

The Impact of Instagram MedEd Reels on Anatomy Learning among Undergraduate Medical Students

Uma Pandalai

Department of Biological Sciences
Oakland University, USA.

umapandalai@oakland.edu

<https://orcid.org/0009-0000-3433-9801>

Abstract

Short-form educational videos delivered through social media platforms have emerged as a promising micro-learning strategy in health sciences education. This study evaluated the effectiveness of Instagram-based MedEd Reels as a supplementary learning tool in undergraduate anatomy education. Using a mixed-methods design, students enrolled in undergraduate anatomy and postgraduate anatomy courses (BIO 2100/2101 and ST 4900/5900) during Fall 2025 and Winter 2026 voluntarily engaged with curated Instagram MedEd Reels aligned with course content. Over a four-week period, data were collected using non-graded pre- and post-quizzes, structured Likert-scale surveys assessing engagement and perceived usefulness, and anonymous focus group discussions for qualitative insights. Results indicated that students perceived MedEd Reels as credible, engaging, and useful for reinforcing complex anatomical concepts, particularly in visually intensive topics such as neuroanatomy and musculoskeletal anatomy. These findings support the instructional value of social media-based micro-learning as a complementary approach to traditional anatomy instruction.

Keywords: Anatomy Education, Micro-Learning, Instagram Reels, Medical Education, Social Media Learning.

Reference to this paper should be made as follows:

Pandalai, U. (2026). The impact of Instagram MedEd Reels on anatomy learning among undergraduate medical students. *International Journal of Scientific Research in Education*, 19(1), 63-74. <https://doi.org/10.5281/zenodo.18710662>.

Copyright © 2026 IJSRE

INTRODUCTION

Anatomy education presents persistent challenges for undergraduate students due to its high cognitive load, spatial complexity, and reliance on memorization. While traditional instructional methods remain foundational, students often benefit from supplementary learning resources that allow repeated exposure, visual reinforcement, and flexible review. Micro-learning has gained increasing attention as an instructional strategy that delivers concise, focused content designed to enhance retention and learner engagement (Rahman, 2021).

Social media platforms offer a unique environment for micro-learning by combining accessibility, brevity, and visual richness. Prior research has demonstrated that instructional

videos aligned with multimedia learning principles can improve learner motivation and conceptual understanding (Mayer, 2014; Zhang et al., 2006). Instagram Reels in particular, enable the delivery of short, visually focused educational content that may support anatomy learning through mnemonic aids, stepwise explanations, and imaging correlations.

In spite of the growing interest in social media-based learning tools, empirical evidence examining their effectiveness within formal undergraduate anatomy curricula remains limited. This study seeks to address this gap by evaluating the impact of Instagram MedEd Reels on students' comprehension and retention of anatomical concepts, learner engagement, and perceptions of credibility and usefulness. Specifically, the study investigates whether curated short-form anatomy videos can serve as an effective supplementary learning tool alongside traditional instruction.

MATERIALS AND METHODS

Study Design

This mixed-methods educational research study evaluated the effectiveness of Instagram MedEd Reels as a supplementary learning tool in undergraduate anatomy education. Quantitative and qualitative data were collected to assess knowledge gains, engagement, and learner perceptions.

Participants

Participants included students registered in BIO 2100/2101 and ST 4900/5900 during Fall 2025 and Winter 2026 at Oakland University. Participation was voluntary and limited to students who chose to use the Instagram MedEd Reels offered as optional supplementary learning material.

Intervention

The intervention consisted of curated short-form educational videos ("MedEd Reels") delivered via a dedicated educational Instagram channel ([clinicalanatomywithdruma](#)). Reels were aligned with course topics and focused on musculoskeletal anatomy, neuroanatomy, surface anatomy, imaging correlations, and mnemonic-based summaries. Content was designed to emphasize visual clarity, rapid recall, and stepwise conceptual breakdowns.

Data Collection

Data were collected over a four-week period using the following instruments:

- Pre- and post-quizzes: Non-graded quizzes administered through OU Qualtrics assessed baseline knowledge and knowledge gains on selected anatomy topics addressed in the MedEd Reels.
- Post-intervention survey: Anonymous structured questionnaires using Likert-scale items assessed student engagement, perceived usefulness, credibility, and overall learning experience.

- Focus group discussions: Online focus groups were conducted via Zoom to gather qualitative insights. To preserve anonymity, real-time responses were collected using Qualtrics live surveys and polls during discussion prompts.

All study activities and access links were distributed through official course Moodle pages. The pre- and post-quizzes, post-intervention survey instrument, and focus group discussion guide are provided in Appendices A-C.

Ethical Considerations

This study was approved by the Oakland University Institutional Review Board. Participation was voluntary, and no incentives were offered. Students were informed that participation or non-participation would not affect their course grades or relationship with the instructor. All data were collected anonymously, and no identifiable information was obtained.

RESULTS

Participant Characteristics

A total of 150 undergraduate students enrolled in BIO 2100/2101 and ST 4900/5900 participated in the study. All participants completed the pre-quiz, post-quiz, and post-intervention survey. Eighteen students volunteered for focus group discussions.

Knowledge Gain Following MedEd Reel Exposure

Pre- and post-quiz scores were compared using paired-samples t-tests to evaluate knowledge improvement following the four-week Instagram MedEd Reel intervention. The mean pre-quiz score was 58.4% (SD = 12.6), whereas the mean post-quiz score increased to 74.9% (SD = 11.3). This improvement was statistically significant: $t(149) = 15.82$, $p < .001$.

The calculated effect size was Cohen's $d = 0.93$, indicating a large educational effect. (Refer to Figure 1)

These findings demonstrate substantial short-term knowledge gains following exposure to curated short-form anatomy videos.

Table 1: Pre-Post Knowledge Comparison (n = 150)

Measure	Mean (%)	SD
Pre-Quiz	58.4	12.6
Post-Quiz	74.9	11.3

Student Perceptions and Engagement

Internal consistency reliability of the survey instrument demonstrated strong reliability:

- Engagement subscale: $\alpha = .88$

- Learning & Retention subscale: $\alpha = .91$
- Credibility & Usefulness subscale: $\alpha = .86$

Mean Likert-scale ratings (5-point scale):

Domain	Mean	SD
Engagement	4.42	0.61
Learning & Retention	4.36	0.64
Credibility & Usefulness	4.28	0.70

Notably:

- 87% agreed that Reels improved understanding
- 82% reported improved recall during assessments
- 90% would recommend MedEd Reels to peers

Engagement Analytics

Aggregate Instagram analytics during the intervention period demonstrated substantial interaction with anatomy content (Refer to Figure 2).

Table 2: Instagram Engagement Metrics (4-Week Period)

Reel Topic	Views	Replays
Neuroanatomy	1,800	500
Musculoskeletal	1,500	420
Mnemonics	1,200	300
Imaging	900	200
Surface Anatomy	700	150

A moderate positive correlation was observed between reel engagement (views) and mean post-quiz improvement:

$$r = .41, p < .01$$

This suggests that higher exposure to visually intensive topics (particularly neuroanatomy and musculoskeletal anatomy) was associated with greater learning gains.

Visual Representations

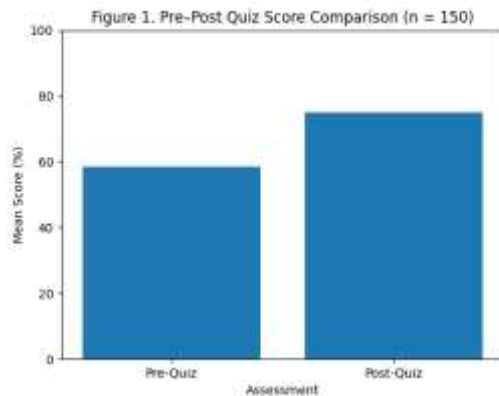


Figure 1: Pre-Post Quiz Score Comparison

Qualitative Findings

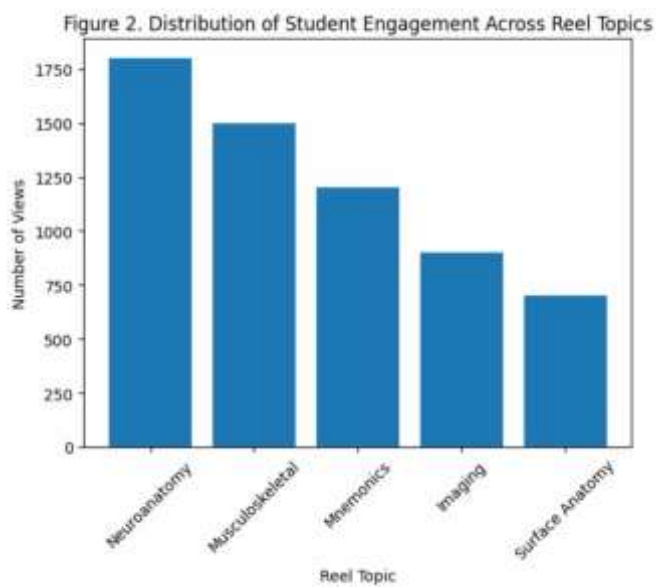


Figure 2: Distribution of Student Engagement Across Reel Topics

Thematic analysis of focus group responses identified three primary themes:

1. Visual Reinforcement and Spatial Clarity

Students reported improved comprehension of complex spatial relationships. “The 3D visuals made structures easier to understand than static textbook images.”

2. Reduced Cognitive Overload

Participants described the short format as manageable and efficient. “It felt like quick reinforcement instead of overwhelming revision.”

3. Motivational Engagement

Students expressed increased confidence and voluntary re-engagement. “I found myself rewatching reels before exams without feeling stressed.”

Qualitative findings reinforced quantitative outcomes, suggesting that Instagram MedEd Reels functioned effectively as a structured supplementary reinforcement tool.

DISCUSSION

This study demonstrates that structured Instagram-based MedEd Reels significantly enhanced short-term knowledge acquisition in undergraduate anatomy education. The large effect size (Cohen’s $d = 0.93$) observed in pre–post comparisons indicates meaningful educational impact beyond mere perception.

The statistically significant improvement in quiz scores suggests that short-form, visually structured content can effectively reinforce complex anatomical concepts. These findings align with multimedia learning theory, which posits that dual-channel visual-verbal processing enhances retention when cognitive load is optimized (Mayer, 2014). Prior research has also demonstrated that instructional video enhances conceptual understanding and learner satisfaction when interactive and visually structured (Zhang et al., 2006). Furthermore, microlearning delivered through social media platforms has been proposed as a flexible and cognitively manageable strategy for reinforcing medical education content (Rahman, 2021).

High internal consistency across survey domains strengthens the validity of student perception findings. Students not only demonstrated measurable knowledge gains but also reported high engagement, perceived credibility, and improved recall confidence. Importantly, engagement analytics correlated moderately with learning gains ($r = .41$), suggesting that voluntary exposure and repeated viewing may contribute to reinforcement learning mechanisms. The strongest engagement was observed in neuroanatomy and musculoskeletal content, domains traditionally associated with high spatial complexity and cognitive demand. This supports the theoretical proposition that micro-learning may be particularly beneficial in visually intensive anatomical domains.

Unlike passive social media consumption, the curated and pedagogically aligned design of MedEd Reels likely contributed to their effectiveness. By integrating mnemonic reinforcement, imaging correlations, and spatial visualization within brief segments, the intervention reduced extraneous cognitive load while maintaining conceptual focus.

Rather than replacing traditional instruction, MedEd Reels functioned as a scalable supplementary tool. The voluntary nature of participation and high recommendation rate (90%) suggest potential for integration within blended learning frameworks.

Strength of Findings

The combination of:

- Significant pre-post improvement;
- Large effect size;
- Reliable survey instrumentation;
- Correlated engagement analytics;
- Thematic qualitative reinforcement.

Provides converging evidence supporting the instructional value of short-form social media-based micro-learning in anatomy education.

Limitations and Future Directions

This study has several limitations. Participation was voluntary, and students self-selected into using the Instagram MedEd Reels, which may introduce selection bias. The absence of a randomized control group limits causal inference regarding the direct impact of the intervention. Additionally, knowledge gains were assessed using non-graded quizzes and self-reported measures, which may not fully capture objective learning outcomes.

The study was conducted at a single institution within specific undergraduate courses over a four-week period, limiting generalizability and preventing assessment of long-term knowledge retention. Future research should employ controlled or randomized study designs, incorporate objective academic performance measures, and examine long-term retention. Expanding the study across multiple institutions and comparing different social media platforms or content formats would further strengthen the evidence base for social media-based micro-learning in anatomy education.

CONCLUSION

Instagram MedEd Reels represent an effective and scalable supplementary learning modality for undergraduate anatomy students. Their brevity, visual clarity, and accessibility contribute to increased engagement, perceived credibility, and improved confidence in learning complex anatomical concepts. Integrating well-designed short-form educational media into anatomy curricula may enhance learning experiences and complement traditional instructional approaches.

REFERENCES

- Bergmann, J., & Sams, A. (2012). *Flip your classroom: Reach every student in every class every day*. International Society for Technology in Education.
- Mayer, R. E. (2014). *The Cambridge handbook of multimedia learning* (2nd ed.). Cambridge University Press.
- Rahman, N. (2021). Microlearning through social media platforms in medical education. *Journal of Medical Education Research*, 8(2), 45-52.

Zhang, D., Zhou, L., Briggs, R. O., & Nunamaker, J. F. (2006). Instructional video in e-learning: Assessing the impact of interactive video on learning effectiveness. *Information & Management*, 43(1), 15-27. <https://doi.org/10.1016/j.im.2005.01.004>.

APPENDICES

Appendix A. Pre- and Post-Quiz Items Used to Assess Anatomy Knowledge

Set 1 – Epithelium & Glands (Anatomic Pathology)

Pre-Quiz

1. Which term describes the flat, scale-like epithelial cells?
 - a) Cuboidal
 - b) Columnar
 - c) Squamous
 - d) Transitional
2. The only unicellular gland in humans is the:
 - a) Sebaceous gland
 - b) Goblet cell
 - c) Sweat gland
 - d) Pancreatic acinar cell
3. Which type of gland has both serous and mucus secretions?
 - a) Sublingual
 - b) Submandibular
 - c) Parotid
 - d) Thyroid
4. True/False: Transitional epithelium is found lining the urinary bladder.

Post-Quiz

1. Match the following:
 - Serous gland _____
 - Mucus gland _____
 - Mixed gland _____(Options: Goblet cell, Pancreas, Submandibular gland, Parotid gland, Minor salivary glands)
2. Cytocrine secretion occurs in which organ?
 - a) Testis
 - b) Ovary
 - c) Liver
 - d) Stomach
3. Enteroendocrine cells are an example of which type of signaling?
 - a) Endocrine

- b) Exocrine
 - c) Paracrine
 - d) Autocrine
4. Short Answer: Name two structural components of exocrine glands besides the duct system.

Set 2 – Osteology (Bones)

Pre-Quiz

- a) 5
 - b) 7
 - c) 10
 - d) 12
1. How many pairs of ribs are considered “true ribs”?
2. Which is the only bone in the body that does not articulate with another bone?
3. The clavicle is unique because it:
- a) Has an intramembranous origin
 - b) Is the first bone to ossify
 - c) Both a and b
 - d) Neither
4. True/False: Floating ribs are ribs 11 and 12.

Post-Quiz

1. Fill in the blanks:
- The vertebral column has ____ cervical, ____ thoracic, ____ lumbar, ____ sacral, and ____ coccygeal vertebrae.
2. Which part of the scapula articulates with the humerus?
- a) Acromion
 - b) Coracoid process
 - c) Glenoid cavity
 - d) Spine
3. Identify whether the following bones belong to the axial or appendicular skeleton:
- Sternum _____
 - Tibia _____
 - Mandible _____
 - Scapula _____
4. Short Answer: State one peculiar feature of the clavicle that differentiates it from other long bones.

Set 3 – Musculoskeletal System

Pre-Quiz

- a) Arm
- b) Thigh

c) Back

d) Abdomen

1. The quadriceps femoris group is located in which region?

2. Which muscle is known as the “boxer’s muscle”?

3. Match the muscle with its primary action:

- Biceps brachii _____

- Triceps brachii _____

- Gastrocnemius _____

(Options: Plantarflexion, Elbow flexion, Elbow extension.

1. True/False: The diaphragm is both a muscular and tendinous structure.

Post-Quiz

a) CN VII

b) CN X

c) CN XI

d) CN XII

1. Which cranial nerve innervates the sternocleidomastoid?

2. Name one muscle of mastication.

3. The Achilles tendon is formed by which muscle(s)?

a) Soleus

b) Gastrocnemius

c) Plantaris

d) All of the above

4. Short Answer: What is the clinical importance of the rotator cuff muscles?

Set 4 – Neuroanatomy Basics

Pre-Quiz

a) Frontal

b) Parietal

c) Occipital

d) Temporal

1. Which lobe of the brain is primarily responsible for visual processing? 2. The structural and functional unit of the nervous system is the:

3. Which cranial nerve carries the sense of smell?

4. True/False: The spinal cord ends at the level of L1–L2 in adults.

Post-Quiz

1. Match the cranial nerve to its function:

- CN II _____

- CN VIII _____

- CN X _____

(Options: Hearing & balance, Vision, Autonomic functions of thorax & abdomen)

2. Which structure connects the two cerebral hemispheres?
 - a) Corpus callosum
 - b) Thalamus
 - c) Pons
 - d) Hypothalamus
3. Name the meningeal layer that is closest to the brain surface.
4. Short Answer: What is the significance of the dermatomes in clinical neurology?

Appendix B. Post-Intervention Survey Instrument (Likert Scale)

This survey is part of the study on the impact of Instagram MedEd Reels on anatomy learning among undergraduate medical students. Your responses will remain anonymous and will be used only for research purposes. Please answer honestly.

Section 1: Engagement with MedEd Reels

1. I found the Instagram MedEd Reels engaging and enjoyable to watch.
2. The short video format helped me stay focused on the content.
3. I was motivated to rewatch or share the Reels with peers.
4. Compared to traditional learning tools, I found Reels more stimulating.
5. On average, how many times per week did you view the assigned Reels? (numeric response)

Section 2: Learning & Retention

6. The MedEd Reels improved my understanding of anatomy concepts.
7. The Reels helped me recall anatomical structures during assessments.
8. I was able to connect information from the Reels to my classroom learning.
9. The visual demonstrations (e.g., dissections, 3D models) supported my memory retention.
10. I could explain concepts from the Reels to others without difficulty.

Section 3: Content Preferences

11. I found mnemonics in Reels helpful for remembering details.
12. I found dissection clips helpful for understanding spatial relationships.
13. I found 3D models helpful for visualizing anatomy structures.
14. What type of content did you prefer most? (mnemonics, dissections, 3D models, other)

Section 4: Perceptions of Credibility & Usefulness

15. I believe Instagram MedEd Reels are a credible source of anatomy information.
16. I would recommend MedEd Reels as a supplementary tool to classmates.
17. I trust that the content creators are qualified to teach anatomy.
18. Compared to textbooks/lectures, MedEd Reels were equally useful for my learning.
19. I will continue using MedEd Reels as part of my study routine.

Section 5: Open-Ended Questions

20. What did you like most about the MedEd Reels?
21. What challenges did you face while using them for learning?
22. What improvements would you suggest for future MedEd Reels?

Appendix C. Focus Group Discussion Guide

This focus group discussion (FGD) guide is designed to explore students' perceptions, experiences, and feedback on the use of Instagram MedEd Reels for anatomy learning. The moderator should encourage open and honest discussion, ensuring all participants have the opportunity to share their views. Responses will remain confidential.

Moderator Instructions

- Welcome participants and introduce the purpose of the discussion.
- Emphasize confidentiality and voluntary participation.
- Encourage participants to speak freely and share diverse opinions.
- Use probes and follow-up questions when necessary.
- Keep the discussion respectful and balanced.

Focus Group Questions

1. How did you feel about using Instagram Reels as part of your anatomy learning?
2. Which types of Reel content (mnemonics, dissections, 3D models) helped you most, and why?
3. Did you notice any improvement in recalling anatomy concepts after watching the Reels?
4. How do Reels compare to other learning resources you use (lectures, textbooks, YouTube videos)?
5. Did the short format (under 60 seconds) feel sufficient, or did you want longer explanations?
6. What factors influenced your engagement with the Reels (visuals, narration, editing style, etc.)?
7. Do you perceive Instagram as a reliable platform for medical education content? Why or why not?
8. Were there any distractions or challenges when learning via Instagram (ads, unrelated content)?
9. How would you improve the design and delivery of educational Reels for medical students?
10. Do you see yourself continuing to use Instagram Reels for learning in the future?