Using Student Comments
with the Implementation of Blue Text Analytics
at Temasek Polytechnic (Singapore)

Presented by: George Gao

2018-11-06

Agenda

Temasek Polytechnic

Institution Overview

Text Analytics Project Using Blue

Project Background

Key Advantages

Implementation Approach

Analysis of Teaching Effectiveness Survey

Survey Design

Quantitative & Qualitative Analysis

Hidden Insights

Key Demographics

Project Reflections

Q&A

Temasek Polytechnic

Institution Overview

- Established in April 1990

- As of 2018, Temasek Polytechnic (TP) offers 52 full-time diploma courses in the areas of Applied Science, Business, Design, Engineering, Humanities & Social Science, and Informatics & IT, to close to 14,500 students.

- TP also offers programmes to facilitate adult learners acquiring relevant knowledge and skills to meet the challenges of a technology-driven economy.
  - ➢ Diploma and Post-Diploma courses, Earn and Learn Programmes, Skills Based Modular Units, Enhanced Post Diploma Certificates, public run short courses, Workforce Skills Qualifications and customised training programmes for organisations

Text Analytics Project Using Blue

Project Background

- **Various surveys conducted**
  - Teaching Effectiveness, Subject Review, Course Review

- **Extensive analysis of quantitative data**

- **Eyeball qualitative data**
  - E.g. Online Student Evaluation of Teaching system collects about 100,000 free-text comments annually

Objective

Leverage on technology to analyse free-text comments, so as to gain insights on themes and sentiments

Why Blue Text Analytics?

- Convert open-ended comments into meaningful themes and quantifiable results

- Leverage on the purpose-built 'Teaching and Learning Dictionary'

- Obtain a more complete picture of what students are saying
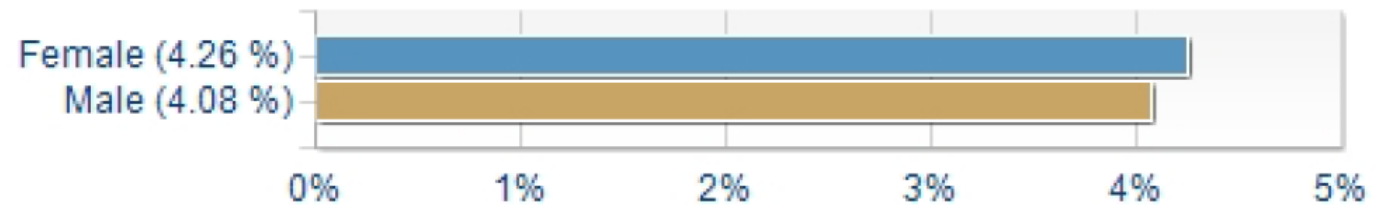
Key Advantage: Dictionary of Themes

- **Helpful/Supportive** – Student feedback that is focused on the instructor's willingness to support them through the learning process. All feedback that refers to the instructor being accommodating, or providing constructive feedback, or encouraging success are captured in this attribute.

- **Engaging** – Feedback where students describe being captivated, or where students refer to the appeal of the course, or where students discuss how communicative the instructor was, are all considered to be part of the 'Engaging' attribute.

- **Interesting** – Student feedback mentioning fascination with material, attentiveness, excitement about the course, and similar ideas, is reflected in the 'Interesting' attribute.

- **Difficult** – Student feedback that discusses challenges throughout the course, or how complex the material is, or refers to instructions as being complicated, are reflected in this attribute.
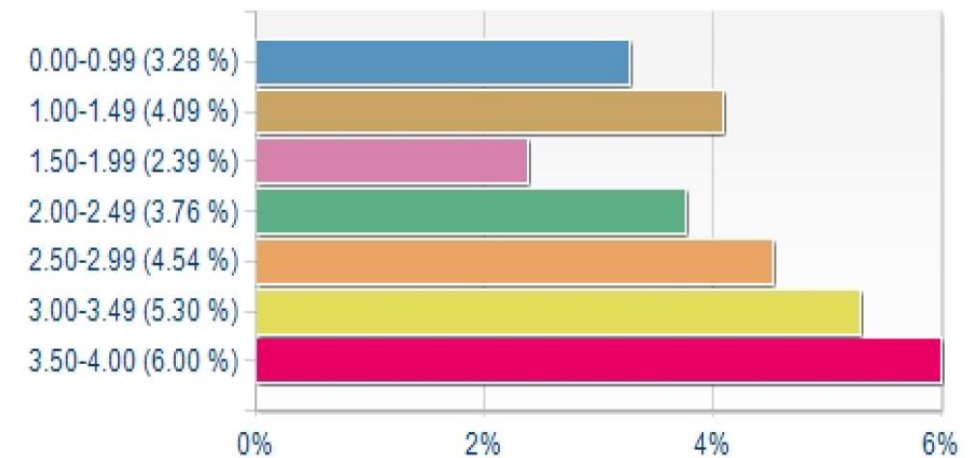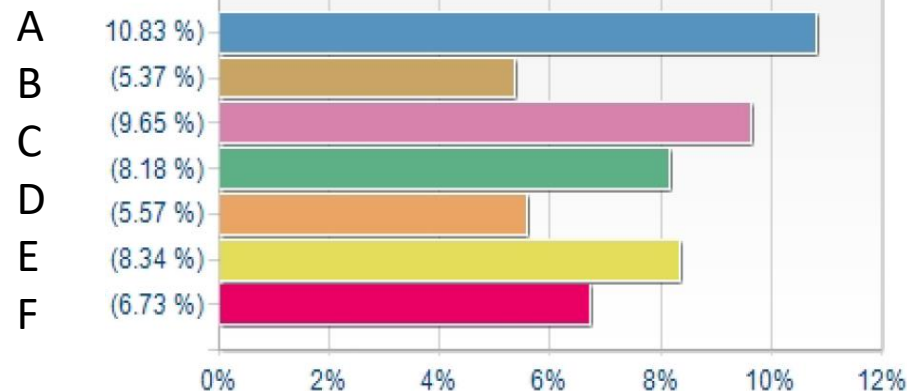
Key Advantage: Thematization

Key Advantage: Frequency Analysis
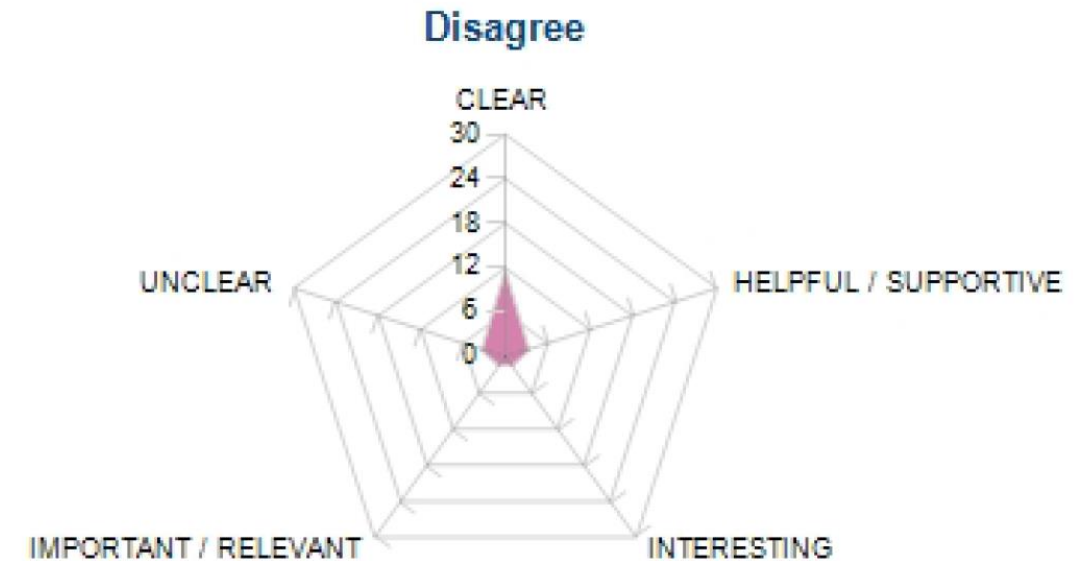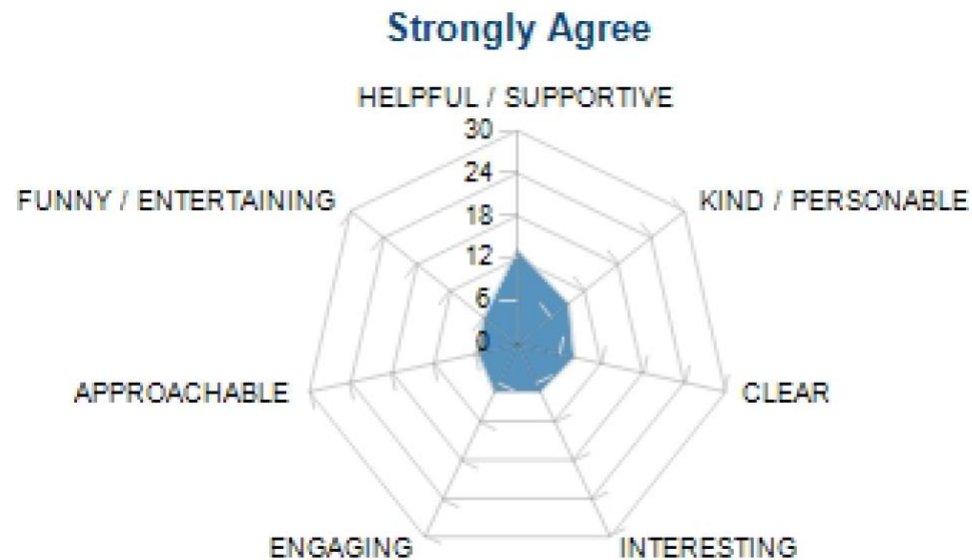

FUNNY / ENTERTAINING

Female (4.26 %)
Male (4.08 %)

APPROACHABLE

KIND / PERSONABLE

A 10.83 %)
B (5.37 %)
C (9.65 %)
D (8.18 %)
E (5.57 %)
F (8.34 %)
  (6.73 %)

0.00-0.99 (3.28 %)
1.00-1.49 (4.09 %)
1.50-1.99 (2.39 %)
2.00-2.49 (3.76 %)
2.50-2.99 (4.54 %)
3.00-3.49 (5.30 %)
3.50-4.00 (6.00 %)

Key Advantage: Outlier Analysis

Strongly Agree

HELPFUL / SUPPORTIVE
KIND / PERSONABLE
CLEAR
INTERESTING
ENGAGING
APPROACHABLE
FUNNY / ENTERTAINING

30
24
18
12
6
0

Disagree

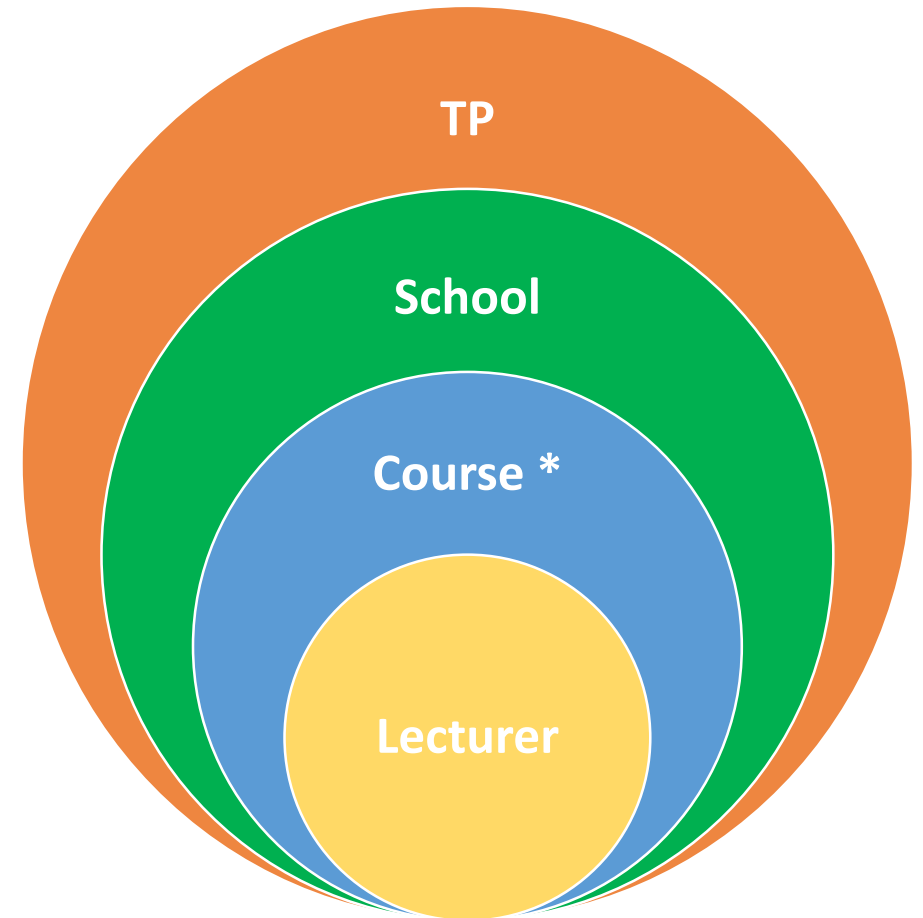CLEAR
HELPFUL / SUPPORTIVE
INTERESTING
IMPORTANT / RELEVANT
UNCLEAR

30
24
18
12
6
0

Implementation Approach

- Top-down approach
  - Analysing overall report before cascading into various levels
- Utilising all possible demographics
  - Identifying relevant demographics
- Optional coverage/accuracy test at an overall level

TP

School

Course *

Lecturer

Analysis of Teaching Effectiveness Survey

Survey Question Design

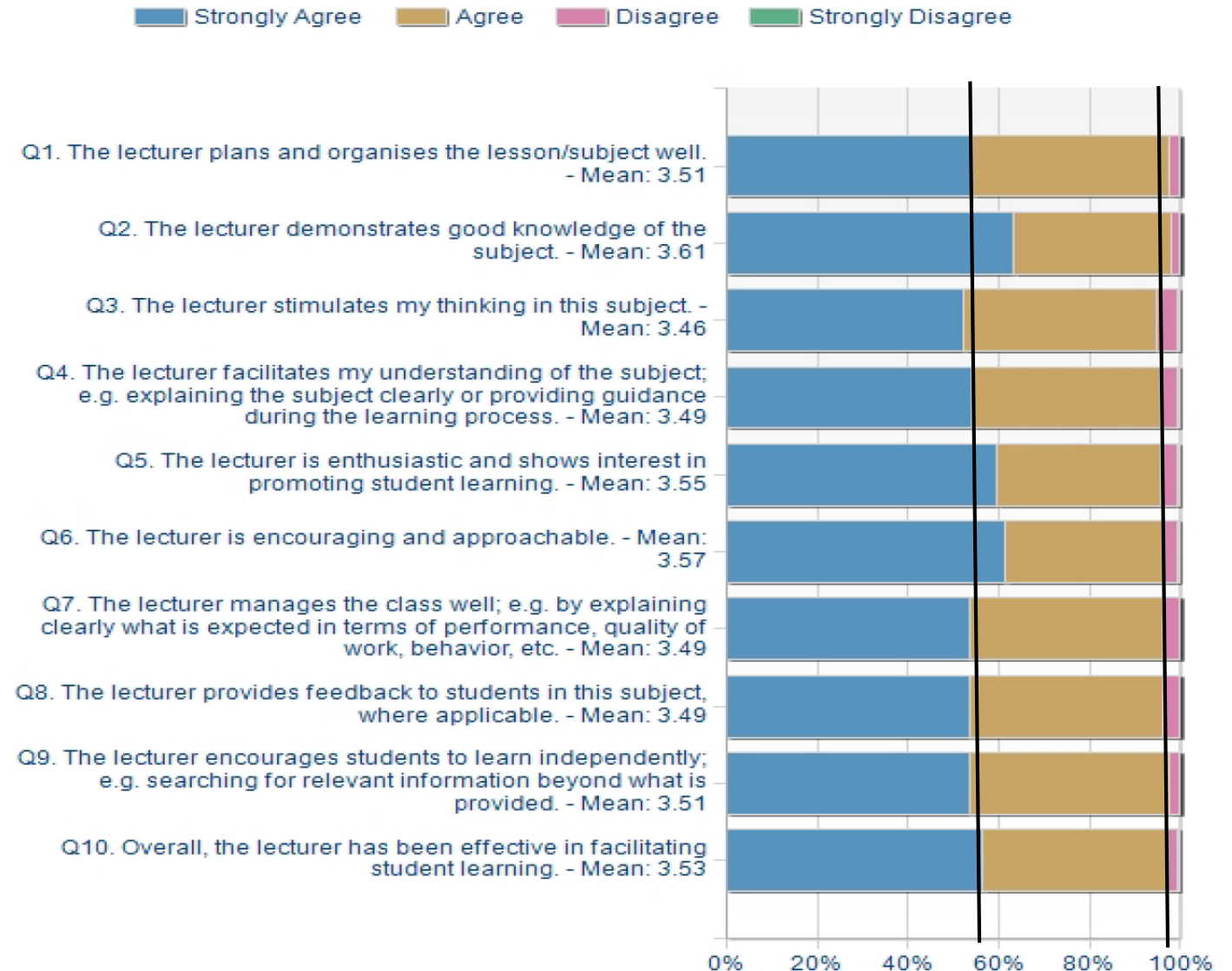| Category	Question	Aspect
Quantitative	Q1. The lecturer plans and organises the lesson/subject well. Q2. The lecturer demonstrates good knowledge of the subject. Q3. The lecturer stimulates my thinking in this subject. Q4. The lecturer facilitates my understanding of the subject; e.g. explaining the subject clearly or providing guidance during the learning process.	Planning & Execution
	Q5. The lecturer is enthusiastic and shows interest in promoting student learning. Q6. The lecturer is encouraging and approachable.	Attitude towards Students
	Q7. The lecturer manages the class well; e.g. by explaining clearly what is expected in terms of performance, quality of work, behaviour, etc. Q8. The lecturer provides feedback to students in this subject, where applicable. Q9. The lecturer encourages students to learn independently; e.g. searching for relevant information beyond what is provided.	Class Management
	Q10. Overall, the lecturer has been effective in facilitating student learning.	Overall Rating
Qualitative	Q11. Write down something that your lecturer has done especially well.	Positive Attributes
	Q12. Suggest something that might be of benefit to your lecturer in helping you to learn.	Suggested Improvements

Data Collection

- The analysis was done on 2 semesters and a full academic year which combined the two semesters i.e. a total of 3 projects.

- There were over 40,000 responses collected from each semester and about 100,000 data points totally.

* In the project Blue is used for reporting and analysis only. A purpose-built in-house system is used for data collection.
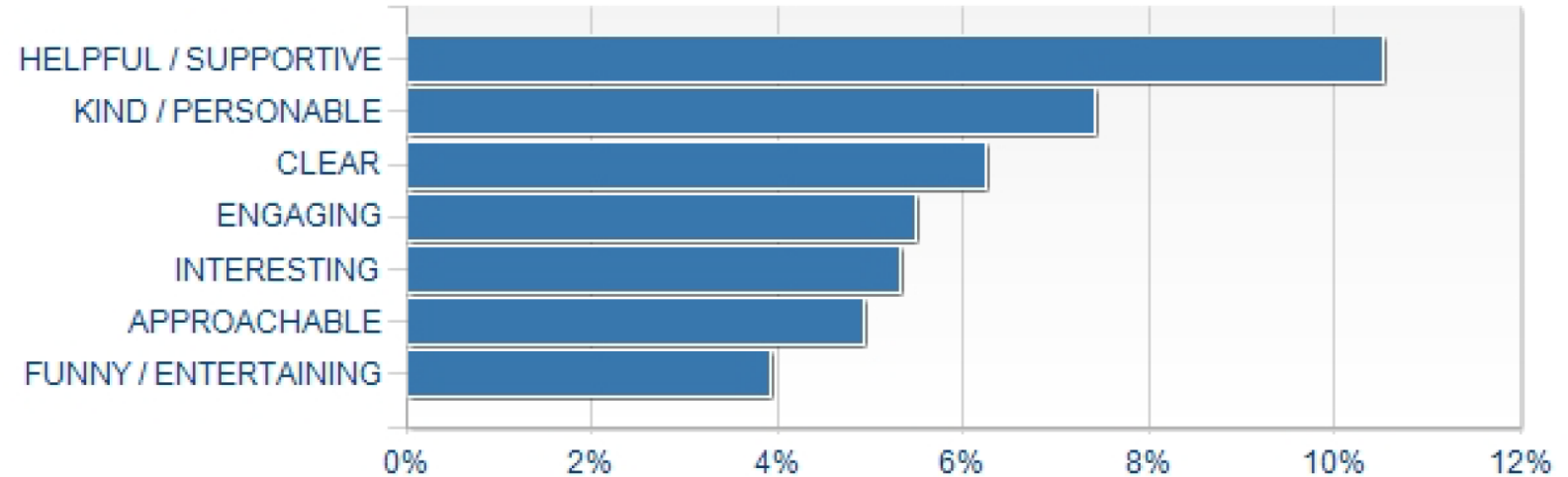
Key Finding: Variation analysis

There is very small variation between the rating of the overall teaching effectiveness (Q10), and the rating of each of the individual performance skills (Q1-Q9)

Key Finding: Ranking Analysis

Q11. Write down something that your lecturer has done especially well.

Q12. Suggest something that might be of benefit to your lecturer in helping you to learn.
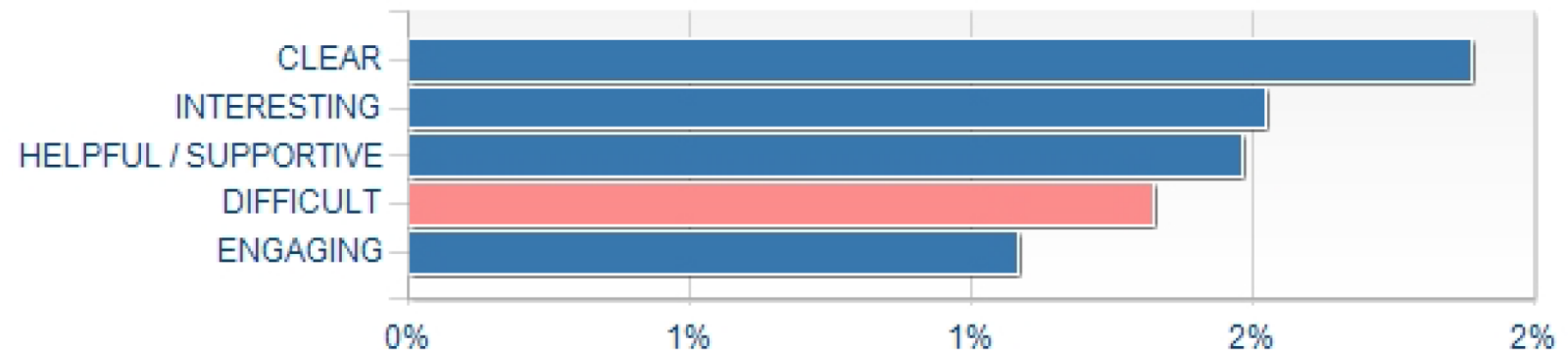
Key Findings: Co-occurrence Analysis

- Q1. The lecturer **plans and organises** the lesson/subject well.
- Q2. The lecturer **demonstrates good knowledge** of the subject.
- Q3. The lecturer **stimulates my thinking** in this subject.
- Q4. The lecturer **facilitates** my understanding of the subject; e.g. **explaining the subject clearly** or providing guidance during the learning process.
- Q5. The lecturer is **enthusiastic** and shows interest in promoting student learning.
- Q6. The lecturer is **encouraging** and **approachable**.
- Q7. The lecturer **manages the class well**; e.g. by **explaining clearly** what is expected in terms of performance, quality of work, behavior, etc.
- Q8. The lecturer **provides feedback** to students in this subject, where applicable.
- Q9. The lecturer **encourages** students to learn independently; e.g. searching for relevant information beyond what is provided.
- Q10. Overall, the lecturer has been **effective** in facilitating student learning.

Qualitative Attributes

HELPFUL / SUPPORTIVE
KIND / PERSONABLE
CLEAR
ENGAGING
INTERESTING
APPROACHABLE
FUNNY / ENTERTAINING
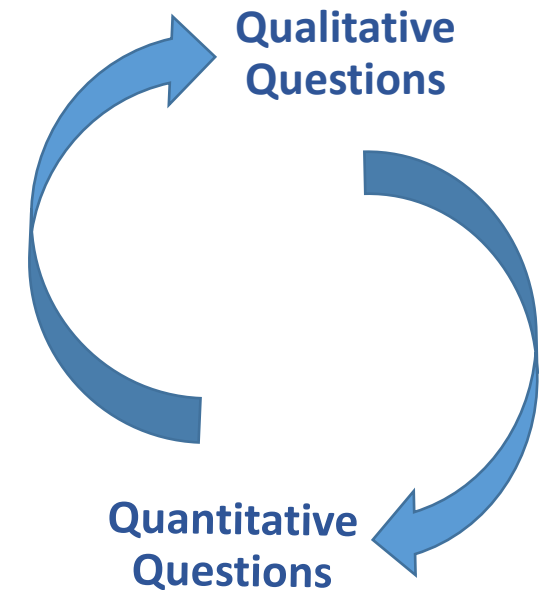
CLEAR
INTERESTING
HELPFUL / SUPPORTIVE
DIFFICULT
ENGAGING

■ Attribute present in comments   ■ Attribute not present in comments

# What if we start with open ended questions?

- **Q11. Write down something that your lecturer has done especially well.**
- **Q12. Suggest something that might be of benefit to your lecturer in helping you to learn.**

- Q1. The lecturer plans and organises the lesson/subject well.
- Q2. The lecturer demonstrates good knowledge of the subject.
- Q3. The lecturer stimulates my thinking in this subject.
- Q4. The lecturer facilitates my understanding of the subject; e.g. explaining the subject clearly or providing guidance during the learning process.
- Q5. The lecturer is enthusiastic and shows interest in promoting student learning.
- Q6. The lecturer is encouraging and approachable.
- Q7. The lecturer manages the class well; e.g. by explaining clearly what is expected in terms of performance, quality of work, behavior, etc.
- Q8. The lecturer provides feedback to students in this subject, where applicable.
- Q9. The lecturer encourages students to learn independently; e.g. searching for relevant information beyond what is provided.
- Q10. Overall, the lecturer has been effective in facilitating student learning.

Qualitative Questions

Quantitative Questions

Hidden Insights

Key Demographics

Gender: Quantitative Cross-tabulation Analysis

Male (51.07 %)   Female (48.93 %)

Q10. Overall, the lecturer has been effective in facilitating student learning.
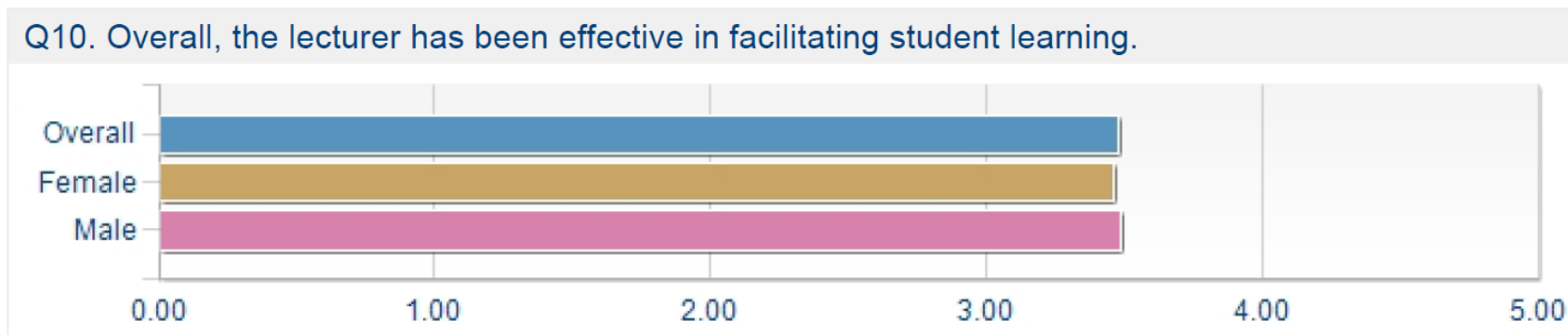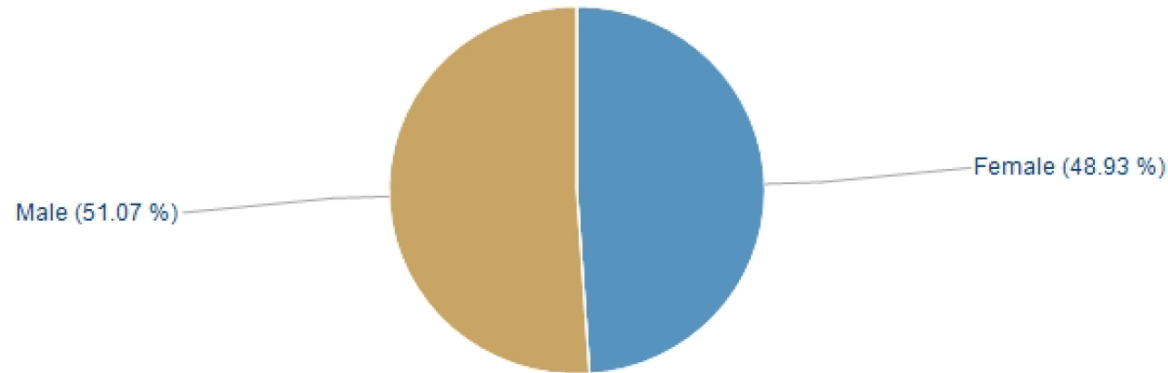
No significant variance between Males & Females on all Teaching Effectiveness Quantitative Questions (Q1 – Q10)
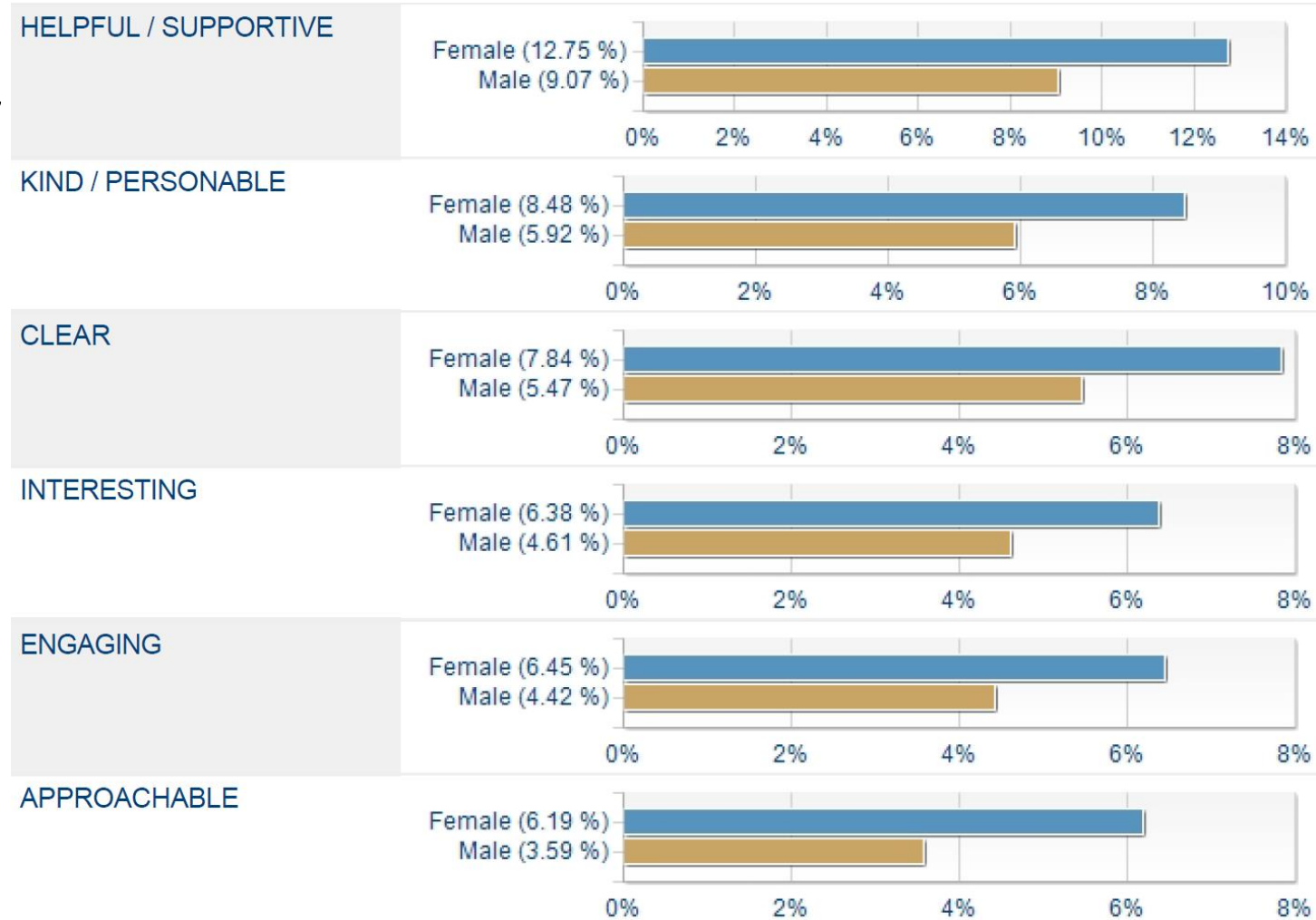
Gender: Qualitative Cross-tabulation Analysis

Q11: Write down something that your lecturer has done especially well.

Female students reflect more positively on the learning experience.

Key insights for further research:
- *Are there more female faculty?*
- *Are there more female students?*
- *What is the graduation rate for females?*
- *What is the employability rate for females?*

Cumulative Grade Point Average (cGPA) Range: Quantitative Cross-tabulation Analysis
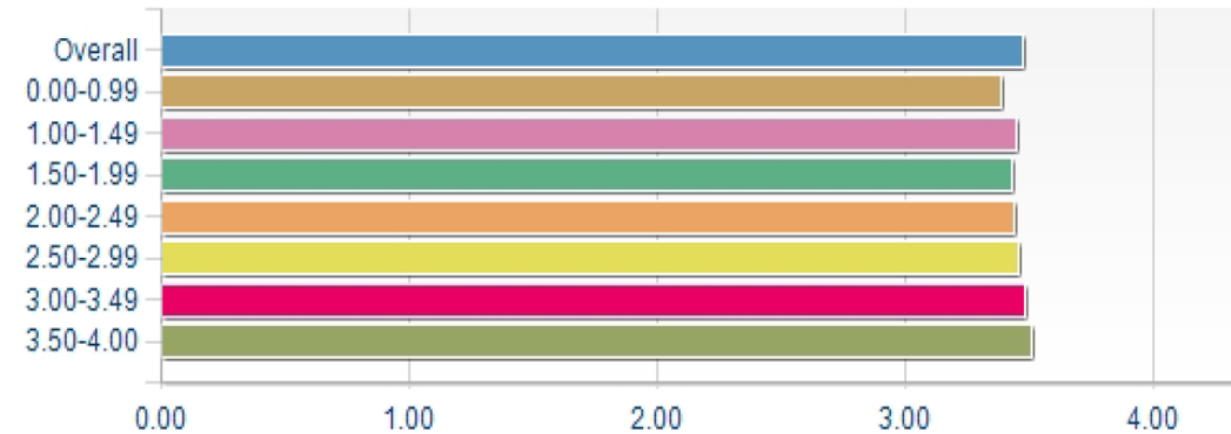
No significant variation between students' academic performance, and feedback on Teaching Effectiveness Quantitative Questions (Q1 – Q10)

cGPA Range: Qualitative Cross-tabulation Analysis

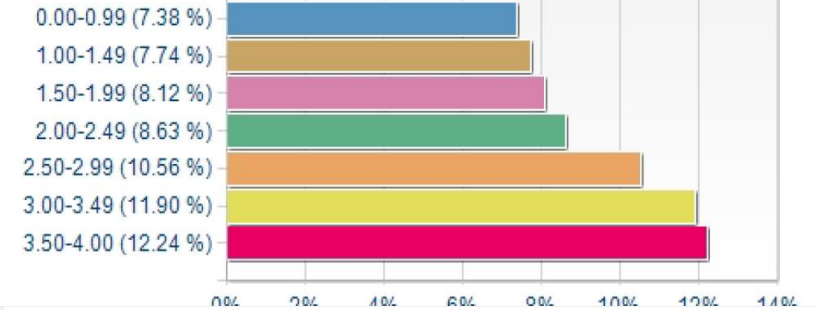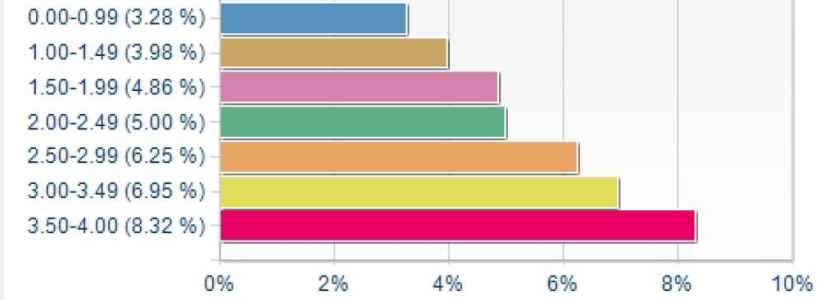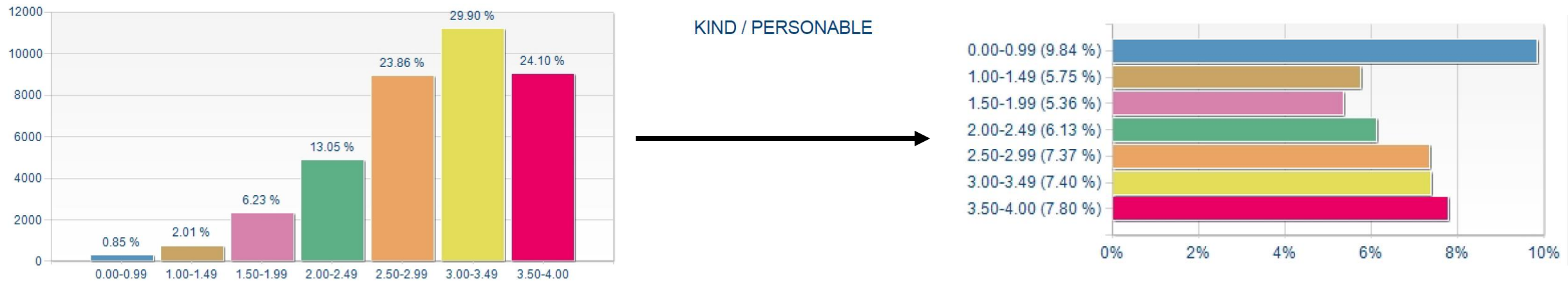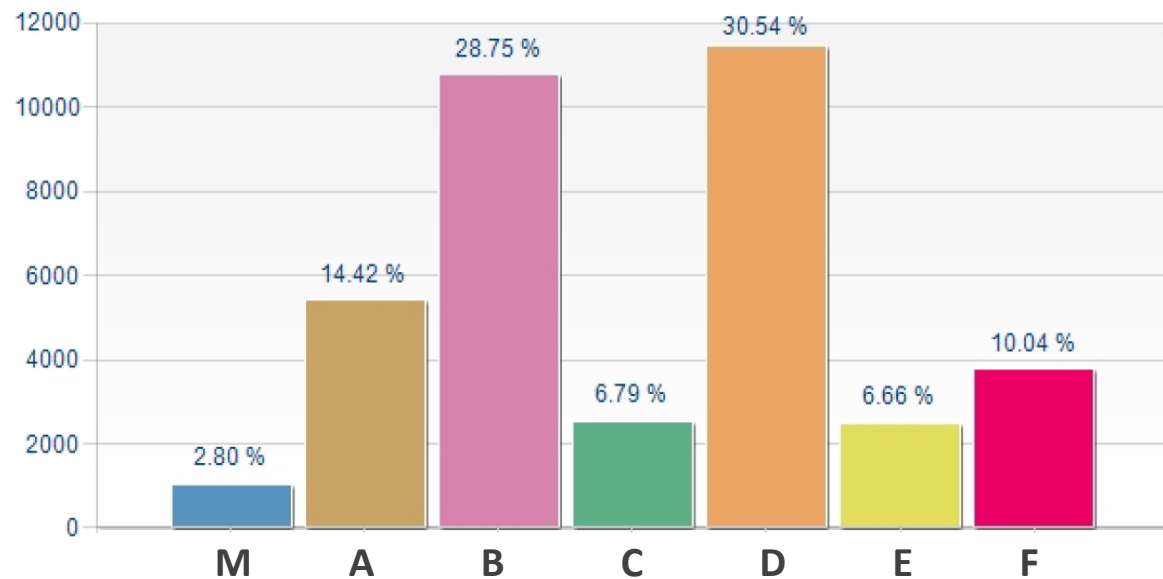*Students with higher cGPA identify the attributes that contribute to positive perception*
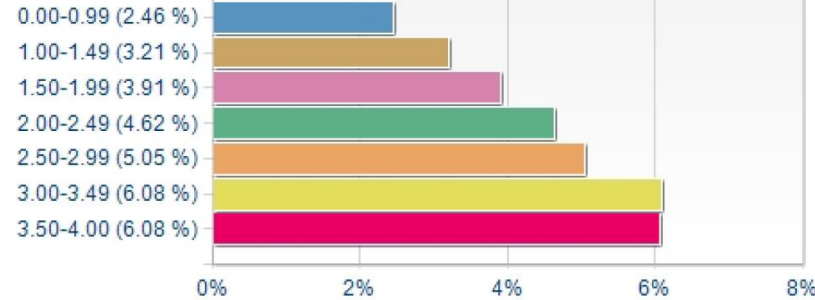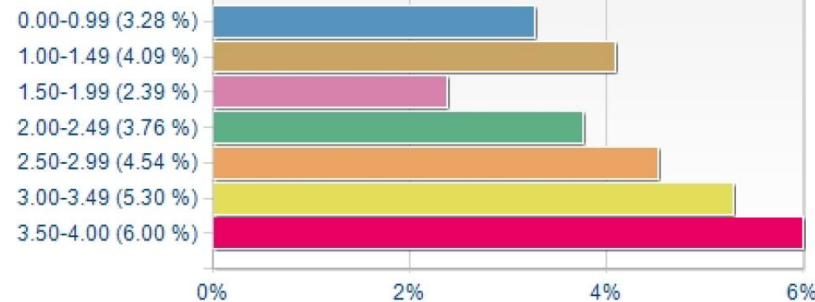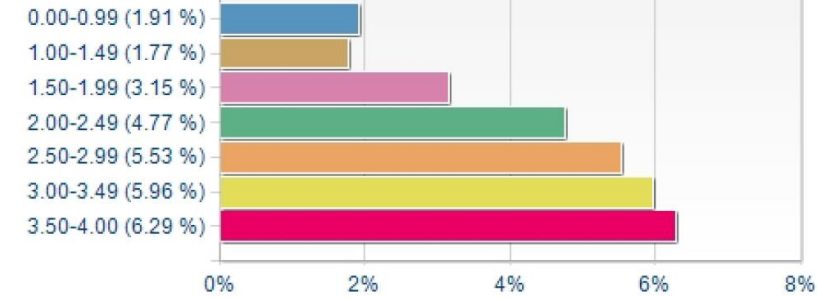
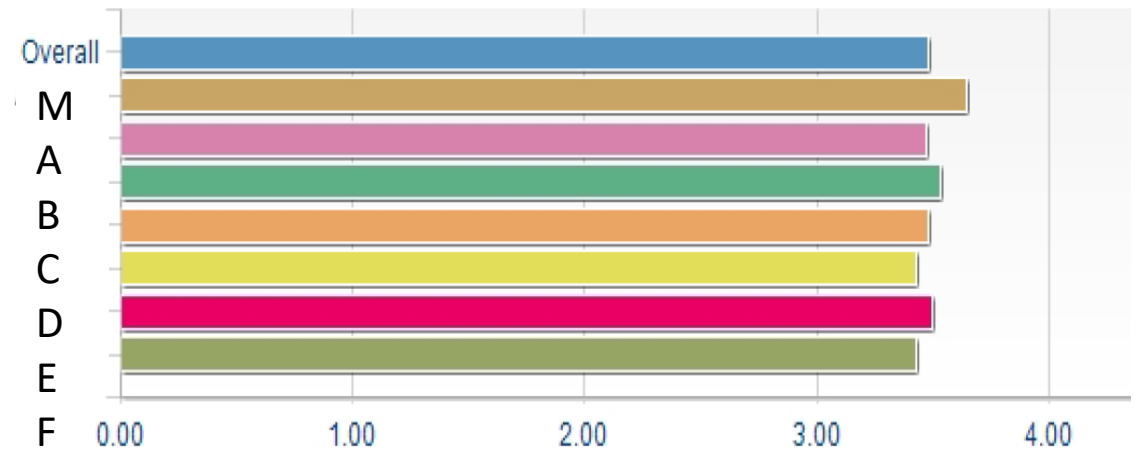# cGPA Range: Qualitative Cross-tabulation Analysis (cont.)

The fact that the lecturer is Kind/Personable can be a misleading indicator for the lecturer. While the students reflect positively on their experience, it does not indicate that they achieve better grades.
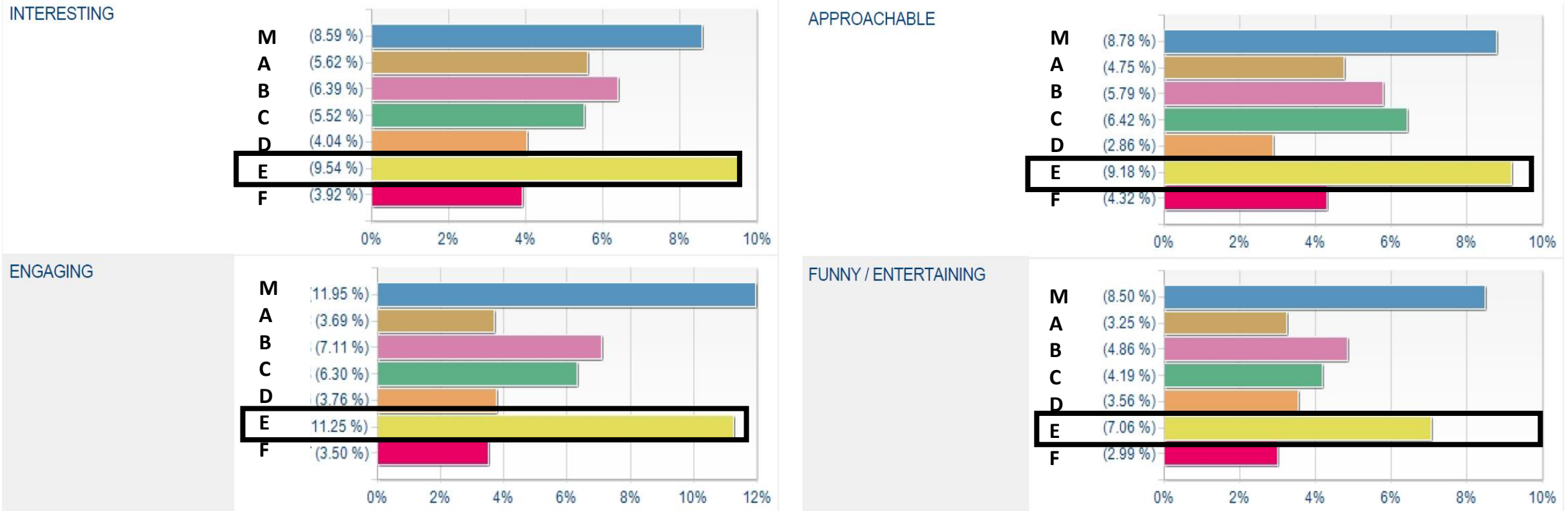
School: Quantitative Cross-tabulation Analysis

No significant variance between students from various schools, and feedback on Teaching Effectiveness Quantitative Questions (Q1 – Q10)

School: Qualitative Cross-tabulation Analysis

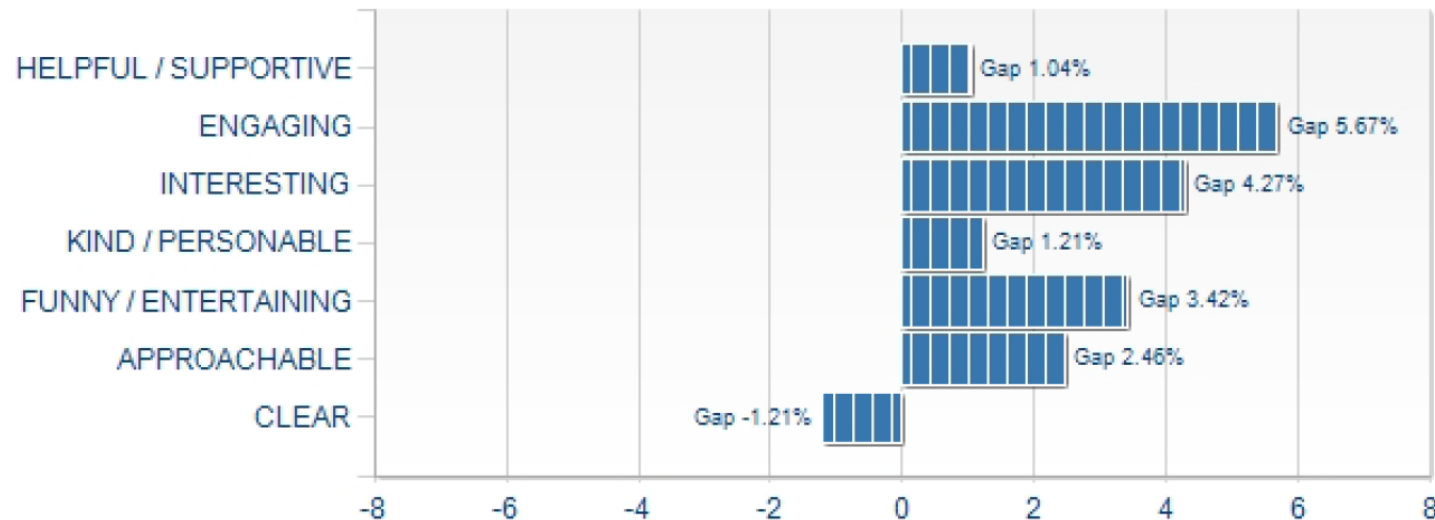Q11. Write down something that your lecturer has done especially well.

While School E represents a smaller percentage of the survey population, they are comparatively more outspoken and more engaged.

Profile School E: Qualitative Gap Analysis

Q11. Write down something that your lecturer has done especially well.

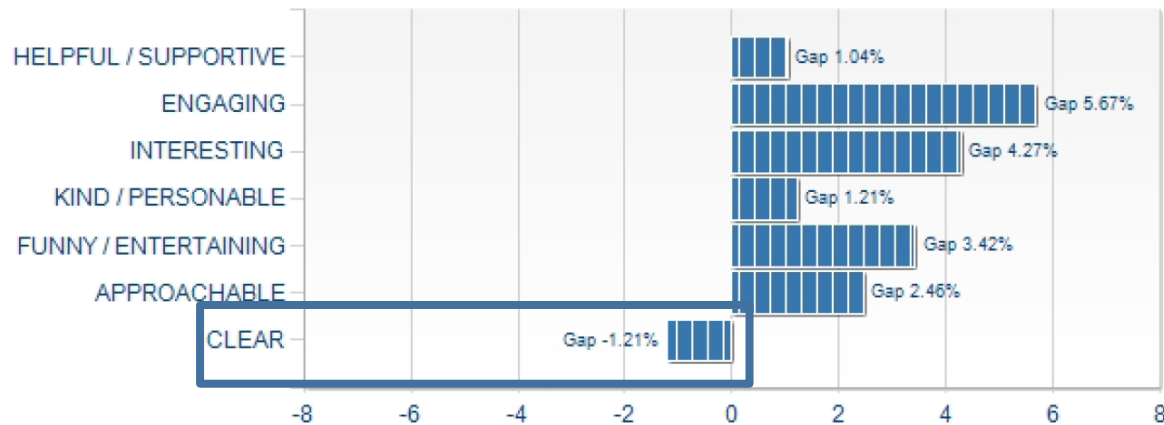Gap Analysis comparison for School to TP

School E's students commented more positively of their lecturers, than whole campus's average
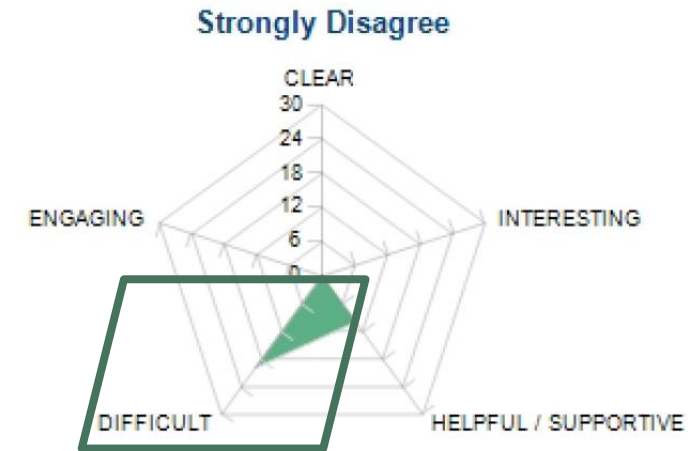
Profile School E: Correlation Analysis

Q11. Write down something that your lecturer has done especially well.

Gap Analysis comparison for School to TP

*School E's only lagging positive indicator as compared to TP's average, is the **Clarity of Lecturer/Subject**.*

Q12. Suggest something that might be of benefit to your lecturer in helping you to learn.

*Correlate Q10 for those students that provided the lowest rating indicate that **Difficulty of the Lecturer/Subject** is their top criteria for improvement*

Project Reflections

Project Reflections

- The analysis and insights provided in this presentation is selective rather than exhaustive.

- It is suggested to include all possible demographics at the start of the project and then filter down to the relevant segments.

- A small percentage of students was observed with "Disagree" or "Strongly Disagree" to Q10 regarding overall teaching effectiveness.

    - This may echo the fact that attributes such as **Clear** and **Engaging** could appear in both Q11 (positive aspects) and Q12 (improvements).

    - It may indicate that dissatisfied students did not share the same feelings as satisfied students regarding their lecturers' teaching effectiveness, and thus identified these "syntactically positive" attributes as "semantically negative".

Thank you