Peer-to-Peer Learning and Flipped Classrooms in Human Anatomy

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Co-funded by the European Union

YOUR OPINION MATTER!

Peer-to-Peer Learning & Flipped Classrooms in Human Anatomy

Introduction

Overview of peer-to-peer learning and flipped classrooms, and their relevance to education.

What They Are

Definition and explanation of peer-to-peer learning and flipped classrooms.

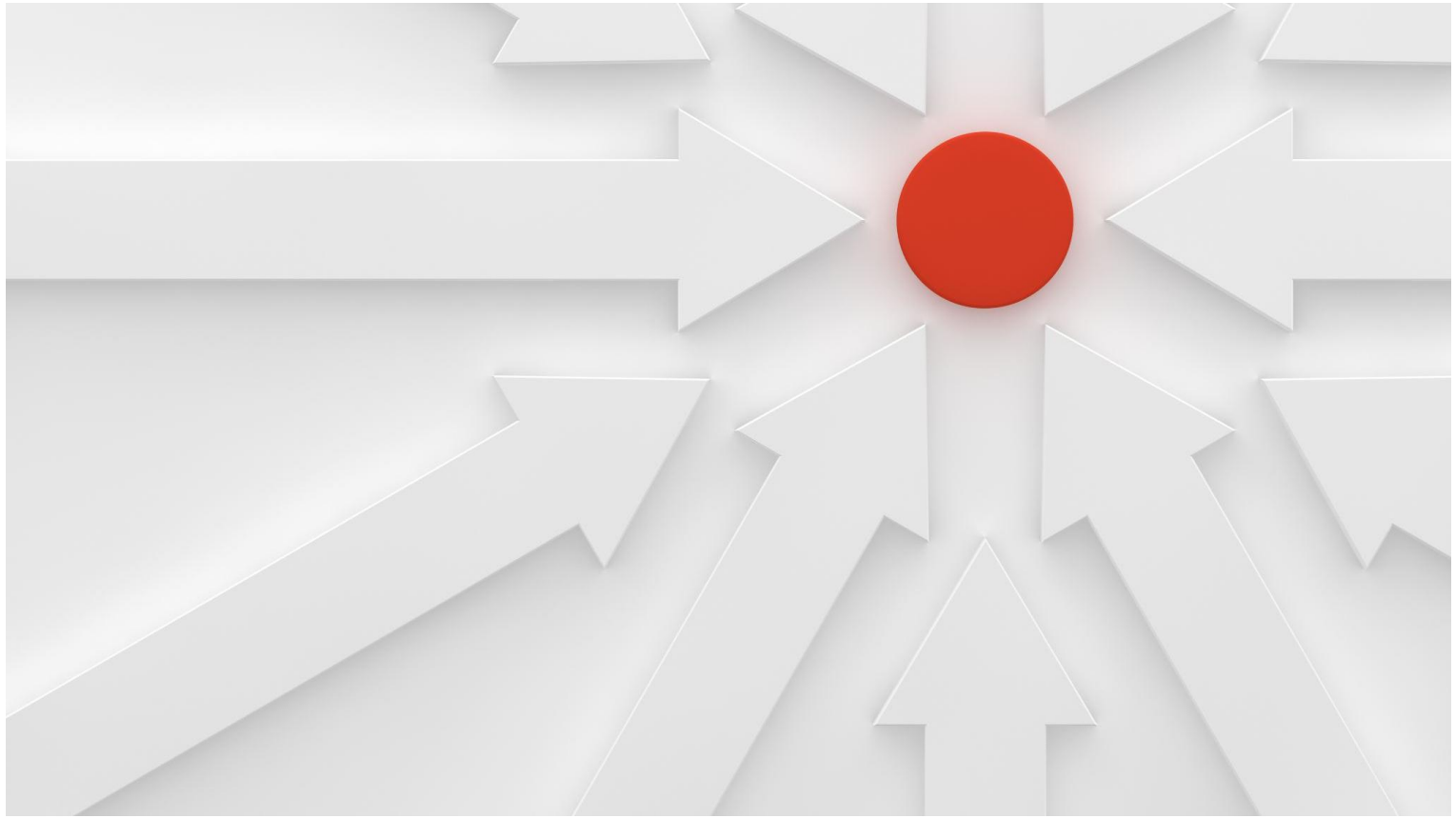
Application in Human Anatomy

How these methods are applied in teaching human anatomy to enhance understanding.

Our Experience

Insights and outcomes from implementing these techniques in our educational practice.

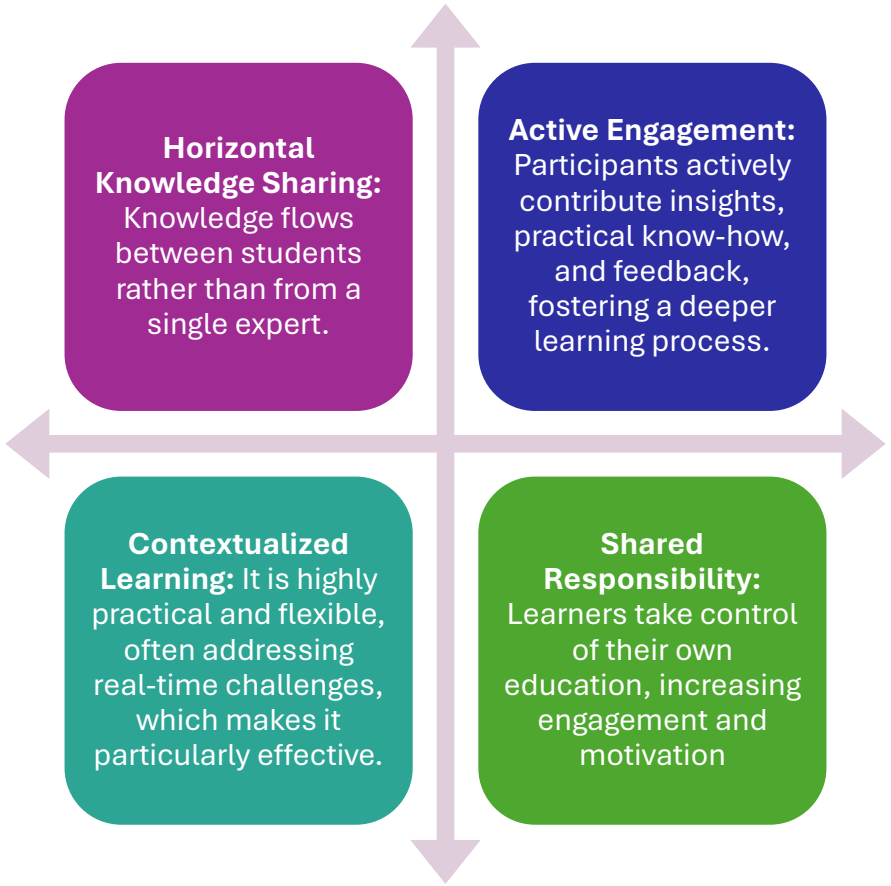
General concepts



Peer-to-peer learning

Peer-to-peer (P2P) learning is a **collaborative** educational approach where individuals at **similar skill levels** or roles teach, mentor, and learn from one another, rather than relying on a top-down, instructor-led model. It involves sharing knowledge, experiences, and feedback to deepen understanding and skills in both academic and workplace settings.

Key Characteristics and Components



Common Forms of P2P Learning

STUDY GROUPS OR WORKSHOPS: STUDENTS OR PEERS MEET TO DISCUSS TOPICS.

PEER MENTORING OR COACHING: PARTNERS GUIDE EACH OTHER IN DEVELOPING SKILLS.

PEER REVIEW: LEARNERS PROVIDE FEEDBACK ON EACH OTHER'S WORK.

ONLINE FORUMS AND COMMUNITIES: DIGITAL SPACES WHERE USERS ASK QUESTIONS AND SHARE ANSWERS

Benefits of Peer-to-Peer Learning

Enhanced Retention: Learning from peers strengthens knowledge retention, as the material is often presented in a more relatable way.

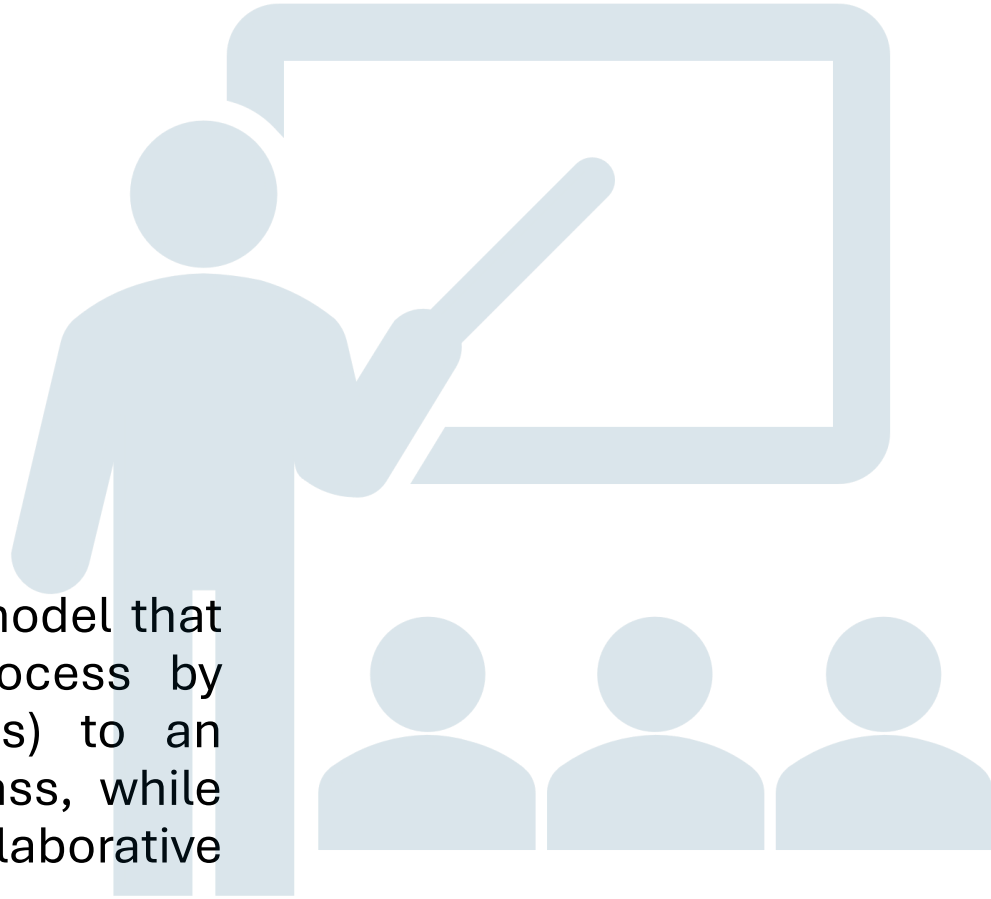
Increased Confidence: Participants feel more comfortable interacting with peers, leading to deeper reflection and safer, more open environments for asking questions.

Development of Soft Skills: Boosts communication, collaboration, and leadership skills.

Cost-Effective and Scalable: Offers a sustainable training method, reducing dependence on formal trainers or outside experts.

Flipped classroom

A **flipped classroom** is a pedagogical model that inverts the traditional instructional process by moving direct instruction (like lectures) to an individual learning space outside of class, while repurposing in-class time for active, collaborative learning



Key Characteristics

THE "FLIP": TRADITIONAL "SCHOOLWORK" (LECTURES) HAPPENS AT HOME, TYPICALLY VIA ONLINE VIDEOS, WHILE TRADITIONAL "HOMEWORK" (PRACTICE AND APPLICATION) IS COMPLETED IN THE CLASSROOM WITH TEACHER SUPPORT.

STUDENT-CENTERED: THE FOCUS SHIFTS FROM THE TEACHER AS THE PRIMARY SOURCE OF INFORMATION TO THE STUDENT AS AN ACTIVE PARTICIPANT IN THEIR OWN LEARNING.

ACTIVE LEARNING: CLASS TIME IS DEDICATED TO HIGH-LEVEL COGNITIVE ACTIVITIES SUCH AS PROBLEM-SOLVING, DEBATES, CASE STUDIES, AND GROUP PROJECTS.

ROLE CHANGE: THE TEACHER MOVES FROM BEING THE "SAGE ON THE STAGE" TO THE "GUIDE ON THE SIDE," FACILITATING AND COACHING STUDENTS THROUGH DIFFICULT CONCEPTS

The 4 Pillars of F-L-I-P

F – Flexible Environment: Teachers create adaptable spaces where students choose when and where they learn.

L – Learning Culture: A deliberate shift from a teacher-centered to a student-centered approach where class time is used for deep exploration.

I – Intentional Content: Educators specifically curate or create materials that students can handle independently, maximizing classroom time for procedural fluency.

P – Professional Educator: Teachers continuously observe, provide immediate feedback, and evaluate student progress during class sessions

Benefits

Individualized Learning Pace: Moves direct instruction to a medium where students can pause, rewind, and review content according to their personal cognitive needs.

Optimized Face-to-Face Time: Repurposes the classroom for high-level application, collaborative problem-solving, and peer-to-peer learning.

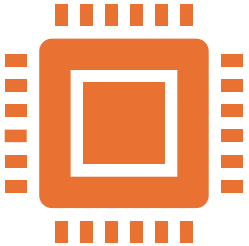
Immediate Feedback Loops: Provides educators the opportunity to diagnose and correct misconceptions in real-time during the "active" phase of learning.

Shift to Student-Centered Autonomy: Transitions students from passive recipients of information to active participants responsible for their own preparation.

Increased Instructor Accessibility: Redefines the teacher's role from a primary lecturer to a facilitator and coach, allowing for more one-on-one student interaction.

Enhanced Engagement: Targets the higher tiers of Bloom's Taxonomy—analyzing, evaluating, and creating—within the supported environment of the classroom.

Structural & Technical Challenges



The Digital Divide: Reliance on home technology can exacerbate inequities for students without high-speed internet or dedicated devices.

Increased Screen Time: Shifting lectures to a digital format adds to the total daily screen time for students, which can lead to fatigue.

Institutional Infrastructure: Requires robust Learning Management Systems (LMS) and IT support to host and manage video content effectively

Instructional & Preparatory Challenges

Front-End Labor: Significant initial time is required from educators to curate, record, and edit high-quality instructional materials.

Curriculum Redesign: Simply recording a lecture isn't enough; teachers must completely redesign in-class activities to be truly "active" and collaborative.

"Double Lecturing" Risk: Teachers may feel the urge to re-teach the video content in class for students who didn't watch it, which undermines the model's efficiency

Student & Behavioral Challenges

Accountability Issues: The model's success is entirely dependent on students completing the pre-class work; if they don't, the in-class activities fail.

Self-Regulation Demands: Students who lack intrinsic motivation or time-management skills may struggle with the responsibility of self-directed learning.

Passive Learning Inertia: Students accustomed to the "passive recipient" role in traditional lectures may initially resist the active participation required in class

Overcoming Flipped Classroom Challenges

Bridging the Digital Divide: Provide offline access to materials (USB drives, printed transcripts) or dedicated in-school "lab time" for students to complete digital pre-work.

Managing Preparatory Workload: Start by "flipping" a single unit rather than an entire course, and curate high-quality existing resources (like Khan Academy or YouTube) to reduce original content creation.

Ensuring Student Accountability: Implement low-stakes "entrance tickets" or short online quizzes that must be completed before class to verify engagement with the material.

Preventing "Double Lecturing": Use class time for brief 5-minute summaries rather than full re-teaching; allow prepared students to begin activities immediately to incentivize pre-class work.

Scaffolding Self-Regulation: Provide students with guided note-taking templates or "watch guides" to help them focus on key concepts while viewing videos independently.

Communicating with Stakeholders: Educate students on the *why* behind the flip through an introductory workshop or video to manage expectations and reduce resistance.

Human anatomy

Medical Science Educator (2025) 35:103–111
https://doi.org/10.1007/s40670-024-02151-4

ORIGINAL RESEARCH

Nerves of Steel: Bolstering Student Confidence in Gross Anatomy Through a Peer-to-Peer Intervention

Tucker J. Morris[1] · Mallory Ruvina[1] · Carolyn E. A. Cooper[1] · Noelle Fukuda[1] · Hunter Berger[1] · Daniel F. Wagner[1] · Sara Allison[2] · Jade Woodcock[2]

Accepted: 21 August 2024 / Published online: 2 September 2024

Abstract

Introduction Increasing confidence and performance in gross anatomy is crucial in medical education. This study identified challenging anatomical topics in a gastrointestinal (GAS) course and applied a peer-to-peer intervention to improve student confidence and performance in these areas in the following endocrine/reproductive (END) course.

Materials and Methods Thirty gross anatomical structures from a GAS mock practical were classified into six categories. As part of the mock practical, medical students rated their confidence in each answer using a scale of 1–5. Performance and confidence were compared across the six categories, revealing two areas with significantly lower scores. In the following END course, these areas were targeted through a 1-h peer-to-peer intervention.

Results Forty-two students participated in the GAS mock practical. Significantly lower performance was found in nerves and viscera categories. Students who attended the peer-to-peer intervention during the END course showed marked improvements in both areas on the END mock practical. Average performance for viscera increased from 31 to 68% ($p < .001$) and for nerves from 35 to 52% ($p < .001$). Average confidence for viscera increased from 2.22 to 3.32 ($p < .001$) and for nerves from 2.07 to 2.61 ($p < .001$).

Discussion These findings align with the expected benefits of peer-to-peer interventions. However, the difficulty students faced with viscera, more so than with vasculature, was unanticipated. This unexpected outcome underscores the nuanced nature of student learning in anatomy and the importance of targeted educational interventions. Future research should explore whether students consistently struggle with nerves and visceral structures across different organ systems.

Comparing Peer-Taught Student Tutors to Faculty-Taught Student Tutors in Educating Medical Students on Musculoskeletal Ultrasound

Matthew Aquino [1], Jedd Santamaria [2], Ebraheem Quadri [3], Benjamin Riegsecker [4], Jeffrey Li [4], Jane Kim [4], Fauzia Nausheen [5], Vy Han [5]

Review began 04/04/2024
Review ended 04/23/2024
Published 04/27/2024

Introduction: In recent years, medical education has witnessed a shift in the integration of ultrasound into the preclinical years of medical school. Given the exponential increase in accessibility to ultrasound technology, students now have the opportunity to create peer learning groups in which ultrasound concepts can be taught from peer to peer, empowering students to work together to integrate ultrasound concepts early in their preclinical education. This project investigates the efficacy of peer-taught student tutors (PTSTs) in imparting the fundamentals of basic ultrasound techniques to first-year medical students in the setting of identifying and labeling upper extremity musculoskeletal (MSK) anatomy.

Methods: First-year medical students were instructed to identify volar forearm structures with an ultrasound probe. Students and instructors were given access to an ultrasound probe, ultrasound gel, an iPad, and a standardized patient. Students were taught either by an ultrasound instructor (UI) or PTST. After a hands-on demonstration by a UI or PTST, participating students were told to take screenshots and label their images as accurately as possible, identifying the aforementioned volar structures on a standardized patient without any feedback. The labeled screenshot images of volar structures were graded based on the ability to clearly visualize the intended structures.

Results: The results of this study compare the efficacy of PTSTs as educators of basic sonographic identification techniques with that of UI faculty members. A chi-square analysis was performed between the images obtained by the UI and PTST students, and there was no statistically significant difference in identification accuracy between the groups ($p = 0.7538, 0.1977, 0.1812, 0.301$). When using the Mann-Whitney U rank test, there remained no statistically significant difference between the accuracy of the students taught by STs compared to students taught by UIs ($p = 0.7744, 0.09538, 0.07547, 0.1846$). Another finding showed that students belonging to both teaching groups were generally not able to infer the pathology of volar wrist structures when given pathology identification questions regarding upper extremity ultrasound. Using chi-square with Yates correction, there is no sufficient evidence to justify an association between the ability to answer pathology-based ultrasound questions and instructor type ($p = p = 0.6299, 0.8725$).

Conclusions: This study supports the interpretation that the capability of first-year medical students to learn novice MSK sonographic identification is independent of whether the educator is a PTST or UI. This interpretation reveals a promising avenue toward the integration of the fundamentals of ultrasound identification early in medical education with little to no concern for the exhaustion of institutional resources. Along with the other well-documented benefits of the utilization of STs in medical school, a peer tutoring system centered on ultrasound skills designed in the way this study describes can be an effective, resource-sparing system that enhances medical students' sonographic capabilities early in their preclinical years.

Journal of Professional Nursing 42 (2022) 15–25

Investigation flipped classroom effectiveness in teaching anatomy: A systematic review

Mohsen Kazeminia [a], Leili Salehi [b], Masoud Khosravipour [c], Fatemeh Rajati [d,*]

Background: In the Filliped Classroom (FC), the educational environment changes from a large place to an individual learning space and presents curriculum content outside the classroom, engaging learners.
Purpose: Several preliminary studies have been conducted to evaluate the effectiveness of the FC in anatomy curricular, there are discrepancies between their results. Therefore, the present study was conducted to determine the efficiency of FC in anatomy courses using systematic review.
Methods: In the current systematic review, all documents related to the FC in the anatomy teaching were searched using validated MeSH terms and their synonyms including "Flipp*", "Backwards Classroom", "Reverse Instruction", "Reverse Teaching", "Anatomy" in the Embase, ProQuest, Scopus, PubMed, Web of science (WoS). Google Scholar search engine and two local resources of Scientific Information Database (SID), MagIran, were also searched. The records were considered without time limitation until April 2021.
Results: A total of 1169 articles were found and after removing duplicate articles in different databases or unrelated to the inclusion criteria, finally 26 articles with a total sample size articles of the FC group of 2401 people were included in the study. According to the included studies the FC increases the level of self-confidence, improves academic achievement and students' interest and satisfaction, engages students in the learning and interactive activities, longevity and increases overall performance in anatomy curricular.
Conclusion: The results of this systematic review show that FC is generally perceived positively, and it has some advantages including increasing self-confidence, academic achievement, interest, learning activity, interaction, satisfaction, and overall performance in anatomy curricular. Therefore, it is suggested that this method be considered as one of the methods in teaching anatomy curricular.

Received: 11 November 2021 | Revised: 18 June 2022 | Accepted: 19 June 2022

DOI: 10.1002/ase.2207

DESCRIPTIVE ARTICLE

Anatomical Sciences Education | AMERICAN ASSOCIATION FOR ANATOMY | WILEY

Flipped anatomy classroom integrating multimodal digital resources shows positive influence upon students' experience and learning performance

Junhua Xiao[1,2] | Sharmeen Adnan[1]

Anatomy is shifting toward a greater focus on adopting digital delivery. To advance digital and authentic learning in anatomy, a flipped classroom model integrating multimodal digital resources and a multimedia group assignment was designed and implemented for first-year neuroanatomy and third-year regional anatomy curricula. A five-point Likert scale learning and teaching survey was conducted for a total of 145 undergraduate health science students to evaluate students' perception of the flipped classroom model and digital resources. This study revealed that over two-thirds of participants strongly agreed or agreed that the flipped classroom model helped their independent learning and understanding of difficult anatomy concepts. The response showed students consistently enjoyed their experience of using multimodal digital anatomy resources. Both first-year (75%) and third-year (88%) students strongly agreed or agreed that digital tools are very valuable and interactive for studying anatomy. Most students strongly agreed or agreed that digital anatomy tools increased their learning experience (~80%) and confidence (> 70%). The third-year students rated the value of digital anatomy tools significantly higher than the first-year students ($p = 0.0038$). A taxonomy-based assessment strategy revealed that the third-year students, but not the first-year, demonstrated improved performance in assessments relating to clinical application ($p = 0.045$). In summary, a flipped anatomy classroom integrating multimodal digital approaches exerted positive impact upon learning experience of both junior and senior students, the latter of whom demonstrated improved learning performance. This study extends the pedagogy innovation of flipped classroom teaching, which will advance future anatomy curriculum development, pertinent to post-pandemic education.

Received: 17 July 2023 | Revised: 5 September 2023 | Accepted: 1 October 2023

DOI: 10.1002/ase.2348

RESEARCH REPORT

Anatomical Sciences Education WILEY

Flipped classroom assisted by Rain Classroom for anatomy practical classes: Challenges and opportunities of anatomy education

Lulu Wang[1] | Baopu Du[1] | Dongliang Fang[1] | Yan Gao[1] | Li Liu[2]

Anatomy practical classes are an essential part of learning human anatomy. The flipped classroom teaching model has been used in medical education in recent years. However, its precise impacts on anatomical knowledge acquisition and learning outcomes remain controversial. With the development of information technology, new educational tools, such as Rain Classroom, have recently attracted much interest. The Rain Classroom is an application that can easily connect students and teachers through smartphones or computers. However, whether and how to apply it to the flipped classroom in anatomy practical classes needs to be evaluated. In this study, we designed a teaching model of flipped classroom assisted by Rain Classroom and carried it out in anatomy practical classes at our university. Results showed that the final exam scores of the experimental group were significantly improved, compared with the control group ($p < 0.01$); the final exam score was significantly correlated with both the pre-class quiz score ($p < 0.05$) and the in-class quiz score ($p < 0.001$). Student satisfaction was measured by a questionnaire on a Likert scale of 1–5. All the mean scores were greater than 4.5, indicating that most students had positive attitudes toward this teaching model. The present study suggests that the Rain Classroom helps support students throughout the learning processes of the flipped classroom, and the model of flipped classroom assisted by Rain Classroom could improve students' learning efficiency and ultimately increase their exam performance in anatomy practical classes.

Comparative Study of the Flipped Classroom and Traditional Lecture Methods in Anatomy Teaching

Shweta Jha [1], Ruchira Sethi [2], Mukesh Kumar [3], Gitanjali Khorwal [4]

Background

The National Medical Commission (NMC), the regulatory body for medical education in India introduced competency-based medical education (CBME) in 2019. It is an outcome-based learner-centric approach. To implement it, active and innovative learning strategies are being introduced. A flipped classroom (FC) is one such teaching method in which learners are provided learning materials before class with active discussion during teaching sessions. This promotes critical thinking, better retention, and future clinical applicability. This study aimed to compare FC and traditional teaching methods for first-phase medical learners for the anatomy curriculum. The objectives of this study were to evaluate the effectiveness of FC viz-a viz traditional lecture method for certain topics of clinical relevance from the anatomy curriculum and assess students' perception of the FC method.

Methodology

The study was conducted on 96 phase-one medical learners after obtaining approval from the Institutional Ethics Committee. After obtaining informed consent, a simple random sampling method was used to group the students into two groups. For the same topic, one group was taught with the FC method, while the other group was taught using the didactic lecture (DL) method. A crossover was done for another topic. Students were assessed by pre- and post-tests. Students' perceptions' were recorded by a pre-validated questionnaire quantified on a Likert scale.

Results

The difference in posttest scores for the topics taught between the two groups was found to be statistically significant. Perception regarding various aspects of the FC method was affirmative.

Conclusions

The results of this study indicated that FC is advantageous for students. It improves learner engagement and performance, and students' perception of the method was positive. Effective execution of this method requires detailed planning, constant motivation, and consistent efforts. Therefore, this method should be used more often for the benefit of students.

OPEN

Flipped classroom combined with human anatomy web-based learning system shows promising effects in anatomy education

Chenchen Yang, PhD[a], Xiaoxian Yang, MS[a], Hanqi Yang, BS[b], Yuqin Fan, MD[c,d,*]

Flipped classroom has received much attention in medical education. The aim of this study was to evaluate the efficacy of flipped classroom combing with human anatomy web-based learning system in anatomy education.

A total of 89 freshmen in medical specialty were enrolled and randomly allocated into either the experimental group (receiving the flipped classroom with human anatomy web-based learning system, n = 45) or control group (receiving the traditional classroom teaching, n = 44). A pre-quiz and a post-quiz were conducted before and after the classes, respectively. The improvement in scores between groups was compared. A 5-point Likert scale questionnaire was used to evaluate perceptions and experience.

The mean pre-quiz scores of the 2 groups were comparable (all $P > .05$). However, the mean post-quiz score in the experimental group was significantly higher than that in the control group (91.44 ± 6.25 vs 86.13 ± 11.67, $P < .05$). The results of questionnaires showed that 44 (97.8%) students agreed with flipped classroom combined with human anatomy web-based learning system, 43 (95.6%) students obtained improved study interest in anatomy learning, and 42 (93.3%) students felt that the interactive, applied in-class activities during the class greatly enhanced their learning.

Flipped classroom combined with human anatomy web-based learning system can be used as an effective learning tool for anatomy education.

RESEARCH ARTICLE Open Access

Joseph et al. BMC Nursing (2021) 20:1
https://doi.org/10.1186/s12912-020-00515-w

Flipped classroom improves Omani nursing students performance and satisfaction in anatomy and physiology

Mickaël Antoine Joseph[1*], Erna Judith Roach[2], Jansirani Natarajan[1], Suja Karkada[1] and Arcalyd Rose Ramos Cayaban[1]

Background: Nursing students struggle with anatomy and physiology course because of the complicated terminology and the difficulty in handling large amounts of information. New, innovative instructional strategies must be integrated into nursing education to improve nursing students' performance in this challenging biosciend course. The aim of this study was to determine the impact of an innovative teaching strategy, the flipped classroom, on the performance and satisfaction of Omani nursing students in an anatomy and physiology course.

Methods: A quasi-experimental design was used with two classes of 112 first-year nursing students at the College of Nursing, Sultan Qaboos University, Oman. Online videos and active-learning activities about the respiratory system were developed and implemented in an anatomy and physiology course with 53 first-semester nursing students. The control group consisted of a previous cohort of 59 students enrolled in the same course but taught with a traditional lecture approach. The impact of the flipped classroom strategy was measured by students' performance on the final examination and students' self-reported satisfaction. Wilcoxon signed-rank and Mann-Whitney U tests were used to compare students' academic performance.

Results: Our results showed that the performance of the flipped classroom group was better than that of the traditional lecture group. The mean scores of students instructed with the flipped classroom method on the respiratory system items in the final examination were significantly higher than those of the control group, $U = 1089.00$, $z = -2.789$, $p < .005$. Moreover, the results of a survey showed that nursing students were satisfied with th flipped classroom method. Overall, 68 to 78% of students agreed or strongly agreed that the flipped classroom method improved their learning and increased their interest in the course.

Conclusion: Compared with the didactic lecture format, flipped classroom strategy improved Omani nursing students' performance in and satisfaction with an anatomy and physiology course. These results show that the flipped classroom is an important teaching strategy in nursing education.

Our Site experience


Università degli Studi di
Milano Bicocca
Medicina e Chirurgia U8
Università degli Studi di
Milano Bicocca
Medicina e Chirurgia U18

Anatomy teaching courses

Courses in **Italian language**

- **Medicine and Surgery** (**n=180**)
- Nursing (n=315)
- Midwifery (n=50)
- Physiotherapy (n=50)
- Imaging and radiotherapy techniques (n=30)
- Dentistry (n=30)
- Dental hygene (n=30)
- Childhood Neuro and Psycomotricity (n=30)
- Biomedical laboratory techniques (n=30)
- Optics and Optometry (n=150)

Courses in **English language** (international course)

- **Medicine and Surgery** (**n=50**)

Residency training programs

Medical Area

- Haematology
- Endocrinology and metabolic disorders
- Geriatrics
- Cardiovascular diseases
- Digestive diseases
- Respiratory diseases
- Emergency medicine
- Sport and exercise medicine
- Internal medicine
- Nephrology
- Neurology
- Child neuropsychiatry
- Paediatrics
- Psychiatry

Surgical Area

- General surgery
- Maxillofacial surgery
- Gynaecology and obstetrics
- Neurosurgery
- Orthopaedics and traumatology
- Otolaryngology

Clinical Services Area

- Anatomical pathology
- Anaesthesia, intensive care and pain management
- Hygiene and preventive medicine
- Occupational medicine
- Physical and rehabilitative medicine
- Nuclear medicine
- Clinical pathology and clinical biochemistry
- Radiodiagnostics
- Radiotherapy

Medicine and Surgery

	Course in **Italian language**	Medicine and Surgery (**n=180**)
	Course in **English language** (IMS)	Medicine and Surgery (**n=50***)

Head of the teaching staff: Prof. Guido Cavaletti, MD

IMS teaching structure

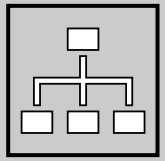
Courses are delivered in English to students coming from all around the world

During the first year, IMS students are given a course named *Fundamentals of Human Morphology*, which aims to give them the foundation for their preparation

In subsequent years, they are once again taught anatomy in the so-called *vertical tracks* during which anatomy is presented in a clinically-oriented approach.

Hence, IMS was deemed as ideal to introduce and implement novel strategies relying heavily on **virtual dissections**, **gamification** and **flipped-classroom** approaches in a pilot and feasibility phase

Lesson structure



At the top of each lessons, the class was divided into **groups** and completed these assignments rotating from one task to the other:

1) 8-mins dissection exercise generating a **score** for each group that was recorded via *Anatomage Table*™

2) exercises **on *Anatomage Lessons*™ platform**

3) paper copy exercise.

Then, the **frontal** part of the lesson started: topics were presented via a combination of a virtual dissection on the Table and as little as possible use of a classic powerpoint slide deck; the latter was mostly used to convey schemes and summaries.

After a topic was presented, students were asked once again to cooperate into teams rotating from different **tasks**: one at the Table and others working together on paper copy exercise/*Anatomage Lessons*™.

Home
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Classes

Regional Anatomy II term

Code: LNFTZ

Edit Delete

Duration	Mar 19, 2026 - Sep 30, 2026	Created	Mar 19, 2026
Days of Week	Mon Tue Wed Thu Fri Sat Sun	Seats Allocated	48
Instructor	Paola Alberti View Instructor >	Active Roster	37 View Roster >

Class Size

Number of Students Enrolled

37

Enrolled	37
Seats Available	11

Class Completion Ratio

Done	0(0%)
Not Done	37(100%)

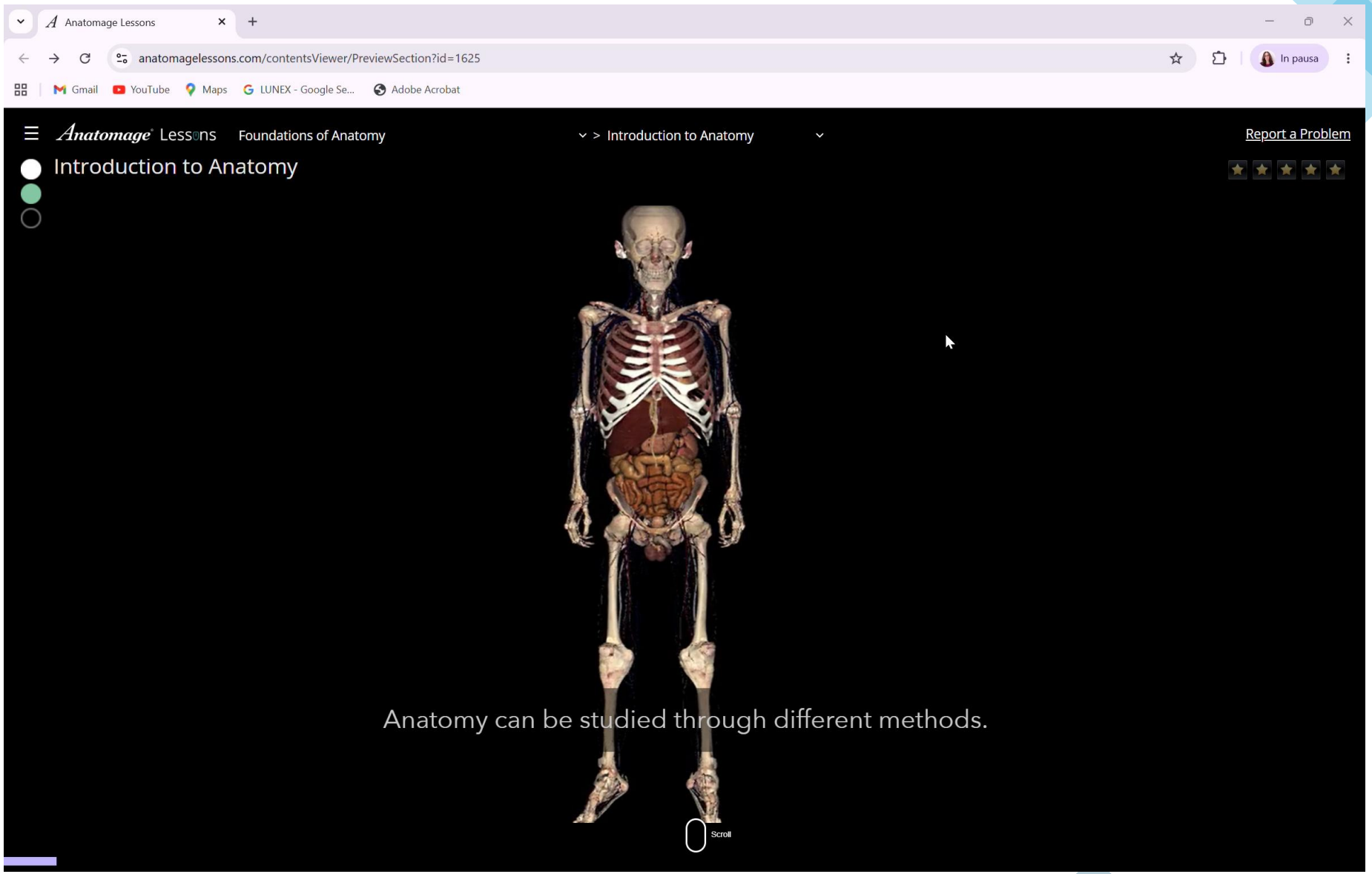
3DonCloud Average

Avg Grade	0%
Quizzes Attempted	0

Time Spent

Median Time

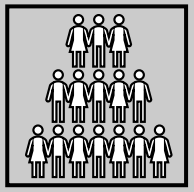
0 min


Anatomage Lessons
anatomagelessons.com/contentsViewer/PreviewSection?id=1625
In pausa
Gmail
YouTube
Maps
LUNEX - Google Se...
Adobe Acrobat
Anatomage Lessons
Foundations of Anatomy
> Introduction to Anatomy
Report a Problem
Introduction to Anatomy
Anatomy can be studied through different methods.
Scroll

Neuroanatomy course (30 hours)

4th year, 2nd term

4-hour periods integrating **both frontal and interactive** activities.

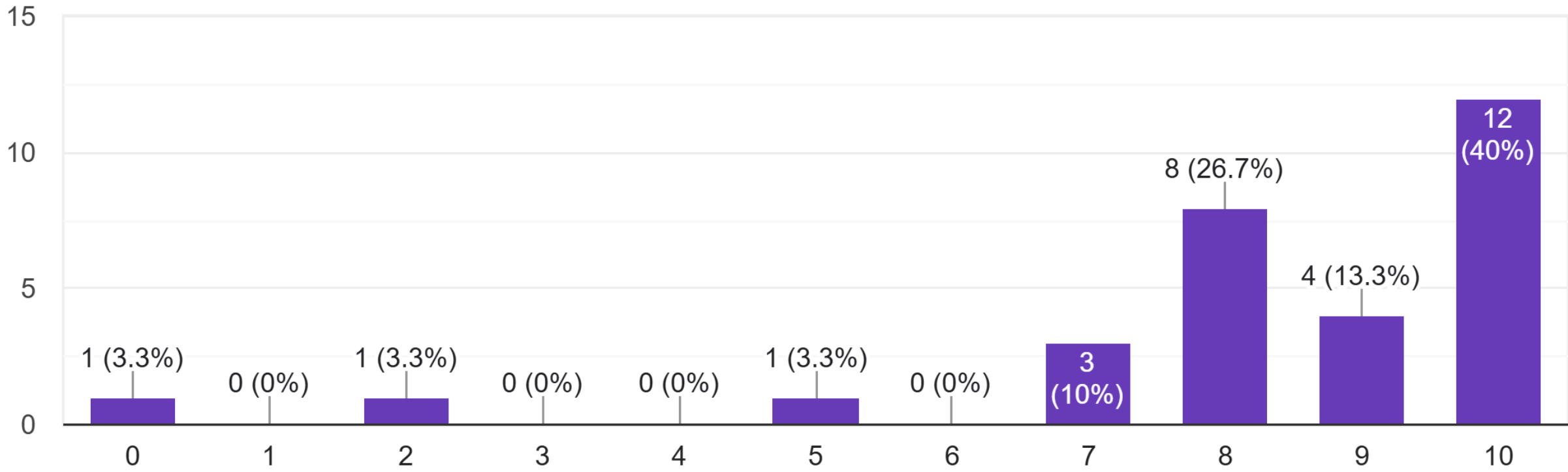


Students (n=36) were divided into 6 **teams** of 6 people, and each team was assigned a name by students' preference: these groups were meant to cooperate in the interactive breakout sessions.

At the start of the very first lesson of the course, students filled anonymously a **self-test multiple choice questionnaire accessible via a QR code**.

How useful was using Anatomage Lessons to consolidate your learning experience?

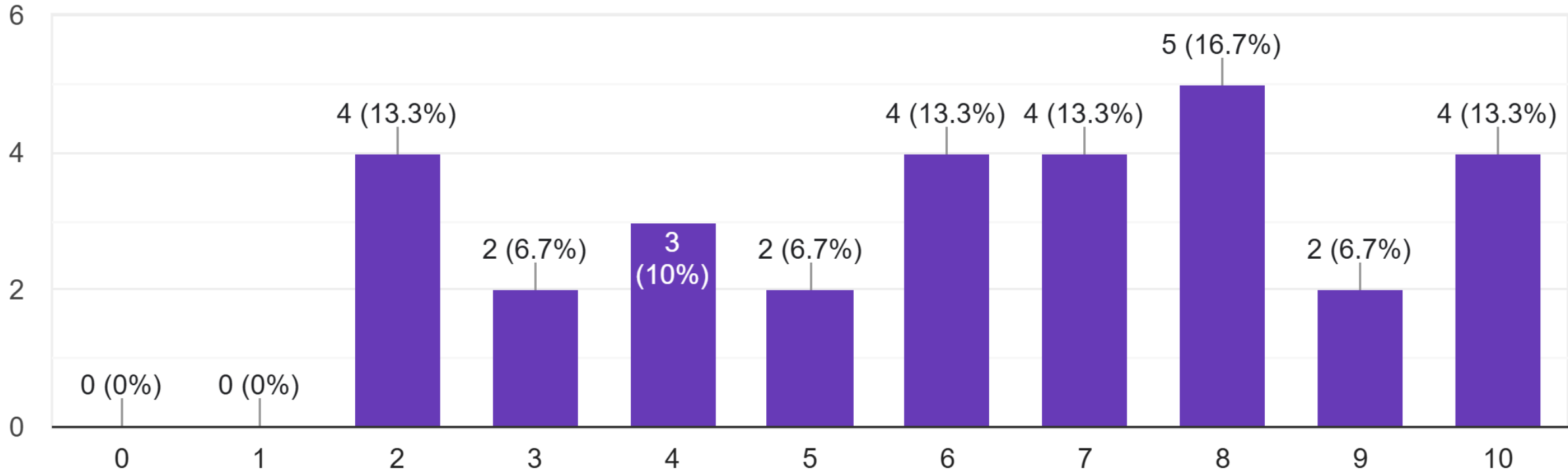
30 responses



Median score: 9 (Q1:8; Q3:10).

How useful was using paper copy exercises to consolidate your learning experience?

30 responses

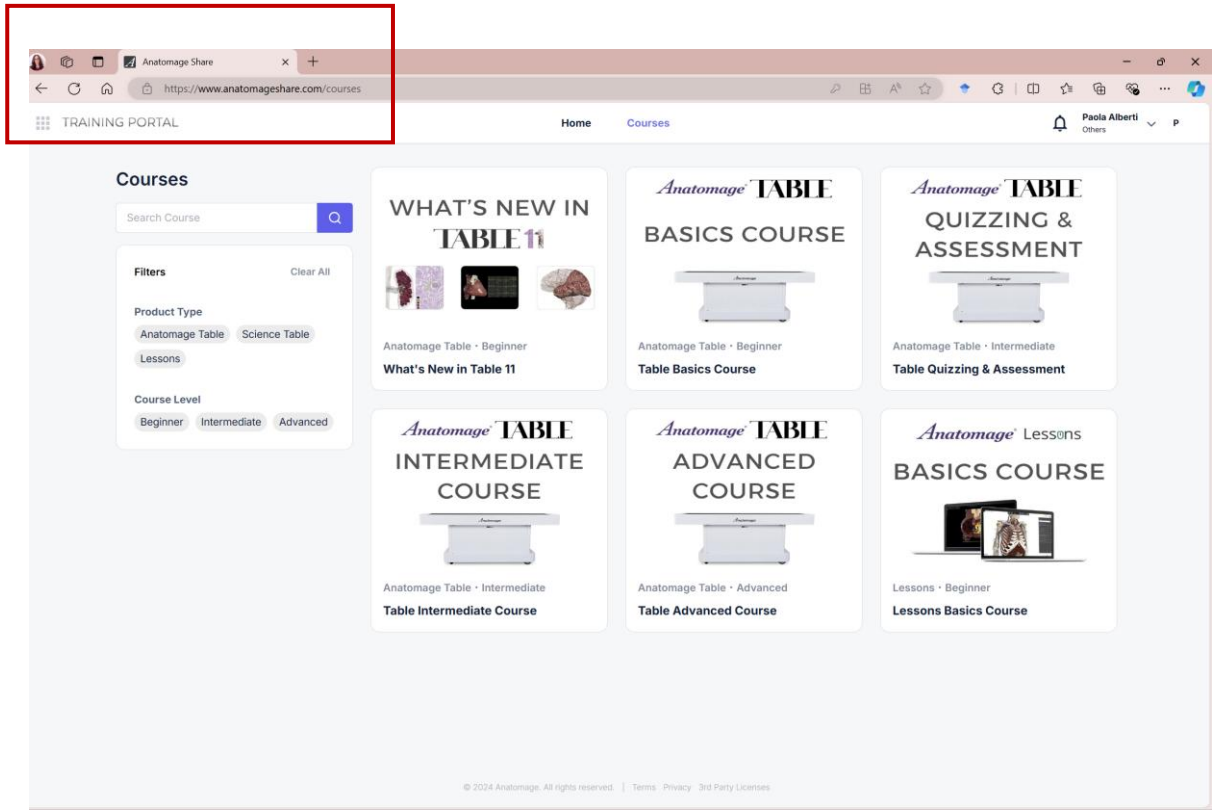


Median score: 6.5 (Q1:4; Q3:8).

Peer-to-peer learning

Methods

- **Tutors**:
  - **10 senior** undergrad students were trained (4th – 6th year, medicine and surgery)
  - **Training session** (2 online + 8 on-site hours)
    - General use of *Anatomage Table*
    - All tutors were instructed to follow the same workflow for each activity, also relying on presets generated by the teacher
- **Participants**:
  - Medicine and surgery 1st students were divided into groups of 10-12 people each
- **Surveys**:
  - A **google module** was made available via a QR code:
    - Before taking part to the whole initiative
    - After each session
  - **Rating system** (0-10):
    - Low: 0-3;
    - Intermediate: 4-7;
    - High: 8-10.



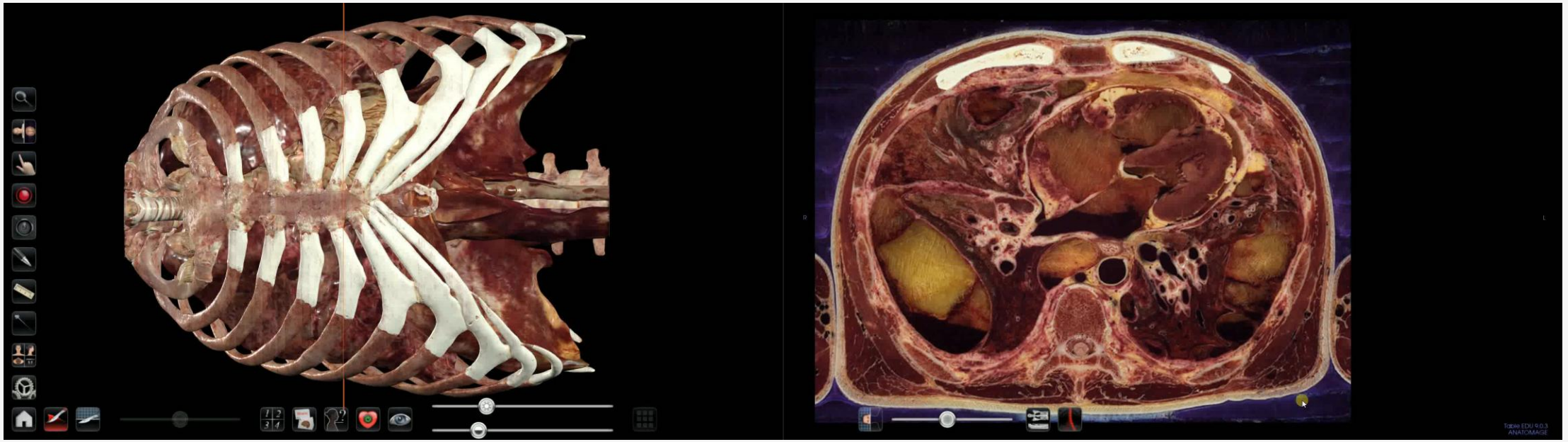
Activities (2 hours each)

TOPIC 1: guided dissection of the **thorax/abdomen**

TOPIC 2: guided dissection of the **abdomen/pelvis**

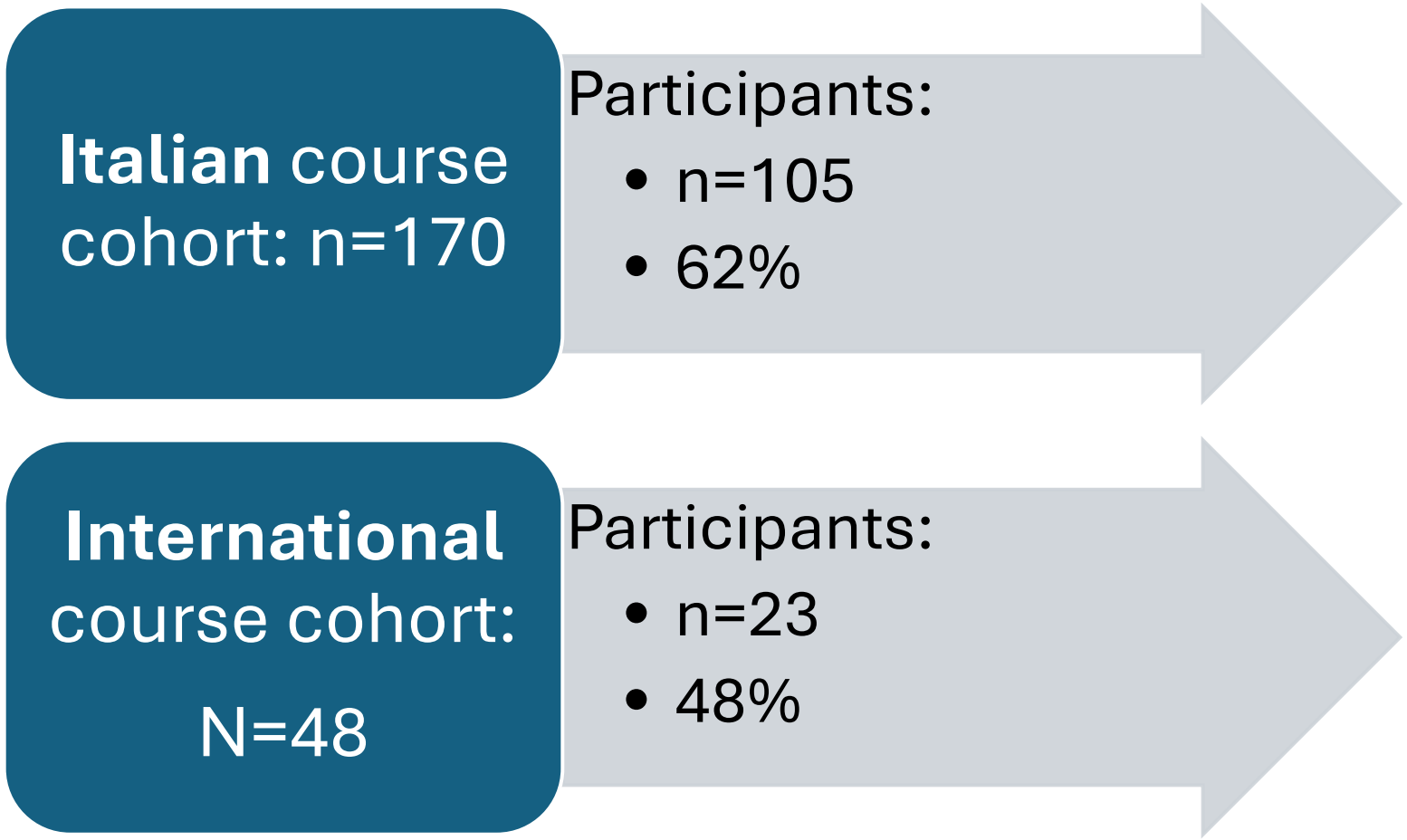
TOPIC 3: guided dissection of the **central nervous system**

Free sessions



An example of activities

Participants



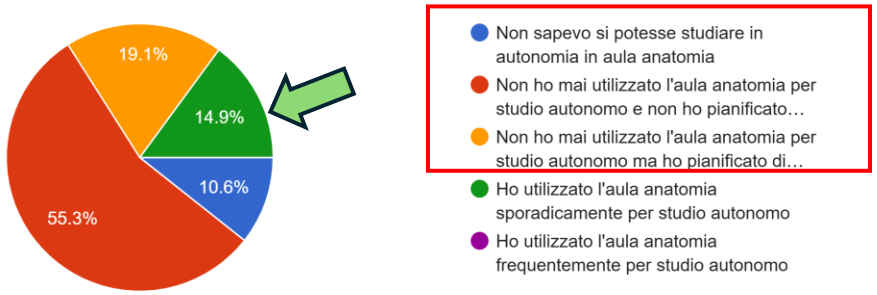
Preliminary survey

Use of Anatomy room before this initiative

Italian course

Quale era la tua frequenza di utilizzo/intenzione di utilizzo dell'aula anatomia per studio autonomo, prima di questa iniziativa?

47 responses



International course

Did you use the anatomy room for independent study before this initiative?

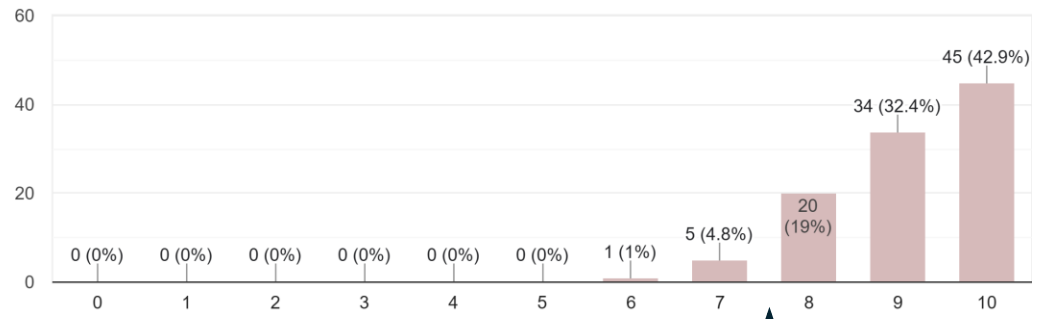
21 responses

Topic 1 (thorax/abdomen)

Level of satisfaction – topic 1

Italian course

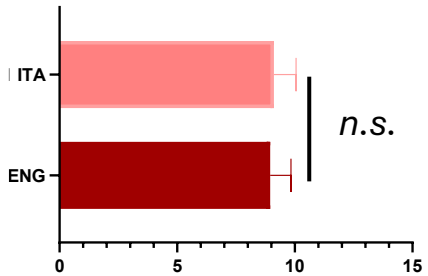
Livello di soddisfazione complessivo per l'iniziativa:
105 responses



6%

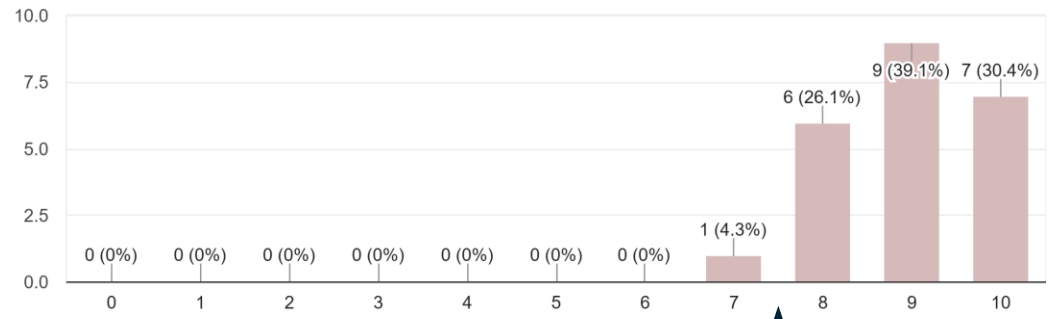
94%

Mean	**8.878**
Std. Deviation	**1.100**



International course

Could you please rate how useful you think peer-to-peer tutoring activities with Anatomage are?
23 responses



4%

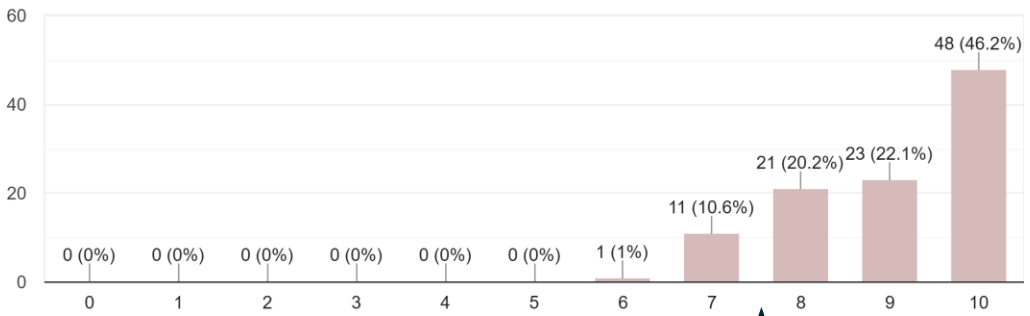
96%

Mean	**9.043**
Std. Deviation	**0.9283**

Was topic 1 useful?

Italian course

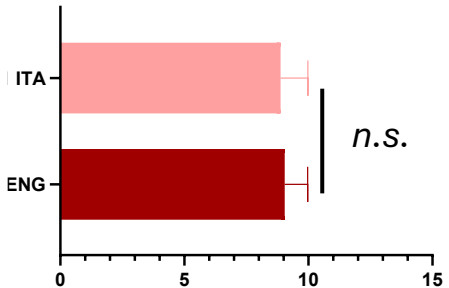
Utilità delle attività del topic 1:
104 responses



12%

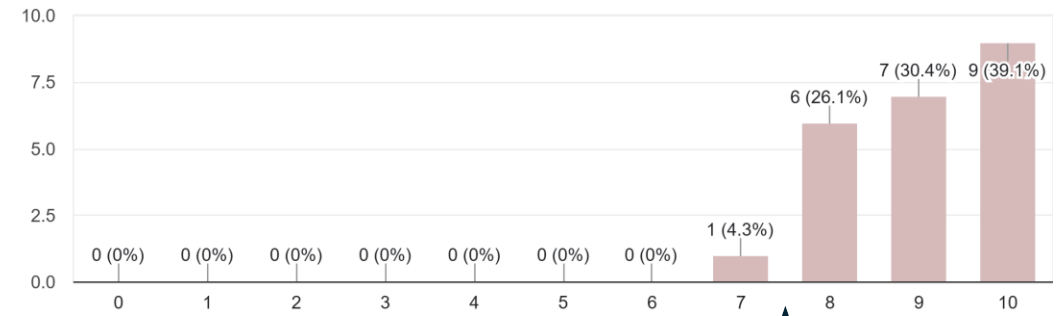
86%

Mean	**9.114**
Std. Deviation	**0.9437**



International course

Could you please rate how useful you think were topics presented today (thorax/abdomen)?
23 responses



4%

96%

Mean	**8.957**
Std. Deviation	**0.8779**

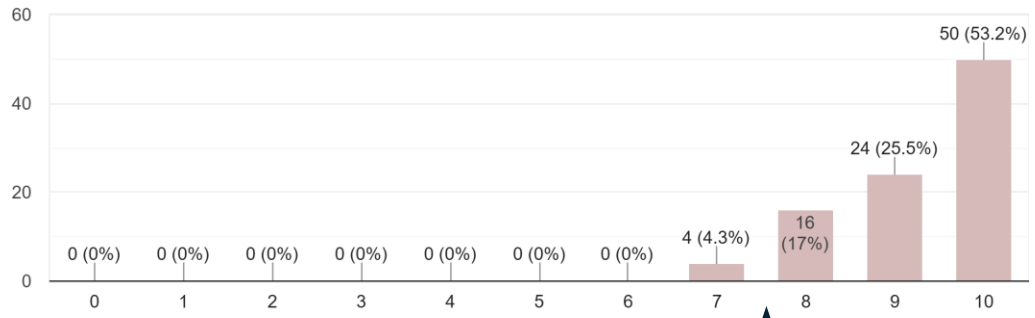
Topic 2 (abdomen/pelvis)

Level of satisfaction – topic 2

Italian course

Livello di soddisfazione complessivo per l'iniziativa:

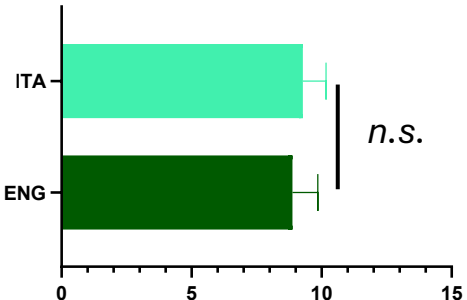
94 responses



4%

96%

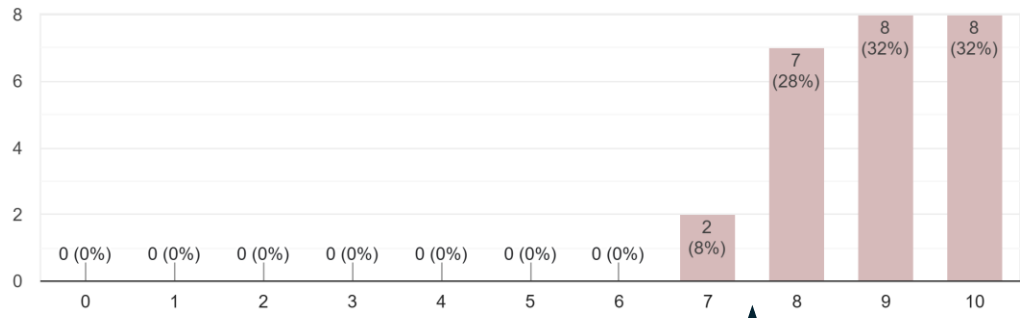
Mean	**9.415**
Std. Deviation	**0.7536**



International course

Could you please rate how useful you think peer-to-peer tutoring activities with Anatomage are?

25 responses



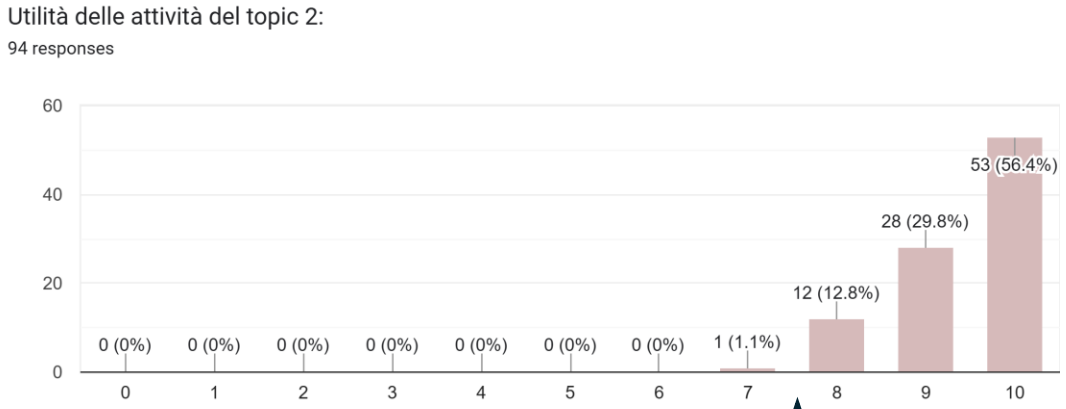
8%

92%

Mean	**8.960**
Std. Deviation	**0.9781**

Was topic 2 useful?

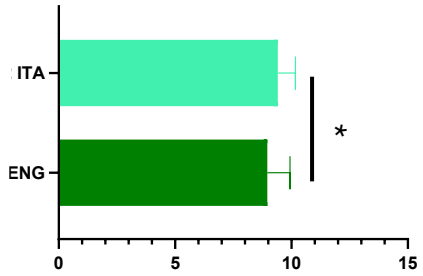
Italian course



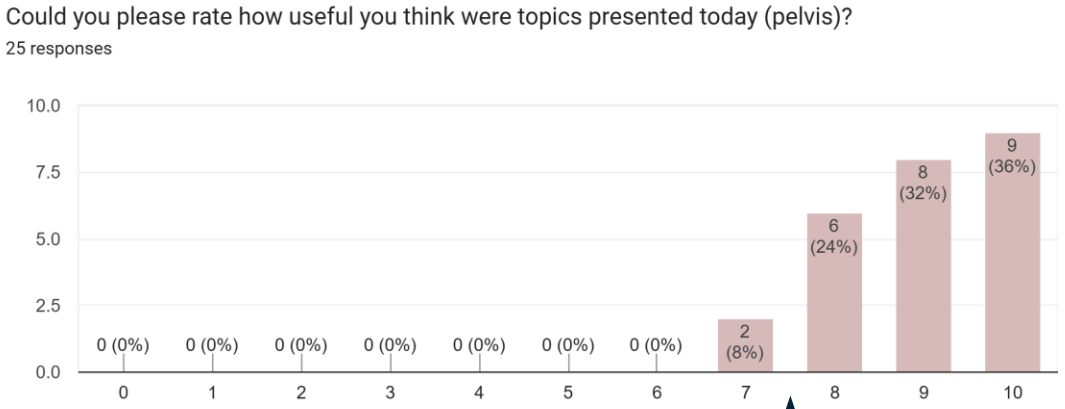
1%

99%

Mean	**9.277**
Std. Deviation	**0..8969**



International course



2%

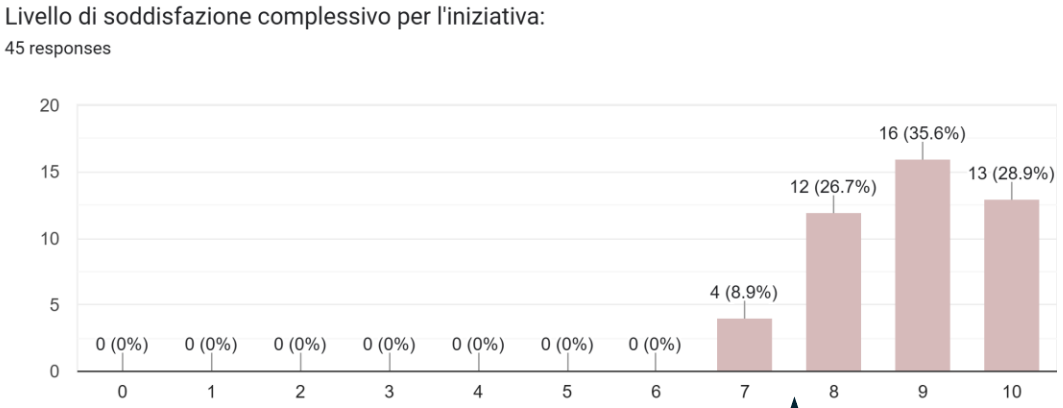
98%

Mean	**8.880**
Std. Deviation	**0.9713**

Topic 3 (neuroanatomy)

Level of satisfaction – topic 3

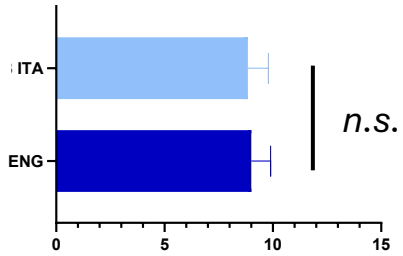
Italian course



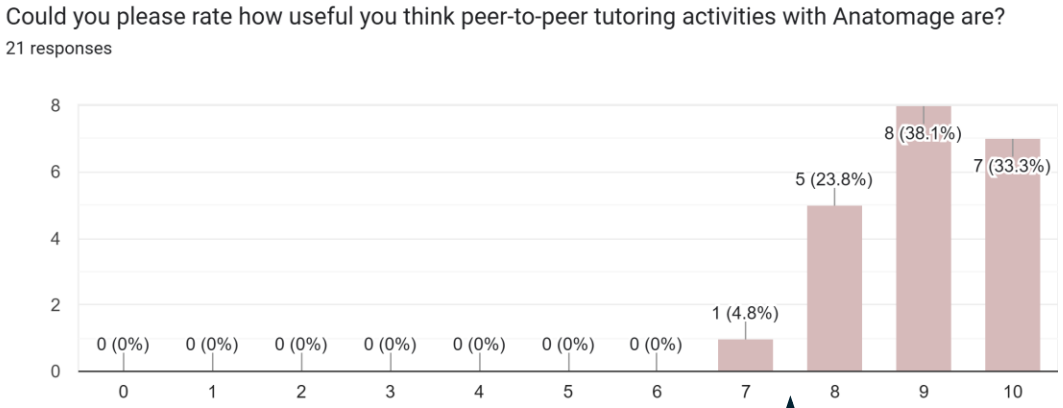
9%

91%

Mean	**9.022**
Std. Deviation	**0.8657**



International course



5%

95%

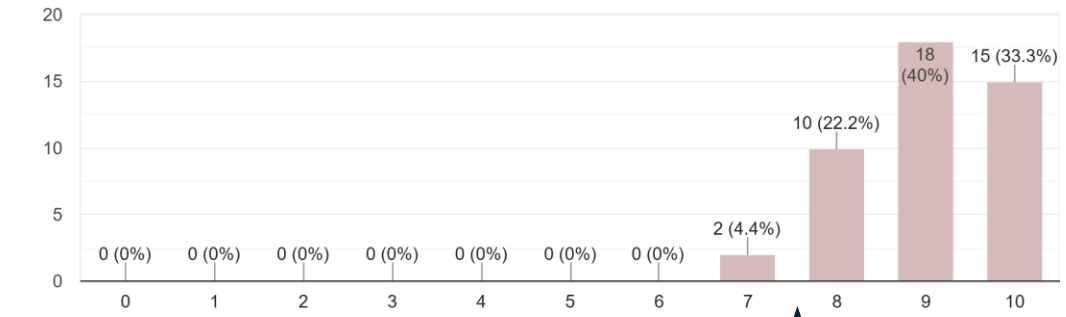
Mean	**9.095**
Std. Deviation	**1.044**

Was topic 3 useful?

Italian course

Utilità delle attività del topic 3:

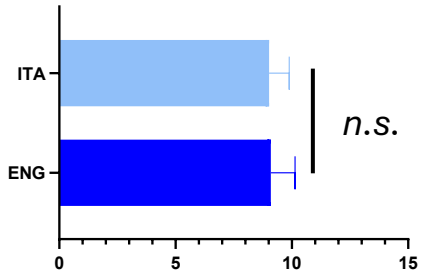
45 responses



4%

96%

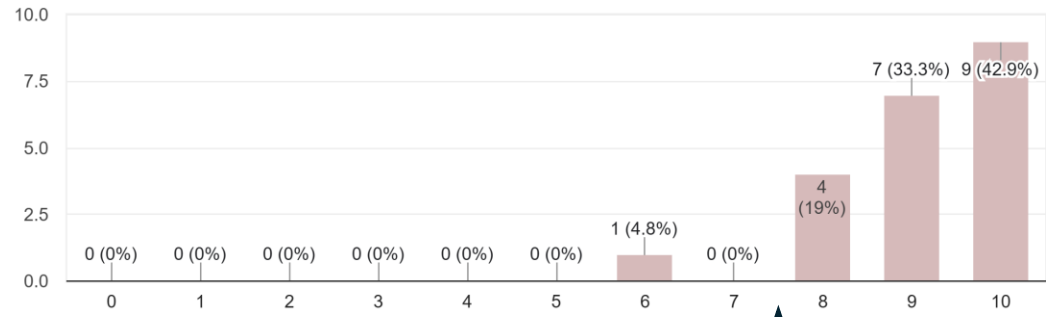
Mean	**8.844**
Std. Deviation	**0.9524**



International course

Could you please rate how useful you think were topics presented today (neuro)?

21 responses

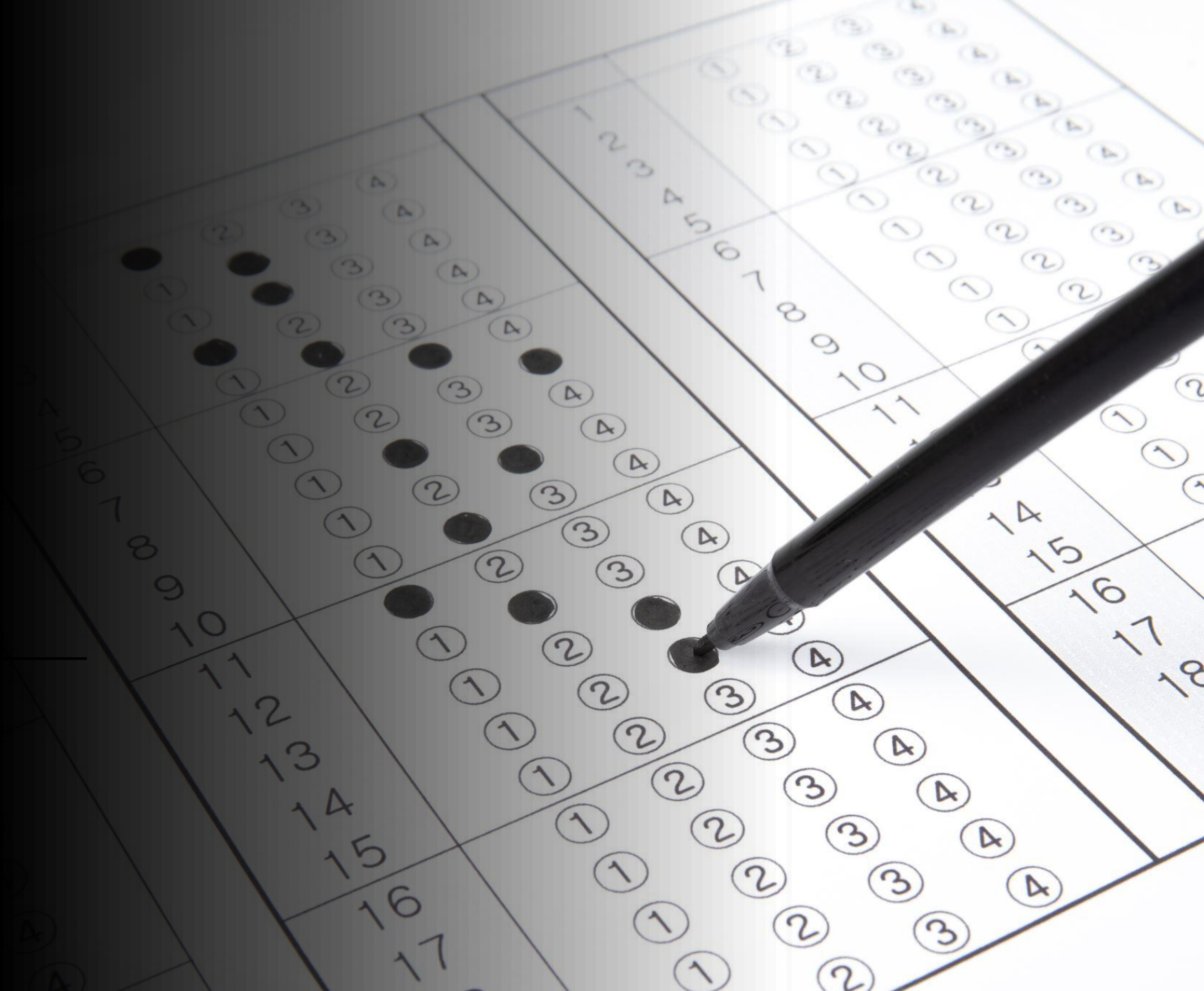


5%

95%

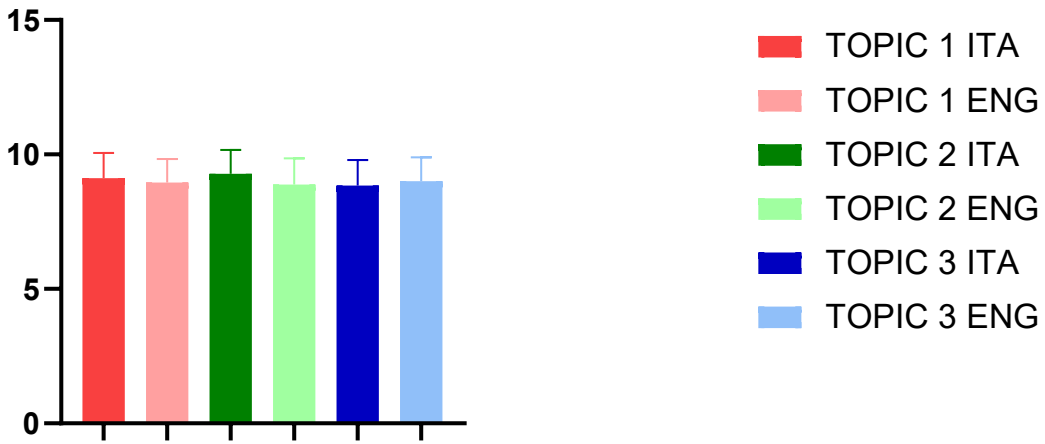
Mean	**9.000**
Std. Deviation	**0.8944**

Overall evaluation

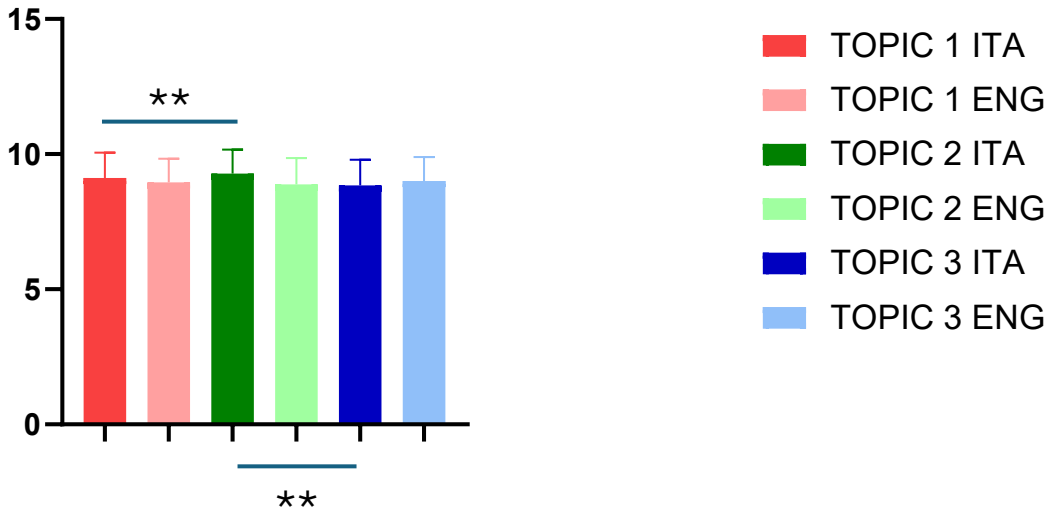


Overall data

Satisfaction



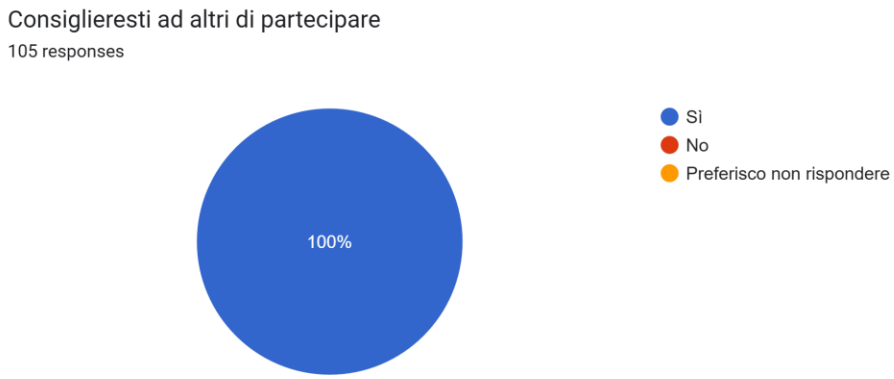
Usefulness



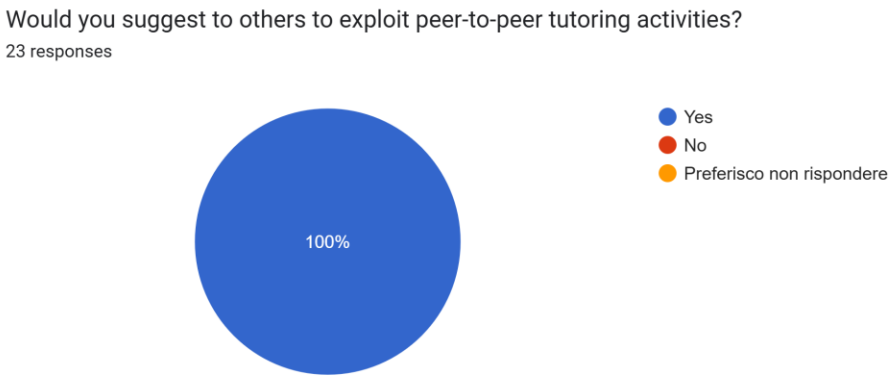
- No significant difference in **satisfaction**
- The **Italian** course cohort found **topic 2** significantly more **useful** than topic 1 and than topic 3

Would you reccomend others to participate in this initiatives?

Italian course



International course



Key Takeaways

Main Message

Peer-to-peer learning and flipped are gaining space in human anatomy teachings.

Supporting Points

Literature and our experience showed promising application.

Next Steps

Longitudinal studies to weight the impact on curricula, taking into account PROs and CONs of innovative approaches.

Please, let us know your feedback! Thank you!

METIS

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