



Lean in Medical Education: Reaching for Quality Management Tools to Teach Human Anatomy Effectively in a Multicultural and Multilingual Learning Space – ERASMUS+ Project LEANBODY - 2021-1-HU01-KA220-HED-000027542

DEPARTMENT OF ANATOMY AND CLINICAL ANATOMY

Incentivizing active learning via constructive alignment

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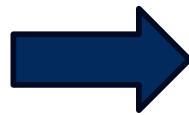
Co-funded by
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How do teachers perceive the curriculum and learning process?

Define what students
need to know



Design the
lesson



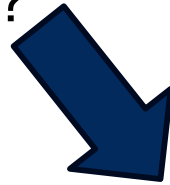
Assessment



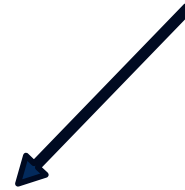


How do students perceive the curriculum and learning process?

What will be on the test?



Attending class



What do I need to study

From the student's perspective, assessment **IS** the curriculum.





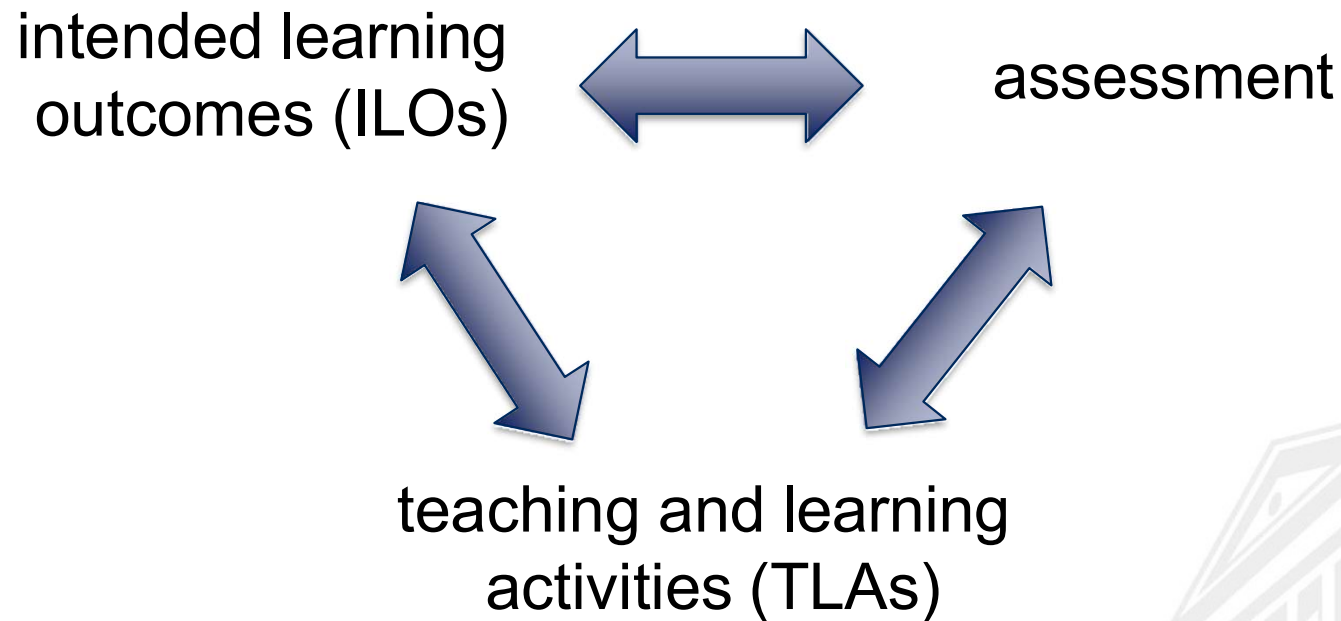
How to approach students and teaching?

- Focusing on students' characteristics – „blame the student”
- Focusing on teachers' characteristics – „blame the teacher”
- Focusing on **what students do** – student success depends on whether they do what is taught and tested – "how to improve the system"



How to get students to do what we think is important?

Constructive alignment





How to "align" Anatomy?

- 24 ECTS points
- 220 teaching hours
 - Lectures: 50 h
 - Seminars: 50 h
 - Practicals: 120 h
- ~ 450 students
- ~ 10000 teaching hours





Anatomy before and after CA

Before CA

- In class: emphasis on practical work
- In the exam: emphasis on cognitive domain

After CA

- In classes and exams: cognitive, affective and psychomotor domains are included





Cognitive domain

1. Remembering/recalling
2. Understanding
3. Applying
4. Analyzing
5. Evaluating
6. Creating/Synthesizing





Example of outcomes and questions at the level of analysis (cognitive domain)

- Compare the principles of anatomical organization in different parts of the human body
- Example question: **Compare** the principles of venous drainage of the head and neck with the principles of venous drainage in other parts of the body.





Affective domain

1. Recognize the importance of **appropriate academic behavior** within the Anatomy course
2. Evaluate the role of the **human body in the process of learning anatomy**
3. Determine the importance of the **body donation program**
4. Develop an ethical attitude towards donated bodies and anatomical prosections

How **we achieve**: interaction during classes and the hidden curriculum are key

How **we assess**: OSPE (behavior), student evaluation of teaching (attitudes), body donor send-off

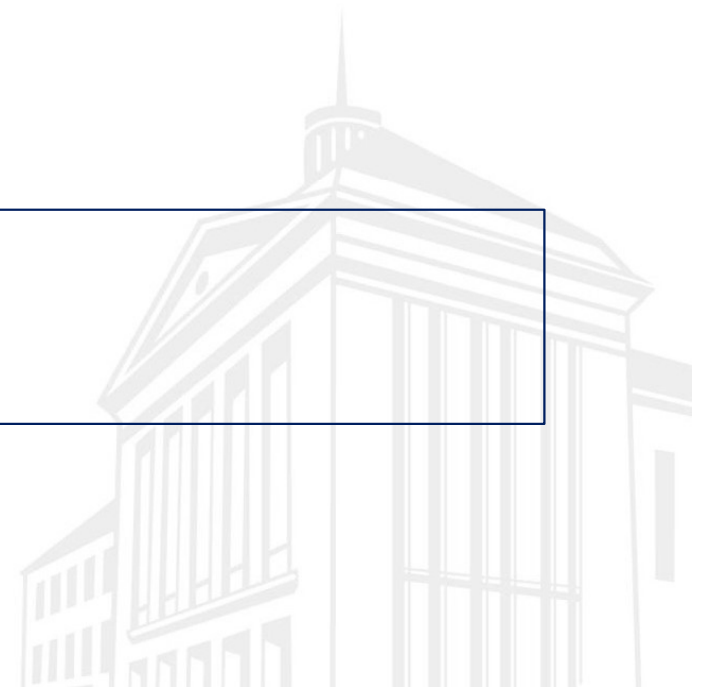


Psychomotor domain

1. **Apply** the skills of **anatomical dissection** in the presentation and study of anatomical structures
2. **Sketch** the principles of anatomical structures and the three-dimensionality of topographic relationships

How **we achieve**: active dissection, sketching

How **we assess**: OSPE





How do we know that constructive alignment has been effective?

- Analysis of student success
- Analysis of student evaluation of teaching
- Cognitive interviews with teachers (evaluation of evaluation)





CA effect using the example of a problem-solving question ("success")

- Percentage of correct answers **before** the introduction of the appropriate TLA:
 - 2021/2022: **6.35%**
- Percentage of correct answers **after** the introduction of the appropriate TLA:
 - 2022/2023: **71.51%**





The effect of CA on performance in partial written exams

2021/2022

- Pass rate: 37.97%
- Average passing grade: 2.67
- Percentage of excellent grades: 0%

2022/2023

- Pass rate: 67.84%
- Average passing grade: 3.24
- Percentage of excellent grades: 5.56%

Fisher's test (difference in pass rate): $P < 0.0001$



OSPE - dissection

Points

1	Correctly approaches the preparation of the body for anatomical dissection (takes reusable scalpels and containers, removes coverings, drains fluid, places coverings so that fluid does not drip on the floor)	0	1
2	Holds anatomical tweezers correctly	0	1
3	Holds the scalpel correctly during sharp preparation	0	1
4	Demonstrates correct sharp preparation technique	0	1
5	Holds the scalpel correctly during blunt dissection	0	1
6	Demonstrates correct blunt preparation technique	0	1
7	Correctly shows the boundaries of the topographic region	0	1
8	Correctly names the structures in the topographic region by layers	0	1
9	Correctly describes the topographic relationships of anatomical structures	0	1
10	Demonstrates correct fine preparation technique	0	1
11	Correctly displays anatomical structures in the topographic region	0	1
12	Shows the continuity of structures in the topographic region	0	1
13	Properly disposes of mixed waste	0	1
14	Properly disposes of sharp waste	0	1
15	Properly disposes of biological waste	0	1
16	Properly closes the workplace (wets and covers the body, wipes the floor, disposes of used instruments and containers)	0	1
17	Overall impression: overall dissection skill, professionalism, theoretical knowledge	0	1 2 3 4

- Average success rate: **86.13%**



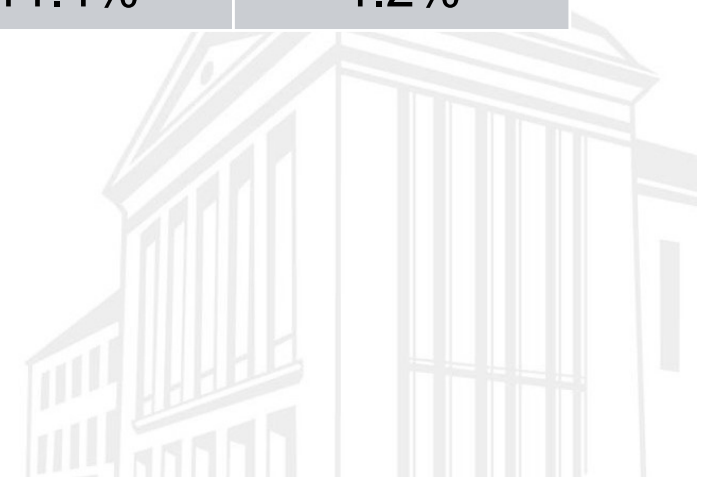


Student evaluation of teaching

2021/2022	2022/2023
273/316 (86.4%)	336/342 (98.2%)

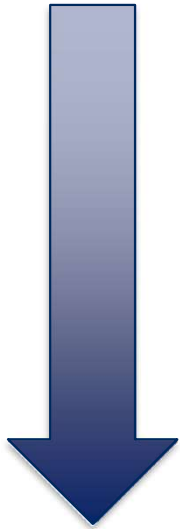
P<0.0001

	2021/2022	2022/2023
Clarity of learning outcomes	3.16	4.01
Alignment of classes and assessment	2.96	3.86
Attitude towards dissection	3.03	4.36
Dissatisfaction with teacher consistency	16.8%	4.8%
Dissatisfaction with organization	11.4%	1.2%





Common mistakes when implementing CA



1. There are NO clearly defined ILOs
2. Assessment exists, but an appropriate TLA is missing
3. TLAs exist but there is NO assessment
4. The "wrong" domain is assessed
5. The "wrong" verb is assessed

Classes:

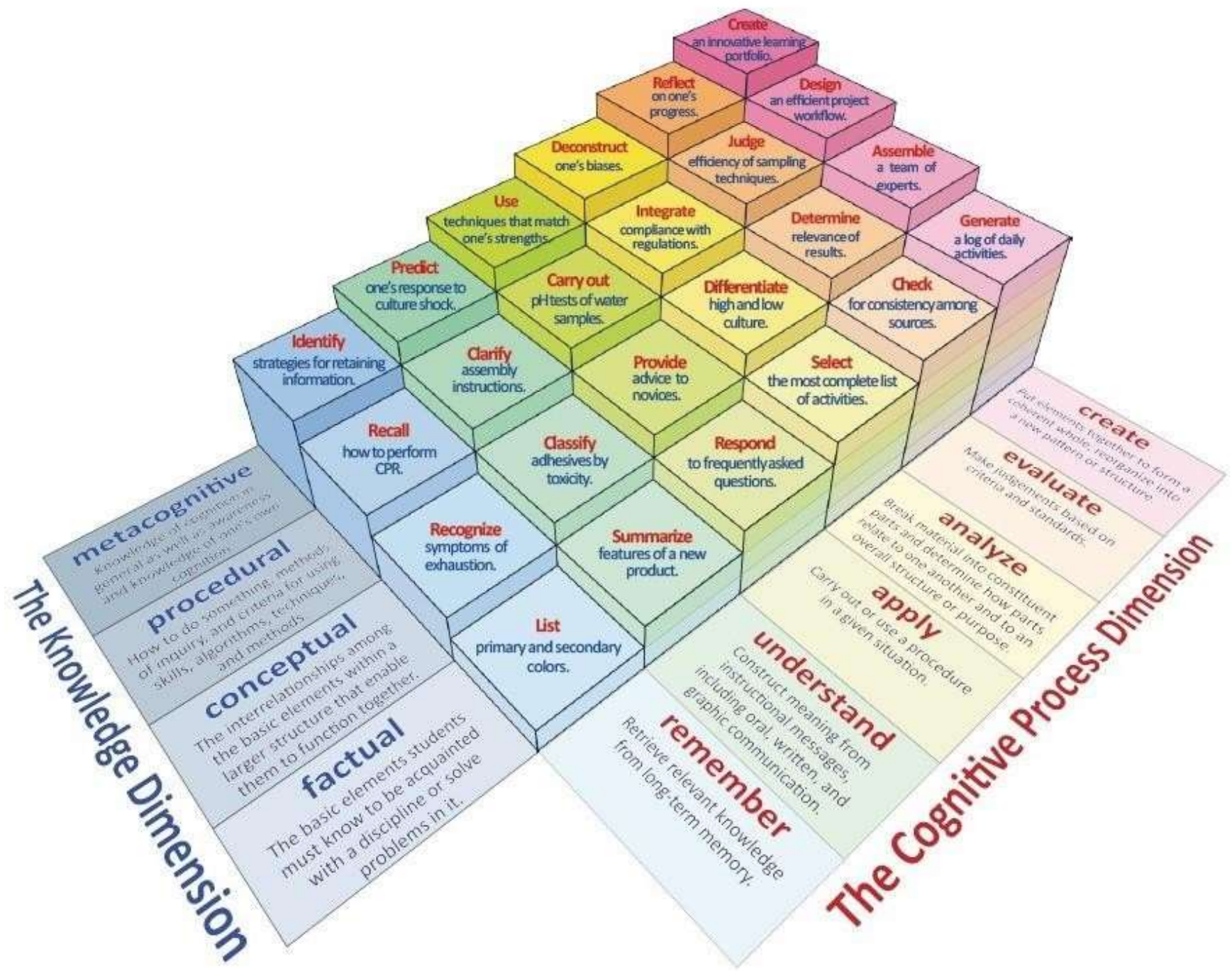
$$2 + 2 = 4$$

Homework:

$$734 + 555 - 432 : 69 = 77 \times$$

Assessment:

During the flight of two sheep, one of which is yellow and the other is flying to the left, what is the price of a kilo of asphalt if the cow is 10 years old?





Conclusions

- CA is extremely important for courses with a heavy teaching load
- CA improved student success







Calculation of ECTS points

Item	Hours	Remark	ECTS points
Contact teaching	220		6:30
Lectures	50		1.45
Seminars	50		1.45
Exercises	120		3.40
Non-contact teaching	620		17.70
Preparation for contact classes	120		3.40
Preparation for lectures	10		0.25
Preparation for seminars	50		1.45
Preparation for exercises	60		1.70
Literature	215		6,10
Simple text	65	325 pages (5 pages/h)	1.80
Complex text	150	450 pages (3 pages/h)	4.30
Tasks for independent work	100		2.90
Preparation for the exam	50		1.45
Independent study using the premises of the Institute	40		1.15
E-learning	95		2.70
In total	840		24.00