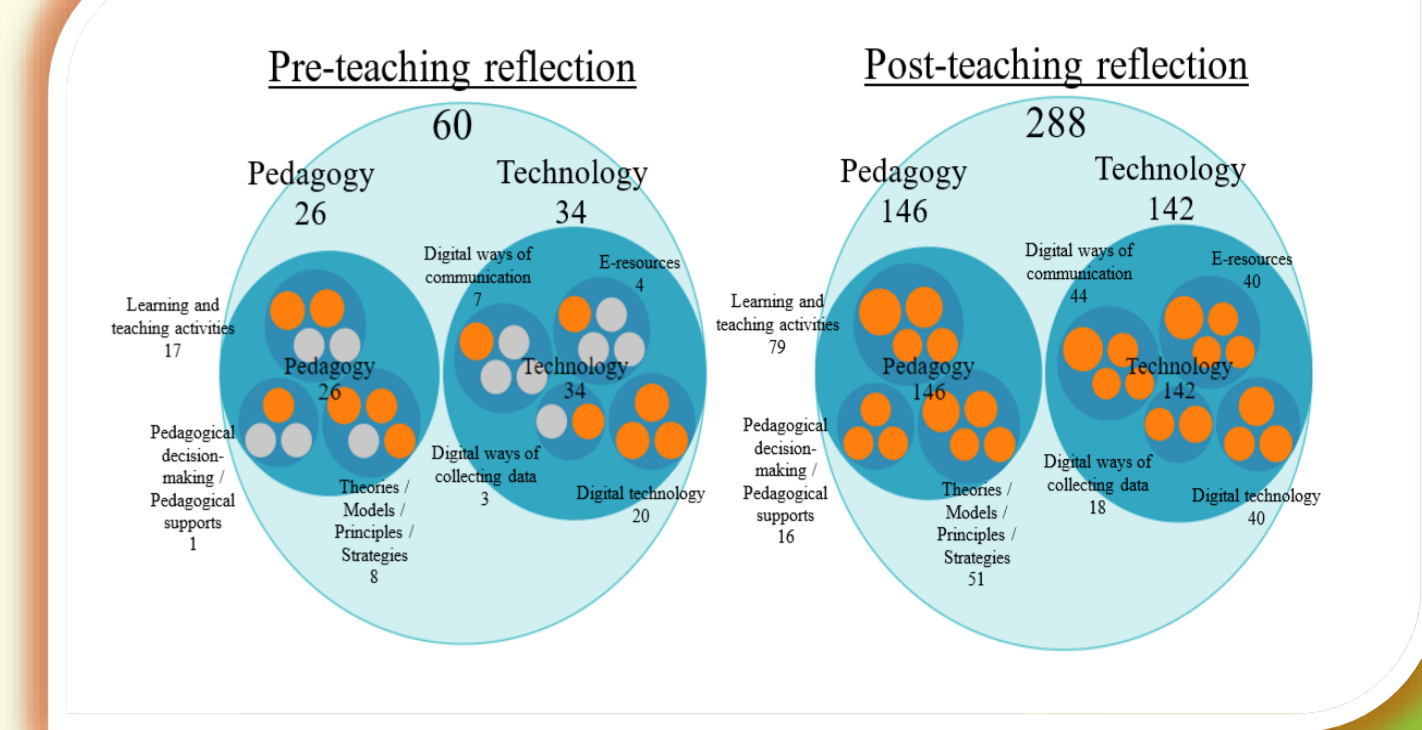
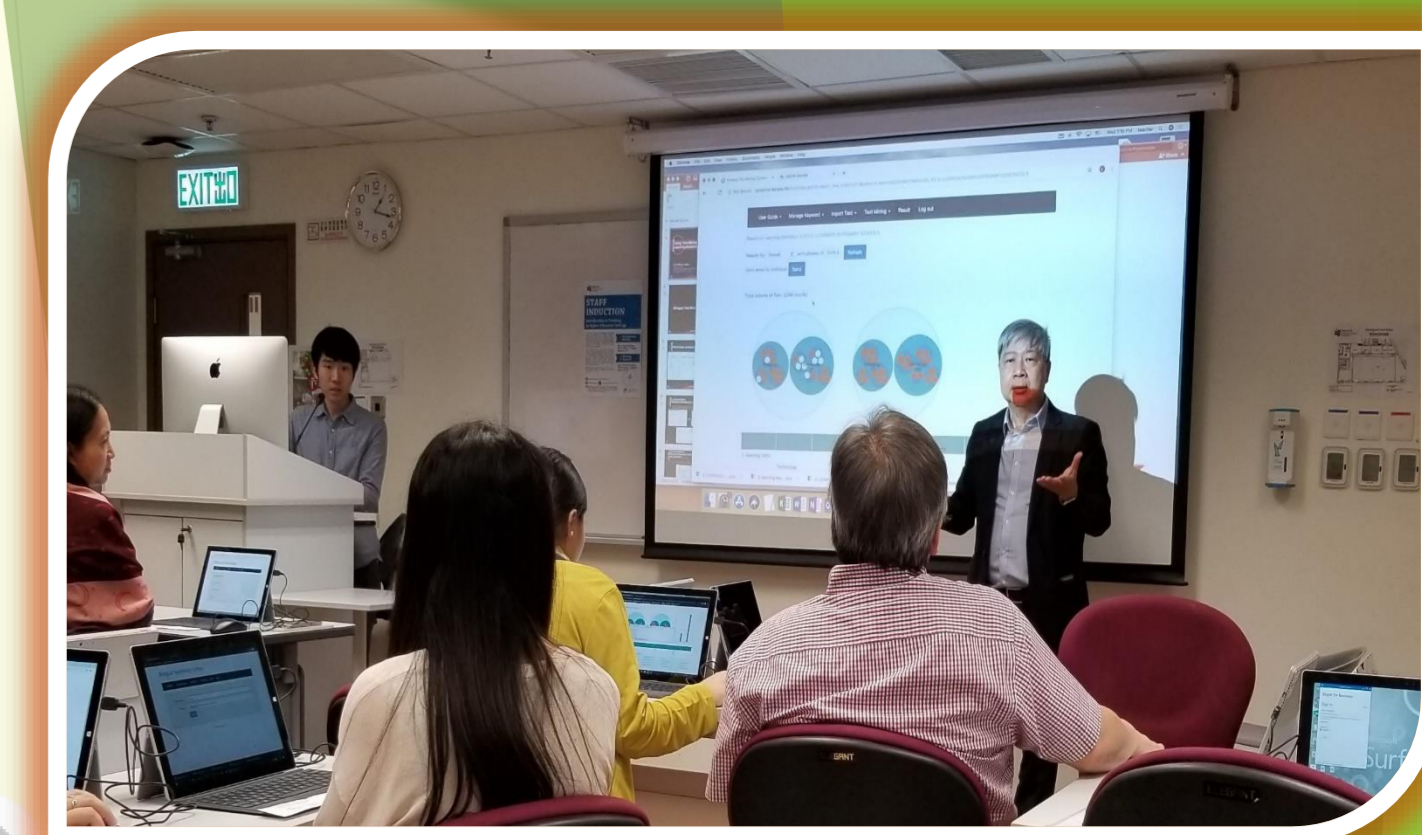


PEDAGOGICAL USE of BILINGUAL TEXT-MINING



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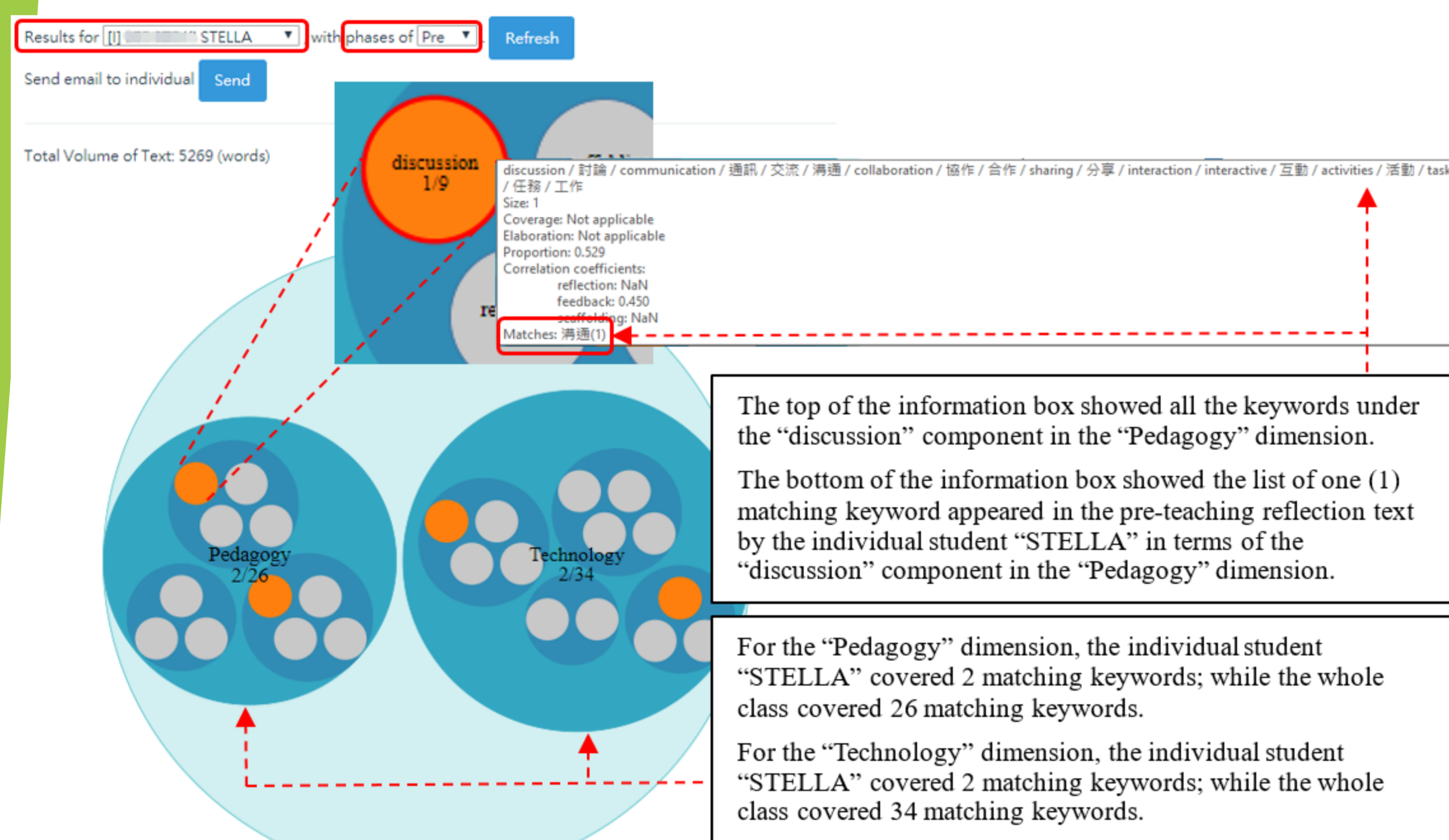
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The use of bilingual text-mining system is introduced to EdUHK courses for 3 types of learning analytics supports.

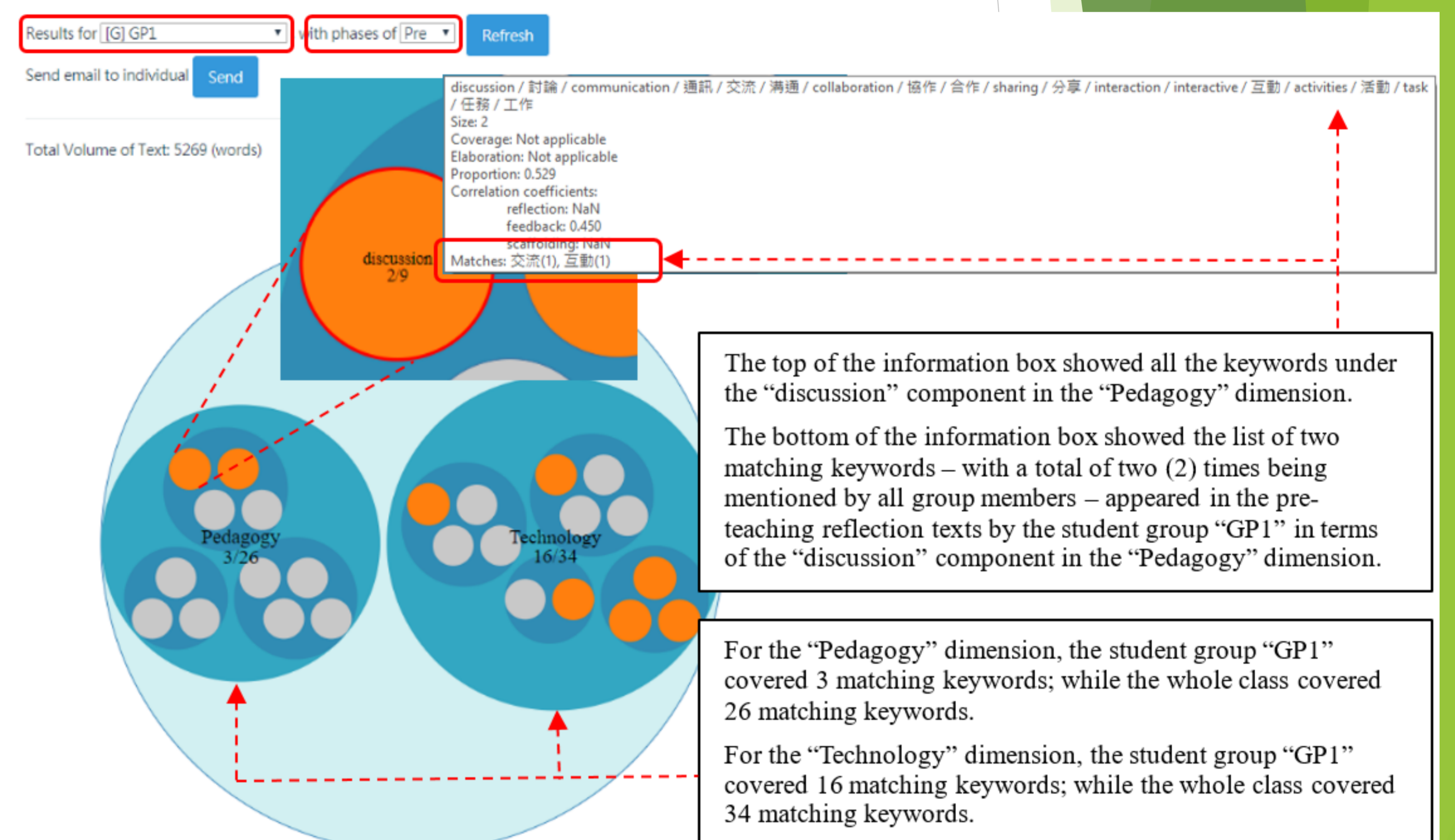
- (1) The system can **automatically identify and count the matching keywords** mentioned in students' reflection texts, according to the frameworks of topic-specific keywords established by the teachers.
- (2) The system can **automatically generate hierarchical visualization of text-mining results**, 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 **automatically analyze students' major focuses in their learning reflection**, 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



“Group / Class” comparison



LexRank analysis

What is e-Learning?

LexRank result for pre of 2018-19S1_INT5018_01C E-LEARNING

Centrality Value ▲ Produced by learn... ▲ Sentence

Result for Chinese sentences (30 sentences)

Result for English sentences (15 sentences)

LexRank result for post of 2018-19S1_INT5018_01C E-LEARNING

Centrality Value ▲ Produced by learn... ▲ Sentence

Result for Chinese sentences (70 sentences)

Result for English sentences (31 sentences)

LexRank result for pre of 2018-19S1_INT5018_01C E-LEARNING

Centrality Value ▲ Produced by learn... ▲ Sentence

Result for Chinese sentences (30 sentences)

Centrality Value	Produced by learn...	Sentence
1.00000	Member 8	老師利用電子教學令課堂更多元化，而課前預習，課後延伸等電子學習令老師更掌握學生所學。
0.95566	Member 2	我認為電子學習是幫助學生透過多元化教學模式進行學習，如運用 IPAD 中不同的 APPS、電子書，以提升學生學習興趣，比傳統課堂電子學習是在學與教過程中利用不同的電子工具以提升學習效能、興趣及課堂互動的方法。
0.91238	Member 4	教師亦可利用不同的程式，如 kahoot!
0.89486	Member 7	老師可以提供支援，協助學生找出難點，提示學生運用不同的學習工具(包括電子科技、設備)以解決難題。
0.85839	Member 4	課堂上，教師可以用不同的軟件幫助學生學習。
0.82027	Member 3	在傳統設計的課堂中，大多是老師主講，老師若要知道學生在特定課堂中是否達到學習目標，老師只能透過提問或提問等方式去了解。
0.81036	Member 8	學生在電子學習時，利用多媒體一起學習，更利用不同的學習平台或軟件，透過自學掌握學習進程，自我評估及訂定學習目標。
0.80311	Member 11	電子學習是透過電子的工具去協助學生學習各方面的知識。
0.78985	Member 4	如數學科，教師可以利用不同的軟件讓學生更了解不同圖形的特性等。

Result for English sentences (15 sentences)

Centrality Value	Produced by learn...	Sentence
1.00000	Member 1	e-Learning can be in different forms, from using online resources to adopting the concept of flipped classroom.
0.91828	Member 1	It is different from the traditional form of learning as it not only motivates students to learn, but it can enhance the effectiveness.
0.66438	Member 5	Teacher and students can have more interaction.
0.59808	Member 1	e-Learning is a form of learning via the Internet, or numerous electronic devices.
0.57606	Member 10	It can also be interactive and arouse students' interest in learning as a lot of e-learning materials are animated and interesting.
0.56204	Member 10	E-learning can also enhance peer interaction by exchanging ideas on a specific topic on the forum.
0.51379	Member 10	Students can do some preparation by viewing the video clips or some information on a certain topic before or after the lesson.
0.50087	Member 10	In general, students can have more fun in learning through e-learning, it's also convenient, flexible and can cater for learners'.
0.48572	Member 10	E-learning is a self-directed learning tool for students to learn according to their own pace anywhere, anytime.
0.48107	Member 10	Teachers can also view students' learning outcome at once and share it with the whole class to provide feedback at once.

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:

- “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)
- “Produced by learner” (i.e. the writer of the ranked sentence); and
- “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.

NE-Rank and HG-Rank analyses

What is academic integrity?

User Guide ▲ Manage Keyword ▲ Import Text ▲ Text Mining ▲ Result

Text Mining

Suggest Keyword(LDA)

Lex Rank

Text Rank

NE-Rank

HG-Rank

Text: 917

Number of Keywords: 50

Run

NE-Rank result (50 keywords) for Pre of

Keyword	WScore
學術	1.0000
誠信	0.7753
別人	0.7071
文章	0.6072
抄襲	0.5772
academic	0.4779
知識	0.4502
引用	0.4374
出處	0.4316
研究	0.4293
尊重	0.3976
必須	0.3931
個人	0.3671
參考	0.3604
創作	0.3604
功課	0.3466
have	0.2963
文獻	0.2709

NE-Rank result (50 keywords) for Post of

Keyword	WScore
學術	1.0000
誠信	0.8359
尊重	0.7604
誠實	0.5946
信任	0.5610
責任	0.5371
公平	0.4874
研究	0.4175
個人	0.4118
other	0.4040
academic	0.3540
行為	0.3342
包括	0.3164
need	0.2890
respect	0.2875
價值觀	0.2859
抄襲	0.2826
資料	0.2794

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)

Students' major focuses in the learning reflection

Keywords-extraction from students' reflection texts