



# Sentiment Analysis of Student Online Interaction in a Blended Postgraduate Programme

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# Research Questions

During a blended postgraduate programme:

1. To what extent do students interact online?
  2. What are the sentiments in student online interaction?
- ➡ What can we learn about using sentiment analysis to study student online interaction?



# TML Blended Postgrad Programme

## First 16 weeks

Weekly Face-to-Face Session and Online Learning

**2 Courses Running Parallel!**

Digital & Collaborative Learning  
in Context (DIGITAL)  
15 credits

Leadership in Digital &  
Collaborative Learning  
(LEADERSHIP)  
15 credits

## Last 16 weeks

Online Learning and Weekly Webinars  
and Live Chat on G+ Community

**3 weeks + 8 weeks + 5 weeks**

Applied  
Practice in  
Context  
(PRACTICE)  
15 credit  
Part 1

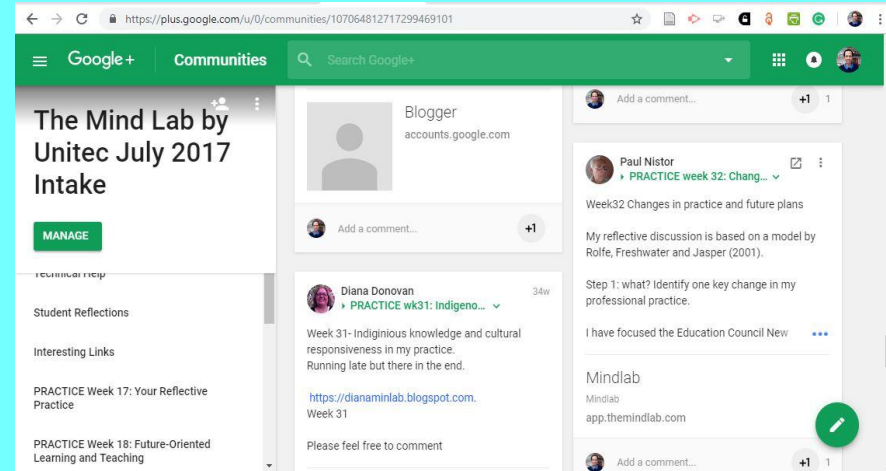
Research &  
Community  
Informed  
Practice  
(RESEARCH)  
15 credits

Applied  
Practice in  
Context  
(PRACTICE)  
15 credits  
Part 2



# Online interaction on G+ Community

- **First 16 weeks:** optional for students to post
- **Last 16 weeks:** posts can be used as small portion of assessments
- Posts are put in **categories** (activity-based or assessment based)



# Sentiment analysis

Sentiment analysis (SA) is “the computational treatment of **opinion**, **sentiment**, and **subjectivity** in **text**” (Pang & Lee, 2008. p.5).

Automatically determine whether a text represents a **positive** or **negative** emotion (Kim & Calvo, 2010; Thelwall, 2016).

Studies of sentiment analysis are grouped into

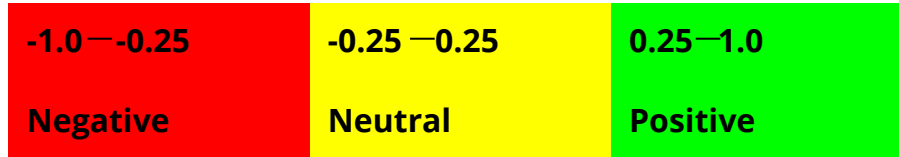
- machine learning,
- sentiment analysis specific methods
- natural language processing

(Mäntylä, Graziotin & Kuutila, 2018)



# Google Natural Language Processing

- **Score: Overall emotions** of the texts, ranging from -1.0 (negative) to 1.0 (positive)



- **Magnitude: Overall strength of emotions** (both positive and negative) within the given text, between 0.0 and +inf.

Sentiment	Sample Values
Clearly Positive*	"score": 0.8, "magnitude": 3.0
Clearly Negative*	"score": -0.6, "magnitude": 4.0
Neutral	"score": 0.1, "magnitude": 0.0
Mixed	"score": 0.0, "magnitude": 4.0



# Research Methodology

## Quantitative research

Observation of **the number**, sentiment **scores** and **magnitudes** of students' initial posts and comments on Google+

- total counts
- the timeline
- categories



# Data Collection and Analysis

- **Initial posts** on and the **comments** on G+ are anonymously collected
- Natural Language API on Google Cloud Platform to **analyse the sentiments** in the collected data
- Microsoft's Power BI is used to graph the results



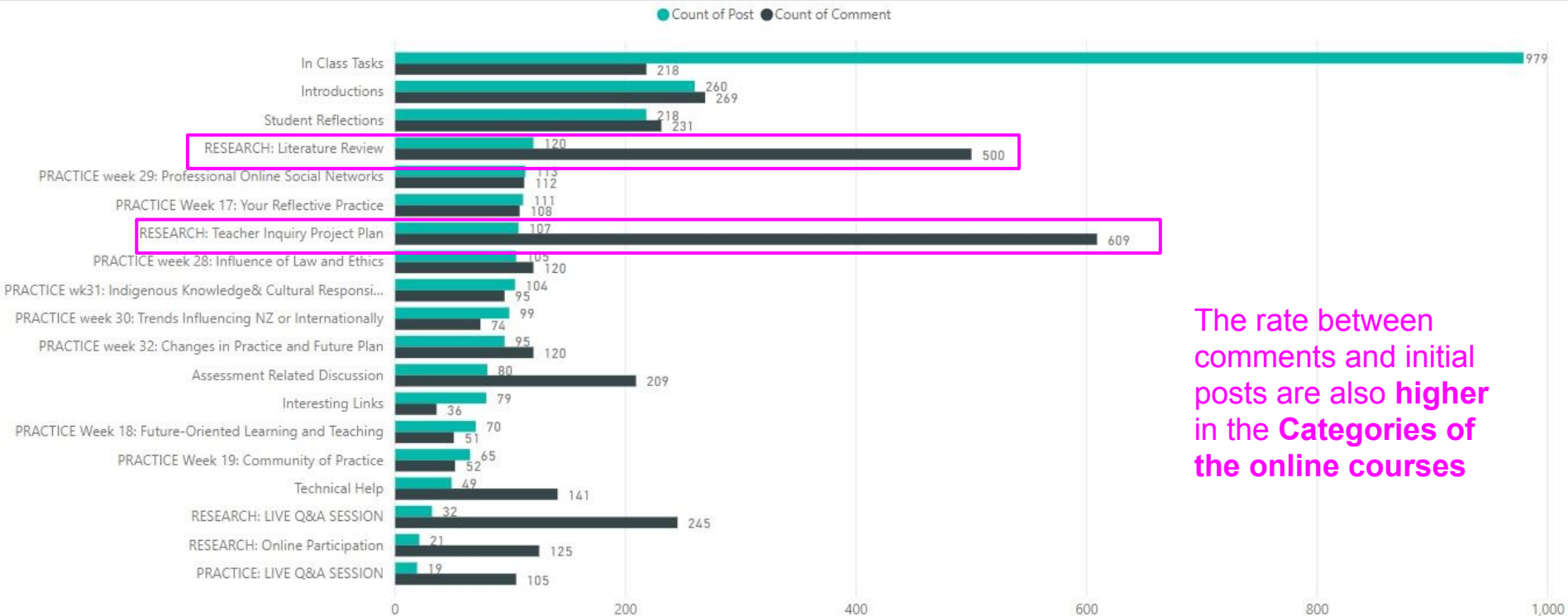


# Overview of the collected data

Total members (students + staffs)	388
Student members (posting/ commenting)	<b>314 / 296</b>
Total number of initial posts	<b>2866</b>
Total number of comments	3630
Posts in English (The service can't process Te Reo)	2844



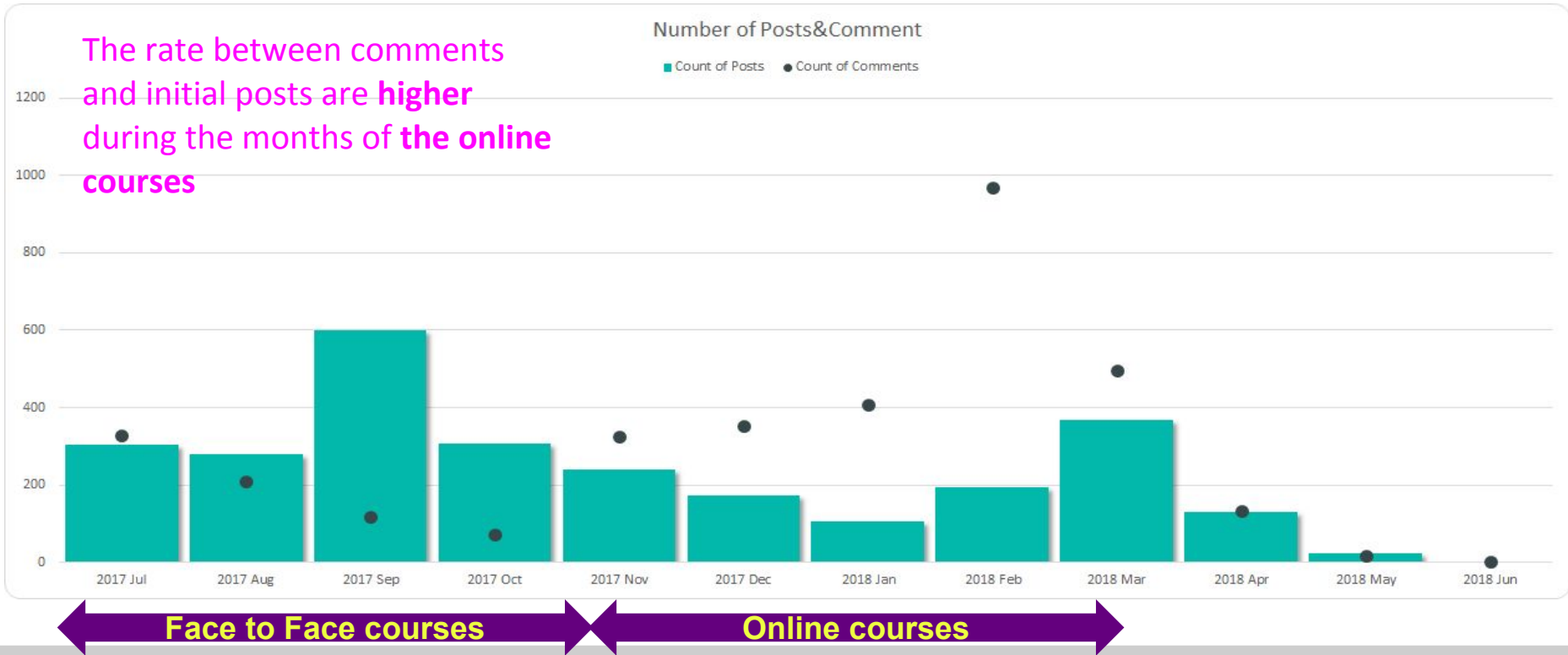
# Results - Number of Posts and Comments Each Category



The rate between comments and initial posts are also higher in the Categories of the online courses



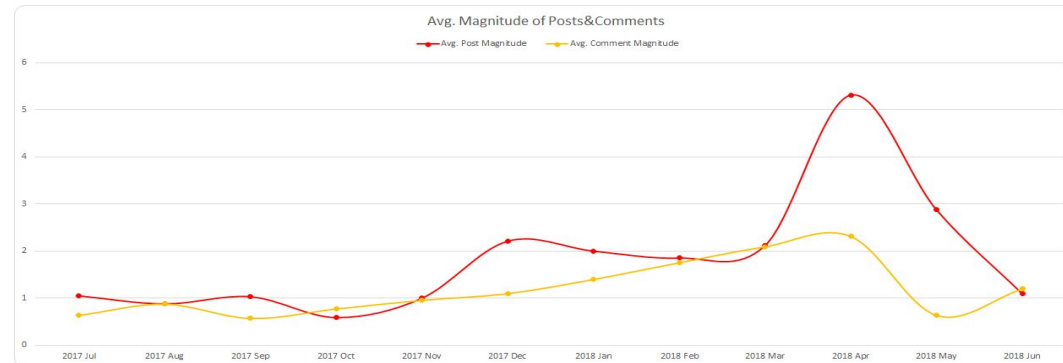
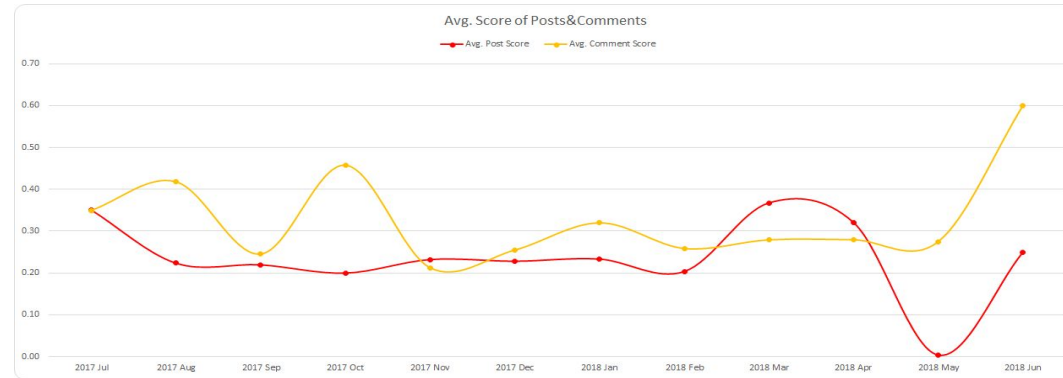
# Results - Monthly Posts and Comments



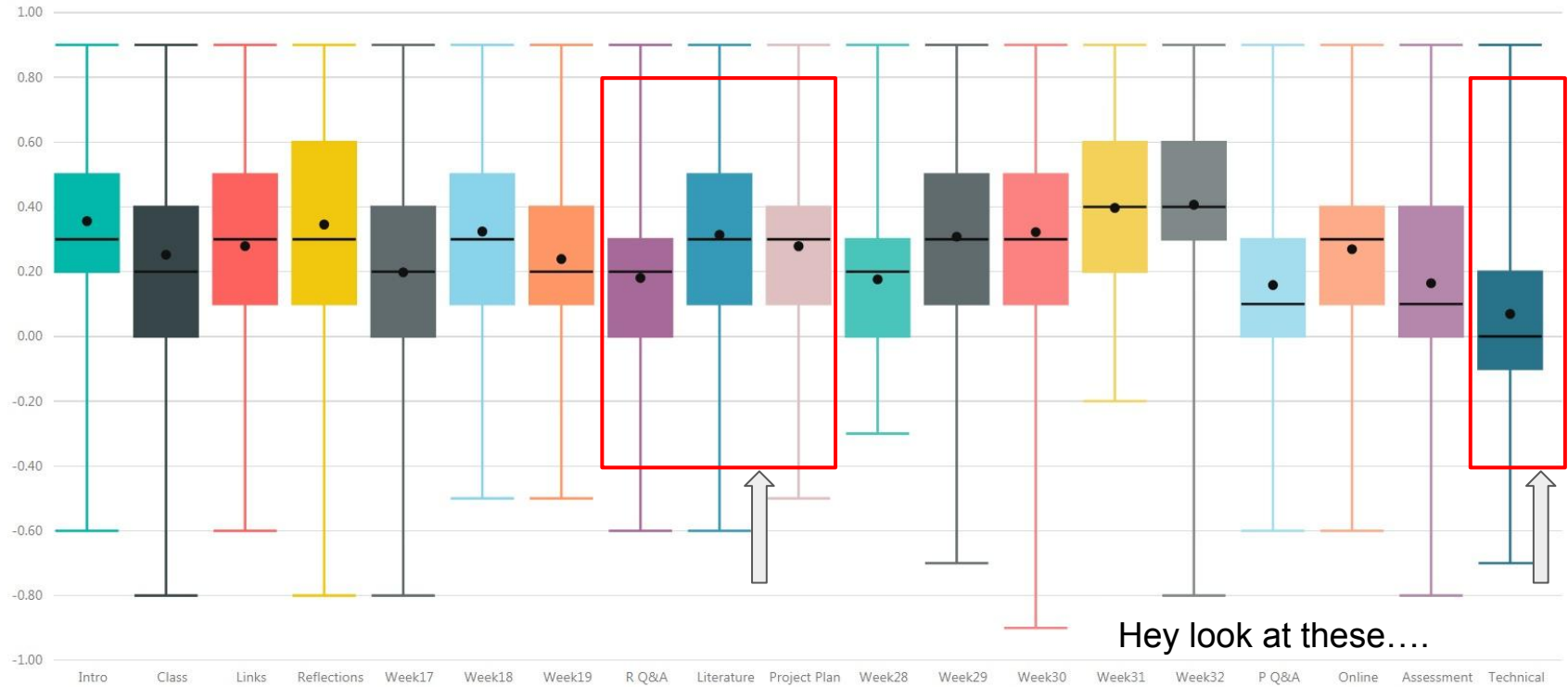
# Results - Monthly Average of Score and Magnitude of Posts and Comments

Most of the sentiment scores for comments are positive while most of them are neutral for initial posts during 32 weeks of the programme.

The initial posts, which have neutral sentiments scores, have mixed emotions during the online courses while they are just neutral during the face-to-face courses.



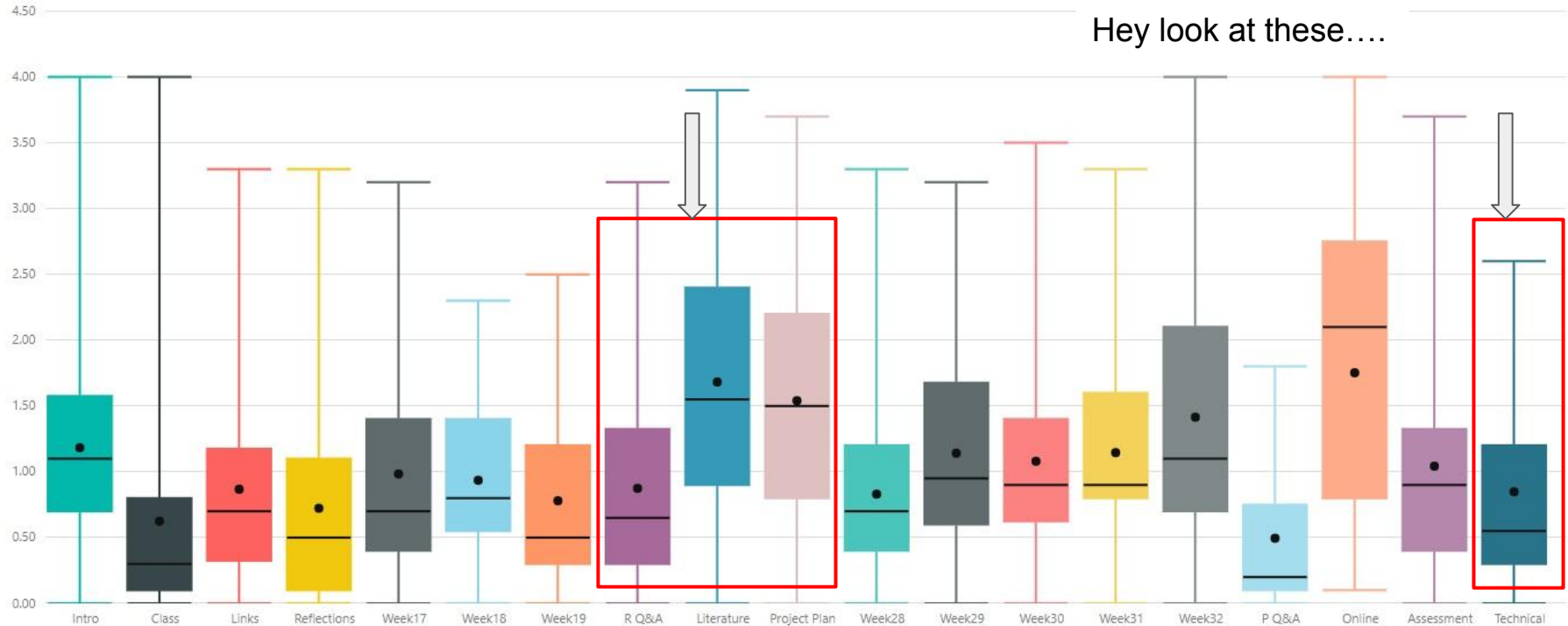
# Results - Box Plot for Sentiment Score in Each Category of G+ Community



Hey look at these....



# Results - Box Plot for Sentiment Magnitude in Each Category of G+ Community



# Discussion - What can we learn?

1/ Students interact more when they have both extrinsic and intrinsic motivations, especially with online courses.

2/ Early evidence shows that students' sentiment on the G+ community during the online courses is more positive than first thought. This can be attributed to timely and frequent supports when there is no weekly face-to-face contact with peers and teacher.

3/ Although Natural Language Processing provided by Google Cloud Platform can help to analyse the emotion and overall strength of emotion in students' online participation, the API is difficult to use and its functions are still limited.



# Conclusion

The research has provided the evidence of how students interact online in terms of timeline and topics as well as the emotion and overall strength of emotion in their interaction during a blended postgraduate programme.

Further research should be carried out to understand more about students' interaction and emotion by looking at

- different intakes or
- top performers and strugglers during the whole journey or
- different tools for sentiment analysis.





# Questions?





**Thank You**

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