

Effects of Open Board Lecture Videos on Anatomy

Efectos de los Videos de Conferencias de Tablero Abierto sobre Anatomía

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KIM, C. Y.; PARK, J. S.; LEE, J. H.; HA, H. M. & CHUNG, B. S. Effects of open board lecture videos on anatomy. *Int. J. Morphol.*, 40(4):1117-1122, 2022.

SUMMARY: COVID-19 has forced anatomists to perform non-face-to-face education using lecture videos. A Korean anatomist has given (white and black) board lectures and distributed lecture videos to the public for many years. This study was to verify the effects of open board lecture videos in the anatomy field. A questionnaire survey was carried out with the help of medical students who were exposed to the board lecture videos. The video provider uploaded the lecture videos on YouTube, where the viewing numbers were counted. At a medical school where the video provider belonged, the students mainly watched the lecture videos before the anatomy class. The watching hours of the lecture videos were related to the written examination scores. Students gave positive and negative comments on the board lectures. At the other two medical schools, students partly watched the lecture videos regardless of the teacher who delivered the lectures. The results suggested that students understood the board lectures themselves. On YouTube, the lecture videos were viewed by approximately 1,000 students. This paper introduces the desirable aspects of open board lecture videos on anatomy. The videos could enhance the quality of both students and teacher.

KEY WORDS: Regional anatomy; Video recording; Undergraduate medical education; Illustrated books.

INTRODUCTION

In 2020 and 2021, COVID-19 forced anatomists to perform non-face-to-face education using lecture videos (Iwanaga *et al.*, 2020; Pacheco *et al.*, 2020). To enhance the educational effect, anatomists should consider how to produce and spread lecture videos.

Currently, most anatomists conduct slide lectures with a beam projector to show real anatomical figures to students. Nevertheless, the board lectures have some advantages that slide lectures cannot provide. During board lectures, students draw anatomical figures and write anatomy terms, which help them memorize the anatomy information (Greene, 2018; Reid *et al.*, 2019).

Usually, lecture videos are only open to students who register for the anatomy class. On the other hand, there is a new movement to open lecture videos to the public

because the open lecture videos can influence more students and honor the teacher (Hulme & Strkalj, 2017). One popular way is to upload the lecture videos onto YouTube. Another way is to distribute the lecture videos as computer files.

In 2006, a Korean anatomist made board lecture videos on regional anatomy (Park & Chung, 2006) and distributed them on YouTube.

This study was to verify the effects of open board lecture videos in the anatomy field. A questionnaire survey was performed with the help of medical students exposed to the board lecture videos. The number of views of the same videos on YouTube was also counted. The students' (consumers of the lecture videos) responses and the teacher's (provider) accomplishments were discussed.

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FUNDING. This research has been supported by the National Research Foundation of Korea (NRF) grant funded by the Korea government (MSIT) (No. 2021R1G1A1092673 and NRF-2021R1F1A1063044) and by the Yonsei University Wonju Campus Future-Leading Research Initiative of 2021 (2021-52-0057).

MATERIAL AND METHOD

Students in three Korean medical schools (School A, School B, and School C) volunteered for this research after listening to the research explanation (Table I).

At School A, the video provider taught all chapters. Before the anatomy class, the students were informed of the lecture videos very early (Fig. 1). At the end of class, the students were asked to write their answers in a form. “Did you watch the lecture videos before class or during class?” “How many hours did you watch the lecture videos?” “What are the good and bad aspects of the lecture videos?”

At School A, the watching hours of the lecture videos and the scores on written examinations/tag examinations were analyzed by calculating the Pearson’s correlation coefficient and P value. The Statistical Package for the Social Sciences (SPSS), version 20 (IBM Corp., Armonk, NY, USA) was used for statistical analyses.

At School B and School C, the video provider taught only the upper limb chapter, which was early in the anatomy class. During the lectures, the students were informed of the lecture videos. At the end of the anatomy class, the students were asked to answer a question on the lecture videos. “What chapter of the lecture videos did you watch?”

The lecture videos on regional anatomy were grouped into nine chapters and 98 subchapters (Table II). The chapters and subchapters were equivalent to those in the follow-up regional anatomy book (Chung *et al.*, 2020). The many subchapters enabled the students to find the lecture videos they wanted quickly.

Each lecture video was uploaded onto YouTube in September 2014. After five and a half years, the number of times that each lecture video was watched was counted (Table II).

Ethics statement. This research was reviewed by the Institutional Review Board (IRB) of Ajou University School of Medicine and granted an exemption of deliberation (AJIRB-SBR-EXP-15-254).

Table I. Status of the volunteer students and their watching incidence of the lecture videos

	School A*	School B†	School C‡
Years of surveillance	2015–2020	2016	2016
Number of (cumulative) students	271	46	64
Chapters taught by video provider	All chapters	Upper limb chapter	Upper limb chapter
Watching incidence of the lecture videos (chapters taught by video provider)	97.1 %	76.1 %	17.2 %
Watching incidence of lecture videos (chapters not taught by video provider)		65.2 %	7.8 %

The video provider belongs to School A* while the authors belong to School B† and School C‡.

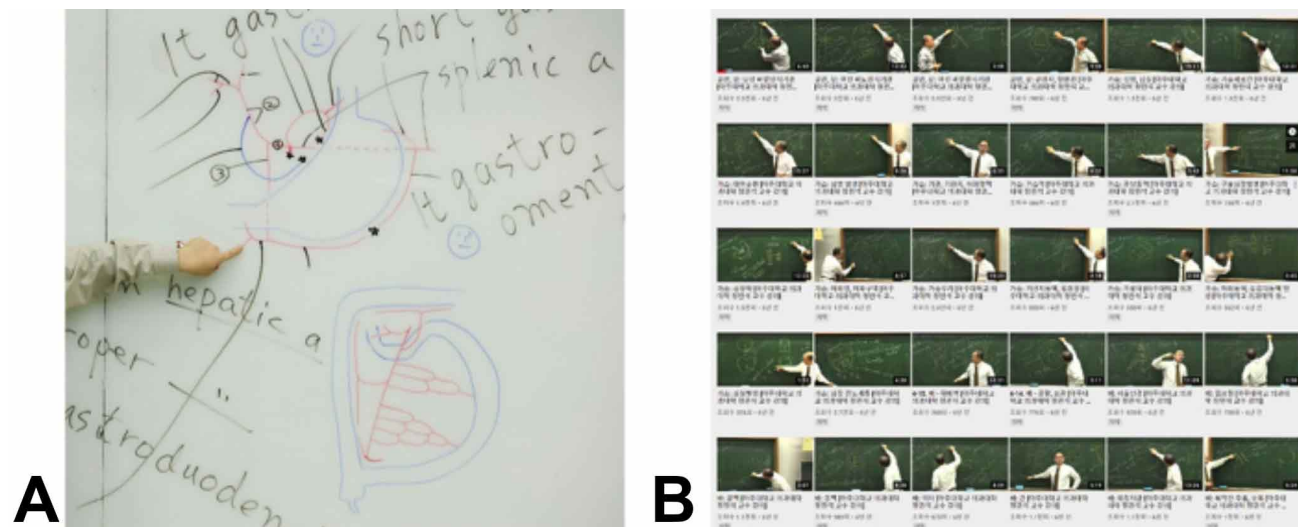


Fig. 1. Board lecture on anatomy (A) and lecture videos uploaded onto YouTube (B). The lecture was done in Korean language with English anatomy terms.

Table II. Watching numbers of the individual chapters of regional anatomy on YouTube.

Chapters	Number of subchapters	Average watching numbers
Introduction	13	2,668
Back	3	1,841
Upper limb	10	1,407
Neck	11	1,048
Head	9	927
Thorax	17	990
Abdomen	13	930
Pelvis & perineum	9	1,689
Lower limb	13	955

RESULTS

At School A, 97.1 % of students watched the lecture videos (Table I). The watching incidence varied according to the year for many reasons, such as curriculum changes. Consistently, the watching incidence before class was higher than that during class (Fig. 2). At School A, watching the lecture videos before class was related to the written examination scores (Table III).

School B and School C students watched the lecture videos of the chapters that were taught by the video provider (76.1 % and 17.2 %, respectively) and those not taught by the video provider (65.2 % and 7.8 %, respectively) (Table I). The difference between School B and School C was because School B had the same lecture style as School A, but school B did not make its own lecture videos.

Table III. Pearson’s correlation coefficient between the watching hours of lecture videos and the examination scores at School A.

	Written examination	Tag examination
Before class	0.251 ($P = 0.000$)	0.061 ($P = 0.321$)
After class	0.106 ($P = 0.830$)	0.134 ($P = 0.290$)

Table IV. Comments from School A students who watched the anatomy lecture videos and their presumptive reasons.

	Comments	Presumptive reasons
Positive comments	The explanation is logical and easy for students to understand. (87) The videos are available for students to prepare by themselves. (64) The content is not excessive and is properly summarized. (43) Students can watch the videos anytime, anywhere. (53)	Because of the strong points of board lectures Because of the available lecture videos online or offline
Negative comments	The lecture videos are partly different from the textbook. (119) The quality of the picture and sound in the videos are not good. (107) There is no real image in the videos. (8) There is no information about cadaver practice. (3)	Because of the out-of-date lecture videos Because of the weak points of board lectures

(Repeated number of opinions among 271 students)

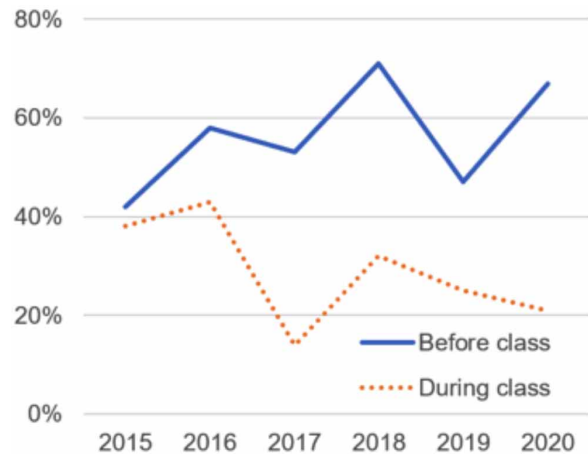


Fig. 2. Watching incidence (by year) of the lecture videos by School A students before or during anatomy class.

The students in School A wrote positive and negative comments on the lecture videos. The comments were grouped according to the presumptive reasons (Table IV).

On YouTube, the individual chapters were watched around 1,000 times on average. The early chapters, such as the introduction, were watched many times (Table II). The video provider’s channel of YouTube had 2,110 subscribers in 2021.

DISCUSSION

The board lecture videos on regional anatomy open to the public are beneficial to both students and teachers. First, the board lecture videos are beneficial to students.

The characteristics of the board lectures, which are different from those of the slide lectures, need to be considered. In the case of the video provider of this research, the drawings and explanations were memorized when

delivering the board lecture of the day. This memorization is possible for the following four reasons: the video provider teaches as little as possible; the video provider draws simply to explain the morphology of the human body (Fig. 1); the video provider uses mnemonics and etymology for the anatomy terms; the video provider uses logic just like solving a mathematical question.

The School A students voluntarily watched the lecture videos before class (Fig. 2). In addition, the watching appeared to be helpful in the written examination (Table III). The results suggested that students understood the board lectures themselves. The School B and School C students partly watched the lecture videos regardless of the teacher who delivered the lectures and prepared the examination questions (Table I). If the students did not comprehend the board lectures, they would not watch the lecture videos.

The School A students wrote supportive, positive comments. "The explanation is logical and easy for students to understand. The videos are available for students to prepare by themselves. The content is not excessive and is summarized properly." These appeared to be because of the board lectures (Table IV).

Negative comments were also written. "There is no real image in the videos. There is no information about cadaver practice." These comments were attributed to the board lectures (Table IV).

The video provider devised simple drawings without artistic talent (Fig. 1). The simple drawings are like a rough map to orient first-time visitors to a destination. After being acquainted with the simple drawings, students can easily figure out the realistic drawings in the anatomy atlas and the dissected cadaver (Van Meter *et al.*, 2006; Wilson, 2015). Recently, these simple drawings can be supplemented with digital learning tools, including the online atlas and videos that students frequently use (Jaffar, 2012; Lewis *et al.*, 2014; Barry *et al.*, 2016; Leung *et al.*, 2020). Another choice of the teacher is that the board lecture is followed by the slide lecture containing real features.

Other research also supports the advantage of board lectures, especially for novice students. Unlike slide lectures, board lectures show the teacher's drawing and writing in real-time, which is like a live performance to interact with the students (Artemeva & Fox, 2011; Singh & Phoon, 2021). Furthermore, the board lectures facilitate students' memorization using multiple senses, including vision, hearing, and even proprioception of redrawing (Backhouse *et al.*, 2017; Reid *et al.*, 2019; Shapiro *et al.*, 2020). The board lectures are good fit for anatomy, a morphology.

The students wrote other negative comments. "The lecture videos are partly different from the textbook. The quality of the picture and sound in the videos is not good." It was because the lecture videos had not been updated by the video provider for 14 years (Table IV). Even if gross anatomy is an old-fashioned subject, the lecture videos should be updated regularly. The quality of the picture and sound needs to be improved by using a new video camera.

Second, the board lecture videos are beneficial to teachers.

In most cases, teachers write a book based on their own lectures. The video provider presented the board lectures so he could write a regional anatomy book that contains little content, simple drawings, many mnemonics, and acceptable logic. The electronic book is available worldwide because it is written in English and obtainable free of charge on the homepage (anatomy.co.kr) (Chung *et al.*, 2020).

The video provider wrote another free electronic book on systemic anatomy (also obtainable at anatomy.co.kr) following the board lectures on the systemic anatomy. The systemic anatomy book is for the students who do not dissect cadavers (Chung & Chung, 2018). The other is a commercial book on neuroanatomy, which also followed the board lectures (Chung & Chung, 2020). In the case of the video provider, the board lectures brought about all the free and commercial books. Although the board lectures took the teacher's time, they were worthwhile investment.

Third, the open lecture videos are beneficial to students.

Usually, lecture videos are open only to students who have paid the tuition. The students access the lecture videos using a password. However, they cannot download the computer files because of the closed property policy. In other words, students can only watch the lecture videos online, not offline.

In the present study, the students watched the lecture videos no matter where they were affiliated. On average, around 1,000 students watched them online (Table II). Additional students might watch them offline after obtaining the Windows media video (WMV) files. For the sake of the students, offline watching is good because the lecture videos are displayed ceaselessly regardless of the communication status.

Students can watch the lecture videos not only on a personal computer but also on mobile devices (e.g., iPad). Medical students utilize their mobile devices heavily, both

in the classroom and dissection room (Mayfield *et al.*, 2013; Wilkinson & Barter, 2016). The students left the comment “Students can watch the videos anytime, anywhere (Table IV).”

Moreover, students utilize lectures for recent pedagogic strategies, including flipped classrooms. The students freely watch the lecture videos beforehand to prepare for group discussion and questioning (Morton & Colbert & Getz, 2017).

The lecture videos in the present study need to be in English to increase the watching times and worldwide contributions. This would not be difficult because the video provider has already published their English books (Chung *et al.*, 2020; Chung & Chung, 2020). The lecture videos will be saved as moving picture experts’ group 4 (MP4) files, which are the universal format for distribution.

Fourth, the open lecture videos are beneficial to the teacher.

The watchers of the lecture videos are regarded as the teacher’s students. The open lecture videos on YouTube will be an excellent chance to honor the teacher, setting aside the income from YouTube. The teachers’ affiliation (medical school) also wants to maintain their reputation because it will enhance the affiliation’s prestige.

Many anatomists are presenting open lecture videos to promote healthy competition. The competition can motivate each teacher to produce better lecture videos to attract many students. Abundant feedback from students (e.g., questions and comments on YouTube) will encourage the teacher to make better lecture videos.

CONCLUSION

COVID-19 motivated anatomists to consider producing and disseminating their lecture videos. The authors introduced the desirable aspects of open board lecture videos for both students and teachers.

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RESUMEN: COVID-19 ha obligado a los anatomistas a realizar una enseñanza no presencial mediante videos de conferencias. Un anatomista coreano ha impartido conferencias (en blanco y negro) y ha distribuido videos de conferencias al público du-

rante muchos años. El objetivo de este estudio fue verificar los efectos de los videos de conferencias de pizarra abierta en el campo de la anatomía. Se llevó a cabo una encuesta con la ayuda de estudiantes de medicina que habían sido expuestos a los videos de conferencias de la pizarra. El proveedor de videos subió los videos de las conferencias a YouTube, donde se contabilizó el número de visualizaciones. En una facultad de medicina a la que pertenecía el proveedor de videos, los estudiantes vieron principalmente los videos de conferencias antes de la clase de anatomía. Las horas de revisión de los videos de las conferencias se relacionaron con las puntuaciones de los exámenes escritos. Los estudiantes dieron comentarios positivos y negativos sobre las conferencias de la pizarra. En las otras dos facultades de medicina, los estudiantes vieron parcialmente los videos de las clases, independientemente del profesor que las impartiera. Los resultados sugerían que los estudiantes entendieron las conferencias de la pizarra por sí mismos. En YouTube, los videos de las conferencias fueron vistos por aproximadamente 1000 estudiantes. Este artículo presenta los aspectos deseables de los videos de conferencias abiertas sobre anatomía. Los videos podrían mejorar la calidad tanto de los estudiantes como del profesor.

PALABRAS CLAVE: Anatomía regional; Grabación de video; Educación médica de pregrado; libros ilustrados.

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