

Rosalind

Making courses better using IBM Watson

Sarang Borude & Liz Mikolaj

Predispositions

- A course is successful only if its content is understood.
- Grades are arbitrary.

Research

- Interviews – Jordan Beck and Marty Siegel
- Exemplar: ETS e-rater
 - Uses natural language processing for grammar and content as a check for human graders in grading the essays for the GRE

Research - Insights

- Historical data to determine interest and understanding is valuable for course planning.
- Current Natural Language Processing is only used for grading and does not produce trends or provide context.
- Watson's use of percentages provides a potential that other computers don't have.

The Challenge

- If we know what in the coursework is understood and what is not, suitable changes can be made to make the course better.

The Challenge

- We are empowering the teachers by letting them know how can the course be made better. This is a small change
- This can bring a big change. A better understanding of the course and hence better education for the students taking the course.

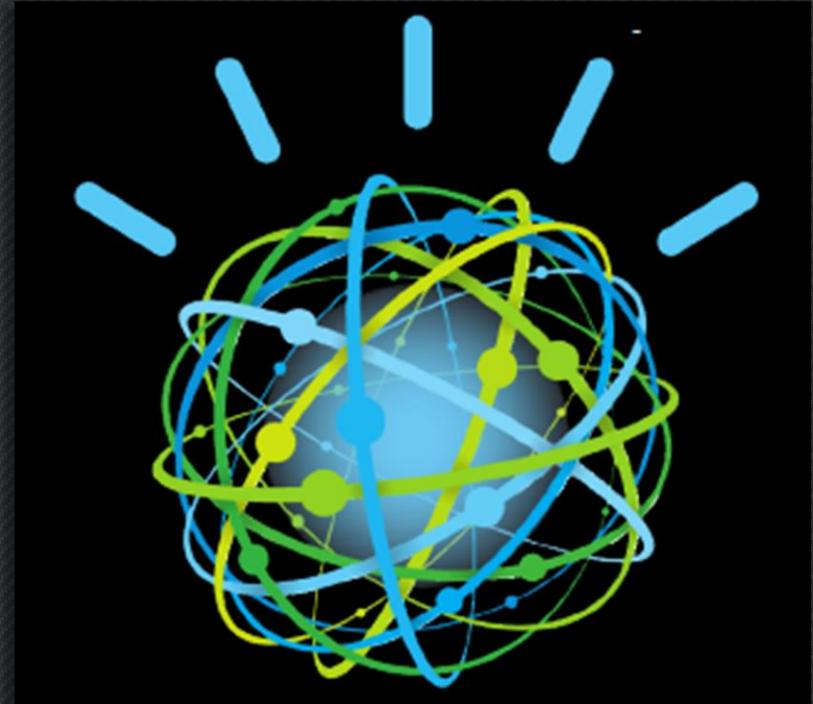
Meet Prof. McGonagall

- She teaches a survey course in American Literature at Hogwarts University
- A big part of her course is reading various texts and interpreting them
- She has around 100 students in her class.
- Students have to write papers as a part of the curriculum
- The level of understanding of students can be known based on how they write their papers, particular their midterm essay
- It is hard for her to go through all the papers thoroughly and know where exactly students are having a difficulty in understanding



Introducing IBM Watson

- It is feasible and possible for a super-computer like IBM Watson to process natural language and make sense of the understanding of students quickly and efficiently. When combined with other methods of essay parsing, you have a powerful analytic tool.
- Watson will help tell Prof. McGonagall what students are understanding and what they are not.



IBM WATSON™

What were are not doing?

- We are not using Watson for grading those papers.
- Watson will only be used to give an estimate of the understanding of the class literature.

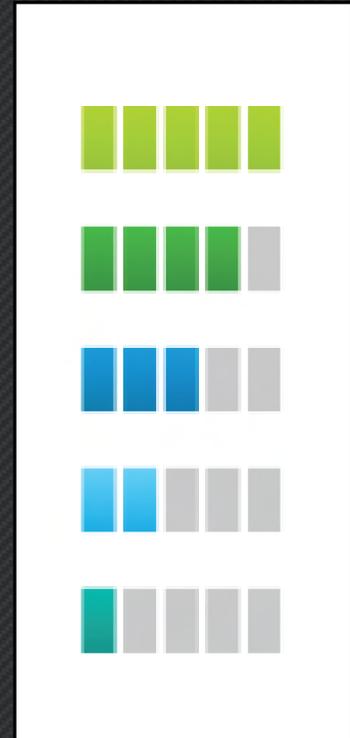
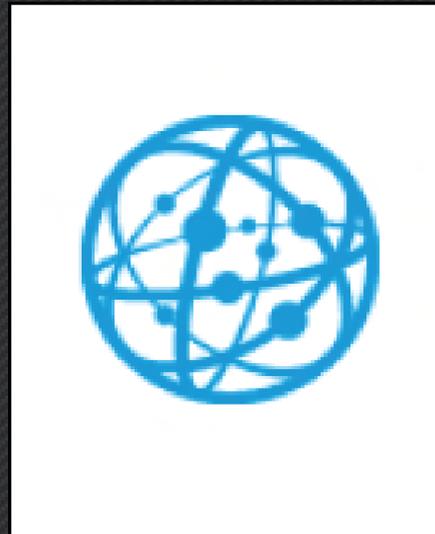
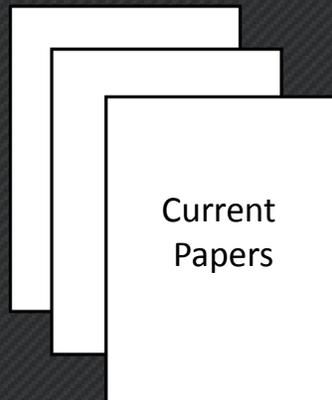
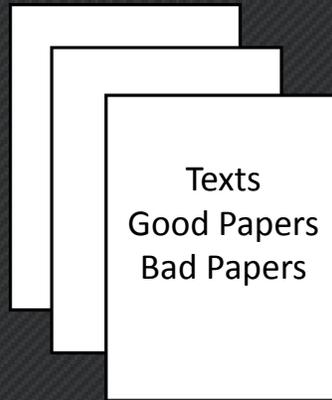
Data Corpus for Watson

What Watson needs to know to tell about students understanding?

Watson will be fed and trained on the following data:

- The literature texts related to the course
- Some ideal previously written papers
- Some incorrectly written papers
- Current papers which students write as a part of curriculum
- Any other supplemental sources for grammar and writing style knowledge

Data Corpus for Watson



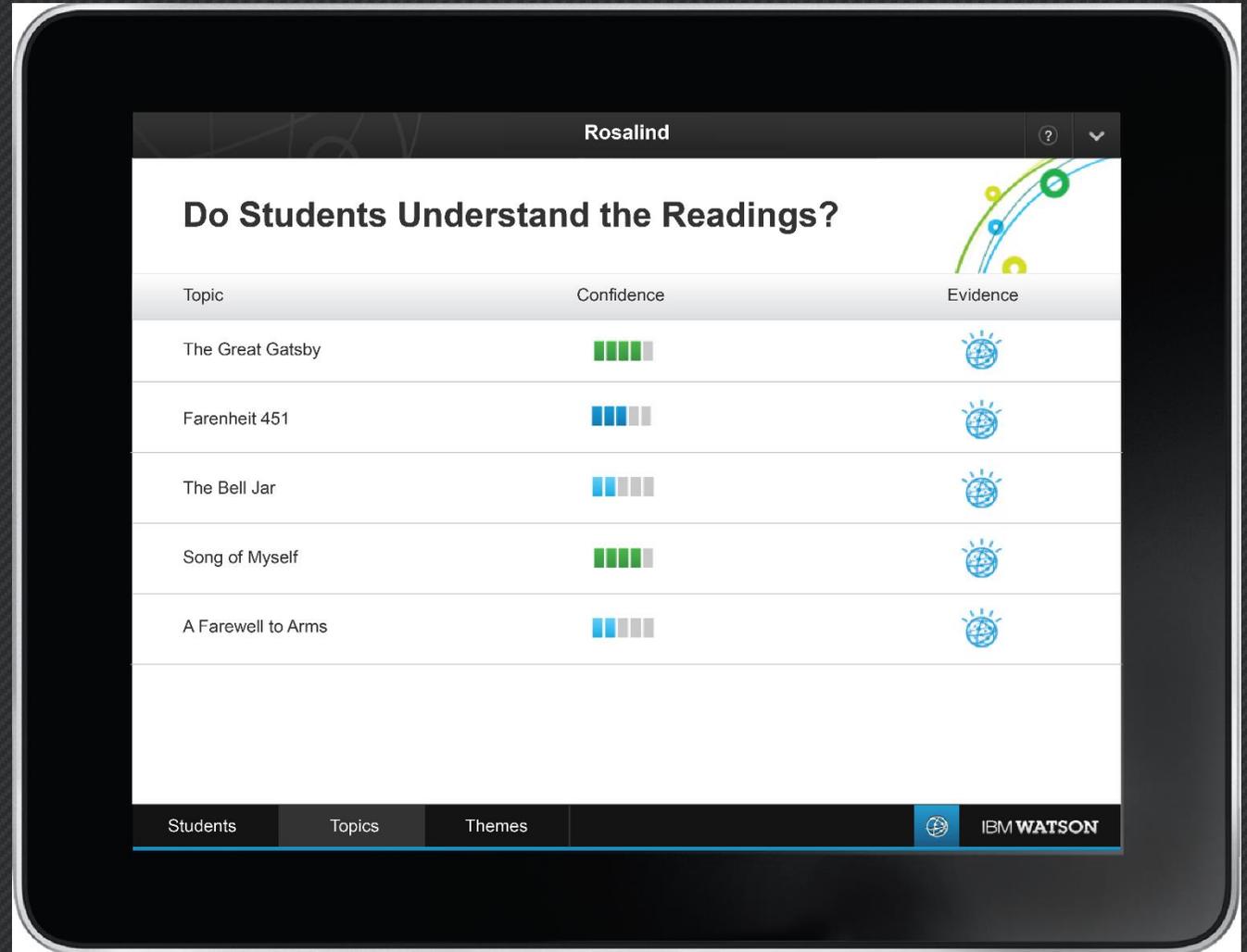
How will Watson analyze the data?

Watson will look for following things to judge understanding of the class from the current papers:

- Improper citation
- Being too wordy
- Writing incorrectly
- No right links and connections in what's being written
- Frequency of citation
- Patterns of mistakes
- Contradictions to the original literature

Information for Prof. McGonagall

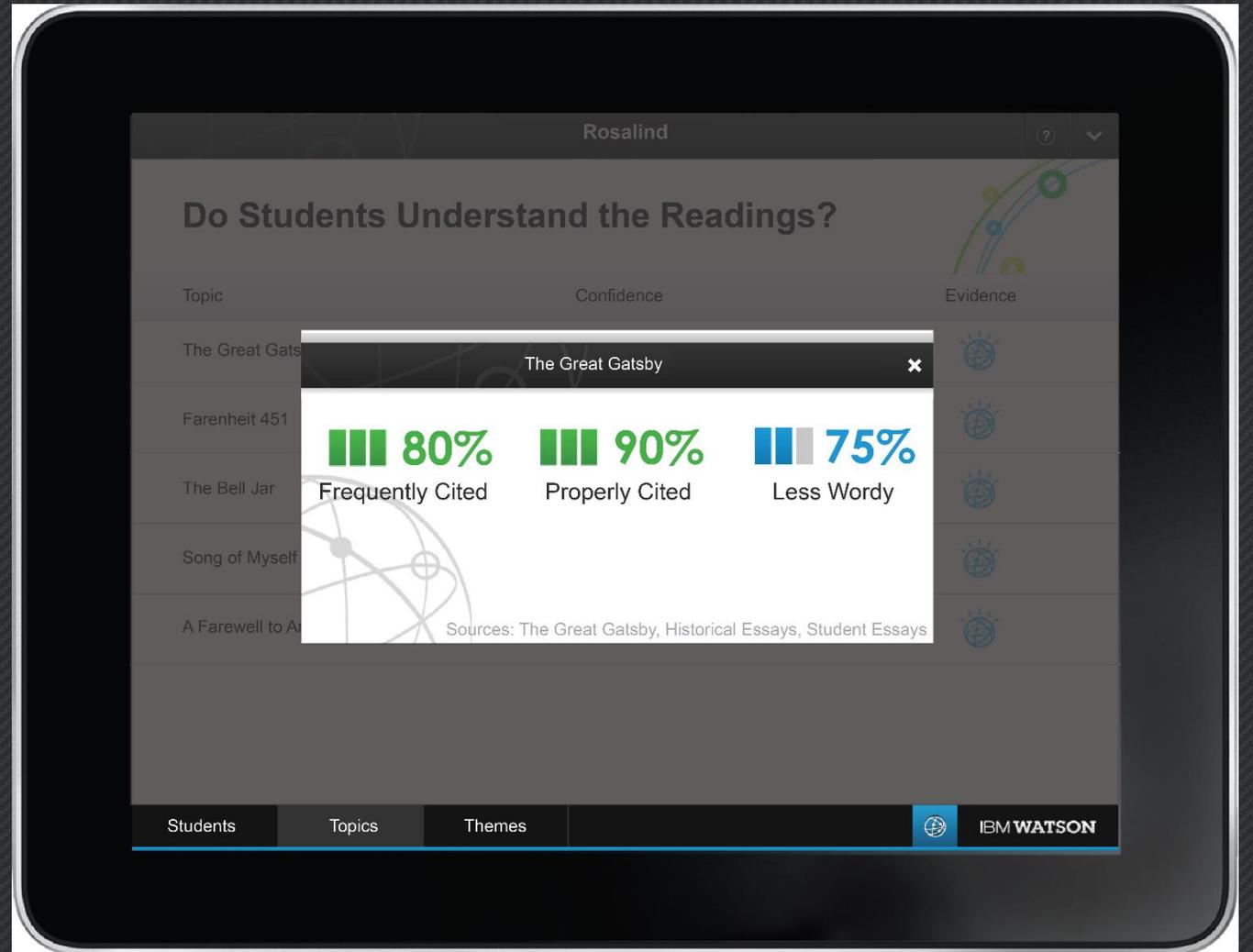
The professor sees the average scores for the understanding of the readings.



Information for Prof. McGonagall

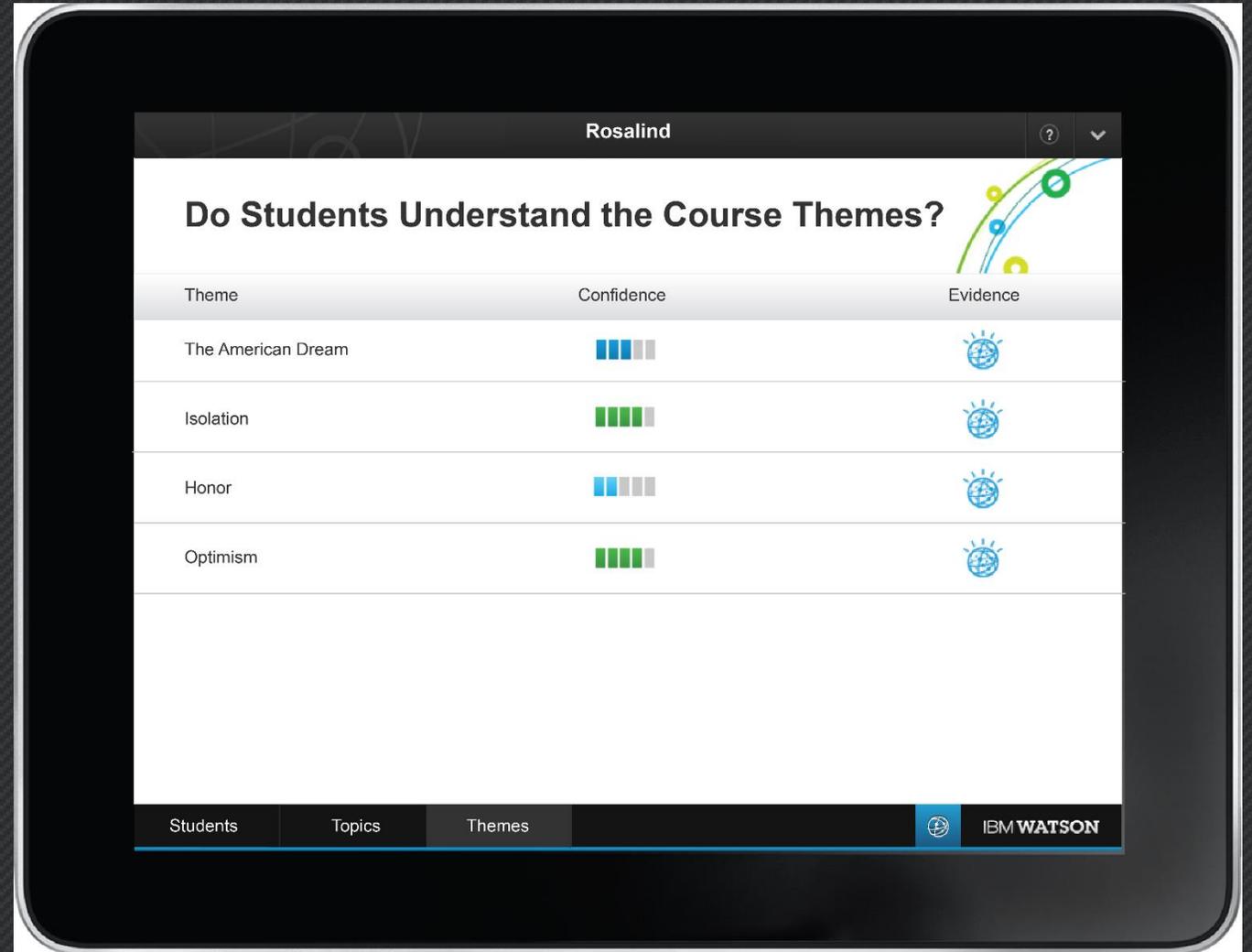
She clicks the evidence icon to see the breakdown of what contributed to that average score.

This is particularly useful to find out where student misunderstandings may have occurred from.



Information for Prof. McGonagall

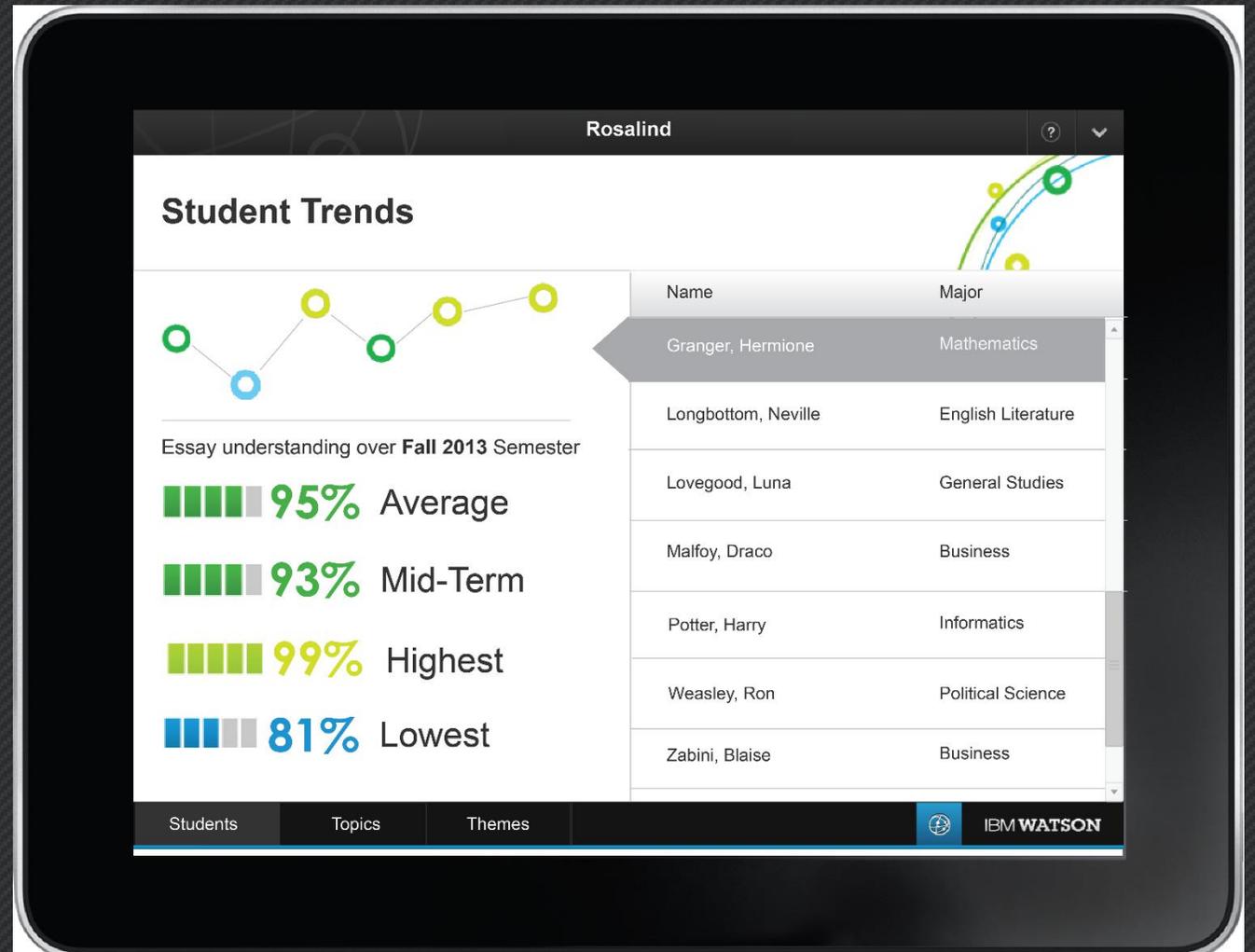
Similar averages are given for course themes, something which is very important for Prof. McGonagall's course.



Information for Prof. McGonagall

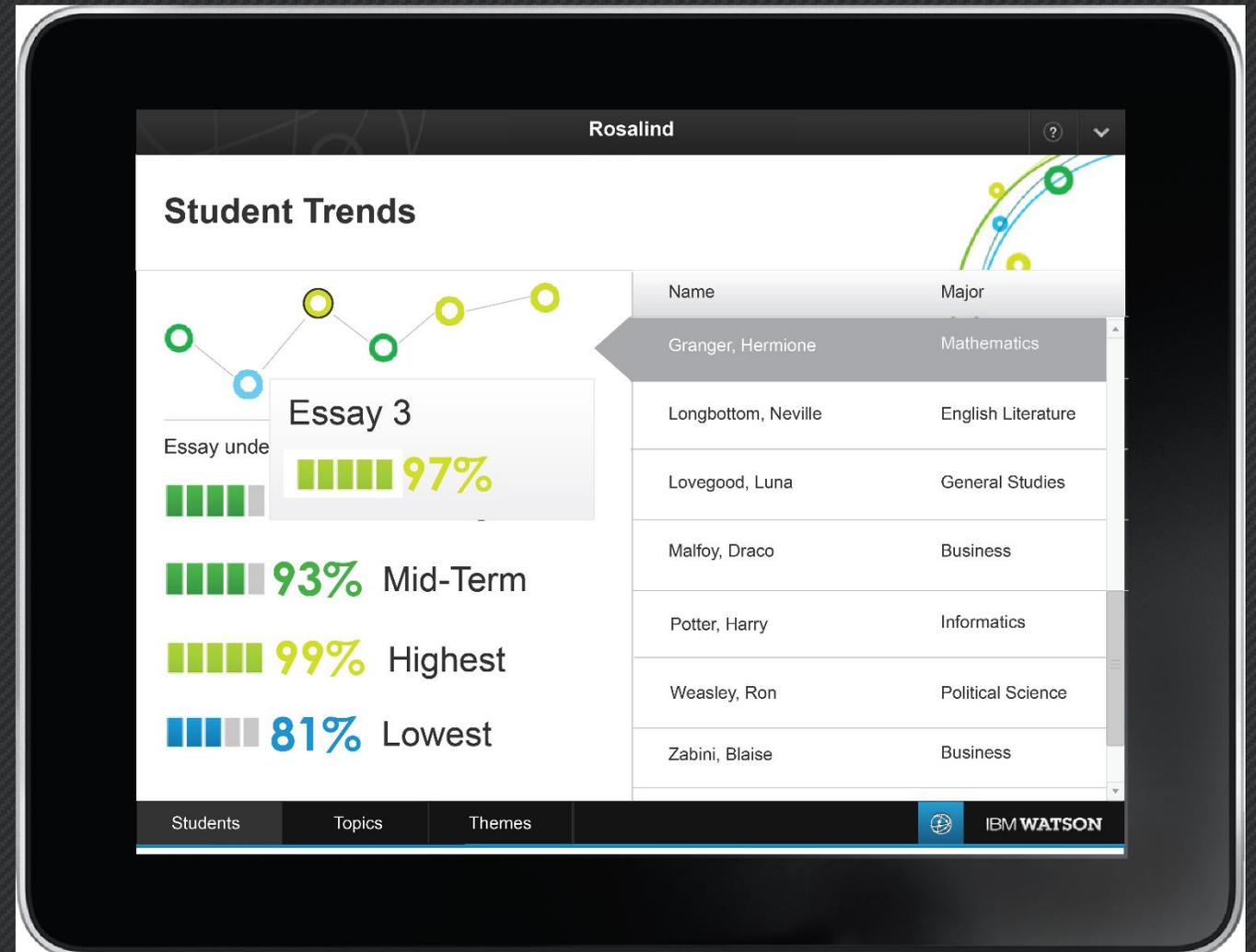
In the student's tab, she can investigate an individual student's trend of understanding throughout the course.

This is much more valuable than grades as those may not account for issues a student may be having.

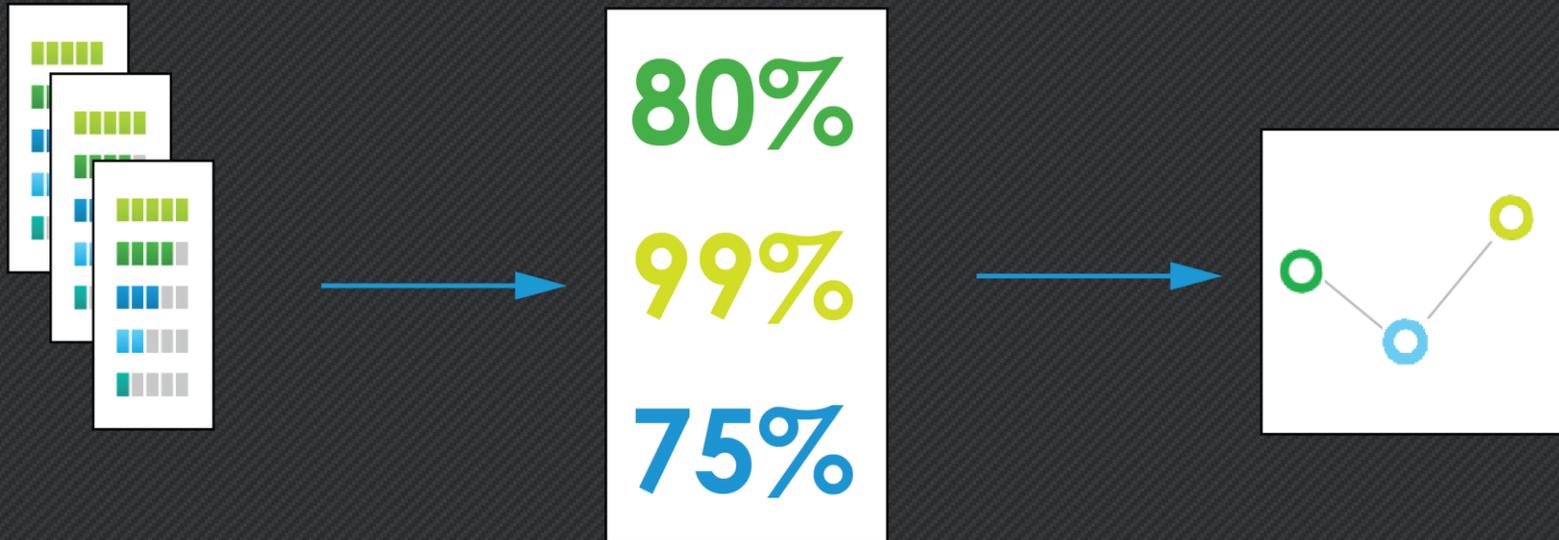


Information for Prof. McGonagall

She can also select an individual point in a student's trend line to see the level of understanding for that particular assignment.



Interpreting Watson's analysis



Take confidence scores on topics and themes for each essay and average together all class essays for class trends.

Benefits for Prof. McGonagall

- As Prof. McGonagall now knows what reading or topic have been less understood by the students, he can make changes to those texts or teach them in different ways. She can also discuss the less understood topics in class to know more about students' understanding.
- This will improve the overall learning experience of the class leading to better education.

How frequently Watson will be used?

- Using Watson is an expensive resource. In our case we think of Watson to be used twice in a semester.
- Once after the Midterm examinations and then after the final examination.

Thank you

Mark Mararra

Tarun Gangwani

Brandon Le

Marty Siegel

Chung-Ching Huang