequential didactic and laboratory courses and clinical rotations to document that students have completed the required skills and acquired the knowledge needed as determined by regulatory authorities.

The challenge for students in veterinary technology programs is to complete the academic and skills-based competencies the CVTEA determine to be required skills. Accredited veterinary technology programs are commonly found in community colleges packaged as associate degrees, with ever-increasing pressure from state legislators to minimize credit requirements and length of program. The State of Maine and Texas public institutions, for example, require that associate degree programs require no more than 60 credits making the development of programs that cover all of the CVTEA required skills in that framework challenging. Accredited veterinary technology programs also commonly

have grade point average requirements making them academically challenging. Graduates of these programs must then prepare for and pass the Veterinary Technician National Exam (VTNE), a rigorous test administered by American Association of Veterinary State Boards (AAVSB). Upon successful completion of the VTNE, they then apply for a license, certification, or registration with the relevant agency or organization in their state (Editor, 2021).

TO CURRENT EDUCATION TO ADVANCE THE ROLE OF VETERINARY TECHNICIANS IN CLINICAL PRACTICE MODIFICATIONS

To support veterinary technician use and in turn increase their level of job satisfaction it is important to integrate them and their expertise in practice improvement initiatives. Integrating the skills and knowledge of veterinary technicians into important decision-making aspects of the practice's animal care and managerial policies will fully utilize the education veterinary technicians complete. One goal of certified veterinary technicians working in clinical practice is to be successful professionals that strive to continuously improve the quality and safety of the profession in which they work. In order for veterinary technicians to focus on quality and safety improvements, they must learn how to move from the application of competencies that apply to only individual patients to system-wide improvement of the quality and safety of veterinary care. Transforming instruction of human healthcare workers to strengthen academic and clinical knowledge while reducing preventable harm began with a 2003 Institute of Medicine (IOM) report that emphasized the need to redesign care systems to improve patient outcomes in the complex healthcare environment (Dolansky and Moore, 2013). In 2005 Quality and Safety Education for Nurses (QSEN) was designed as a national movement to help nurses understand why and how they deliver nursing care, so they can ensure safe, high-quality care. QSEN defined six competencies are embedded in the standards for nursing schools in the United States and nurses must achieve to be able to lead and transform practice to improve patient care quality and safety (Hunt, 2012). Using QSEN as a template for improving safe, high-quality care in the veterinary field, educators can incorporate the six nursing competencies to supplement their existing ones. The six competencies for nurses and suggested use in veterinary technician education are listed in Table 1.

Adjusting curricula to address how certified veterinary technicians can positively affect their work environment and workplace culture validates the addition of QSEN-like competencies to existing veterinary technician programs. The integration of QSEN-like competencies into a veterinary technician curriculum can be challenging; therefore, it is important to get instructor and program input and agreement about its value to both students and the profession. Successful integration of this initiative involves faculty education and training, core work on the concepts of the curriculum, and institutional support. Collaboration with clinical staff (practicing veterinarians, veterinary technicians, and other veterinary team staff), and advisory board members will help obtain current, relevant content to incorporate into the curricula as well as educating clinical stakeholders about the skills veterinary technicians are trained to perform. The successful implementation of curriculum that addresses both individual patient care and veterinary systems benefits the veterinary profession because it educates veterinary technicians about how the practice of veterinary medicine can improve based on the input of all care members.

MOVING FORWARD

Veterinarians who optimally utilize veterinary technicians understand how this practice improves job satisfaction and impacts quality of patient care. Veterinary teams that are staffed according to an optimal efficiency model and use their team members according to their credential and training level, can provide the best opportunity for quality care for patients. When job duties are not clearly defined according to role and training, inefficiencies can occur that lead to confusion about what has or has not been done, who is expected to be monitoring patients, and how to schedule patient treatments in an efficient way, as well as many other potential problems. Veterinarians can be overwhelmed by trying to do their own job as well as determine what should be the job of veterinary technicians. Confusion in this regard can also lead to errors that impact patient well-being. Clear definition of team member roles according to credential and training allows veterinarians to function as the leader of the team, supported by veterinary technicians with their broad education in technical skills, who are then supported by their own team of veterinary assistants. Every person in this team structure plays a role that is critical for providing efficient and quality patient care. Only when a team is properly structured and defined can teams look forward to finding ways to provide an even higher quality of care for their patients. For the betterment of the veterinary profession, it is imperative to educate veterinary employers about the skill set veterinary technicians possess and what they can legally perform in a clinical setting to ensure their full engagement in providing optimal patient care and improving the veterinary culture within their working environment. Organizations and leaders within veterinary technician associations need to provide a focus on improving professional and public awareness of what they are educated to do before using limited resources that take away that focus to make big industry changes. The AVMA recently released a statement that rejected supporting the mid-level position for this reason (Larkin, 2023). The National Association of Veterinary Technicians in America (NAVTA) released a similar statement (2023). As the need for qualified veterinary technicians continues to increase, educators must produce qualified graduates who want to not only improve the quality and safety of the care they provide their patients but also the environment and culture in which they work.

TABLE 1: QSEN COMPETENCIES AND PROPOSED VETERINARY TECHNICIAN CURRICULUM EXAMPLES

Competency	Competency Description	Clinical Nursing Example	Proposed Veterinary Technician Curriculum Example
Patient-centered care	"involves including patients/ designees in all decisions and providing compassionate and coordinated care based on a patient's preferences, needs, and values" (Hunt, 2012).	Treating patients/clients/family members with respect, including them in healthcare decisions, and honoring their culture and values (Cronenwett, et al, 2007).	"Describe how client diversity (cultural, ethnic, economic, and social) and their values influence decision-making regarding veterinary care for their pets" or "Describe pain management techniques recognizing client values and culture."
Teamwork and collaboration	"relates to interdisciplinary collaboration and shared decision making among the healthcare team" (Hunt, 2012).	All care team members including the patient and family work effectively to foster open communication, mutual respect, and informed and shared decision-making to achieve quality patient care (Cronenwett, et al, 2007).	"Describe how the expertise of every veterinary team member adds value to the veterinary team to develop collegiality within a practice" or "Identify strategies for managing overlaps in veterinary team member roles."
Evidence based practice	"assures latest evidence guides practice interventions that also support patient values and preferences" (Hunt, 2012).	Delivering optimal health care by integrating best current evidence with clinical expertise and patient/ family preferences and values (Cronenwett, et al, 2007).	"Summarize an original, peer-reviewed research journal article related to the content of a specific course (i.e., pharmacology, behavior management, etc.) or clinical practice specialty" or "Identify reliable sources of scientific research and clinical practice guidelines."
Quality improvement	"applies a spirit of inquiry to question processes for best practices, measuring actual practice to compare with desired benchmarks, and implementing appropriate system improvements" (Hunt, 2012).	Uses data to monitor the outcomes of healthcare processes and design and test improvement methods to continuously improve the quality and safety of health care systems (Cronenwett, et al, 2007).	"Analyze the cause of a specific unintended event (i.e., hypothermia in a post-op patient, drug calculation error, etc.) to prevent its reoccurrence" or "Describe the importance of using a variety of measures when assessing quality of care."
Safety	"identifying and alleviating conditions and processes in the healthcare environment that contribute to preventable harm" (Hunt, 2012).	Minimizing risk of harm to patients and healthcare team members through system effectiveness and individual performance (Cronenwett, et al, 2007).	"Create a safety plan for a specific area of a veterinary facility" or "Describe strategies to improve safety in a veterinary facility."
Informatics	"participating in design and application of data and technology to support decision-making, data management, and information sharing and retrieval" (Hunt, 2012).	Use data and technology to communicate, manage knowledge, reduce error, and support decision making (Cronenwett, et al, 2007).	"Describe the importance of the role of veterinary team members in implementing electronic communication systems in clinical practice" or "Identify how the time needed for staff training is influenced by the type of technology used in a veterinary facility."

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Guiding Students to Become Comfortable a-ROUND the Veterinary Clinic

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While some students come to college with a good grasp of what happens in a veterinary clinic, many have no idea what happens daily in practice. Their experience is often limited to visits with their family pet or shadowing during a high school assignment. This means they have little understanding of working up a case from admit to discharge. Putting it all together can be a challenge at the undergraduate level, but after attending a session by Dr. Jennifer Folger on case-based learning, I decided to bridge the gap between what students are learning in the classroom and what occurs in a clinic by presenting weekly case rounds for students; at all levels; in our department.[1] I wondered to myself; would anyone show up for the first case?

BUILDING CASE ROUNDS

As we do in lecture, we start with the basics and work our way into more challenging aspects of veterinary science. Case one is easy and gets students familiar with the process. Attendance is 100% voluntary and I select a day and time when most students are available. Case rounds are not graded, and I declare the room a judgment-free zone, so students feel comfortable participating. I do offer students in my courses bonus points if they attend, but active participation is required for points. To my surprise attendance is excellent but does vary per session.

The goal of case rounds is for students to demonstrate their knowledge from patient check in to discharge. This includes using proper medical terminology, the SOAP format for medical records, and listing differential diagnoses. Students are tasked with suggesting tests and requesting materials needed to perform them, interpreting test results, formulating potential treatment plans, calculating medications, properly writing dispensing instructions, and providing recommendations for clients. The latter includes discharge instructions, recheck appointments and follow-up treatments. I guide them in their journey as they ask questions and I provide test results as they request them. The entire process is completed as one, judgment-free group and I remind them mistakes are part of learning.

UNCOVERING THE HISTORY

Cases focus on common clinical presentations and diseases. Although cases are prepared from start to finish, the students manage the flow. We start with the signalment and case history which includes either patient pictures or a video I find online. In the beginning, students must ask for each component of the signalment, and I supply the information as they ask for it. An unlimited number of history questions can be asked, and I creatively provide answers. If they miss key questions, I steer them toward necessary information until we complete the subjective portion of the SOAP.

EXPLORING THE FACTS

For the objective portion I require students to request exam findings and specific parameters to confirm they know what is necessary for a complete physical exam. As they ask, I provide all pertinent information. We discuss normal parameters and develop a list of abnormal findings for the patient, which may include additional pictures or videos to help students form a visual picture of what the patient is experiencing. The discussion leads to an accurate description using proper medical terminology of the clinical symptoms they see. Upon completion, we move to the assessment which seems to give students the most difficulty, but I find it an important step in completely understanding case rounds.

MAKING AN ASSESSMENT

Formulating rule outs for a case is challenging for experienced professionals, let alone novices. For the assessment, students list abnormalities from the exam using proper medical terminology. Then we brainstorm as a group the reasons for each abnormality. We work through each problem, highlighting any overlaps to a potential diagnosis. Students recommend tests and must explain what materials and supplies they need to run them, and they outline the steps to properly perform those tests.

Test results are presented next, including representations of actual radiographs, lab work, parasite screenings, in-house rapid tests, etc. needed for the case. Students work through the results describing normal versus abnormal, and what abnormal means for the patient. Next, we revisit our assessment and begin to rule things out. Ultimately, they declare the suspected or confirmed diagnosis. This is the most exciting part of case rounds as students often have an "aha moment" or there is a ripple of excitement when they get the diagnosis correct. After diagnosis declaration, a brief discussion of the pathogenesis and background information of the disease occurs.

FORMULATING A PLAN

Finally, it is time for a plan. Students recommend hospital treatments, calculate medications, discuss dispensing instructions, and recommendations for the owner including recheck appointments. An in-depth conversation takes place regarding the supplies needed and the actions for performing treatments. Potential complications and/or side effects are discussed for treatments and medications. Often, we have discussions about how to present pricing options to clients and different treatment plans based on what the client can afford. Before closing the case rounds, a prognosis is presented.

STUDENT FEEDBACK

Upon completion of the semester, I asked for student feedback. To date, all students who responded to the survey reported the sessions help their learning process and allow them to take what they are learning in courses and apply it to a clinical setting. A few comments from students about what they like most about case rounds include: "I loved the challenge of completing case rounds and being around like-minded people;"- "How the PowerPoints are laid out to where the students get to solve the puzzle;"- and "It gave me insight on the information I knew right off the top of my head and things I need to freshen up on." When asked to rate case rounds, students report an average rating of 4.86 out of 5 stars and 100% say they would attend case rounds next semester if they were offered. This positive feedback is encouraging and supports the need to continue case rounds into future semesters.

ACHIEVING BETTER STUDENT OUTCOMES

Overall, I have found a way to entice students to attend case rounds because they want to, not because they must. On average, rounds last approximately 50 minutes and while they can be time consuming to prepare, the outcomes for students have proven it is worth my effort. I have seen an improvement in students being able to successfully apply their knowledge during class and they have a better grasp of how clinical practice works. I have observed a significant improvement on SOAP assignments and students better understand how to properly write a SOAP and they use deductive reasoning to complete the assessment and plan. Working through a case from start to finish can be overwhelming but gaining practice in a no-consequence situation builds confidence and skills.

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Animal A & P FLIP

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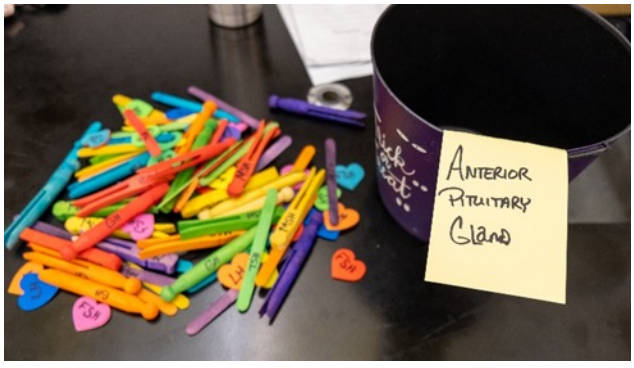
Another year of Animal Anatomy & Physiology has come and gone; sort of. I have had some new revelations from the fall semester and with some students being unready for college and being unsuccessful in their semester, I have the opportunity to do it all over again this spring semester, but I am not repeating everything exactly the same.

LET'S START WITH THE FALL SEMESTER

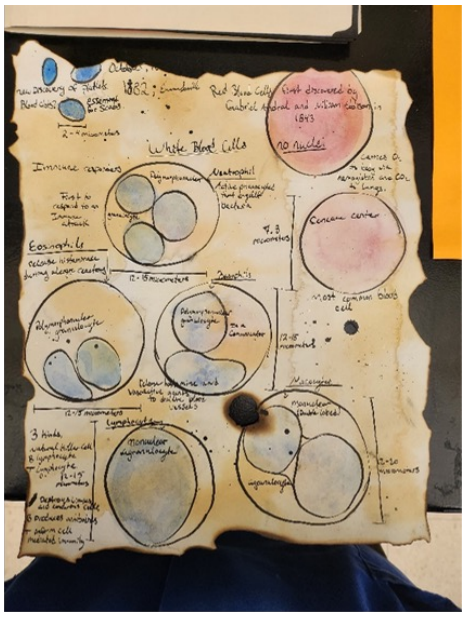
The fall semester I had some new ideas going on. I have an Endocrine Game that I was able to play and there were some great thoughts with that and a few bugs to work out. It is a relay type race and it was full of laughs as students are trying to figure out their hormones. One of the games I liked the best was the FSH, LH, Estrogen, Progesterone part. I had pre-filled balloons with glitter and a googly eye (progesterone). Students had to find the FSH on a foam heart (which is on the instructor table in a bucket (master gland) mixed with all the other hormones of the anterior pituitary gland) and present that "hormone" to the instructor; which is standing at the beginning of our lab benches. If it is correct, they proceed to the next instructor; if it is incorrect, they go back to the "Master Gland" and try to find it again. The correct student then is given a balloon that they must blow up to a correct size (stimulating the follicle to grow) and once done they are awarded "Estrogen token"; which is a foam paw with Estrogen written on it and they take that back to their bucket, which is with their partner at their lab station and then their partner then has to go to the "master gland" and find the luteinizing hormone and present that to the instructor at the beginning of the lab benches and if correct they pass and if not they go back to the "Master Gland" and try again. If correct, the student gets a wooden pick (like a tooth pick, but fancier) and they pop their balloon in a large container (trying to contain glitter and the googly eye from making a huge mess) where they must then find the googly eye (progesterone) and then go back to their bucket and place it in there. I will be adding a points section where I will make 1 to 10 points and stick them on a far wall. Once they complete the whole race then we will count out the points and then I will have a them go from 5 points to 1. I go over what the students need to do before they start. I like to give them a scenario and then they have to figure out the hormones they need. For example, the female dog is beginning to start her Estrous cycles and what hormone begins the process of the estrous cycle. Then once you find that hormone what does it do? What hormone is produced; they are supposed to ask for estrogen. Then after getting back to their station, what hormone is required next and what does that hormone do? The second student then goes and finds the correct hormone required and with that hormone they will release the egg and progesterone begins to be released.

Each of the different hormones has a different activity that is performed. Some of the hormones are not well related back and forth. For melatonin, I use tea bags and have students use a plastic spoon and pour warm water over the tea bag from a faucet back to their seat (the bowl stays at their station) onto the tea bag until it turns the water black and gets the "good" from an instructor and then they can collect points. In this scenario I tell students that the animal is being exposed to increased amounts of sun from it being spring/summer weather. What is potentially happening to their skin if they have these cells that react to the sun. What makes the cells react besides the sun?



Another project I worked on was a Blood Cell Poster project. Students could make a poster with the Blood cells any way

they would like and there were many different takes on it. I had one poster made with buttons, some used clay, some made small books, some made a comic strip, one made a mobile.



I continue to use the play-dough brain and had some very interesting results.

Play Dough Brains

2.0 pts	1.75 pts.	1.5 pts.	1.0 pts.	0.5 pts.	0.25 pts.	0	Student grade: Comments
Half brain has complete structures.	Half brain is almost complete (missing 1 piece)	Half brain is almost complete (missing 1 piece or in wrong spot)	Half brain is partially complete (missing 2 pieces or in wrong spots); brain is confusing to look for structures	Half brain is missing and/or in incorrect spots 3 pieces, but has a complete key	Brain is incomplete 3+ pieces missing	NO KEY to give direction of brain structures	
Key is complete and has all the structures present in the key and on the brain	Or Key is almost complete (missing 1 piece of information)	And/or Key is almost complete (missing 1 piece of information)	And/or Key is partially complete (missing 2 pieces of information)	Key is missing 3 pieces, but brain is complete or a mix of both to equal 3. Misspelled any words. Messy handwriting	Key is missing 3+ pieces of information and/or a mix of both key and brain missing more than 3 pieces	NO KEY	
Student thoroughly gives great details about the structures of the brain	Student gives very good information and is fairly detailed	Student gives good information on the brain and components	Student gives minimal information with a couple of examples at most.	Student has minimal information	Student gives no information about the structures of the brain	No information	
Brain resembles an animal brain			Brain has some resemblance to an animal brain	Slight resemblance to an animal brain	Brain does not resemble an animal brain	It's a human brain	
The brain is creatively designed; wowed me	It's an interesting brain	Moderate Amount of creativity	Average brain	Some creativity is used to develop the brain	Very little creativity is used in designing the brain	No creativity; slapped playdough on paper and said it was good	

SPRING SEMESTER

I am now teaching Animal A & P this spring semester, which we have not done in years. I know that students probably saved their labs from last semester and would consider reusing the same information that they had used last semester and I did not want to do that. I decided that I or my assistant was not going to label all the cadavers and skeletons this semester, I am making the students do it all. They are labeling/tagging everything. I have gone through the directional terms; skeleton systems and they are taping/labeling everything. I give them a list of items that they need to label. Students then use masking tape and either use a letter or a number and then place the tape on the area of the skeleton that the tape belongs, or where they think the tape belongs, and either myself or the instructional assistant look at what they have completed and then we sign off on the ones that are correct; if it is not correct then the student needs to go back and figure it out. When I first told the students what they were going to be doing in lab, they were not excited about it, but after doing it for the semester, the students are loving it! They are feeling more confident about themselves; it gives us time to go over what the student does not understand; and it also points out what they need to work on as well. I am considering trying this in the fall semester, but maybe with a little twist. I would have unlabeled pins put in the designated areas on cadavers so I do not have 130ish students all trying to put pins around a cadaver and potentially ruining them. Now that the semester is completed, I believe that we are going to try something different. We are going to try to use surgical staples and they will mark areas that we can have students place pins. We are going to see about getting some small alligator clips and those clips can attach to the staple and then students can place the pin in the end of the alligator clip that faces upward. This way, the body is not being poked multiple times by so many students. I know that it appears that everything will be already marked, but students will have to figure out the general area they need and then find the staple to do the attachment.

Other things that I did this semester was to have two additional lab tests in which I had already pinned cadavers and questions for students, but then they had a skeleton or a brain and eye and then had a list of ten items that they had to label themselves. They had tape or numbered pins in front of them and they took them and placed them on what area(s) that they felt were the correct area and then put that number or letter in the corresponding space on the sheet. When they completed the labeling, the student then left the sheet behind at the skeleton that they used. I did make several different sheets so that everyone in the lab had a different sheet so it would minimize the potential for cheating. An example is below:

Skeleton Labeling

Please use the tape provided to label the skeleton in front of you with the following list of bones and directional terms. You must attach the tape to appropriate site(s) and then write the letter/number on the blank line on this sheet for the instructor to refer back to for grading purposes.

Skeleton:	Letter/number	Correct:
Metacarpals	_____	_____
Tarsal	_____	_____
Digit V	_____	_____
Proximal phalanges	_____	_____
Maxilla	_____	_____
External Acoustic Meatus	_____	_____
Cervical vertebrae	_____	_____
Directional Terms:		
Rt. Lateral	_____	_____
Proximal	_____	_____

Students did have an extra credit project that they could do and that was to make an Endocrine Gland Poster. The poster was supposed to have information about Endocrine gland and

the hormones that are produced and where they go and what happens to that area that is affected by the hormones. They did well with that and it seemed to help some of them out with hormones and trying to learn them.

Lectures: I flipped that bad boy! There is so much information and not enough lecture time. Therefore, I voiced all of my PowerPoints and made them into movie media (through Microsoft Windows) and uploaded that to my YouTube account and uploaded the link into my course. I do lecture, but it just skims the surface and I tell students that they need to be going to the voiced YouTube videos to get all the information from there. The students that do go into the YouTube videos tend to do better in the class and on the tests than those that choose to not do that. I will throw in a Kahoot, even though they dropped the number of students that can play, the students enjoy racing to see who gets into the Kahoot. I have developed my own review PowerPoints that we use in lecture for review; kind of a Kahoot style. I made up letters on 8 X 10 sheets of paper and tried to fancy them up with glitter, fancy tape, colors, etc. (A, B, C, D). I use one slide to ask the question and give them the options (A-D); then on the next slide I will restate the question and then show the answer. I use a great deal of animation with this procedure so that the answer shows when I want it to. Students can work in small groups to come up with an answer and then they need to hold up a letter. I am the only one that sees the answer that they raise, so it is still kind of secretive. I then will show the answer once everyone has raised an answer and then we can go over the reason for that answer if need be; if people chose an incorrect answer, then I review it with them. Students liked this because it was a slower pace than the Kahoot and everyone can participate. I do explain answers during a Kahoot as well, but they thought that the "old school" method was kind of fun. We had a student find the Kahoot music and play that throughout the class and that made it fun as well.

My hope for Animal Anatomy and Physiology is to have it eventually become a two-semester course where I can break the information up. For now, the struggle is real for the instructor as well as with the student(s). I would love to say that the students that did retake the class in the spring semester all passed, but unfortunately not all did pass. The student(s) have to take it upon themselves to want to put the work in and take the opportunity to grow and ask questions. As instructors we can only do so much and I tried to work on presenting the information differently, but students have that option as to whether they want to study for the tests and do the quizzes. What I can say is that the students that did fail in the fall semester all had about a 20-point increase in their overall grades when they retook the class in the spring. I saw the growth and a better understanding of the material and in that I feel good about the changes and I do plan on implementing them in the fall semester and see how it goes with the large class coming in. Change can be scary and it can mean more work in the beginning, but I think that the end result of having students obtain a higher level of understanding is worth it. If anyone is interested in discussing any of the above information feel free to reach out.

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