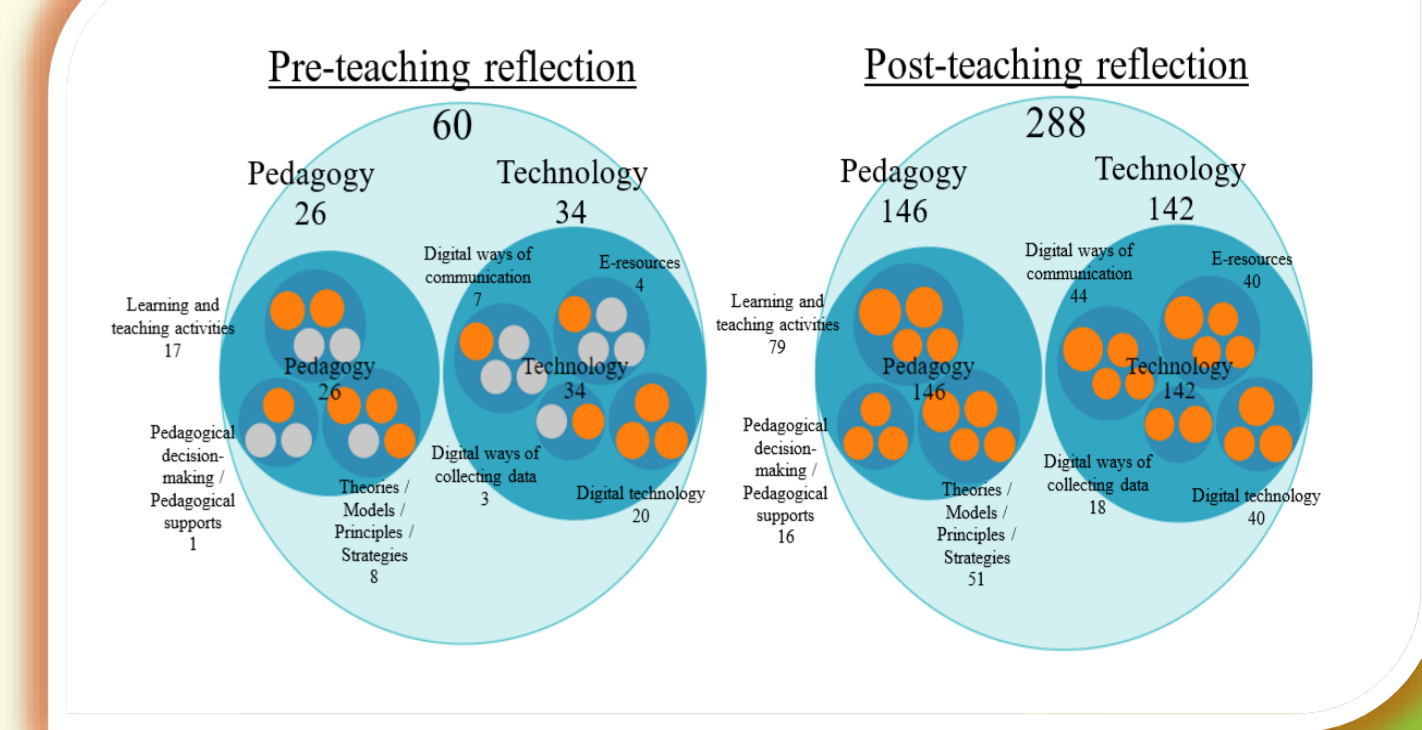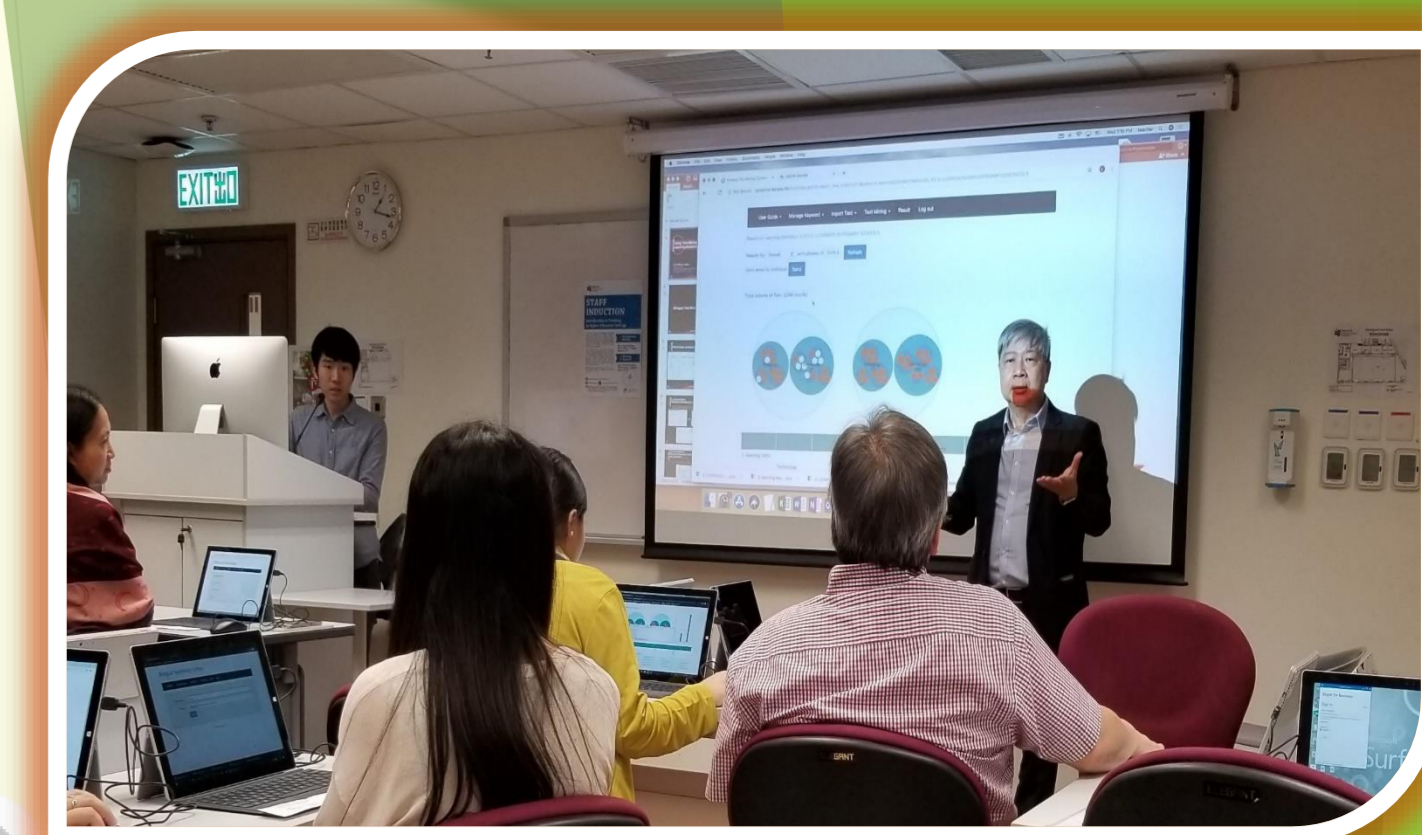# PEDAGOGICAL USE of BILINGUAL TEXT-MINING

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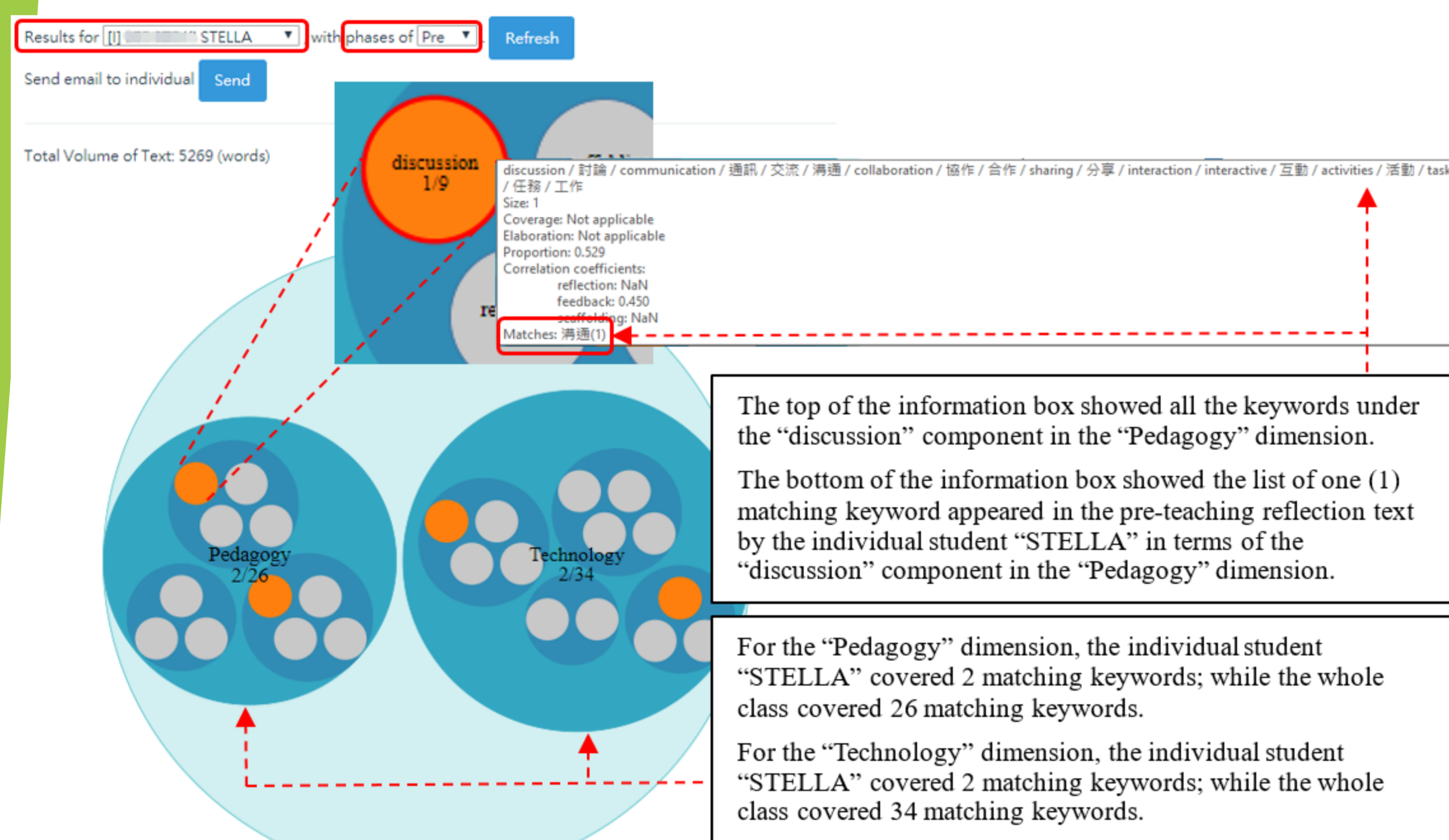
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The use of **bilingual text-mining system** is introduced to EdUHK courses for **3 types of learning analytics supports.**
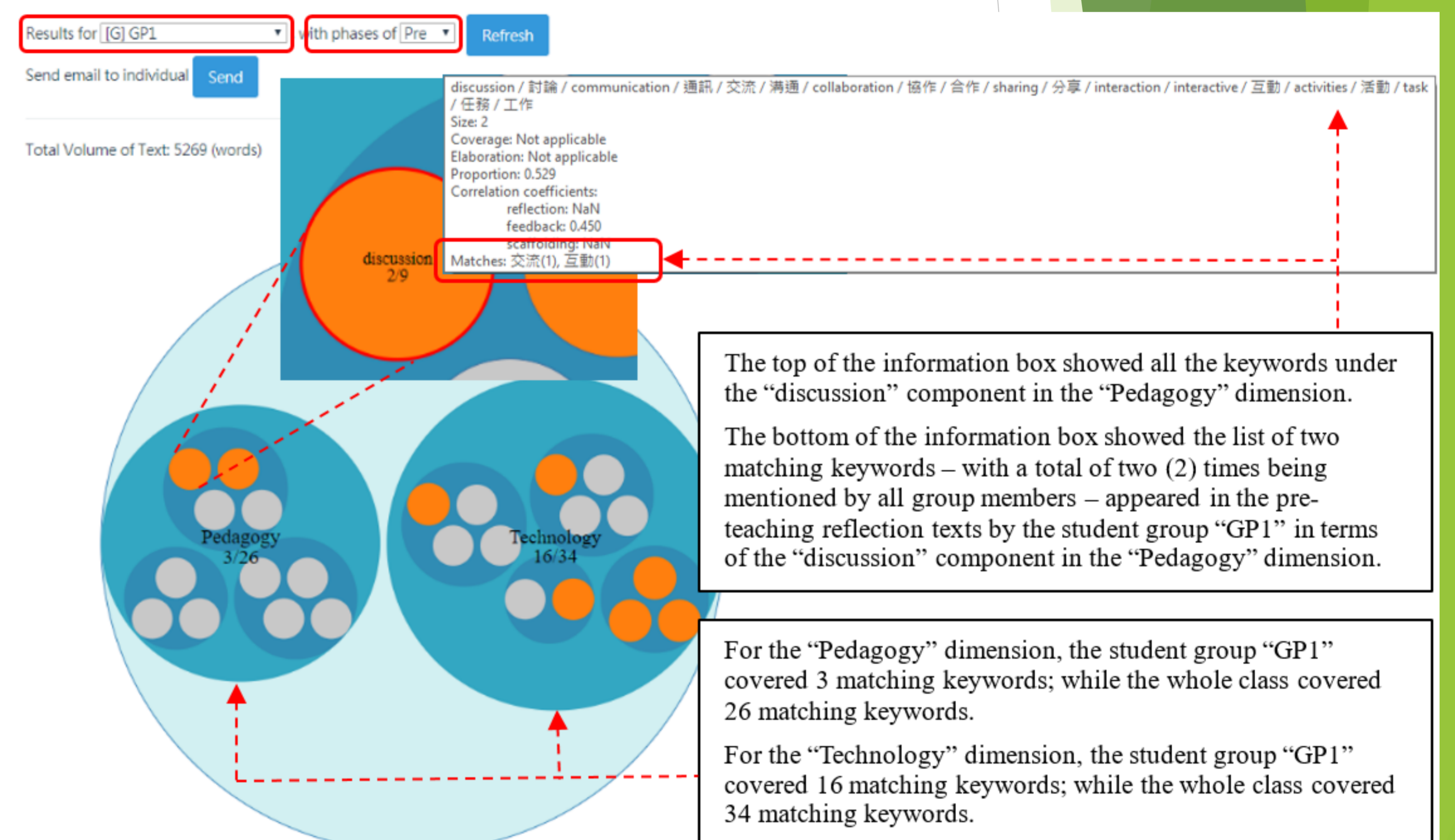
(1) The system can <u>automatically identify and count the matching keywords</u> mentioned in students' reflection texts, according to the frameworks of topic-specific keywords established by the teachers.

(2) The system can <u>automatically generate hierarchical visualization of text-mining results</u>, of which the zoom-able diagrams incorporate a number of statistical quantities for interpreting text-mining results from the individual-student, student-group, and whole-class perspectives.

(3) The system can <u>automatically analyze students' major focuses in their learning reflection</u>, for checking students' strengths and inadequacies in understanding the topic-specific concepts.

These learning analytics supports are empirically examined to be effective for stimulating and guiding students to **check learning inadequacies, identify areas of improvement, and re-think learning focuses in course learning.**

"Individual / Class" comparison

The top of the information box showed all the keywords under the "discussion" component in the "Pedagogy" dimension.

The bottom of the information box showed the list of one (1) matching keyword appeared in the pre-teaching reflection text by the individual student "STELLA" in terms of the "discussion" component in the "Pedagogy" dimension.

For the "Pedagogy" dimension, the individual student "STELLA" covered 2 matching keywords; while the whole class covered 26 matching keywords.

For the "Technology" dimension, the individual student "STELLA" covered 2 matching keywords; while the whole class covered 34 matching keywords.

"Group / Class" comparison

The top of the information box showed all the keywords under the "discussion" component in the "Pedagogy" dimension.

The bottom of the information box showed the list of two matching keywords – with a total of two (2) times being mentioned by all group members – appeared in the pre-teaching reflection texts by the student group "GP1" in terms of the "discussion" component in the "Pedagogy" dimension.

For the "Pedagogy" dimension, the student group "GP1" covered 3 matching keywords; while the whole class covered 26 matching keywords.

For the "Technology" dimension, the student group "GP1" covered 16 matching keywords; while the whole class covered 34 matching keywords.

LexRank analysis

In this example, the student browsed the LexRank summary of pre-teaching reflection texts. The LexRank result page showed three types of information for each ranked sentence:

(i) "Centrality Value" (i.e. the statistical value of LexRank analysis in this project for ranking the relative importance of the sentence in the set of reflection texts; the centrality value was normalized with a score of 1 for the highest ranked sentence)

(ii) "Produced by learner" (i.e. the writer of the ranked sentence"; and

(iii) "Sentence" (i.e. the ranked sentence).

When pressing the "Result for Chinese sentences" button, the student viewed all 30 Chinese sentences ranked by LexRank.

When pressing the "Result for English sentences" button, the student viewed all 15 English sentences ranked by LexRank.

What is e-Learning?

Students' major focuses in the learning reflection

NE-Rank and HG-Rank analyses

In this example, the teacher generated the NE-Rank summaries of students' pre—post teaching reflection texts. The summaries were set to show 50 important words identified from the set of pre-teaching reflection texts and the set of post-teaching reflection texts, respectively. After pressing the "Run" button, the NE-Rank summaries were automatically generated to show two types of information:

(1) Keyword (i.e. the ranked word)

(2) WScore (i.e. the statistical value of NE-Rank analysis in this project for ranking the relative importance of the word in the set of reflection texts; which was normalized with a score of 1 for the highest ranked word)

What is academic integrity?

Keywords-extraction from students' reflection texts

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