

A Comparison of Anatomy Education in a Large Chinese Medical School and a Small Korean Medical School

Una Comparación de la Educación de Anatomía en una Escuela Grande de Medicina en China y una Escuela Pequeña de Medicina en Corea

Jingxing Dai¹; Jun Ouyang¹; Rongmei Qu¹; Hua Liao¹; Min Suk Chung² & Beom Sun Chung²

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SUMMARY: At the Southern Medical University in China, 600 medical students study macroscopic anatomy (briefly, anatomy), whereas at Ajou University in Korea, only 50 medical students study anatomy. Because of the significant difference in student numbers, the educational situations are quite dissimilar. The purpose of this study was to suggest desirable anatomy education in the large and small classes. For that purpose, the teaching of anatomy in the participating Chinese and Korean universities was compared. Subsequently, best practices and recommendations for the large and small classes were gathered from questionnaire surveys from the medical students (30 Chinese and 48 Koreans) and anatomists (12 Chinese and 2 Korean). Best practices noted were encouraging one another, while each group's recommendations were instructive to its counterpart. Considering these findings can help to guide the progress of students' learning and the corresponding anatomists' activity. This report provides useful information to other anatomists who instruct large or small numbers of students.

KEY WORDS: Anatomy; Education; China; Korea; Cadaver.

INTRODUCTION

The Chinese and Korean authors of the present study are affiliated with Southern Medical University and Ajou University, respectively. Their common job is to teach macroscopic anatomy (briefly, anatomy) professionally. The anatomists have visited one another several times to talk about the remarkable differences in the teaching of anatomy between the two universities. At Southern Medical University, approximately 600 medical students learn anatomy every year; this large number of students is common in China (Statista, 2017). By contrast, at Ajou University, only 50 medical students learn anatomy; this number is even smaller than average (85 medical students) in Korea (Korean Education Statistics Service, 2017). Accordingly, the number of anatomists who teach in the two schools is quite different; their teaching styles are also dissimilar. Such differences between the two nations have not been previously reported. After repeated discussion between the authors, it was eventually decided to perform a joint investigation.

The purpose of this study was to suggest the desirable anatomy education in the large and small medical schools. To

achieve this purpose, the Chinese and Korean situations and teaching methods were intensively compared; the opinions on best practices and recommendations were collected from the medical students and anatomists at both schools.

MATERIAL AND METHOD

Details about anatomy education in 2016 and 2017 at the two universities were collected and were listed in Table I.

The subjects for the questionnaire survey were sorted into four groups. Group 1 was the Chinese medical students. Six hundred medical students at Southern Medical University were divided into 500 in the 5-year course and 100 in the 8-year course. The former/latter learned systemic anatomy in the second semester of the first/fourth year and then learned regional anatomy in the first semester of the second/fifth year (Table I). Among the latter students who had just finished the anatomy curriculum, 30 volunteered. For that

¹Department of Anatomy, Southern Medical University, 1023 Shatai Nan Road, Guangzhou, 510515, China.

²Department of Anatomy, Ajou University School of Medicine, 164 Worldcup-ro, Suwon, 16499, Republic of Korea.
Jingxing Dai and Jun Ouyang contributed equally to the manuscript.

reason, the first author explained to them the purpose of this study. The first author also won approval from the university government for the students' survey.

In 2016, the fifth author from Korea author visited Southern Medical University to meet the 30 Chinese students. He presented the state of anatomy education at Ajou University in English (Table I) by showing related pictures (Fig. 1). The presentation was followed by free discussion. He then asked the Chinese students, "What seems good for the Korean students?" and "What is recommended for the Korean students?" It was emphasized to answer in comparison with Chinese anatomy education (Table I). The students wrote anonymously on paper in English. Personal details, such as sex and age, were not considered.

Group 2 was the 12 Chinese anatomists (4 professors and 8 teaching assistants) (Table I). The fifth author from Korea gave the same presentation and asked the same

questions in the Chinese department. Two supplementary questions were added: "What seems good for the Korean anatomists?" and "What is recommended for the Korean anatomists?"

Group 3 was the 48 Korean medical students, who were in a 6-year course. They learned only regional anatomy at the beginning of the second year (Table I). The students who were finishing the anatomy curriculum volunteered. Prior to subject participation, the proposed study was examined by the institutional review board (IRB) at the Ajou University School of Medicine. The IRB granted an exemption of deliberation (AJIRB-SBR-EXP-15-254).

In 2017, the fifth author did a similar survey of the Korean students. He demonstrated the state of anatomy education at Southern Chinese University (Fig. 1, Table I) and asked, "What seems good for the Chinese students?" and "What is recommended for the Chinese students?"

Table I. State of anatomy education in the Chinese medical school (2nd column) and the Korean medical school (3rd column).

	Southern Medical University	Ajou University
Medical students	Approximately 600 students ¹	Approximately 50 students ¹
Anatomists	18 professors (including 8 lecturers) ² 10 teaching assistants ²	1 professor, 1 teaching assistant
Course weeks	12 weeks (for systemic anatomy) 12 weeks (for regional anatomy) (together with other subjects)	4 weeks (for regional anatomy) (together with no other subjects)
Lecture hours	60 hours (for systemic anatomy) 10 hours (for regional anatomy)	50 hours (for regional anatomy)
Lab hours	22 hours observation (for systemic anatomy) ³ 60 hours dissection (for regional anatomy)	50 and extra hours dissection (for regional anatomy)
Total hours	152 hours	100 and extra hours
Lecture style	Board lecture, slide lecture	Board lecture
Lecture review	Online (ID needed)	Both online and offline (ID not needed)
Textbook	In Chinese; very inexpensive ⁴ (Xu, 2012a,b)	In English; free of charge ⁵ (Chung & Chung, 2016)
Dissection manual	In Chinese; free of charge ⁴	In Korean and English; free of charge ⁵ (Chung & Chung, 2015)
Students per cadaver	12–16 students	5–6 students
Lecture exam	Choice quiz, description quiz	Blank quiz ⁶ , description quiz
Lab exam	Tag quiz, oral quiz in group, description quiz	Tag quiz, oral quiz in group
Learning during vacation	After curriculum, selected students dissect for clinical anatomy research.	Before curriculum, all students learn osteology from senior students.

¹ The number is larger than the entrance quota due to the students who retake the anatomy course.

² In total, they teach 3,300 medical and co-medical students anatomy (including neuroanatomy; excluding histology, embryology).

³ Observation of specimens is carried out in the university anatomy museum with the help of eight technicians.

⁴ Textbook and dissection manual are distributed to students without profit.

⁵ Textbook and dissection manual (electronic books) are obtainable gratis on the homepage (anatomy.co.kr).

⁶ Students have to fill in the blanks in the sentences and figures from the textbook.

Group 4 was the 2 Korean anatomists (1 professor and 1 teaching assistant) (Table I), who were the fifth and last authors, respectively. Four questions were answered: “What seems good for the Chinese students?” “What is recommended for the Chinese students?” “What seems good for the Chinese anatomists?” and “What is recommended for the Chinese anatomists?”

RESULTS

The opinions of the students and anatomists from both nations were summarized in Tables II, III and IV. Repeated numbers of the opinions were indicated in the parenthesis.

The recommendations for Korean students, Chinese students, Korean anatomists, and Chinese anatomists were emphasized below. The first reason to focus solely on recommendations, rather than best practices, was that the recommendations for Koreans were closely related to the best practices for the Chinese, and vice versa. The second reason was that the recommendations might improve the anatomy pedagogy of the counterparts, while the best practices were merely encouraging for the counterparts.

Recommendations for Korean students (Table II).

The Chinese students and anatomists were concerned about the one-month curriculum in Korea (Table I). This duration was adopted because of the Korean medical schools’ tendency to accept current trends in medical education as early as possible. The Chinese students and anatomists thought that anatomical knowledge should be reinforced over the course of several months. Even if the curriculum was decided by the dean of the medical school, the Korean anatomists ought to ask for a longer duration of anatomy education for their students.

The merit of board lecture in Korea was approved; simultaneously, the absence of realistic figures was mentioned as a problem. Chinese students suggested that the board lecture be supplemented by a slide lecture (Fig. 1).

Chinese participants mentioned the higher prevalence of oral quizzes in Korea and the international communication between China and Korea. They also recommended adding systemic anatomy to regional anatomy to give Korean students more comprehensive knowledge.

Recommendations for Chinese students (Table III).



Fig. 1. Features of anatomy education in the Chinese medical school (left column) and the Korean medical school (right column). Large and small numbers of medical students (1st row), large and small numbers of anatomists (2nd row), slide lecture and board lecture (3rd row), Chinese and English textbooks (4th row), anatomy museum and virtual dissection (5th row).

In China, 12–16 students dissected a single cadaver (Table I). It was recommended that the number of cadavers be increased to let the Chinese students experience the human body more.

In Korea, medical students become familiar with English anatomical terms first and then study Korean terms. However, in China, medical students usually become familiar with Chinese anatomical terms first (Fig. 1) (Xu, 2012a,b). It was recommended to teach more English terms because Chinese medical students have to read medical books and journals in English after graduation.

Other recommendations to consider included having Chinese students study anatomy for a shorter term and take blank quizzes like the Korean students do (Table I).

Korean anatomists in this study have developed anatomy learning tools that could assist Chinese students. One is an anatomy book full of mnemonics and schematics; another is anatomy comics (Chung & Chung, 2016; Kim *et al.*, 2017); another is modifiable dissection manual (Chung & Chung, 2015); and yet another is a virtual dissection tool with three-dimensional surface models (Shin *et al.*, 2012, 2013) (Fig. 1). All students are allowed to download them

free of charge or register on the Internet site (anatomy.co.kr).

Recommendations for Korean anatomists (Table IV).

A Chinese anatomist asked Korean anatomists to spend more time preparing the anatomy curriculum (e.g., permanent specimens to demonstrate the real morphology of the human body) (Fig. 1). This was especially important because of the short one-month curriculum (Table I).

Another Chinese anatomist suggested hiring more anatomists for various activities (e.g., students' research on vacation) in Korea.

Recommendations for Chinese anatomists (Table IV).

Korean anatomists regarded the large number of Chinese students and anatomists as the recourse of articles on anatomy education.

The Korean anatomists encouraged their counterparts to make use of English educational tools, such as English books (Fig. 1). By providing English content to global medical students, the Chinese anatomists could be world famous.

Table II. Opinions of the Chinese students and Chinese anatomists regarding the Korean students.

	Best practices for Korean students	Recommendations for Korean students
30 Chinese students+12 Chinese anatomists	English teaching by English textbook will strengthen the students after they become medical doctors. (15 + 5) Students in such a small class can receive intensive attention. (10 + 9).	One-month curriculum of a natomy should be lengthened. (8 + 6).
	One cadaver per 5–6 students gives rise to many opportunities for dissection. (8 + 6).	Board lecture needs to be followed by slide lecture showing real pictures. (7 + 0).
	Board lecture enables students to write, draw, and concentrate. (10 + 2).	Oral quiz should be increased in proportion. (3 + 0).
	Dissection time including extra time seems enough. (8 + 1).	Communication with foreign medical school is desirable. (2 + 1).
	Online lecture on YouTube must be helpful. (8 + 0).	Systemic anatomy can be added for more understanding. (1 + 2).
	It seems effective that senior students teach juniors osteology. (7 + 1).	It would be helpful to divide the one curriculum into two curricula. (1 + 0).
	Textbook is full of schematics and mnemonics. (3 + 1).	Osteology should be taught not by senior students but by anatomists. (1 + 0).
	Funny comics on anatomy in the textbook increased students' interest. (3 + 1).	Communication with clinics is suggested. (0 + 1).
	One-month curriculum of anatomy will enable intensive education. (2 + 0).	
	Oral quiz is good to motivate students. (2 + 0).	
Blank quiz is effective to encourage students to read the textbook. (1 + 0).		

(Repeated numbers of the Chinese students' opinions + the Chinese anatomists' opinions).

Table III. Opinions of the Korean students and Korean anatomists regarding the Chinese students.

	Best practices for Chinese students	Recommendations for Chinese students
48 Korean students	Before dissection, they observe fabulous specimens in the museum. (35 + 2)	Students require even more cadavers. (36 +1)
+		English anatomical terms need to be positively taught. (25 + 2)
2 Korean anatomists	The curriculum is long enough for students to study anatomy and dissect cadaver. (22 + 1)	Students will concentrate if they study only anatomy, excluding other subjects for a short term. (11 + 0)
	Students learn from lots of anatomists in diverse ways. (20 + 0)	Blank quiz is better for making students read the textbook than choice quiz. (7 + 1)
	The teaching of systemic anatomy enhances understanding of the subsequent regional anatomy. (15 + 0)	Free anatomy book written by the Korean authors is likely to help students memorize anatomy. (0 + 2)
	Students who do extra dissection for clinical anatomy will have research experience. (7 + 2)	Anatomy comics may be helpful to beginning students. (0 + 2)
	Students can see real features of structures in slide lectures. (7 + 1)	Virtual dissection of three-dimensional models can be utilized during systemic anatomy. (0 + 2)
	Huge number of students influence one another in many good ways. (6 + 1)	
	After graduation, the abundant alumni assist individual members. (1 + 1)	
	Description quiz in the lab promotes students' concentration on the cadaver observation. (0 + 1)	

(Repeated numbers of the Korean students' opinions + the Korean anatomists' opinions).

Table IV. Opinions of the Chinese and Korean anatomists regarding their counterparts.

	Best practices for anatomists	Recommendations for anatomists
12 Chinese anatomists	They have enough time to do the research. (3)	They should spend more time preparing the anatomy curriculum. (1)
		More anatomists are needed for various activities (1)
2 Korean anatomists	From many experienced anatomists, young anatomists will learn a lot. (2)	Many articles on anatomy education are expected (2)
	Abundant students provide large data sets for scientific articles on anatomy education. (2)	Educational tools should be made in English and spread globally. (1)
		More lecture movies and dissection movies should be made for self-study. (1)

(Repeated numbers of the anatomists' opinions).

The Chinese authors were commonly devoted to anatomy education for 4 months every year, while the Korean authors spent only 1 month on anatomy education. Therefore, the Korean authors advised their counterparts to save time by developing educational tools for self-study (e.g., dissection movies).

DISCUSSION

In this study, the anatomy education of 600 Chinese students and 50 Korean students has been compared (Table I). The opinions of students and anatomists regarding the

differences have been collected in these two nations (Tables II, III, and IV).

The individual opinions vary. In the case of osteology taught by the senior students in Korea, the Chinese generally agree on its effectiveness, but one Chinese student does not (Table II). Nevertheless, patterns do emerge from the opinions in China and Korea.

For many reasons, it is not easy to actualize the recommendations. One is the social and cultural gaps between the two countries. Another is the complicated differences between the educational situations (for example, the number of students) in Chinese and Korean universities (Fig. 1) (Table I). The other is the difference in educational goals between the Chinese and Korean authors. Nevertheless, the opinions should be considered to improve students' learning and anatomists' activity (Tables II, III, and IV).

Analysis of the differences sometimes changes the authors' way of thinking. An example follows: The enormous teaching burden of the Chinese anatomists prevents their research activity. However, the Korean anatomists hold a different view. The burden could be the source of their research activity if they were to investigate anatomy education. The large number of students, anatomists, learning materials, and pedagogic systems would interest other anatomists (Fig. 1) (Table IV).

This report is expected to provide useful information to other anatomists who teach very large or very small number of students. Additionally, this report hopefully satisfies the curiosity of medical students who learn anatomy in various environments.

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RESUMEN: En Southern Medical University de China, 600 estudiantes de medicina estudian anatomía macroscópica, mientras que en la Universidad de Ajou, en Corea, hay 50 estudiantes de medicina que estudian anatomía. Debido a la diferencia significativa en

el número de estudiantes, las situaciones educativas son bastante diferentes. El objetivo de este trabajo consistió en identificar que tipo de educación de la anatomía es deseable en los cursos con mayor y menor cantidad de estudiantes. Se comparó la enseñanza de la anatomía en ambas universidades. Posteriormente, las mejores prácticas y recomendaciones para las clases grandes y pequeñas, se obtuvieron a partir de cuestionarios realizados a los estudiantes de medicina (30 chinos y 48 coreanos) y a los anatomistas (12 chinos y 2 coreanos). Las mejores prácticas observadas fueron motivadas por estudiantes y anatomistas, mientras que las recomendaciones de cada grupo fueron instructivas para su contraparte. Tener en cuenta estos hallazgos puede ayudar a guiar el progreso del aprendizaje de los estudiantes y la actividad correspondiente de los anatomistas. Este informe proporciona información útil a otros anatomistas que instruyen a un número grande o pequeño de estudiantes.

PALABRAS CLAVE: Anatomía; Educación; China; Corea; Cadáver.

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Corresponding author:
Beom Sun Chung
Department of Anatomy
Ajou University School of Medicine
164 Worldcup-ro
Suwon, 16499
REPUBLIC OF KOREA

Email: bschung@ajou.ac.kr

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