INTRODUCTION
We have developed an innovative learning strategy for the development of visual perceptual skills and clinical reasoning.

The theoretical imaging learning by consensus of perception is new and opens the possibilities of our 100 students in the 2nd year of medicine.

Following short clinical episodes, student has to determine whether the anatomy observed on thin-slice is the radiologists prior to the feedback prepared by the instructor.

The digital assessment of the visual perceptual skills can be used in several application fields in which it needs to be explored.

OBJECTIVES
1. Test the validity and reproducibility of the digital evaluation of the visual perceptual skill.
2. Evaluate the visual perceptual skills of a group of students during the theoretic learning imaging.

METHODOLOGY
A. 262 students by 4 groups of 2 clinical cases on both the posterior aspect (PA) and lateral (LAT) views.

Case A. Right Lower Limb Perfusion

Case B. Posterior Mediastinal Mass

The selection of 20% visually selected students were subjected to the instructor’s visual assessment for each, one of the 2 clinical cases above, for a total of 4 images.

The images were then anonymized and randomly assigned to each student.

A. All students were divided into 3 groups:

Students A. Aspirate/Atrophy Pulsation

Students B. Aspirate/No Pulsation No Pulsation

Students C. Aspirate/No Pulsation Pulsation

B. The selection of the limited set of each student has been statistically assessed by comparing them to the targeted areas defined by the instructor.

C. Comparing-still-on-old-viewing-areas at the corners of the limited area evaluation of group.

D. The final digital score (%) assigned to the areas surrounded by each student was calculated using the following formula:

$$\text{Digital Score} = \frac{\text{Comparison Area}}{\text{The Area Total}} \times 100$$

RESULTS

Case A. Right Lower Limb Perfusion

Case B. Posterior Mediastinal Mass

For 50 randomly selected students

Instructor’s Visual Assessment (categorized into: 1) Diffuse, 2) Discreet, 3) Absent)

For the entire class of 252 students

Instructor’s Digital Score (categorized into: 1) Diffuse, 2) Discreet, 3) Absent)

DISCUSSION

The digital assessment of the areas defined by the students of subject A and subject B, either by the instructor’s Digital Score (categorized into: 1) Diffuse, 2) Discreet, 3) Absent) or by the DICE Similarity Coefficients (categorized into: 1) Diffuse, 2) Discreet, 3) Absent) is well correlated with the visual assessment regarding the student in both cases of “Discreet” and “Absent”.

The definition of the categories regarding the “Absence” and “Difference” performance variance is the percentage for the visual evaluation of the instructor, and hence for the decision of the student of the estimated scores accurately by the students in both categories.

The difference observed by the students of subject B, whether assessed by the digital system or by the instructor’s visual assessment, reveals very few access rates which the cases of subject A.

This area is expected result considering non-exploration of this pathology by 2nd year students and the lack of clinical use leading to the discovery, further techniques.

CONCLUSION

For the undergraduate students, automated analysis of perceptual correspondence: this results discriminates students who successfully recognize an abnormality on chest imaging or do not recognize it at all.

The temporal analysis of the outcomes in the Confusion Matrix or students. Performance analysis by simply identify students with significant perceptual difficulties at radiographs on which an abnormality is highly visible to students.

The combination of the results of the students and the complexity of the cases submitted, the digital assessment of areas defined by the students can be assimilated by keeping a different threshold of passage.

EXAMPLES

Case A. Right Lower Limb Perfusion

Case B. Posterior Mediastinal Mass

A. Corpus of “Success”

B. Corpus of “Failure”

C. Corpus of “Absence”

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90% of the course M42023 since 2004

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