

Maëlle Moranges, Noha Ibrahim, Olivier Palombi, Sihem Amer-Yahia

Laboratoire d'Informatique de Grenoble, CNRS, Univ. Grenoble Alpes, France

01 CONTEXT

Digital University for Health and Sports (UNESS) : Provides online exams and training resources via uness.fr.

National Training Bank (BNE) :

- Centralized access to 30,787 MCQs.
- Includes Isolated Question Sequences (IQS), Progressive Cases (PC) and Critical Article Readings (CAR).
- Covers 31 medical specialties.
- Facilitates student interaction through chats, comments, and evaluation systems.
- Serves over 60,000 users from all medical faculties in France.
- Prepares students for the national exams at the end of the sixth year.

Student Data :

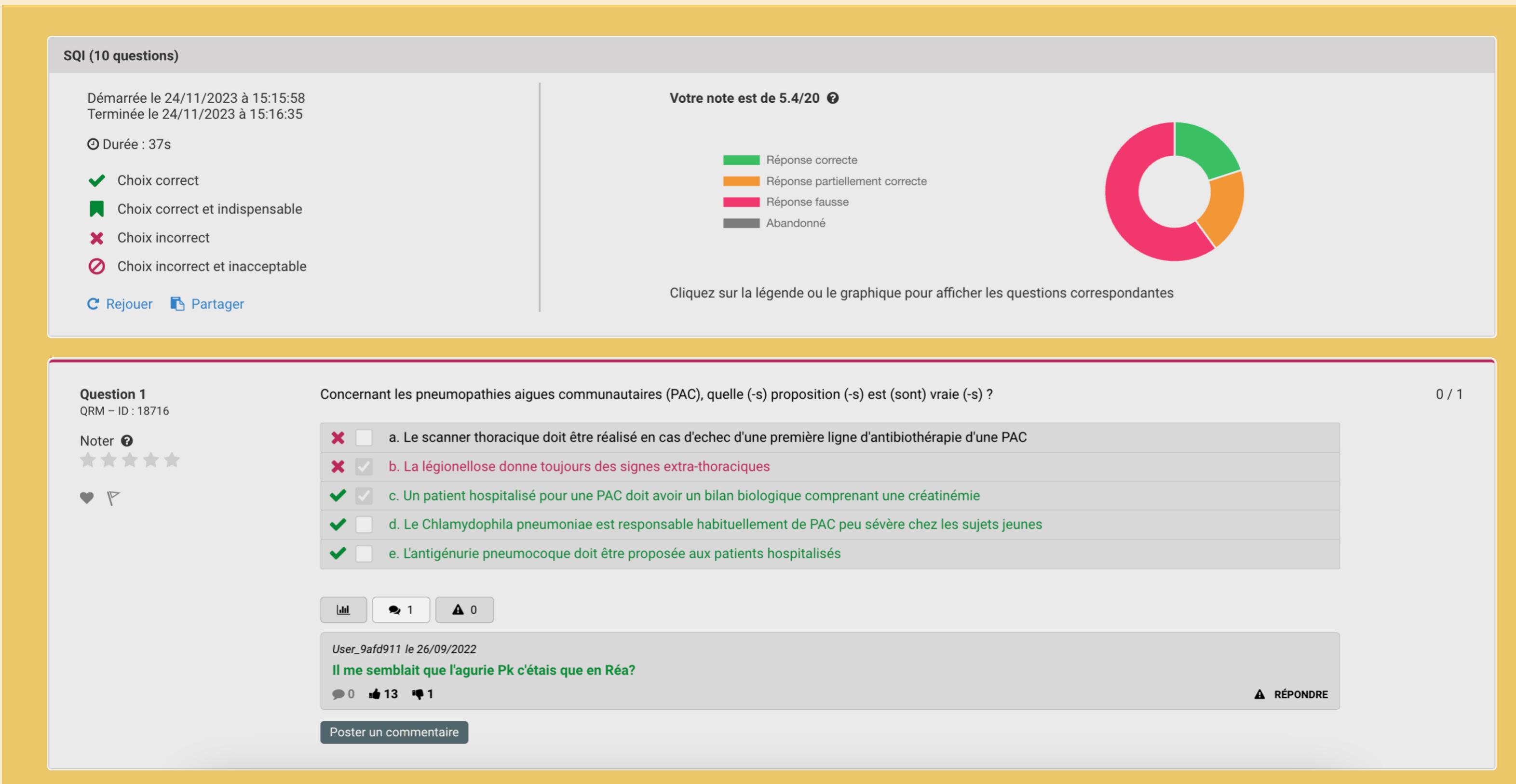
- Cohorts analyzed: 2022 and 2023.
- Academic performance: exam scores and rankings.
- Demographic information: gender and university.
- Interaction history: comprehensive record of all interactions on the BNE.

Aim : Understand the diverse uses of the BNE on the UNESS platform to enhance both the platform itself and learning across medical faculties in France.

Hypothesis: The use of the UNESS training platform varies according to the gender and university of students.

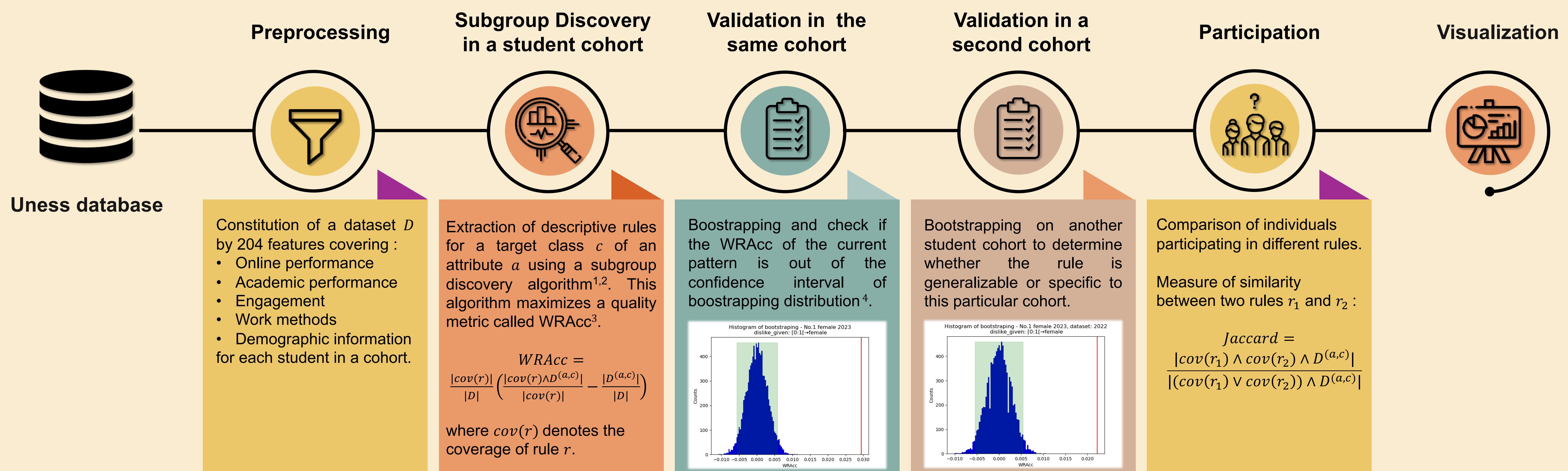
Challenges:

- Data complexity and volume
- Pattern representativity
- Interpretability of pattern descriptions
- Description of inter-individual variability within the same population



Partial view of the correction page for a Isolated Question Sequence

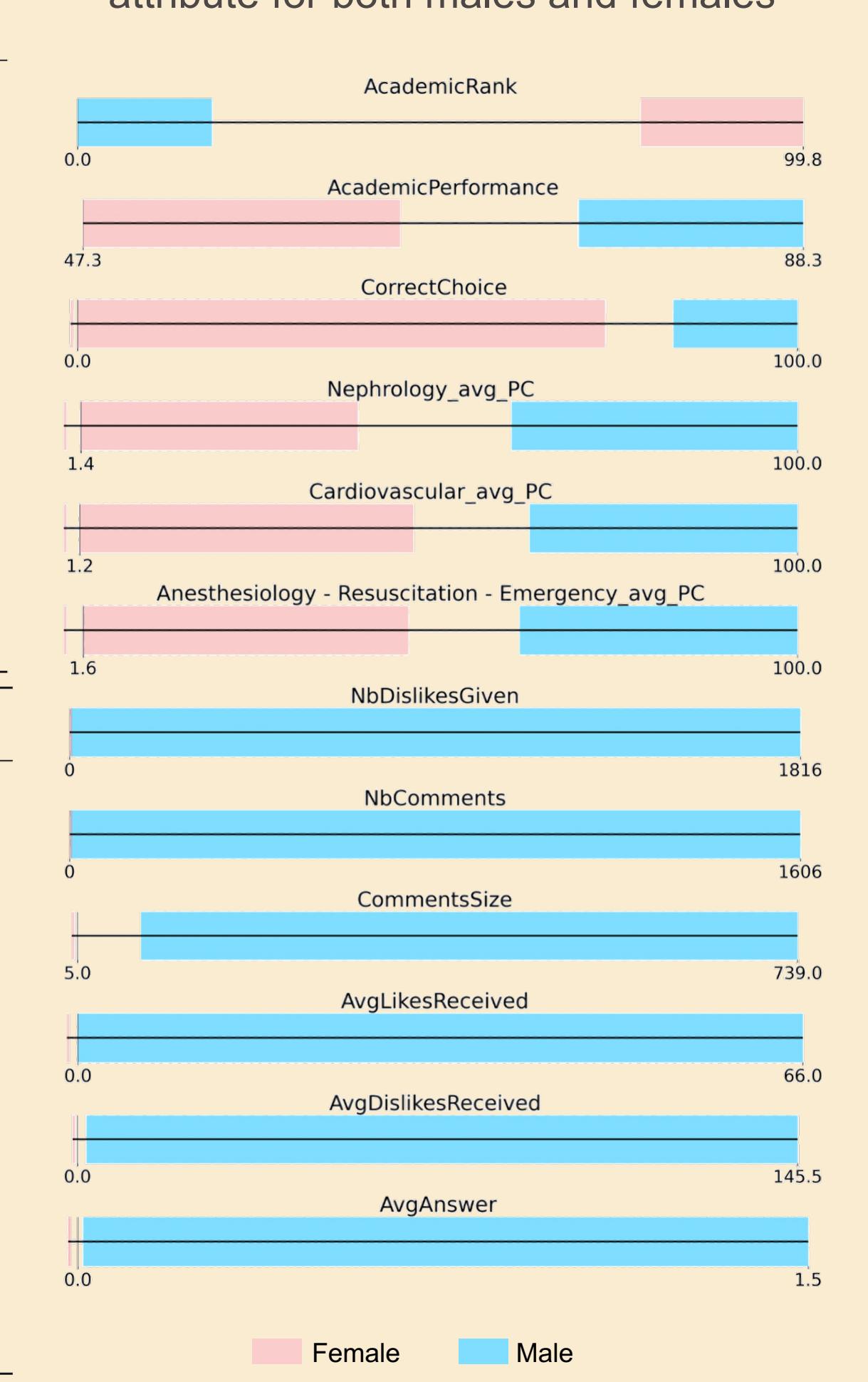
02 METHOD



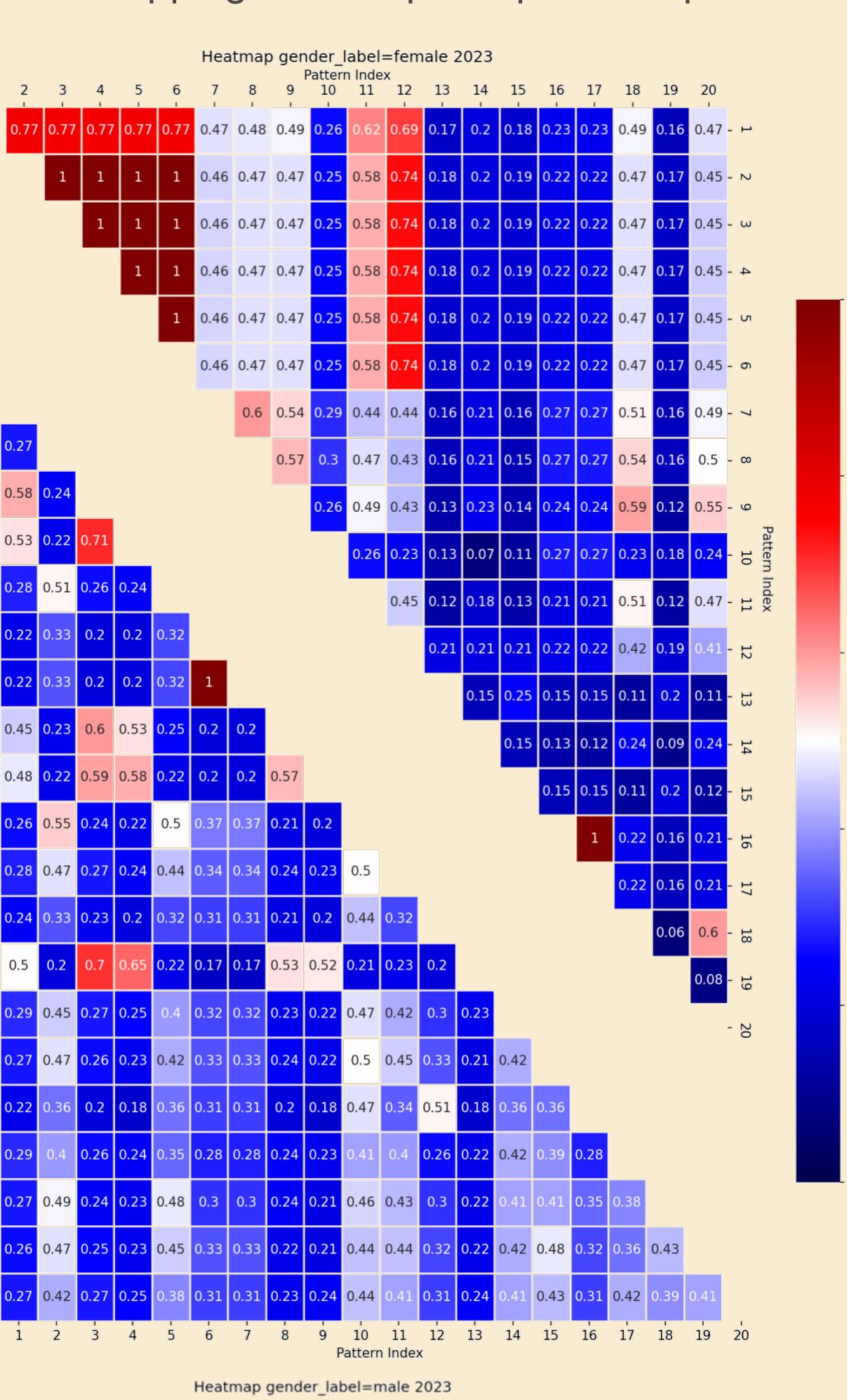
03 RESULTS

Gender patterns for the 2023 student cohort			
subgroup	WRAcc	validity	validity
1 dislike.given:>=1	0.03	True	True
2 avg.dislike.received:<-1:0.01	0.02	True	True
3 comment.size:<1:5:0	0.02	True	True
4 avg.answer:<1:0.01	0.02	True	True
5 NbComments:<0:1	0.02	True	True
6 avg.dislike:<0:1:0	0.02	True	False
7 Cardiovascular_avg_PPC:<1:47:14	0.02	True	False
8 Anesthesiology - Resuscitation - Emergency_avg_PCC...	0.02	True	False
9 Nephrology_avg_PCC:<1389:51	0.02	True	False
10 correct.choice:<73:27	0.01	True	True
11 like.given:<0:1	0.01	True	True
12 nb.message:<0:1	0.01	True	True
13 Hepato-Gastroenterology_avg_IQS: [43:49:59:06]	0.01	True	False
14 abandoned.question:<4:17	0.01	True	True
15 Neurology_avg_IQS: [48:75:60:24]	0.01	True	True
16 aca.rank:><75:49	0.01	True	False
17 aca.perf:<65:40	0.01	True	True
18 Neurology_nb_PC: [0:0:55]	0.01	True	False
19 Ophthalmology_avg_PCC: [1:35:50:63]	0.01	True	False
20 Dermatology_nb_PC: [0:0:39]	0.01	True	False
subgroup	WRAcc	validity	validity
1 dislike.given:>=4	0.03	True	True
2 Anesthesiology - Resuscitation - Emergency_avg_PCC...	0.02	True	True
3 NbComments:>=3	0.02	True	True
4 avg.dislike.received:>=0:01	0.02	True	True
5 Cardiovascular_avg_PCC:>=63:15	0.02	True	True
6 aca.rank:<18:55	0.02	True	True
7 aca.perf:>75:56	0.02	True	True
8 comment.size:>=69:64	0.02	True	True
9 avg.like.received:>=1:82	0.02	True	True
10 aca.PC.all:>=62:59	0.02	True	True
11 Nephrology_avg_PCC:>=60:65	0.02	True	True
12 correct.choice:>=82:75	0.02	True	True
13 avg.answer:>=0:01	0.02	True	True
14 Hepato-Gastroenterology_avg_PCC:>=60:65	0.02	True	True
15 Neurology_avg_PCC:>=61:77	0.02	True	True
16 essential.choice:>=84:13	0.02	True	True
17 Urology_avg_PCC:>=60:67	0.02	True	True
18 Neurology_avg_PCC:>=61:33	0.02	True	True
19 Pharmacologie - Thérapeutique_avg_PCC:>=59:40	0.02	True	True
20 Rheumatology_avg_PCC:>=61:38	0.02	True	True

Visualization of patterns related to a common attribute for both males and females



Overlapping student participation in patterns



04 DISCUSSION

Gender Differences:

- Engagement variations on the platform observed in the two cohorts.
- Academic level variations in specific test types (PC) and specialties (e.g., neurology) with stronger differences in 2023 than in 2022.
- These two differences do not concern the same students.

The number of female medical students is increasing; however, disparities in academic achievement are intensifying. Previous research has shown that female medical students are at a higher risk of depression⁵ and subsequently experience slower career progression⁶. It is crucial to continue research in this field in order to correct this trend.

University Differences :

- Variations across the five dimensions observed.
- Many patterns indicate lack of training in certain specialties and extensive training in others.

Specific behaviors hint at greater interest or need in certain specialties, revealing potential training gaps locally (e.g., at private schools).

Future Perspectives:

- Use these results to tailor education to the specific needs of each university.
- Analyze the progression of scores to understand intra-individual variability, to provide personalized recommendations on the platform.