

# The use of youtube in learning human anatomy by venezuelan medical students

## Abstract

Human anatomy learning methods have evolved from traditional teaching methods of cadaver dissection, prosection, tutorials, anatomical models and lectures now supplemented by a new e-learning through web based technology. An unnamed survey was handed out to 120 first year medical students of the José María Vargas Medical School at Central University of Venezuela during the academic year 2014-2015. The results showed that 85% of this medical students group used YouTube as an online information resource to study human anatomy, albeit in different frequencies. The 82.5% consider that human anatomy's videos represent a positive tool to archive the objectives related to learning human anatomy but their perception in 75% of the surveyed about importance of human anatomical dissection has not changed with new innovations in learning human anatomy. The Use of YouTube In learning human anatomy can be a complementary and useful tool.

**Keywords:** human anatomy education, youtube, human anatomy videos, web based technology

Volume 2 Issue 7 - 2016

Rafael Romero Reverón<sup>1,2</sup>

<sup>1</sup>Department of Human Anatomy, Universidad Central de Venezuela, Venezuela

<sup>2</sup>Medical doctor Specialist in Orthopedic Trauma Surger, Centro Médico Docente La Trinidad, Venezuela

**Correspondence:** Rafael Romero Reverón, Department of Human Anatomy, José María Vargas Medical School, Faculty of Medicine, Universidad Central de Venezuela, Medical doctor Specialist in Orthopedic Trauma Surgery at Centro Médico Docente La Trinidad, Venezuela, Email rafa1636@yahoo.es

**Received:** May 11, 2016 | **Published:** December 30, 2016

## Introduction

Human anatomy has historically been a cornerstone in medical education regardless of country or place over the world. This is the matter where medical students learn the indispensable language of medicine, learn to develop understanding through experimentation and develop expertises in solving problems in a three-dimensional space<sup>1-4</sup> but also represents a critical initial learning experience about the patient-physician relationship.<sup>5-8</sup> Human anatomy itself is relevant to all, health-care specialties and not only to surgery specialties.<sup>9-11</sup>

The web based technology had become an integral part of everyday life and undoubtedly influences in the way medical student learn.<sup>12</sup> The proliferation and continued adoption of web based technology has increase new learning opportunity in human anatomy education outside conventional instructional setting.<sup>13-15</sup> The new generations of students have high standards in worth of digital resources, having had web based technology from early schoolyears including YouTube.<sup>16,17</sup> The digital era has been distinguished by an expansion in access to free information. YouTube started in May 2005, since then, it has grown extraordinarily to be one of the most popular websites. YouTube is becoming in a growing stage for learning human anatomy and its success can be endorsed to its easy sharing of videos via upload, or emailing a link, or inserting to websites, user friendly publication environment, and the service being completely free of charge. A new service named YouTube Education has been introduced in 2012 giving access to a wide-ranging set of academy lectures and encouraging speeches endorsed by persons, institutions and universities.

Although human anatomical dissection in many countries including Venezuela is still considered the best way to visualize topographical landmarks and anatomical variation, and allow the students to establish relationships between different organs and structures and the three-dimensionality of the structures of the human body The use of online social networks in medical education could change and improve human anatomy teaching and learning; one such network is the video-sharing site YouTube. These aspects have been scarcely addressed in most of the countries and they have not been

an issue of research in Venezuela. Indeed, there are not references in Venezuela on this issue. This was the reason to do this research project handing out an unnamed survey about the use of YouTube in learning human anatomy by Venezuelan first year medical students.

The purpose of this research is to evaluate Venezuelan medical student's perceptions and patterns of usage of this resource in learning human anatomy.

## Methods

Human anatomy is one of the basic and first subjects that medical students must study in medical sciences. Inside this branch of learning is human anatomical dissection supplemented by group tutorials (approximately 20 students per group) with a demonstrator who dissect a cadaver with help of medical students and exhaustively review the gross human anatomy in a cadaver in the dissection room during 5hours per week in 2days weekly. An unnamed survey by a written questionnaire was handed out to 120 first year medical students in this medical school with a average age of 19years old ranging between 17 and 26years old, during the last month of the academic year 2014-2015. According to the study design, the survey should be answered voluntarily before a cadaver dissection session. The written informed consent of all the participants was obtained prior to their participation. The collected general data in this survey include eight questions: age, gender, use of YouTube before to start to study medicine, use of YouTube to study human anatomy, kind of audiovisual material used in YouTube to study human anatomy (cadaver dissection, power point presentation, surface anatomy), frequencies of YouTube to study human anatomy per day, perception of YouTube 's fulfillment of the objectives related to learning human anatomy and medical students perception about importance of human anatomical dissection.

## Results

A survey was performed to 120 Venezuelan medical students: 73 female students (60.8%) and 47 male students (39.2%), aged between 17 and 26years old for an average of 19years old. 117 medical

students, 97.5% reported knowledge YouTube before starting their medical studies and the results demonstrated that 102 of this students' group (85%) used YouTube as an online information resource to study human anatomy, with a predominance of 66 female medical students, 55%. Considering the dedication of hours of study albeit in different frequencies these range from 1 to 6hours with an average of 1.88hours per day. This group of Venezuelan medical students surveyed have a preference for the use of different tools offered YouTube, with the highest percentage 75.8% prefer using tutorials and illustrations, in contrast to 39.2% select cadaver dissection videos. These percentages are overlapped due to several prefers that can choose the same student in this question (Figure 1). In this survey 99 medical students (82.5%) consider that human anatomy's videos represent a positive tool to help meet the objectives related to learning human anatomy (Figure 2). The perception of 75% surveyed (90 medical students) about importance of human anatomical dissection has not changed with new innovations in learning human anatomy (Figure 3).

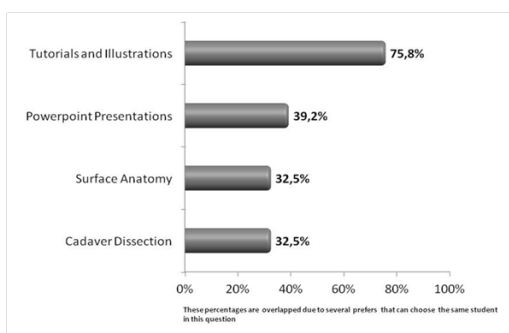


Figure 1 Preferences for the use of the different tools offered by YouTube to study human anatomy among 120 Venezuelan first year medical students.

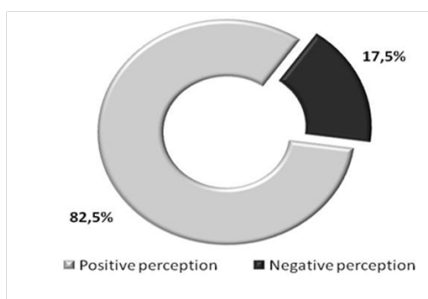


Figure 2 Venezuelan first year medical students (n=120) perception about human anatomy's videos as positive tool to help meet the objectives related to learning human anatomy.

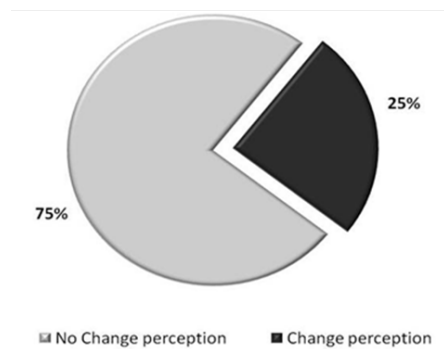


Figure 3 Perception about importance of human anatomical dissection with new innovations in learning human anatomy among 120 Venezuelan first year medical students.

## Discussion

In this survey 85% of Venezuelan first year medical students surveyed pointed that they used YouTube as an online information resource to study human anatomy, albeit in different frequencies. 75% of medical students surveyed favored the use of tutorials and illustrations in YouTube and also medical students perception in 75% of cases about importance of human anatomical dissection has not changed with new innovations in learning human anatomy, just as they have been reported by other research.<sup>17-20</sup>

However, due reflection should also be given to the fact that there are known difficulties in procuring enough cadavers to please pedagogical needs in medical schools leading to students complaining of not getting to do dissection because of too many students per cadaver. Cadaver shortage is the problem facing medical schools all over the world.<sup>21,22</sup> Dissection of human cadavers is still an essential method for teaching and learning human anatomy in many countries.<sup>22-25</sup>

Cadaver dissections is utilized as a major tool in teach and learning human anatomy, owing to its perceived effectiveness for understanding classification and inter-relationships of different parts of human body, integration of theory and practice of human anatomy, touch-mediated perception, humanistic care, three-dimensional perspectives of structures, and applications of practical skills.<sup>21,26</sup> As the start of YouTube in 2005 the number of human anatomy videos has continually increased every year with an expansion in recent years. The increasing availability of internet, video recording, mobile phones, tablets, other video recording devices, and video editing tools might have influenced this rise. Increased focus on self-directed learning in modern undergraduate curricula could have pushed the demand for these videos, which in return encouraged the production.<sup>4,27-29</sup>

Tools for better learning of human anatomy based on evolving technologies are being actively sought and evaluated.<sup>30,31</sup> Nevertheless there is no consensus on the best methods for teaching of human anatomy.<sup>29,32</sup> Very few research in the literature exists on the use of YouTube as a platform for human anatomy education.<sup>27,28,33</sup> The use of online social networks in medical education could change and improve human anatomy teaching and learning; one such network is the video-sharing site YouTube. The new generations of medical students have high standards in worth of digital resources, having had web based technology including YouTube.

On the other hand medical students should be selective when looking up on public video databases as it can prove challenging, time consuming and human anatomy information may be misleading due to absence of content review.<sup>34,35</sup> This research has some limitations, this survey did not assess to human anatomy examination scores among this group of Venezuelan medical students in order to have a relationship with YouTube's helpful to study human anatomy. The results of this survey may not represent the opinion of the majority of medical students in Venezuela. This survey should be repeated during although two or three years in this medical school and others medical school in order to compare results.

As anatomists, we need to acquire the most effective ways to both leverage and integrate these web based technologies into the learning environment to maximize learning and address the challenges and opportunities of human anatomy instructions.<sup>8,15</sup> The new era of cloud computing and huge video sharing communities involves additional cautions as many videos are uploaded by no specialists in human anatomy and contain deficient human anatomical content coverage and unclear information.<sup>28</sup> Human anatomy education is a

dynamic field and modern anatomist cannot afford just to preserve all traditionally established.<sup>36</sup> Faculties of human anatomy must accommodate their teaching style in order to be consistent with how medical students in this new digital era learn according to student's aptitudes, acctitudes, and expectations.<sup>37</sup> The author of this survey like other researchers.<sup>27,33,38,39</sup> Consider that YouTube human anatomy videos including cadaver videos are not superior to cadaver dissection but they can improve anatomical structural appreciation along with human dissections in the dissecting room

## Conclusion

Different medical students may have dissimilar approaches in dealing with diverse teaching and learning tools for that reason undergoing divergent learning experiences, which may result in differences in the amount and form of human anatomy knowledge among medical students. Medical students' perception about the importance of dissection has not changed with the new innovations in teaching anatomy but despite its perceived effectiveness, nowadays cadaver dissection alone may not be the only tool for learning human anatomy. Human dissection videos have the potential to turn into an important resource and it can be a counterpart in the human anatomy teaching and learning process. However, this cannot be compared to the experience that a medical student gets when attending a dissecting room. The usefulness of cadaver dissection for learning anatomy should not be underestimated. The challenge is to reinstate more effective teaching and learning tools as the use of YouTube while maintaining the beneficial values of human anatomical dissection.

## Acknowledgements

The author thanks to all medical students from José María Vargas Medical School, Faculty of Medicine, Universidad Central de Venezuela who participated in this research.

## Conflict of interest

Author declares that there is no conflict of interest.

## References

- Von Ludinghausen M. The goal of dissection in clinically oriented teaching. *Clinical Anatomy*. 1992;5(6):488–489.
- Ellis H. Teaching in the dissecting room. *Clin Anat*. 2001;14(2):149–151.
- Arraez Ybar L, Sánchez Montesinos I, Mirapeix R, et al. Relevance of human anatomy in daily clinical practice. *Ann Anat*. 2010;192(6):341–348.
- Barry D, Marzouk F, Chulak Oglu K, et al. Anatomy education for the YouTube generation. *Anat Sci Educ*. 2016;9(1):90–96.
- Aziz M, Mckenzie J, Wilson J, et al. The human cadaver in the age of biomedical informatics. *Anat Rec*. 2002;269(1):20–32.
- Boulware E, Ratner L, Cooper L, et al. Whole body donation for medical sciences: A population-based study. *Clin anat*. 2004;17(7):570–577.
- Nwachukwu C, Lachman N, Pawlina W. Evaluating dissection in the gross anatomy course: correlation between Quality of laboratory dissection and students outcomes. *Anat Sci Educ*. 2015;8(1):45–52.
- Pawlina W, Drake R. Authentic learning in anatomy: a primer on pragmatism. *Anat Sci Educ*. 2016;9(1):5–7.
- Korf H, Wicht H, Snipes R, et al. The dissection course - necessary and indispensable for teaching anatomy to medical students. *Ann Anat*. 2008;190(1):16–22.
- Sugand K, Abrahams P, Khurana A. The anatomy of anatomy: A review for its modernization. *Anat Sci Educ*. 2010;3(2):83–93.
- Sheikh A, Barry D, Gutierrez H, et al. Cadaveric anatomy in the future of medical education: What is the surgeons view? *Anat Sci Educ*. 2015;9(2):203–208.
- Jaffar A. YouTube: An emerging tool in anatomy education. *Anat Sci Educ*. 2012;5(3):5158–5164.
- Trelease R. Diffusion of innovations: Smartphones and wireless anatomy learning resources. *Anat Sci Edu*. 2008;1(6):233–239.
- Netterstrom I, Kayser I. Learning to be a doctor while learning anatomy. *Anat Sci Educ*. 2008;1(4):154–158.
- Mayfield C, Ohara P, O'Sullivan P. Perceptions of a mobile technology on learning strategies in the anatomy laboratory. *Anat Sci Edu*. 2013;6(2):81–89.
- Dilullo C, Coughlin P, D'Angelo M, et al. Anatomy in a new curriculum: Facilitating the learning of gross anatomy using web access streaming dissection videos. *J Vis Commun Med*. 2006;29(3):99–108.
- Marker DR, Juluru K, Long C, et al. Strategic improvements for gross anatomy web-based teaching. *Anat Res Int*. 2012;2012:146262.
- Dinsmore C, Daugherty S, Zeitz H. Teaching and learning gross anatomy: dissection, prosection, or "Both of the Above". *Clin Anat*. 1999;12(2):110–114.
- Snelling J, Sahai A, Ellis H. Attitudes medical and dental students to dissection. *Clin Anat*. 2003;16(2):165–172.
- Lewis T, Burnett B, Tunstall R, et al. Complementing anatomy education using three-dimensional anatomy mobile software applications on tablet computers. *Clin Anat*. 2014;27(3):313–320.
- Biasutto SN, Sharma N, Andreas Weiglein, et al. Human bodies to teach anatomy. Importance and procurement-Experience with cadaver donation. *Rev Arg de Anat Clin*. 2014;6(2):72–86.
- Biasutto SN, Namita Sharma, Andreas H Weiglein, et al. Human bodies to teach anatomy. Importance and procurement-Experience with cadaver donation. Part II. *Rev Arg de Anat Clin*. 2014;6(3):162–175.
- Lempp H. Perceptions of dissection by students in one medical school: beyond learning about anatomy. A qualitative study. *Med Educ*. 2005;39(3):318–325.
- Turney B. Anatomy in a modern medical curriculum. *Ann R Coll Surg Engl*. 2007;89(2):104–107.
- Romero R. Anatomical Dissection: A Positive Experience for Venezuelan First Year Medical Students. *Int J Morphol*. 2010;28(1):213–217.
- Elizindo Omaña R, Guzman Lopez S, Garcia M. Dissection as a teaching tool: Past, present, and future. *Anat Rec B New Anat.* 2005;258(1):11–15.
- Hayanga AJ, Kaiser H. Medical information on YouTube. *JAMA*. 2008;299(12):1424–1425.
- Raikos A, Waidyasekara P. How useful is YouTube in learning heart anatomy? *Anat Sci Educ*. 2014;7(1):12–18.
- Winkelmann A. Anatomical dissection as a teaching method in medical school. a review of the evidence. *Med Edu*. 2007;41(1):15–22.
- Shaffer K. Teaching anatomy in the digital world. *New Eng J Med*. 2004;351(13):1279–1281.
- McLachlan J, Bligh J, Bradley P, et al. Teaching anatomy without cadavers. *Med Educ*. 2004;38(4):418–424.
- Older J. Anatomy: a must for teaching the next generation. *Surgeon*. 2004;2(2):79–90.
- Azer S. Can "YouTube" help students in learning surface anatomy? *Surg Radiol Anat*. 2012;34(5):465–468.

34. Granger N, Calleson D. The impact of alternating dissection on student performance in a medical anatomy course: Are dissection videos and effective substitute for actual dissection? *Clin Anat.* 2007;20(3):315–321.
35. Koya K, Bhatia K, Hsu J, et al. YouTube and the expanding role of videos in dermatologic surgery education. *Semin Cutan Med Surg.* 2012;31:163–167.
36. Drake R. Meeting the challenge: the future of the anatomical science in medical school curricula. *Anat Rec.* 2002;269(2):68.
37. Farnan J, Paro J, Higa J, et al. The YouTube generation: Implications for medical professionalism. *Perspect Biol Med.* 2008;51(4):517–524.
38. Bergman E. Discussing dissection in anatomy education. *Perspect Med Educ.* 2015;4(5):211–213.
39. Saxena V, Natarajan P, O’Sullivan P, et al. Effect of the use of instructional Anatomy videos on student performance. *Anat Sci Educ.* 2008;1(4):159–165.