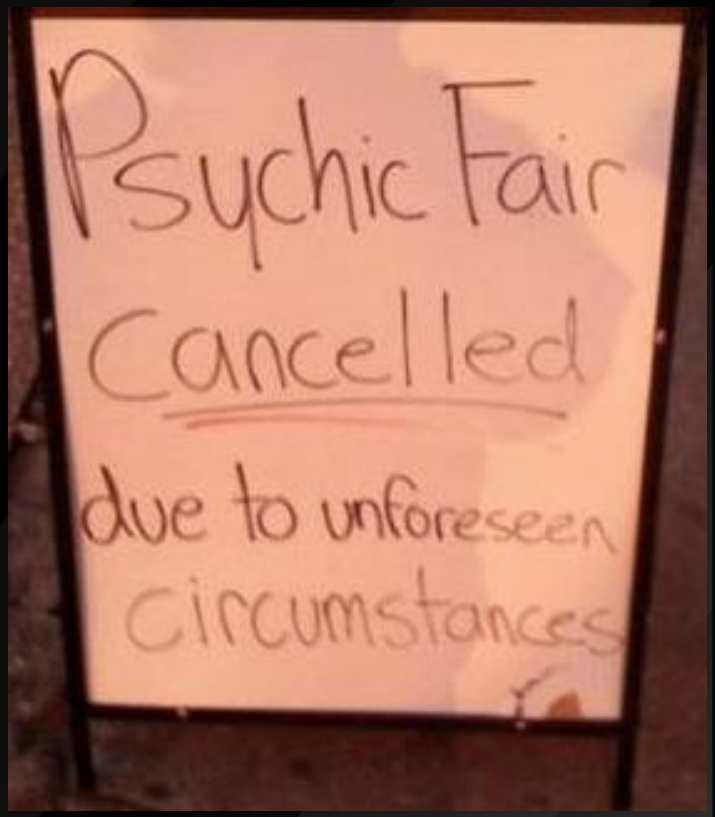


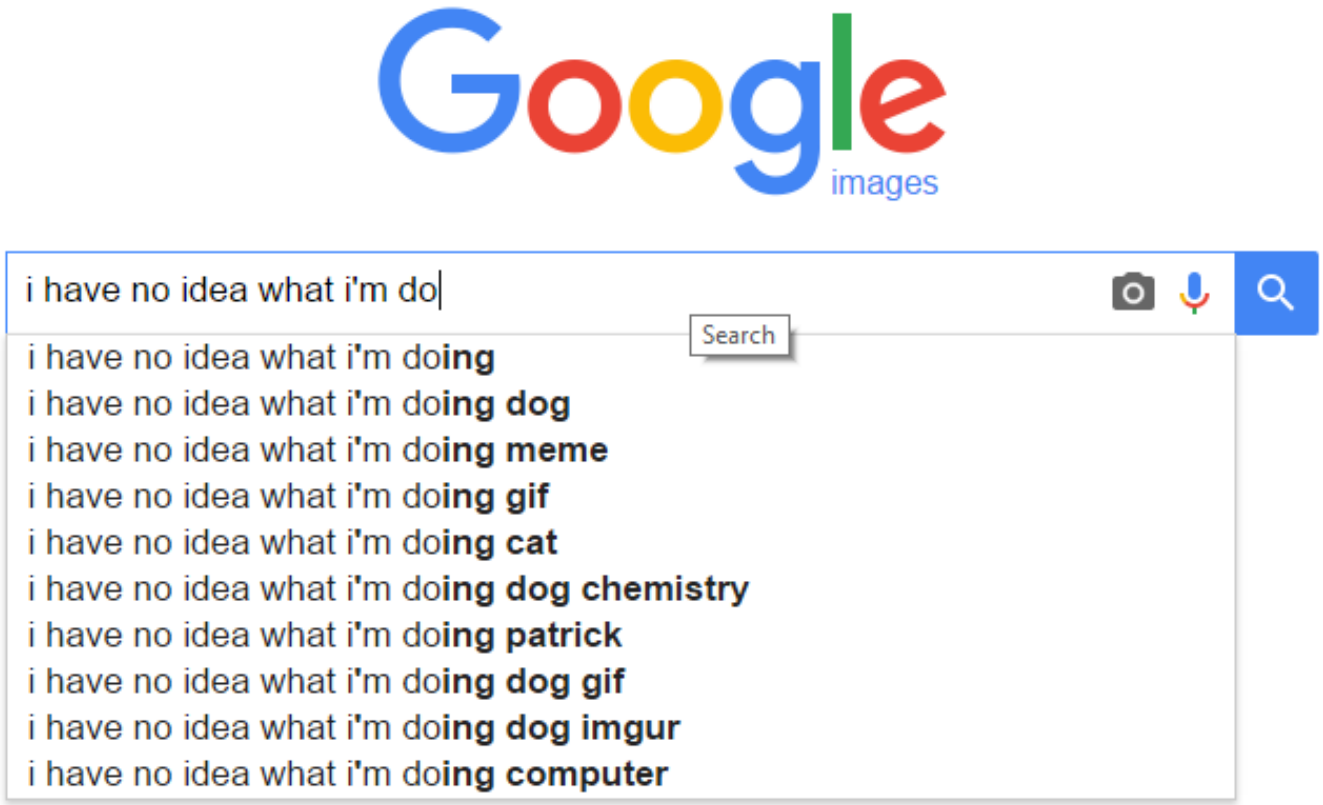
Stand Up and (not) be Counted: Data Analytics in Education

Trent Driver
Deputy Head (Academic)

Newington College

Newington College

Disclaimer



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Learning analytics is the process of developing actionable insights through the application of statistical models and analysis of student performance data.

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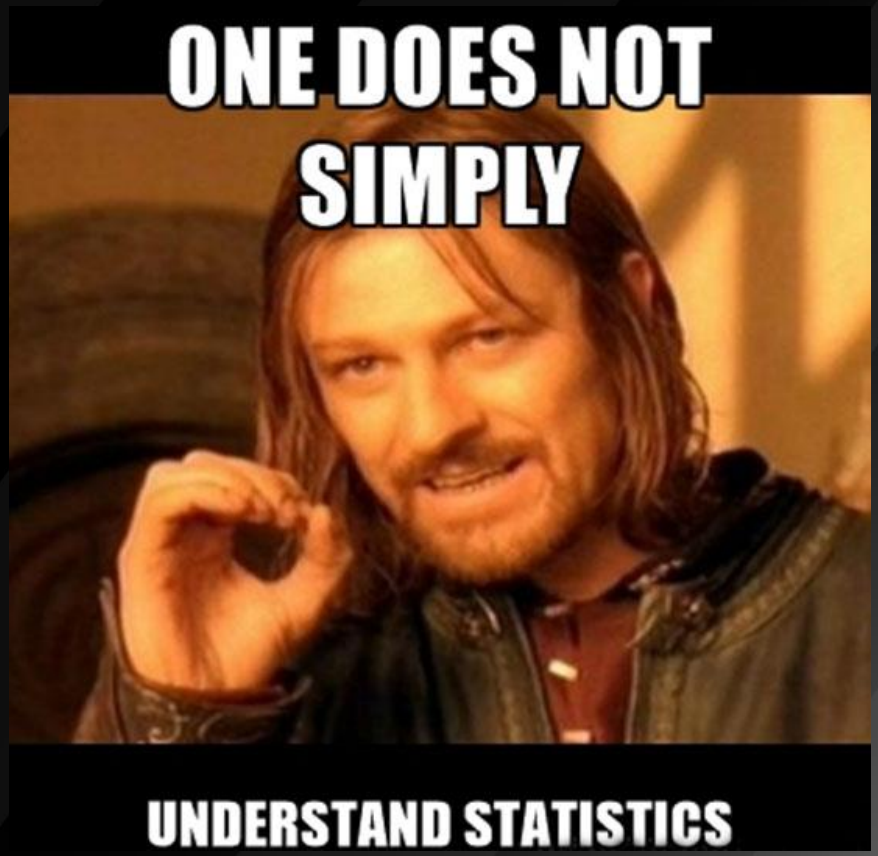

(Learning analytics) is especially persuasive because so many people are awed by mathematics and do not understand it: a dangerous combination.

Ewing (2011)

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Our Rationale

Implement tools to track student performance

Provide teachers with insights into the learning needs of students

Promote timely intervention with students

Foster improved academic performance, of both individual students and cohorts.

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Does our data just tell us where we have been?

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Is our data a statistical selfie?

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How can we use student data to influence where we are going?

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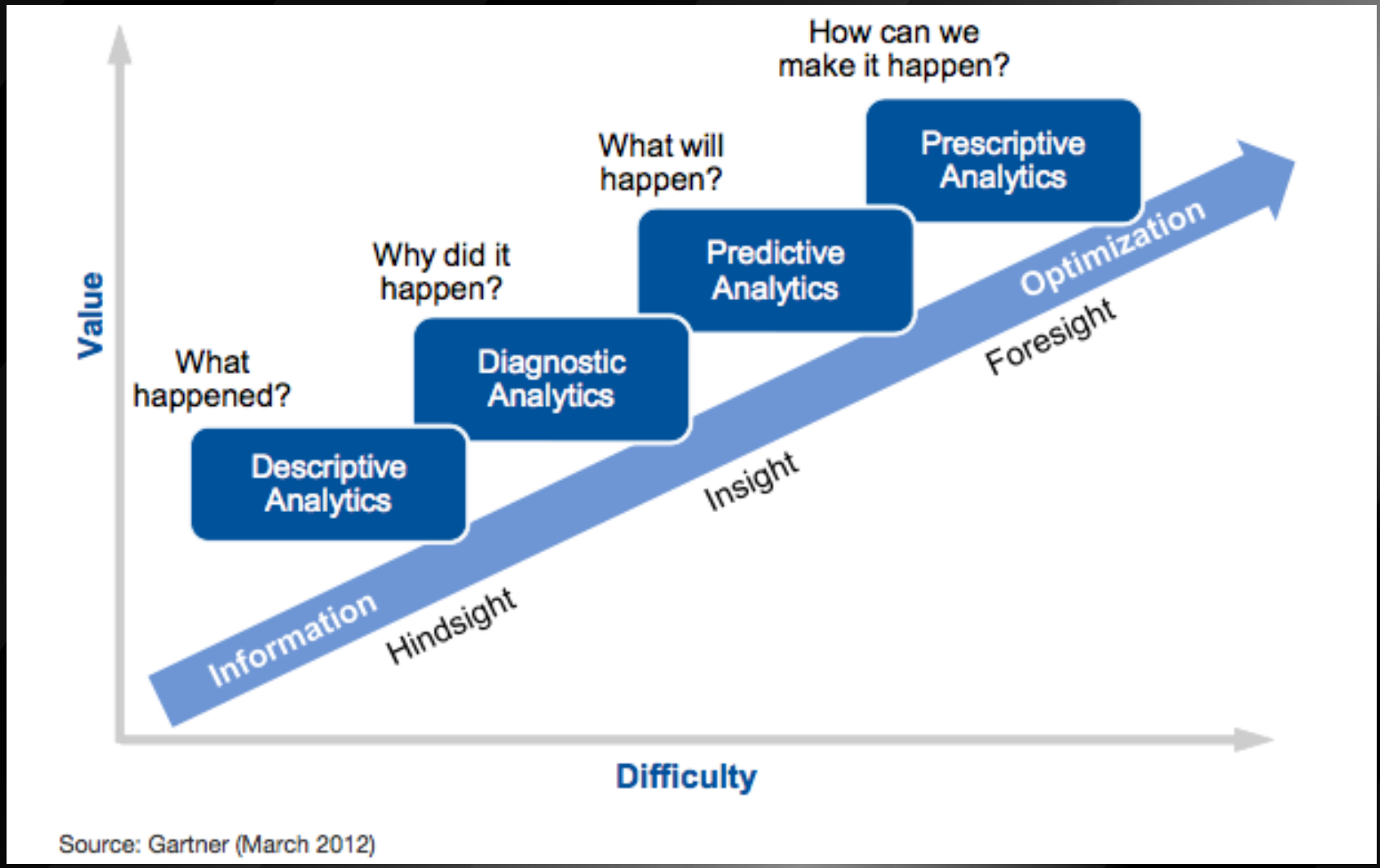
Gartner Analytics Ascendancy Model



Source: Gartner (March 2012)

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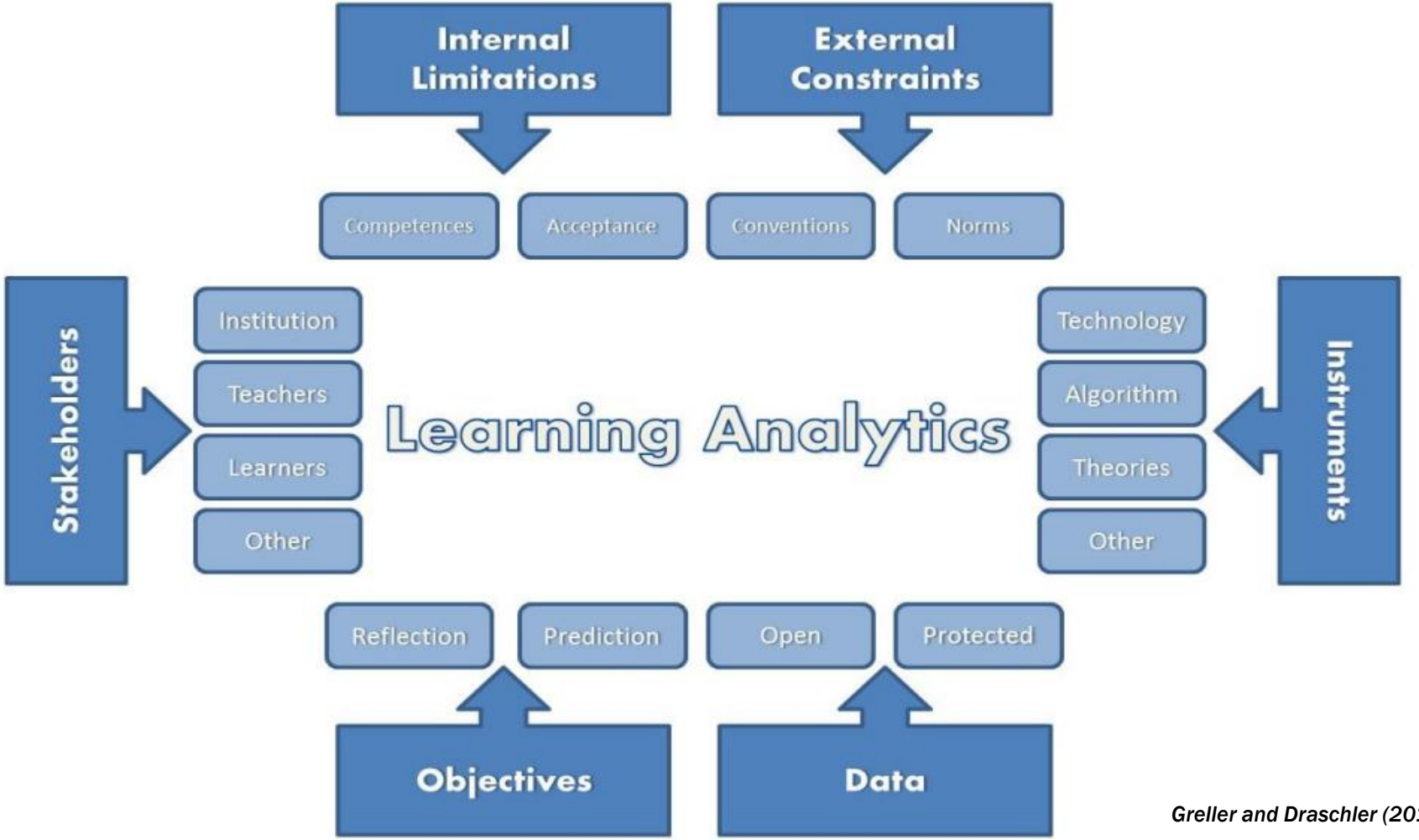

Greller and Draschler (2012)

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Our External Environment

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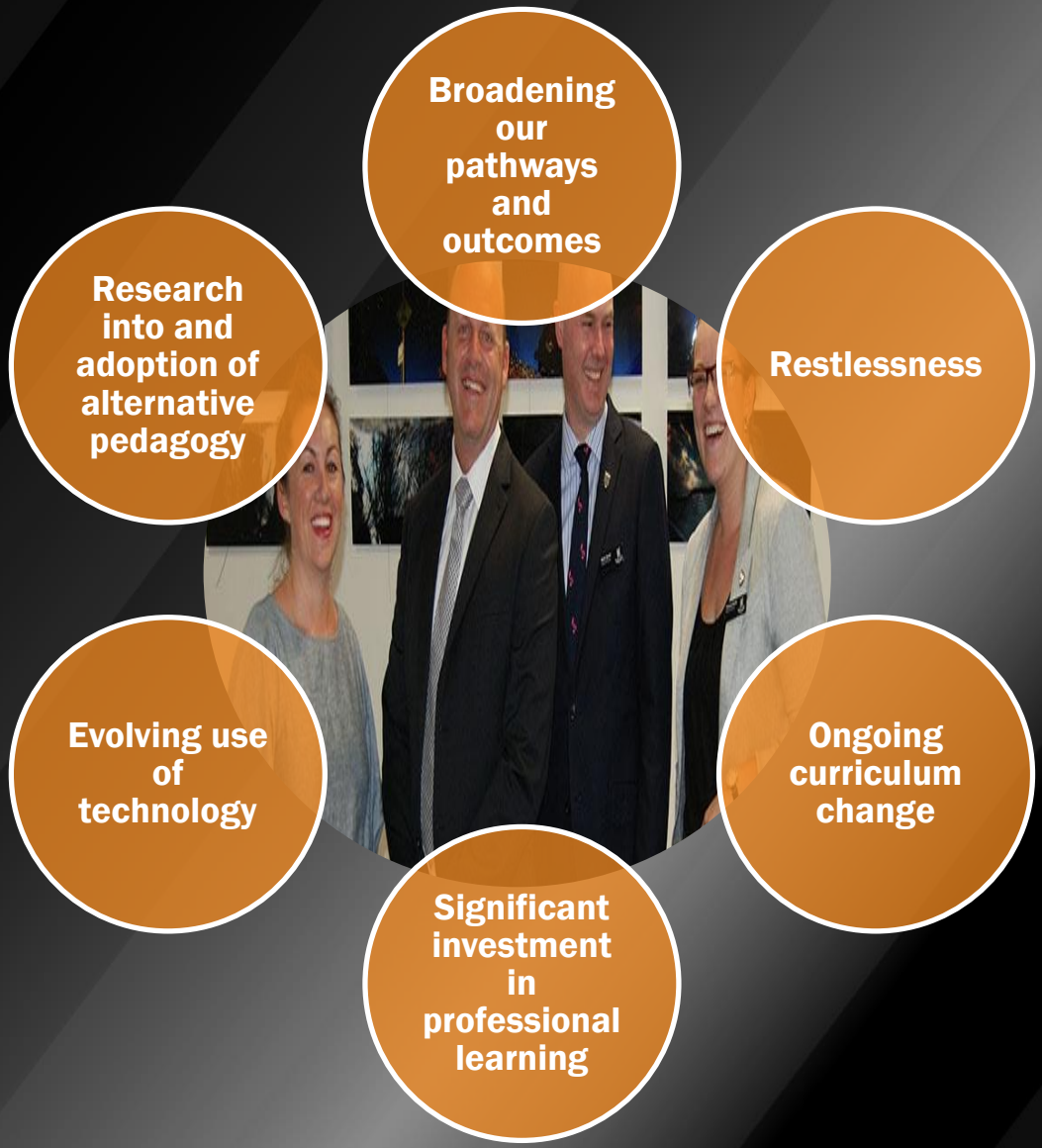
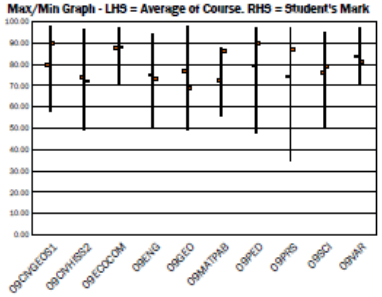
Our Cultural Forces



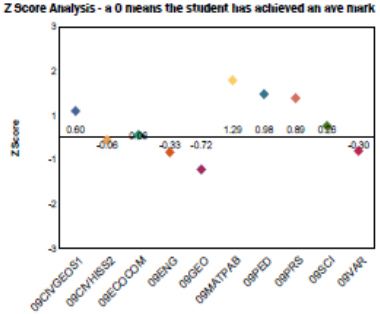
Academic Profile - 2015 - S4 - Year Level = 9

Fletcher (09MENTFLRTU) — Stanine Level - 6

Max/Min Graph - LHS = Average of Course. RHS = Student's Mark



Z Score Analysis - a 0 means the student has achieved an ave mark

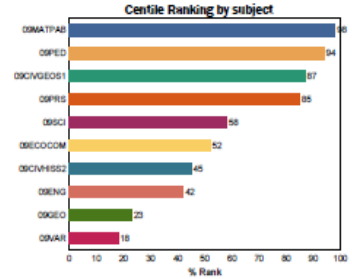


Years 7 to 9 do not receive a Mark or Rank on their report. Below is confidential for them. For Year 10 - this mark and rank will appear on their report.

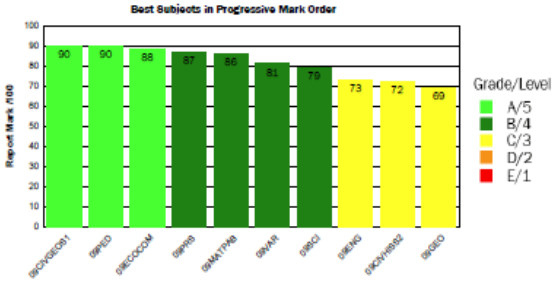
Mark = The weighted moderated progressive mark based on all completed assessment points. Raw marks are moderated according to our common mark scale.

Class	Mark	Rank	Class	Mark	Rank
09CIVGEOS1	90	13/121	09CIVHISS2	72	63/123
09ECOCOM	88	50/111	09ENG	73	125/234
09GEO	69	30/40	09MATPAB	86	2/68
09PED	90	11/234	09PRS	87	33/233
09SCI	79	90/232	09VAR	81	20/29

Centile Ranking by subject



Best Subjects in Progressive Mark Order



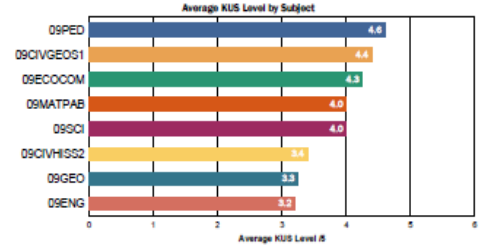
For every assessment a student does in a subject, they are given a level from 5 down to 1. (5 = The student has an extensive knowledge and understanding of the content etc. 1 = The student has an elementary knowledge and understanding in few areas of the content etc) *Board of Studies Common Grade Scale*

A level 5 for all subjects is moderated to a mark from 98 to 88; 4 from 88 to 75; 3 from 75 to 62; 2 from 62 to 50 and 1 from 50 to 0.

The progressive, weighted moderated mark is then used on reports, shown as a histogram. NOTE: boys do not get this mark, only a range on a histogram in their report.

The progressive moderated mark is shown here for each

Average KUS Level by Subject



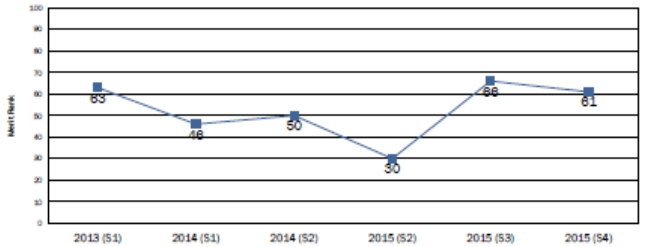
In a report for a student, each subject gives a student a level from 5 to 1 for specific Knowledge, Understanding and Skills (KUSs) that a student has been assessed on in that reporting period. (5 = The student has an extensive knowledge and understanding of the content etc. 1 = The student has an elementary knowledge and understanding in few areas of the content etc) *Board of Studies Common Grade Scale*

The average of the KUS Levels acheived by a student in each assessment code is shown here.

Academic Profile - 2015 - S4 - Year Level = 9

Fletcher (09MENTFLRTU) — Stanine Level - 6

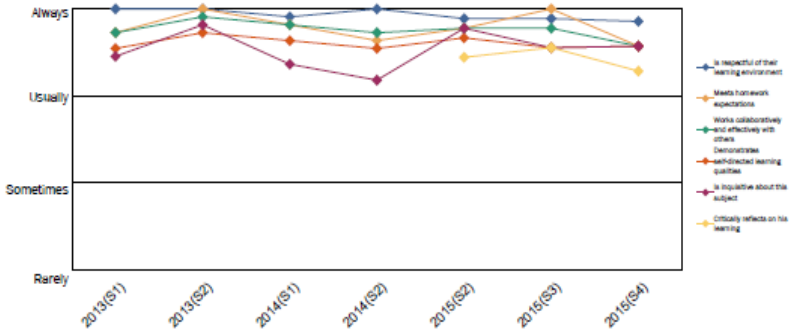
Past Merit Rankings



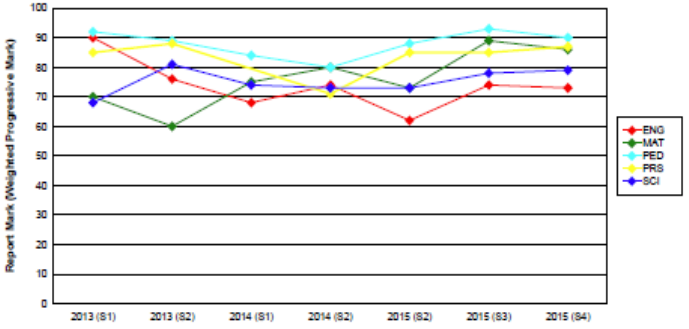
A student with a stanine level of 6 should be working at a merit ranking between 43 and 20.

Learner Profile Information - The average result for each LP across all subjects...

Note: LPs changed slightly in 2015 and an extra LP added...



Report Mark in specific subjects over time



For Years 7 to 10, all students complete English, Maths, Science, PE and PRS. This graph shows the change in report mark in these subjects over time.

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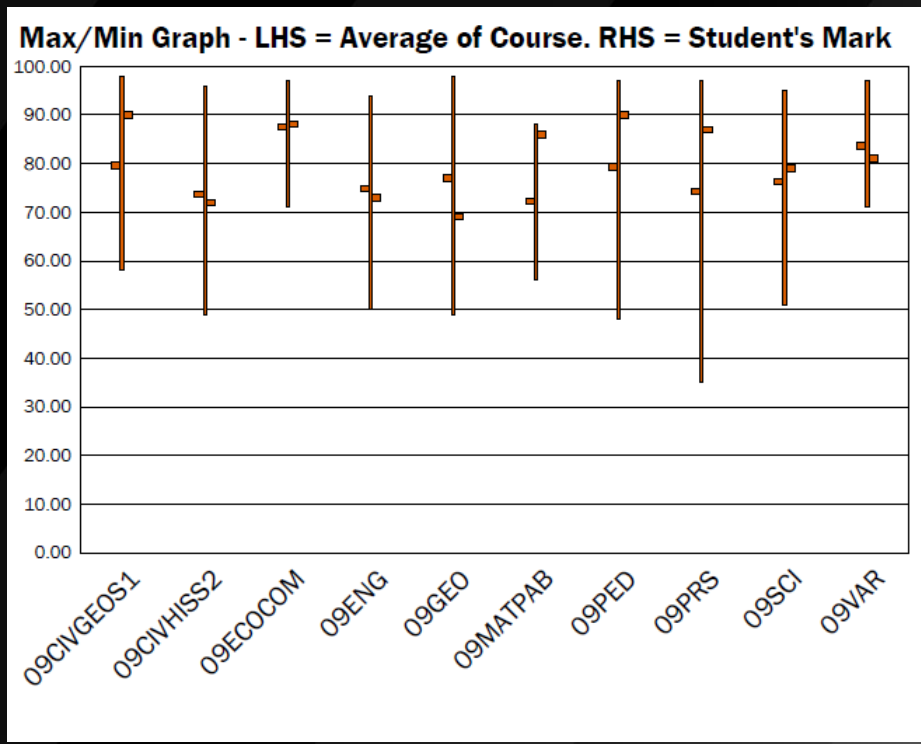
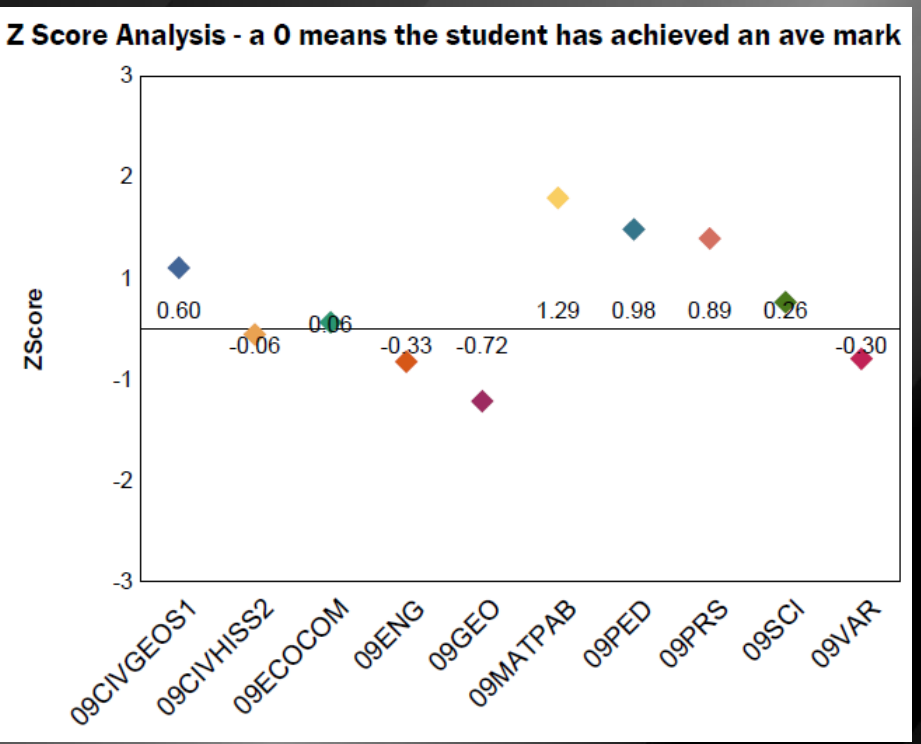
Performance Relative to Others





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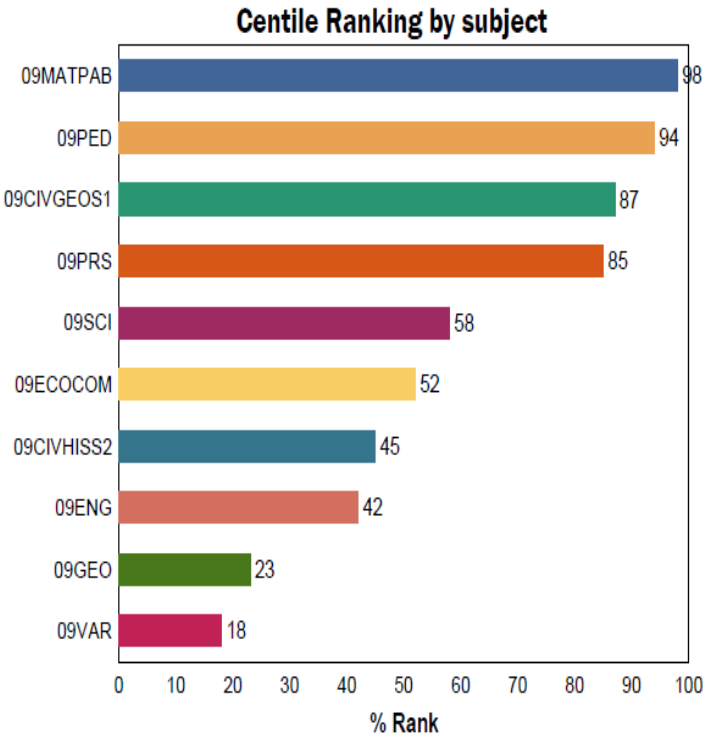

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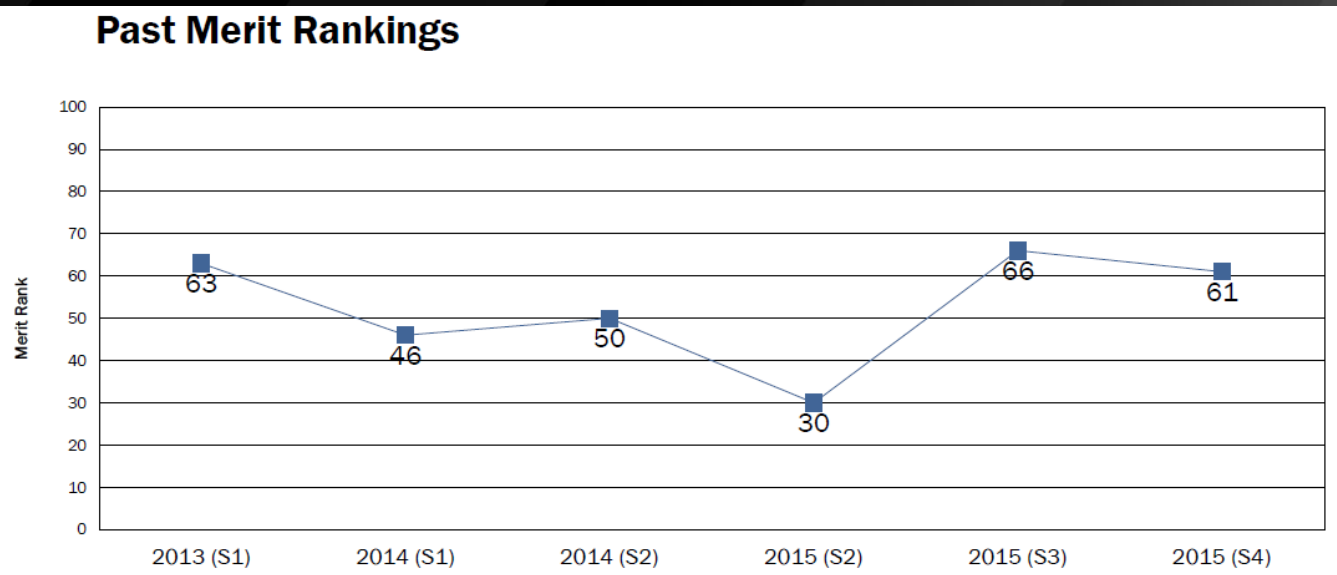
Performance Relative to Others



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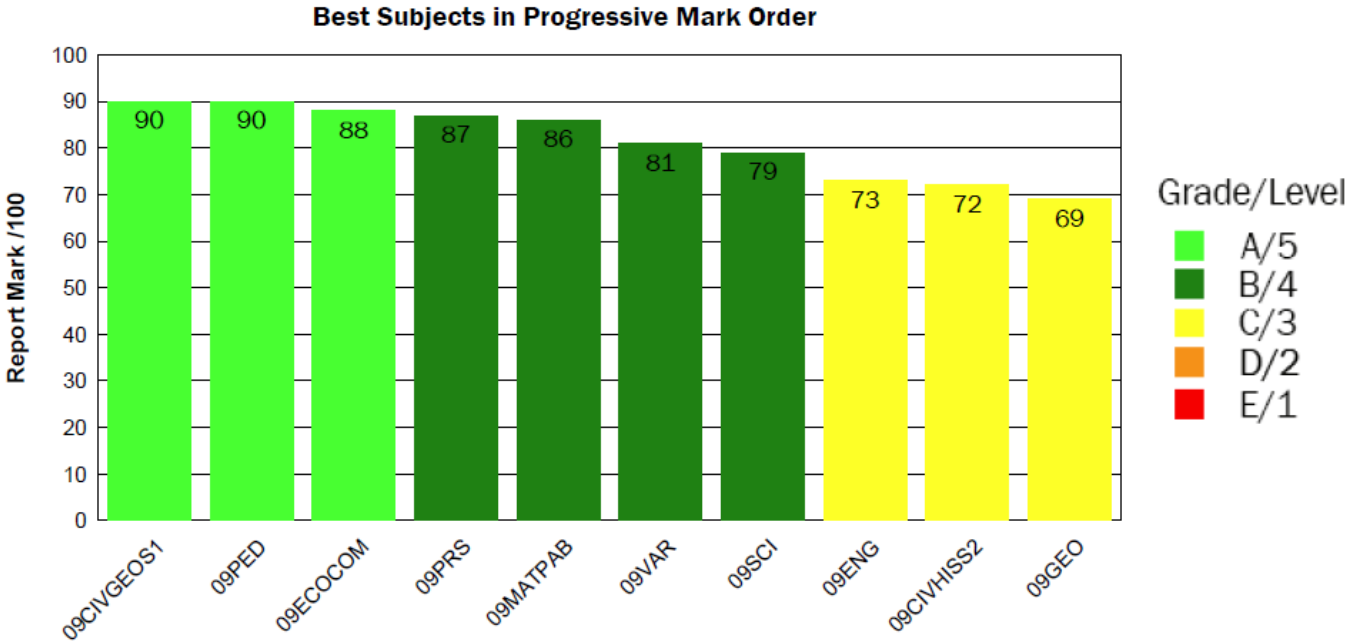
Performance Relative to Standards



Mapping Scale		
Grade	Max	Min
A	98	88
B	87	75
C	74	62
D	61	50
E	49	0

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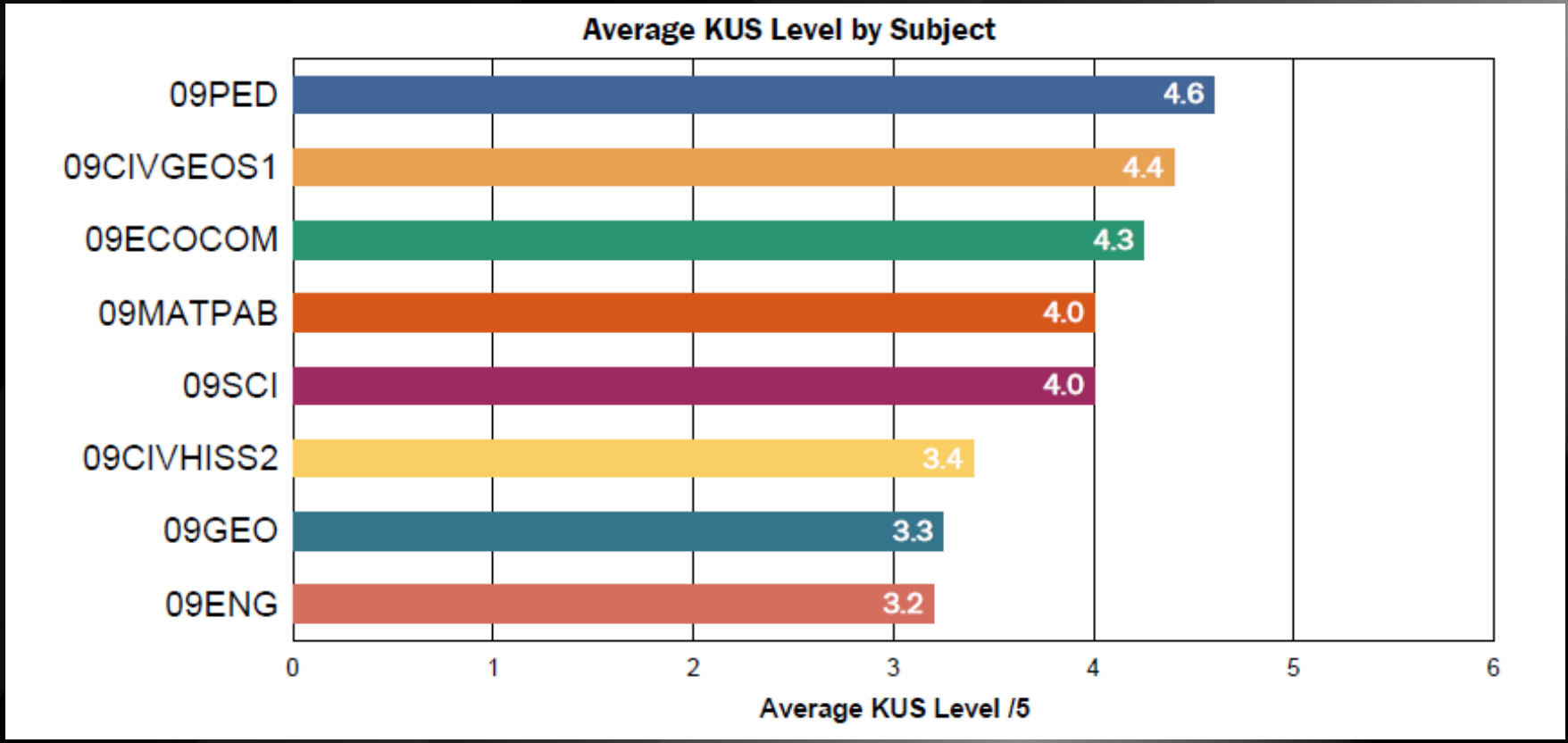
Performance Relative to Standards



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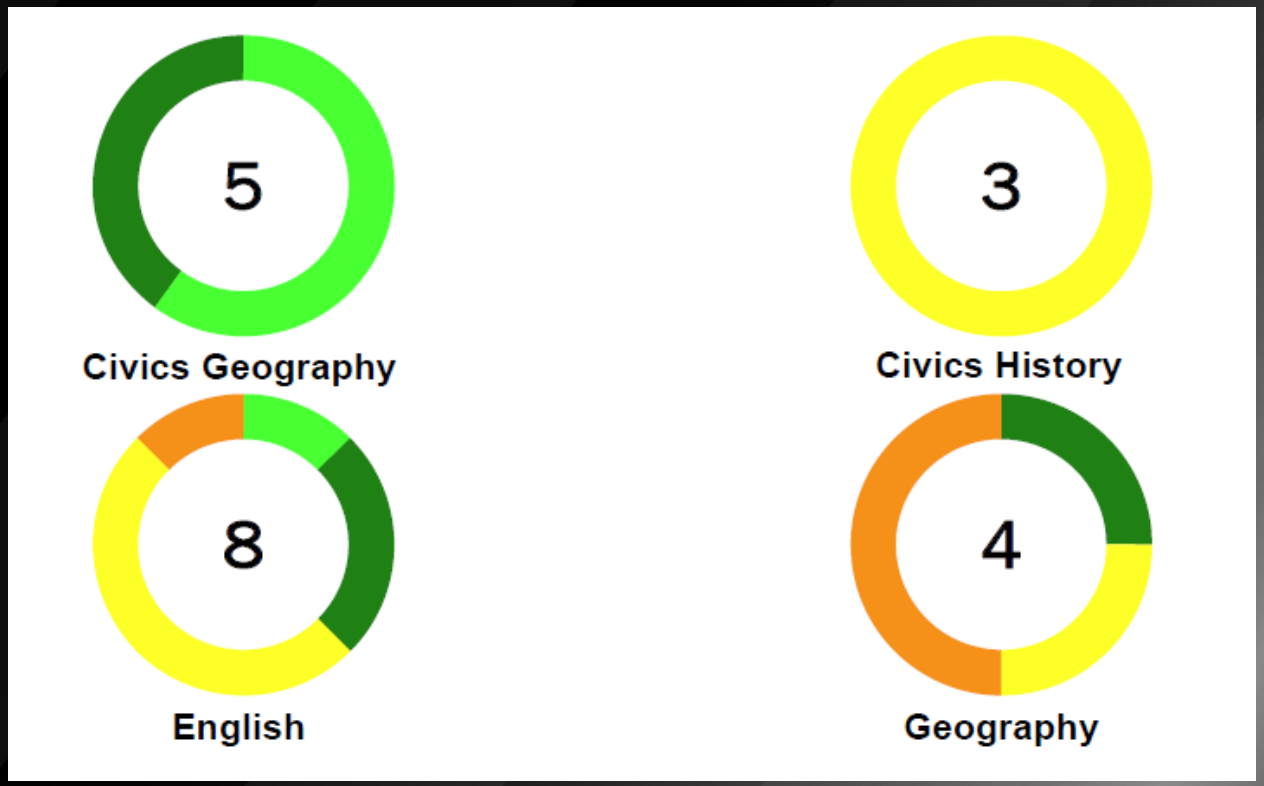
Performance Relative to Standards



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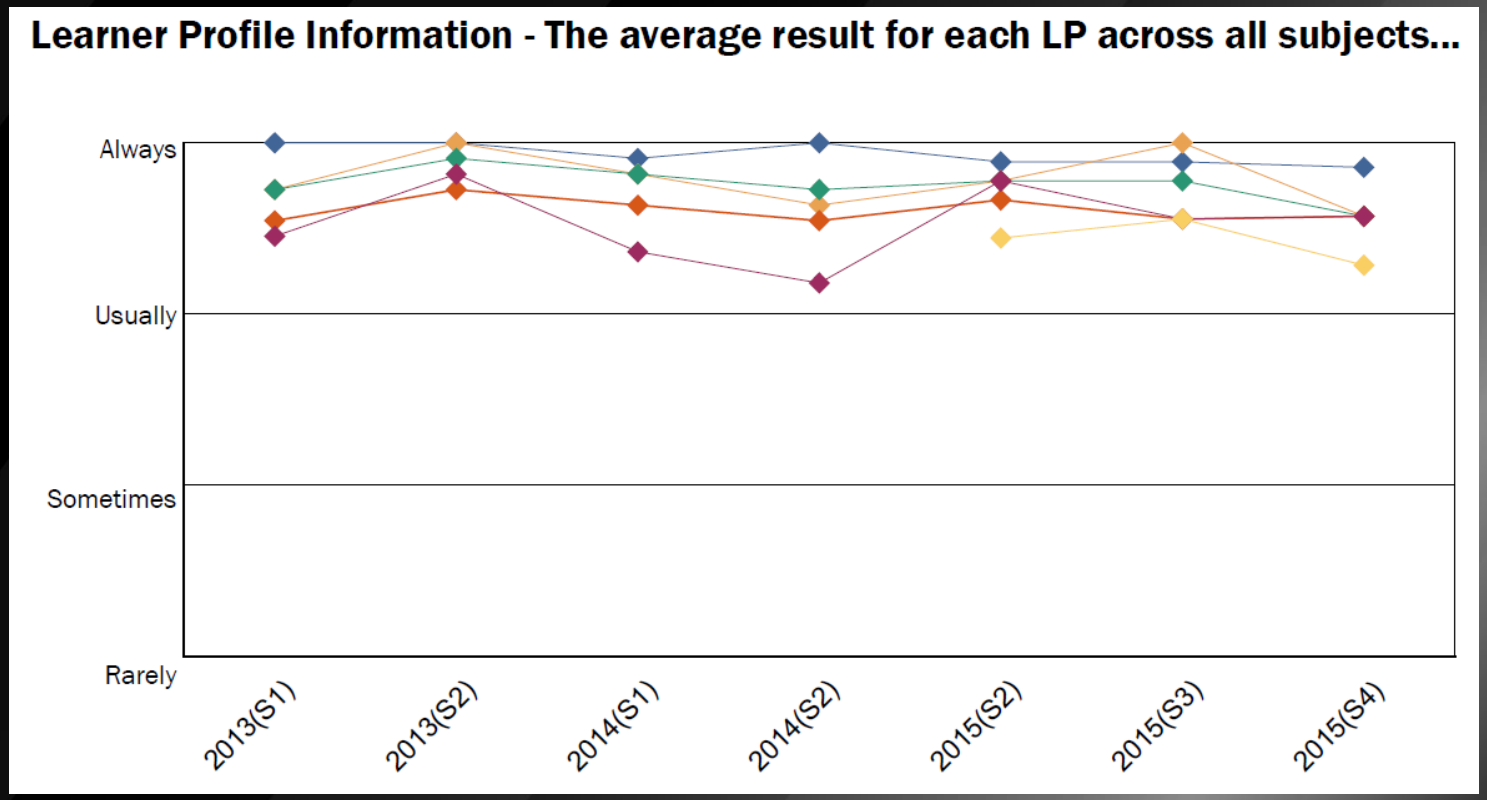
Effort and Engagement



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Confirmation Bias??

But, what does success look like???

- External vs Internal Indicators?
- Absolute vs Relative achievement?
- Performance vs Growth?
- Quantitative vs Qualitative measures?
- Exam performance vs Alternative Assessments?
- Learning skills vs Assessment results?

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What can happen when the analytics conversation is about achievement?

- Works to entrench structures based on achievement.
- Reinforces gaps between high and low achieving students
- Focuses on extrinsic motivation for success
- Squeezes formative assessment out of schools
- Allows assessment to drive the academic cycles in a school

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Does analytics work against what it sets out to measure?

- **Rewarding success does not necessarily lead to academic success in students**
- **Academic success is a function of process, not of achievement**
- **How do we measure the process? (And, hence change the conversation?)**
- **Making the 'holy trinity' of curriculum work towards that aim:**
  - Teaching and Learning
  - Assessment
  - Reporting

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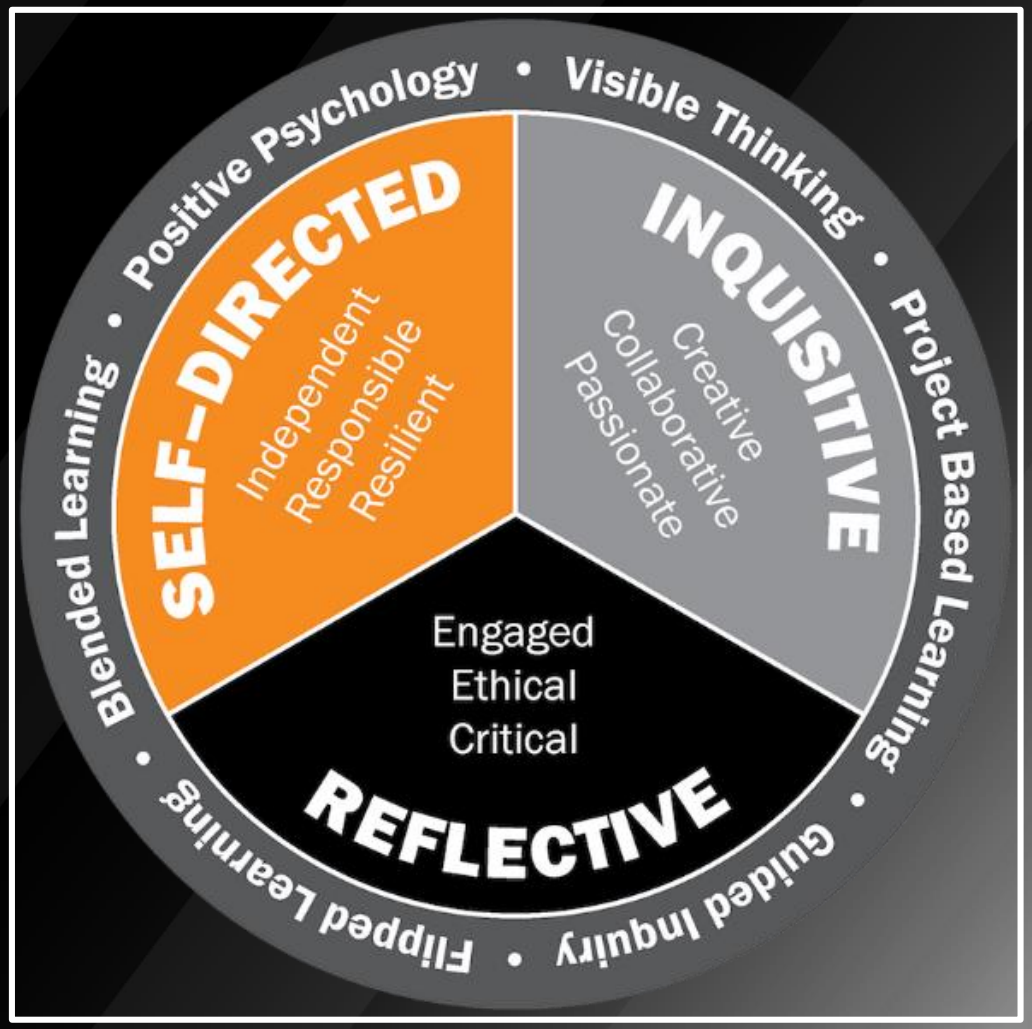
Measuring learning as a process



- Is respectful of their learning environment
- Meets homework expectations
- Works collaboratively and effectively with others
- Demonstrates self-directed learning qualities
- Is inquisitive about this subject
- Critically reflects on his learning

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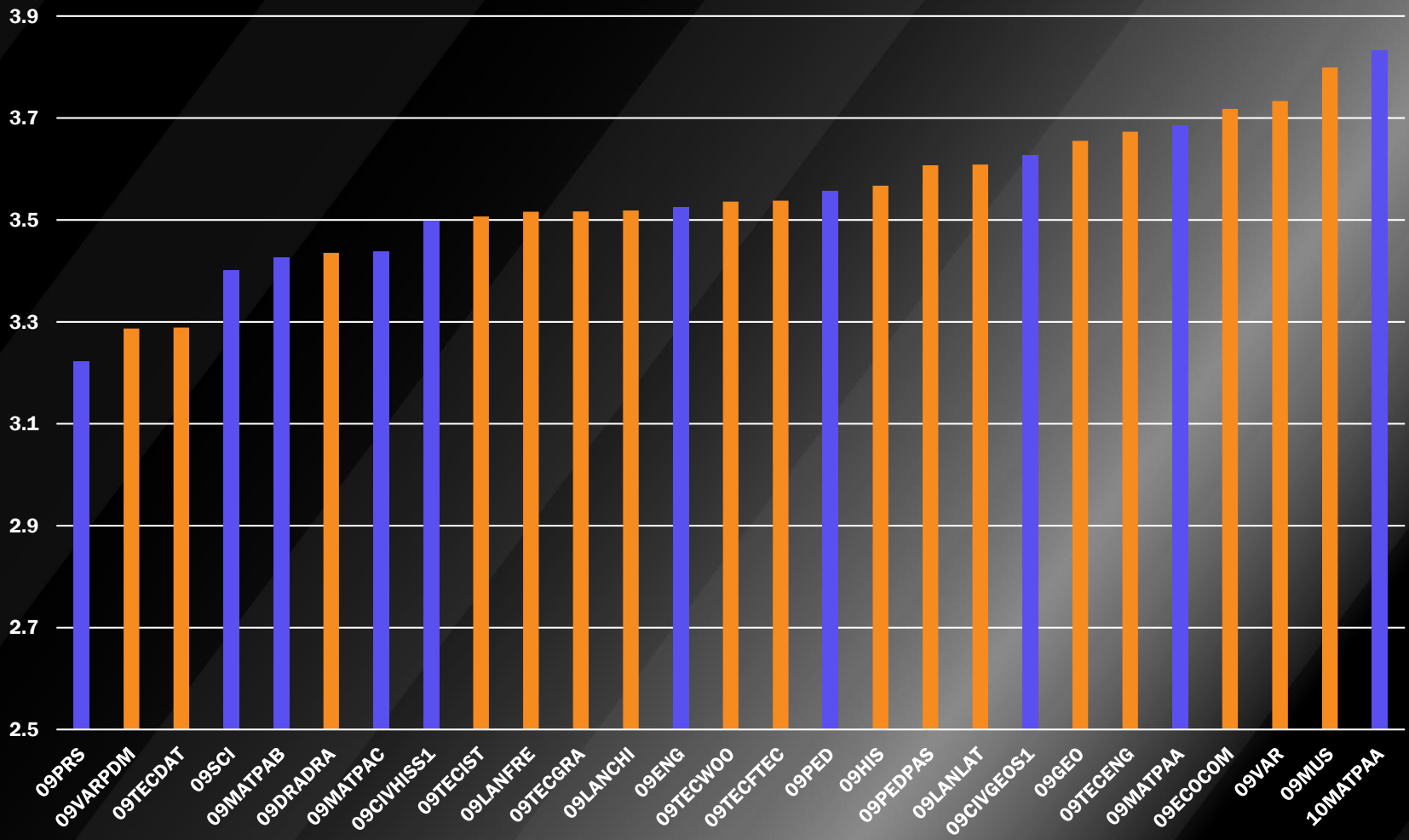
Effort and Engagement by Subject



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What Data do we want on them to ensure that we are teaching to their needs?

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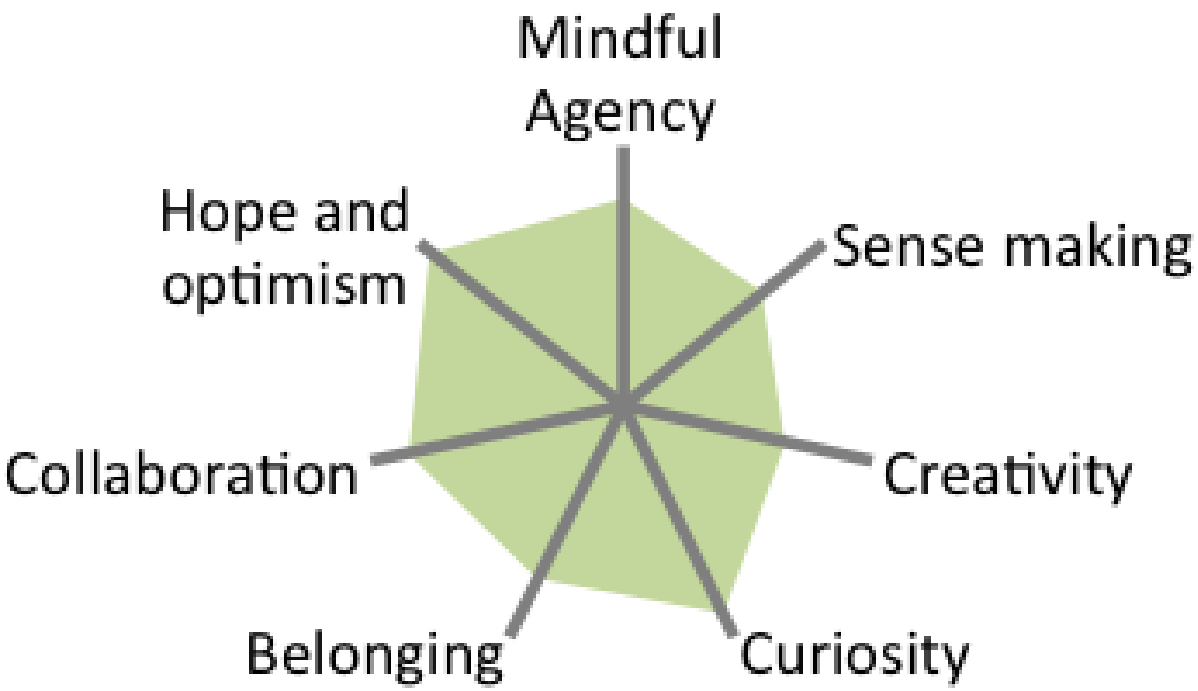
Crick Learning for Resilience Agency (CLARA) Profile



UTS CIC (2016)

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In a climate of benchmarks, comparisons, accountability, and league tables, it is important to ensure that students are not excluded from access to academic 'success' or denied a sense of what academic progress entails.

(Nichols & Berliner, 2007)

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