Evaluation and comparison between online and traditional learning of veterinary anatomy

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With 6 diagrams and 2 tables. **Received Nov., accepted for publication Dec. 2021**

Abstract

In the shadow of covid-19 pandemic, electronic learning (E-learning), also known as online classes, has become the main option. Therefore, the aim of this study was to assess the efficacy of online learning in veterinary anatomy, as well as the theoretical and practical outcomes that resulted from it. it compares the exam scores of students in both teaching methods (conventional and E-learning). About 100 students were used in this study. Further-more, it demonstrated the students' practical know-ledge in the area of E-online learning. The first semester was dedicated to formal education. The second semester was completed entirely online. The findings revealed that during lectures, complex involvement in online activities is substantially reduced. The aware-ness of students was assessed by comparing stu-dent grades from these three semesters. In comparison to traditional schooling, the exam results showed an irregular distribution in E-learning and online tests, with E-learning scores substantially higher. During the E-learning time, the functional laboratory was completely absent. The practical part, of the veterinary anatomy classes, involves laboratory participation to show students various systems of the animals and enable them to use different techniques, training them for future classes such as clinical and surgical classes. The results revealed that reached the conclusion that e-learning is inadequate for teaching veterinary anatomy.

Introduction

Since the Corona Virus (Covid-19) outbreak, we, in the Department of Anatomy, were able to teach almost all lessons. E-learning is more common in some majors than in others in college education. Due to laboratory sections and practical training, it is difficult for many science majors, especially veterinary medicine one, to teach courses online. Since the Covid-19 outbreak, many educational institutions have closed, with most, if not all, using E-learning to replace in-class teaching. Many majors using E-learning, also known as online learning, as their

regular way of learning. While others, such as veterinary medicine and, in particular, veterinary anatomy, are unfamiliar with it. This is due to the fact that realistic sessions necessitate student attendance. Veterinary anatomy is one of the most difficult subjects to teach online because it necessitates students in contact with cadavers and specimens. It is the art of separating the sections of an organism in order to establish their location, relationships, and structure in order to aid clinical diagnosis where aspects of anatomy are still important in veterinary medicine (Morries, 2014). It has been regarded as the foundation of medical education since its inception (McLachlan and Patten 2006), but with the advent of science and E-learning technologies, anatomy teaching has progressed from dissection to online learning. Animals are being used less often in anatomy because of their high cost. Some organizations attempted to abolish dissection, a decision aided in part by using computer-assisted learning (CAL) methods learning (CAL) tools (McLachlan et al., 2004; Korf, et al., 2008). Due to difficulties in anatomy education, more than 20 veterinary schools have looked at using animal substitutes in the classroom (Hart et al., 2005). In traditional learning, there are types of interactions: student-instructor–contents of course, as defined by Moore (1989). The website of the Online Veterinary Anatomy Museum (OVAM) will help to change anatomy education and the way students' study (Gemma and Bara 2015). When body area and animal cadaveric resources are minimal, E-learning tools have become a critical component of teaching anatomy in the anatomical sciences (Sonya et al., 2017). However, observational research comparing their effectiveness to visible kinesthetic learning patterns are uncommon. (Commission of the European Union, 2014). Students are seen as a driving force behind high-quality, versatile, and student-centered online learning opportunities.

On the other hand, it is unsurprising that E-learning resources have become a common alternative to conventional anatomy instruction (McNulty et al., 2009; Sugand et al., 2010; Preece et al.,2013). Due to increasing enrollment rates and many students wishing to study veterinary medicine, as well as a decline in physical space and cadaveric animals, anatomical E-learning resources have become extremely important (Trelease 2016). None of the online anatomy courses mentioned in the literature or found on university websites about anatomy, according to (Stefanie et al., 2015). However; various resources have become available to teach veterinary anatomy online. Students must participate in practical training to improve their understanding of animal’s structure.

Keywords: veterinary anatomy education, E-learning, online, skills assessment, and evaluation

Material and Methods

Individuals and time period:

We found that conventional training is more successful than E-Learning in this research. During the Covid-19 outbreak, professors of anatomy and undergraduate students at Qassim University Kingdome of Saudi Arabia (KSA) conducted study in the department of veterinary medicine in 2019 and 2020. Veterinary Anatomy 1 (VMD 221) and Veterinary Anatomy 2 (VMD 224) were studied at the third and fourth levels of undergraduate study (VMD 224).

The research took two semesters to complete. Before the Covid-19 outbreak, the first semester (August 2019 to December 2019) The Veterinary Anatomy courses were offered as a conventional learning with 53 students (Term1). With a total of number students 50, the anatomy courses were offered in the second semester using E-learning during the Covid-19 pandemic (January 2020 to May 2020).

Teaching strategies

The course extended 15 weeks and consisted of 50-minute didactic lectures (30 hours in total). Two-hour presentation in the lab (30 hours in total). In Term 1, students were required to attend lectures and practical sessions in person, while in Term 2, students were required to attend lectures and practical sessions by using Blackboard Collaboration System (Blackboard Inc., Reston, VA 20190, USA).

Exams: In traditional learning, students are required to attend written exams. However, in E-learning, students were unable to attend the tests, which were conducted online. True or False, multiple choice, short response, and comprehension ques-tions are all included in the exams. Each term has its own set of questions, but they are all of similar quality.

Evaluation and statistical analysis

Teachers, students, and Blackboard were the E-Learning resources used in this research. Collaborate during the first and second terms of 2020 undergraduate Veterinary Anatomy -VMD 221- (Group-1), and Veterinary Anatomy -VMD 224- (Group -2) courses offered by the Department of Veterinary Medicine, Qassim University, KSA. In traditional learning, the number of students in first group 1 was 34 and second group was 17, while in online learning, the number of students in first group of VMD 221 was 28 and second group of VMD 224 was 22 students.

The total number of students who were studied (101). Teachers communicated with students via email and phone apps. Furthermore, the study online learning resources, such as Blackboard Collaborate, had significant links to the researchers. Using Blackboard Collaborate, lectures given to students are simultaneously broadcasted to online students. The didactic lecture can be streamed live and then archived using Blackboard Collaborate (BBC) so that it can be obtained by

students. Students who received E-learning had their final examination performed online, while students who received traditional education had the final examination conducted in a classical way (Qayumi et. al. 2004; Codd and Choudhury 2011 and IVALA. 2018).

Results

Veterinary anatomy is considered one of the most difficult courses to teach within the medical study requirements due to its dependence on student access to animals' cadavers and anatomical specimens. where the teaching of anatomy is of intrinsic importance in veterinary medicine as well as practical anatomy is required for students. Traditional learning is distinguished by some negatives and positives. The results of this study confirmed one of the positive points of traditional learning is that the students can touch the anatomical specimens. One of the positives of the traditional learning of veterinary anatomy is that the lectures are given to students in one classroom in logical time, specified by the management as well as the students are more concerted and focused with the teachers. One of the negatives of the traditional learning of veterinary anatomy is many animals are killed by eutha-nasia by (Execution) for anatomy learning. In this study, each of images, PowerPoint presentations, flash animations, and videos was used to integrate E-learning with traditional education. They cover a wide variety of anatomical subjects, such as dissection and osteology.

We found in E-learning; more than ten questions patterns are provided by online learning for veterinary anatomy. shape A quick response, Either / if, fill in the blanks. Complete the sentences below. True/False, Post and Matching there are a lot of options, and there are a lot of responses. Post and Matching. These methods can be used by students to improve their skills. As a result, all students, particularly those interested in anatomy specifics, have an equal opportunity to learn online. The practical laboratory was entirely missing from online learning, as were anatomical specimens, and clinical and surgical applications were lacking. Both drawbacks would have an effect on potential veterinarians. Students in online learning may have more theoretical science knowledge than students in conventional learning, but they lack practical knowledge and skills, according to the report. In an online course, however, there is no complex participation by students.

Despite of the high scores of students who have been studied in the E-learning in this research, nevertheless; they prefer the traditional learning because they lac-ked the practical sections. In this study, the percentage of students who passed and the distribution of scores in the first and second groups

who participated in the e-learning were 100% and 96%, respectively, compared to their participation in traditional education, that were 76% and 62% respectively, as shown in Table (1) and diagrams (1,2,3,4,5)

Discussion

In this study, it was found that the veterinary anatomy traditional learning, even, epidemiological circumstan-ces, is irreplaceable (Covid -19 case). The teaching philosophy was revolutionized to promote and improve learning practices with more emphasis on the internet where we agree with (Sugand, et al., 2010). We also share the opinion with there is not enough proof that new instructional practices can be fully replaced by online helped to learn (McLachlan and Patten 2006). One of the advantages of traditional learning is that students deal with the anatomical specimens directly. Our study disagrees that online learning interaction techniques are accepted as a teaching direction in the transmission of anatomical knowledge (Khalil et al., 2005 and Codd and Choudhury, 2001), also disagrees with the study, which showed how e-learning resources affect student awareness more effectively than conventional studies (Venail et al., 2010; Codd and Choudhury, 2011).

Our study revealed that teachers and students in classical learning became more concerted and concentrated through the lectures in one classroom within a logically defined period by management. We agree with (McNulty et al., 2009; Su-gand et al., 2010; Preece et al., 2013) that it can't where online learning resources cannot suddenly replace conventional methods.

The current study confirmed that multimedia systems and other technology utilized in anatomy instruction have made traditional anatomy lectures more pleasant for students, which we agree with) Ozkadif and Eken 2012). We also agree with (Sonya et al., 2017) on the use of movies that might be deemed Interactive Anatomy, which combines traditional and e-learning by comparing the impacts of learning to the putative movement of unambiguous, two-dimensional (2D) anatomy.

According to our results study, we agree with (Rei-denberg and Laitman and 2002, Pereira, et al 2007) recorded that students build their skills through CAL (Computer Assisted Instruction, or CAL) opportunities in tandem with online learning, making them more reliant and high-performing. This is demonstrated in our study by the high pass percentage of students in the two groups who took e-learning exams, having 100% and 96 % passing respectively.

The current study showed in traditional learning one of the negative aspects of cadaveric use that agree with (Hart, et al., 2005) that mentioned fear of cadaveric use. It can be done by avoiding the harmful consequences of dissection and special formaldehyde used to

maintain every animal's cadaver often badly endangers human health) Ozkadif and Eken 2012).

In this study, we observed that the students with e-learning lacked practical expertise relative to the students face-to-face, and the practical laboratory was not fully integrated with online training. Thus, lack of realistic knowledge contributes to poor details that will impact prospective clinical and surgical veterinarians with rare experience, therefore our study disagrees which sho-wed e-learning resources affect student awareness more effectively than conventional studies (Venail et al., 2010; Codd and Choudhury, 2011).
The present study is entirely in agreement with (Tem et al 2009) the students preferred using animals and machines teaching gross anatomy. The students declined online learning to replace the dissection of animals Despite the high scores of the students in online exams.

Ana Yoe et al., (2017), Francis and Lewis (2018), and Nicholson et al., (2006) that be through with the students usually expressed the online class ranking. Students cha-racterized their online learning experience as fun benefiting from their Knowledge of veterinary anatomy. We do not agree with the authors as teachers of anatomy, because the students were not happy because they didn't have manual skills, this is confirmed by (Francis and Lewis,2001 and Tan et al., 2012)

These study findings revealed extremely irrational values for online learning All the online exams scores were high and academically. In e-learning, the percentage of students who passed and the distribution of results were 100 percent and 96 percent, respectively, compared to 76 percent and 62 percent, respectively, in traditional education. This study's findings agree with (Norman, 2014 and Inuwa et al., 2012).
In this study the average number of e-learning stu-dents in anatomy veterinary courses was (81, 86), the variance was (57.15, 52.25), and the Standard Deviation was (7.65, 7.22), whereas the average number of traditional learning in anatomy veterinary courses was (88, 65), the variance was (1561, 430) and the Standard Deviation was (39.50, 20.75).

There is a distinction between E-learning and traditional learning in terms of outcomes. E-learning had a Standard Deviation of (7.65 - 7.22) while conventional learning had a Standard Deviation of (39.50 - 20.75). We discovered in this study that there was a significant disparity between electronic and traditional learning, that the average number of students is not significant, and that students' grades are dispersed throughout the average and do not reach the same level.

Our research confirmed that e-learning tools are not only insufficient but useless for the students as compared with classical learning of learning according to (Webb and Choi, 2014; Mathiowetz et al., 2016). This Study is Interested in E-learning resources, as compared with traditional learning which will show more negative effects on the students of veterinary medicine.

Finally, as a result, e-learning will not sufficient to teach anatomy, and the most practical presence of anatomy students will be required.

Contributions of the authors

Gamal Allouch (Syria) had the quest prepared and designed, the findings were presented and the statistics were drawn. Written. The authors read the final manuscript and accepted it.

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Competing interests

The authors declare that it has no financial or personal relationships, which may have inappropriately influenced them in writing this article

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Table (1): showing frequency Distribution scores from online learning and traditional learning.

	Veterinary Anatomy (1)			Veterinary Anatomy (2)	
	Traditional L. 2019 (1440)	Online L. 2020 (1441)		Traditional L. 2019 (1440)	Online L. 2020 (1441)
A+	4	7		2	5
A	0	5		1	2
B+	2	7		1	8
B	1	2		0	3
C+	1	5		2	2
C	3	1		2	2
D+	3	0		1	0
D	7	0		4	0
F	13	1		4	0
pass	62%	96%		76%	100%
fail	38%	4%		24%	0%
Total	34	28		17	22

Table (2): Showing Standard deviation scores from online and traditional learning.

	Veterinary Anatomy (1)					
	Total de-grees	Val-ues (n)	(n-1)	Mean	Vari-ance	Stand-ard De-viation
Online learn-ing 2019	2291	28	27	81.82	57.15	7.65
Traditional learning 2019	2999	34	33	88.20	1561	39.50
	Veterinary Anatomy (2)					
	Total de-grees	Val-ues (n)	(n-1)	Mean	Vari-ance	Stand-ard De-viation
Online learn-ing 2020	1902	22	21	86.95	52.25	7.22
Traditional learning 2020	1119	17	16	65.82	430.70	20.75

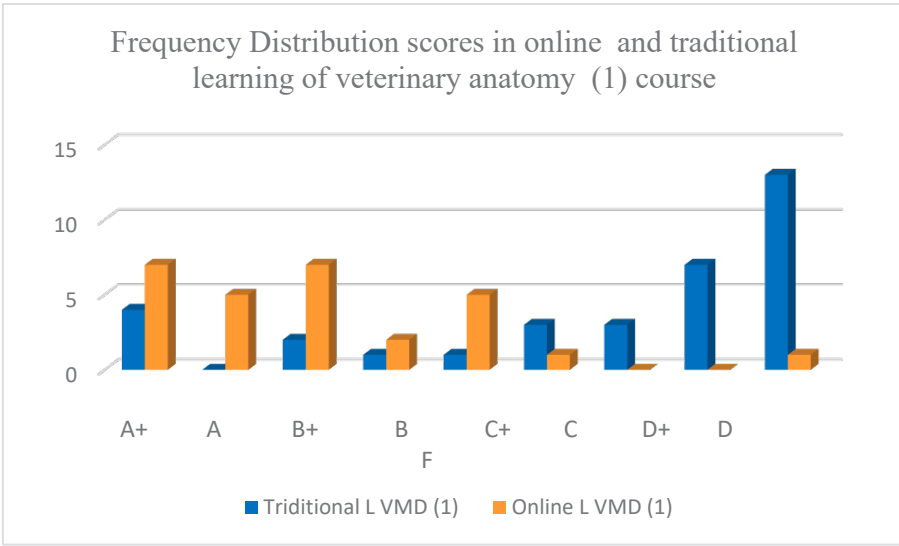

Diagram (1): Showing frequency distribution scores in traditional and online learning of veterinary anatomy (1) course

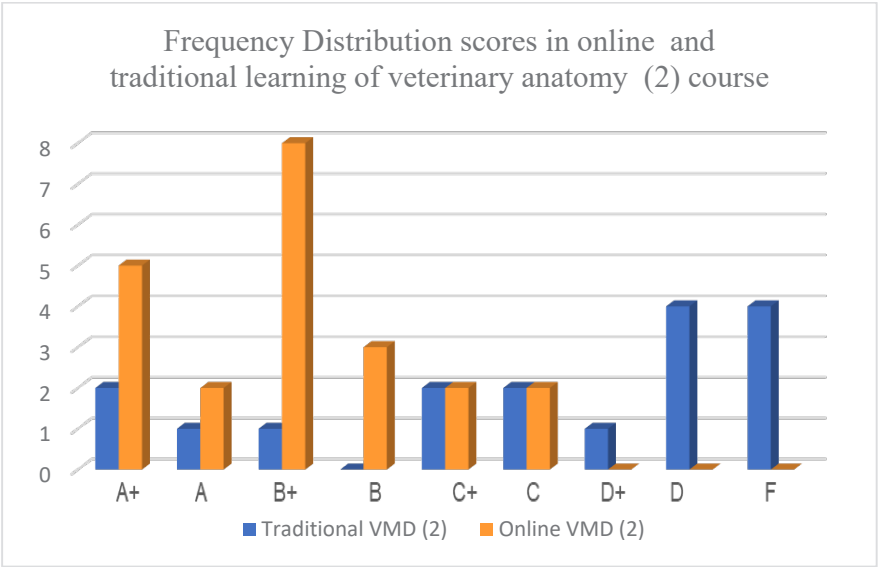

Diagram (2): Showing frequency distribution scores in online and traditional learning of veterinary anatomy (2) course

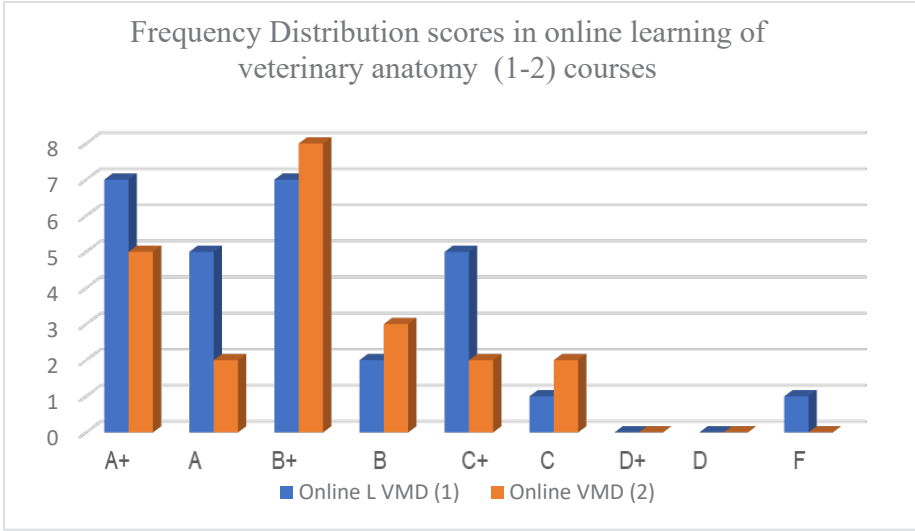

Diagram (3): Showing frequency distribution scores in online learning of veterinary anatomy (1-2) courses

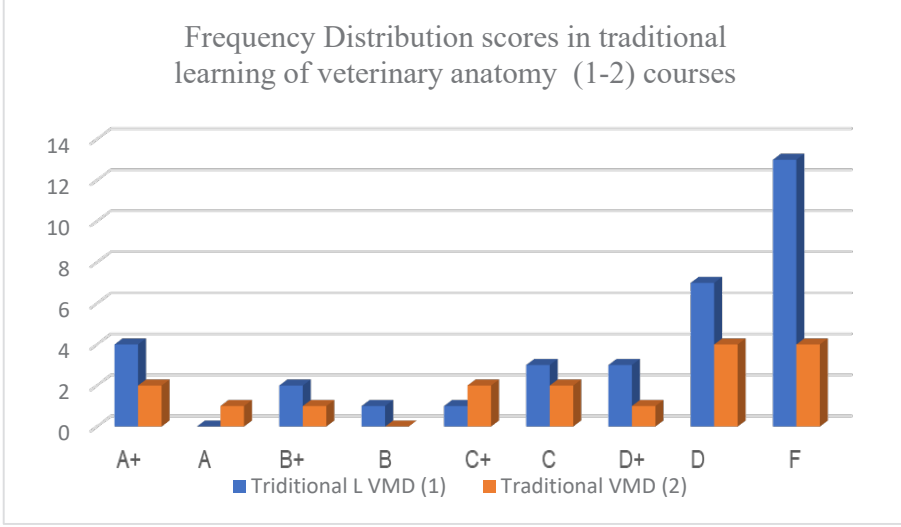

Diagram (4): Showing frequency distribution scores in traditional learning of VA (1) and VA (2) courses

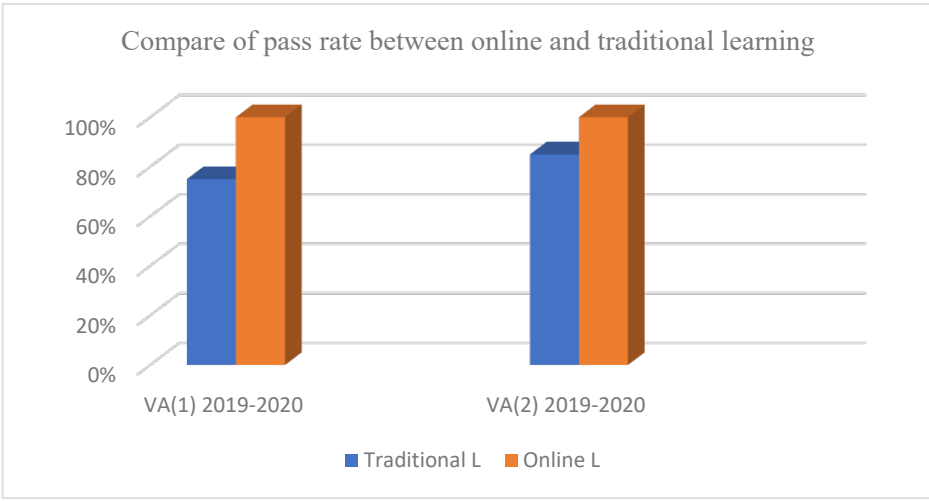

Diagram (5): showing compare of pass rate from online and traditional learning

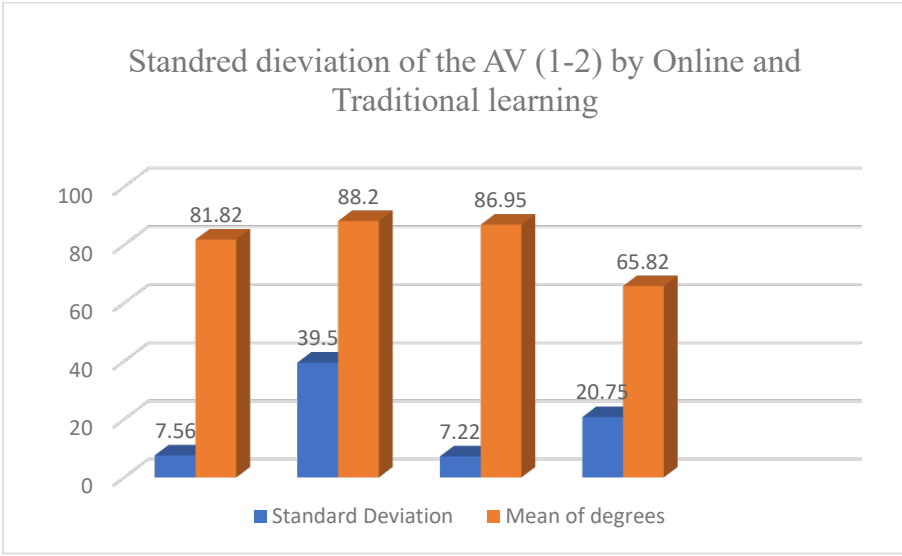

Diagram (6): Showing Standard deviation scores between the online and traditional learning.

Animal species in this Issue

Domestic dog (*Canis familiaris*)

Kingdom: Animalia & Phylum: Chordata & Class: Mammalia & Order: Carnivora & Family: Canidae & Genus: ***Canis*** & Species: ***C. familiaris***

The **dog** or **domestic dog** is a domesticated descendant of the wolf which is characterized by an upturning tail. The dog is derived from an ancient, extinct wolf, and the modern wolf is the dog's nearest living relative. The dog was the first species to be domesticated, by hunter–gatherers over 15,000 years ago, before the development of agriculture.

Dogs are the most variable mammal on earth with around 450 globally recognized dog breeds.

All healthy dogs, regardless of their size and type, have an identical skeletal structure with the exception of the number of bones in the tail, although there is significant skeletal variation between dogs of different types. The dog's skeleton is well adapted for running; the vertebrae on the neck and back have extensions for powerful back muscles to connect to, the long ribs provide plenty of room for the heart and lungs, and the shoulders are unattached to the skeleton allowing great flexibility.

The three basic skull shapes are the elongated dolichocephalic type as seen in sighthounds, the intermediate mesocephalic or mesaticephalic type, and the very short and broad brachycephalic type exemplified by mastiff type skulls.

Source: Wikipedia, the free encyclopaedia