

THE ANATOMY TEACHING ADVENTURE OF AN AMERICAN FULBRIGHT SCHOLAR IN THE MIDDLE EASTERN STATE OF QATAR: FACILITATING STUDENT SUCCESS WITH TARGETED COMMON ISLAMIC RELIGIOUS NUANCES, MNEMONICS AND ONLINE RESOURCES

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Received:08/08/2018

Revised:24/08/2018

Accepted:27/08/2018

ABSTRACT

Standard audio-visual tools of teaching require enhancement in topics such as anatomy where the students are required to memorize numerous terms often likened to learning a new language. Such challenge is more paramount when English is not the students' first language as is the case of Qatar University (Doha, Qatar) where I served as a Fulbright Teaching/Research Scholar. In this work, I share my discovery of a novel connection between the layout of the appendicular skeleton and Islamic practices in the daily lives of my students. Specifically, upper limb bones could be related to the Muslims' five obligatory daily prayers which are called and practiced almost everywhere in the Middle East including most buildings at Qatar University. Amazingly, this seemingly-simple parallel was a turning point in enhancing student engagement and motivation, which was thence maintained by mnemonic and online resources, with the ultimate outcome of hundred percent student success rate and success along with an overwhelmingly positive student feedback.

Keywords: Skeleton, appendicular, mnemonics, Islamic prayers, Fulbright scholar, Middle East

INTRODUCTION

In general, teaching relies on auditory and visual means to deliver academic content with the hope that students will integrate the information to build upon the bedrock of knowledge that is needed for their future careers (1-3). In anatomy, the challenge is that the student not only needs to memorize the names of numerous body structures, but also their three-dimensional locations and relationships alongside basic functional and histological footnotes (4, 5). While serving as a Fulbright Scholar in Qatar University (Doha, Qatar), I had the unique opportunity of teaching two sections of anatomy with

one of the sections at the basic level for a handful of male sports management students and the second being more advanced for about 60 female health science students. Both courses used Tortora and Nielsen's textbook titled: Principles of Human Anatomy (5) and the students were clearly intimidated by the immense amount of knowledge coming their way, especially since a significant number of them had previously failed and had to repeat the course. After teaching the introductory cell, tissue and integumentary system chapters, voices of concern about the burden of the course became

increasingly apparent. Over my fifteen years of prior teaching to a totally different student clientele in Chicago State University, I had developed a large repertoire of puns and analogies that were not as easy to implement in an environment where English is a second language (6). At that point, my challenge as a Fulbright scholar was to pull all the tricks out of my project proposal to help the students overcome their fears. With this challenge, I had to search for the means to “Keep It Simple in Science,” which gave birth to the acronym KISS. So, after some sleepless nights, I came up with a combination of cultural references and mnemonics that helped the students forget their fear of anatomy and become engaged in every anatomy lecture thereafter (6-9).

Fortunately, I was able to impart this transformation in the most feared and challenging part of the course for anatomy students, namely the skeletal system, with its 206 bones to memorize and relate to each other (5). So, starting with hand bones and up to the forearm, there are 30 bones that are duplicated in the upper and lower limbs to make 120 bones that articulate to the axial skeleton through a total of 6 bones: four for the pectoral and two for the pelvic girdle, summing up to a grand total of the 126 bones of the appendicular skeleton (5).

Interestingly, I was able to pinpoint a unique numerical correspondence between the layout of the thirty limb bones and numbers of Muslim obligatory prayers and their parts. First, there are five metacarpals which correspond to 5 daily obligatory Muslim prayers (5, 10). Second, there are two thumb bones/phalanges corresponding to the number of parts (raka't) of the first predawn pray (Fajr) (5, 10). Third, moving on to the other fingers, there are four proximal, four middle, and four distal bones/phalanges that correspond similarly to parts of the Midday (Dhuhr, 4 raka't), Mid-afternoon (Asr, 4 raka't), and late evening (Ishaa, 4 raka't), respectively (5, 10). Finally, there are the bones of the forearm (ulna and radius) and arm (humerus) that add up to three which is also the number of the raka't in the sunset (Maghrib) prayer (5, 10). Because Muslim students know these numbers by heart, connecting the

numbers made it quite intuitive and easy to remember. Indeed, it was remarkable how almost every student perked up and started paying attention as soon as I began stating this way of memorizing your bones! Next, the students were ready to study the eight carpal (wrist) bones and relate them to the eight gates of heaven, per the common Islamic tradition (5,11). To avoid losing their excitement, I added two mnemonics to the textbook's carpal and tarsal bone mnemonics (5), namely: (A) For upper limbs: “R U a humorous Scandinavian class?” corresponds to: Radius, ulna, humerus, scapula, and clavicle, and (B) For the lower limbs: “Tickle the funny feet with interesting, imaginary puppies” which corresponds to: Tibia, fibula, femur, ilium, ischium, and pubis) (5).

By the end of the course, this unique teaching experience entailed a lot of hard work for additional mnemonics, numerical correlations, and relevant online resources, but it was all truly worth it as it not only helped the students succeed, but also immensely molded my approach to teaching way beyond the standard auditory and visual means for delivering academic content. As such, what initially seemed to be an insurmountable challenge, ended up being such a great benefit that it transformed my teaching philosophy in a way that pays a lot more attention to making real life connections that attract student attention and especially cultural nuances that tap into the students' second nature and emotional comfort zones (6,7). Fortunately, such pedagogical transformation was rewarded by the outcome of the course which included almost hundred percent student participation and success rate along with an overwhelmingly positive student feedback.

CONCLUSION

Learning is greatly influenced by the students' language, cultural, religious and emotional background and engagement (6, 7). Here, standard audio-visual anatomy teaching tools were supplemented by an innovative combination of cultural, online resources, and linguistic enhancements. Specifically, a unique connection

between the layout of the appendicular skeleton and the Muslim prayers was introduced at the beginning of the course to trigger student attention and participation. This was followed by a blend of meticulously designed and/or selected mnemonics, online resources, and assignments that were carefully synchronized with the course lecture and lab schedules in order to maintain continued student engagement and success. This approach resulted in continued high student attendance and participation with almost hundred percent success and satisfaction as gauged by the overwhelmingly positive course feedback.

ACKNOWLEDGMENTS

I would like to sincerely thank the many great faculty, students, and staff I met and worked with at Qatar University and especially the chairman (Dr. Marwan Abu Madi) and faculty of the Department of Biomedical Sciences as well as the wonderful students and lab support staff of my anatomy course. Generous financial support for the Fulbright Scholar program (Award ID number: PS00254692) was administered by Bureau of Educational and Cultural Affairs of the United States Department of State with the cooperation of Institute of International Education (IIE) and the views and information presented here are the author's own and do not represent the Fulbright Program, the U.S. Department of State, or the IIE.

REFERENCES

1. Casado MI, Castaño Luis G, Arráez-Aybar A. Audiovisual material as educational innovation strategy to reduce anxiety response in students of human anatomy. *Advances in Health Sciences Education*. 2012; 17(3): 431-440.
2. Martin K. Style and non-style in anatomical illustration: From Renaissance Humanism to Henry Gray. *J Anat*. 2010; 216(2): 192-208.
3. Anyanwu EG. Anatomy adventure: a board game for enhancing understanding of anatomy. *AnatSci Educ*. 2014; 7(2):153-60.
4. Miller SA, Perrotti W, Silverman DU, Dalley AF, Rarey KE. From College to Clinic: Reasoning Over Memorization Is Key for Understanding Anatomy. *The Anatomical Record (New Anat; Special Issue)* 2002; 269:69 -80.
5. Tortora GJ, Nielsen MT. *Principles of Human Anatomy*. John Wiley & Sons, Inc; Hoboken, NJ, USA. 13th Edition, 2014.
6. Zurada A, Gielecki JS, Osman N, Tubbs RS, Loukas M, Zurada-Zielińska A, Bedi N, Nowak D. The study techniques of Asian, American, and European medical students during gross anatomy and neuroanatomy courses in Poland. *Surg Radiol Anat*. 2011;33(2):161-9.
7. Tyng, CM, Amin HU, Saad Mohamad NM, Malik AS. The Influences of Emotion on Learning and Memory. *Front Psychol*. 2017; 8: 1454.
8. De Moll EH, Routt E, Heinecke G, Tsui C, Levitt JI. The use of an imagery mnemonic to teach the porphyrin biochemical pathway. *Dermatol Online J*. 2015; 16;21(4).
9. Yang A, Goel H, Bryan M, Robertson R, Lim J, Islam S, Speicher MR. The Picmonic® Learning System: enhancing memory retention of medical sciences, using an audiovisual mnemonic Web-based learning platform. *Adv Med Educ Pract*. 2014; 5: 125–132.
10. Zaman Z, and Zaman N (Presenters). *How to Pray Salah: Prophet's (pbuh) Prayer*. Institute of Social Engineering (Canada), 2012.
11. Khalid O. 8 doors of Jannah: While all of us want a ticket to paradise, not many of us know much about Jannah. 2017. <https://www.islamicfinder.org/iqra/8-doors-of-jannah/>