Empowering Schools with PISA: Strategies for Evidence-Based School Improvements

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e.g., 2 School Reports

retired principals helped explain to sch

A. Famous School in a district

- Affect (positive affect)
- Affect (no anxiety/depression
- Teaching (clarity)
- Teaching (support)
- Sch atmosphere (belonging)
- Class climate (no discipline)
- Late for School

High support, but low demand

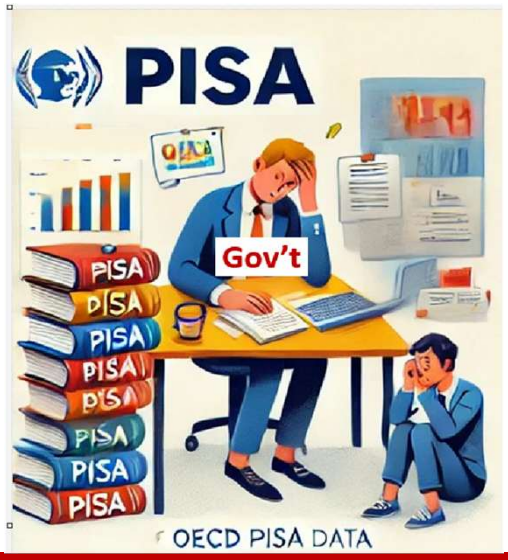
B. Famous in whole Hong Kong

- Affect (Positive Affect)
- Affect (no academic anxiety)
- Affect (no anxiety for failure)
- School Atmosphere (belonginess)
- Teaching (Teacher support)
- Teaching (clarity)

Coaching /Tuition Institute, not a school

Reports distributed to schools, 2 examples: School A has high affect, high teaching clarity, but low demand, many students late and disruptive classroom classmates. High teachers support, good relation, but at the expense of low demand; the school rewrites their sch development plan takes into consideration of PISA sch report. School B is famous, but actually sch belongingness low, teaching poor, it is not a good sch in students' perspective, just purely coaching sch

I. Making use of PISA: from "Gov't" alone to "Gov't + Schools"



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If only Education Ministry reads PISA report and work on that, it is difficulty. We need the help of all schools to improve their own weaknesses, which may differ from one sch to the other

Small Economies

Use School PISA reports

Large Economies

Nat Ass Sch Reports + Nat PISA report

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For small countries/economies that all schools have PISA report, they can benchmark themselves with Singapore, Finland, etc. For large countries, each sch can use their national assessment school reports to map onto the country PISA first, before comparing with Singapore, Finland. However, we must introduce more PISA questionnaires into our national assessment system.

II. Understand scale properties: 2018 PISA 32 Q scales + Read, M, Sc

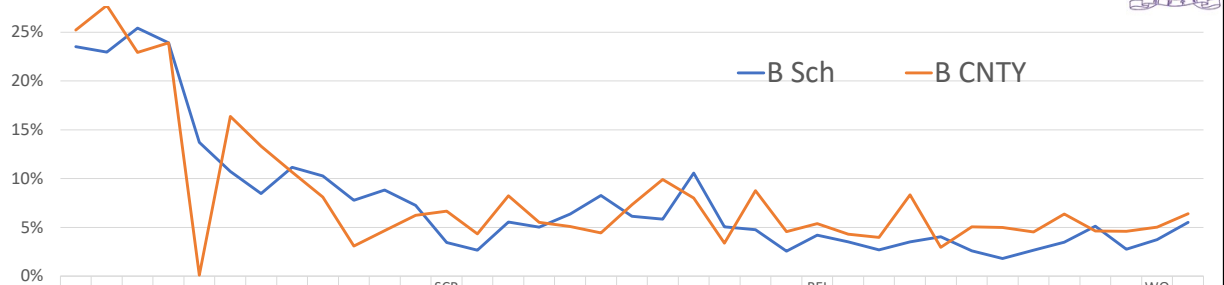
SES, eco soc cultural status	**ESCS**
Math	PV1MATH
Read	PV1READ
Science	PV1SCIE
Gender	Gender
Learn time math	MMINS
Learn time test lang	LMINS
Learn time in sc	SMINS
Learn time total	TMINS
Meta-cog: understand, remember	UNDREM
Meta-cog: summarise	METASUM
Meta-cog: assess credibility	METASPAM
Self-concept: perc'n competence	SCREADCOMP
Self-concept: perc'n difficulty	SCREADDIFF
Perc'n PISA difficulty	PISADIFF
Perc'd teacher feedback	PERFEED
Teachers' stimulation strategies	STIMREAD
Teachers' interest in teaching	TEACHINT

Teacher support	**TEACHSUP**
Teacher directed instruct'n	DIRINS
Disciplinary climate	DISCLIMA
Adaptivity of instruction	ADAPTIVITY
Enjoyment in read	JOYREAD
Attitude learn activities	ATTLNACT
Being bullied	BEINGBULLIED
Sense of belonging	BELONG
Competitive motive	COMPETE
Mastery goal	MASTGOAL
Parent emotion support	EMOSUPS
Meaning purpose in life	EUDMO
Gen fear of failure	GFOFAIL
Resilience	RESILIENCE
Competition climate	PERCOMP
Cooperation climate	PERCOOP
Subjective well-being	SWBP
Work & mastery ach motive	WORKMAST

5

II. Now we move to a more statistical issue, looking at 32 questionnaire scales in PISA 2018

Variance at Student (within Sch), School, CNTY levels

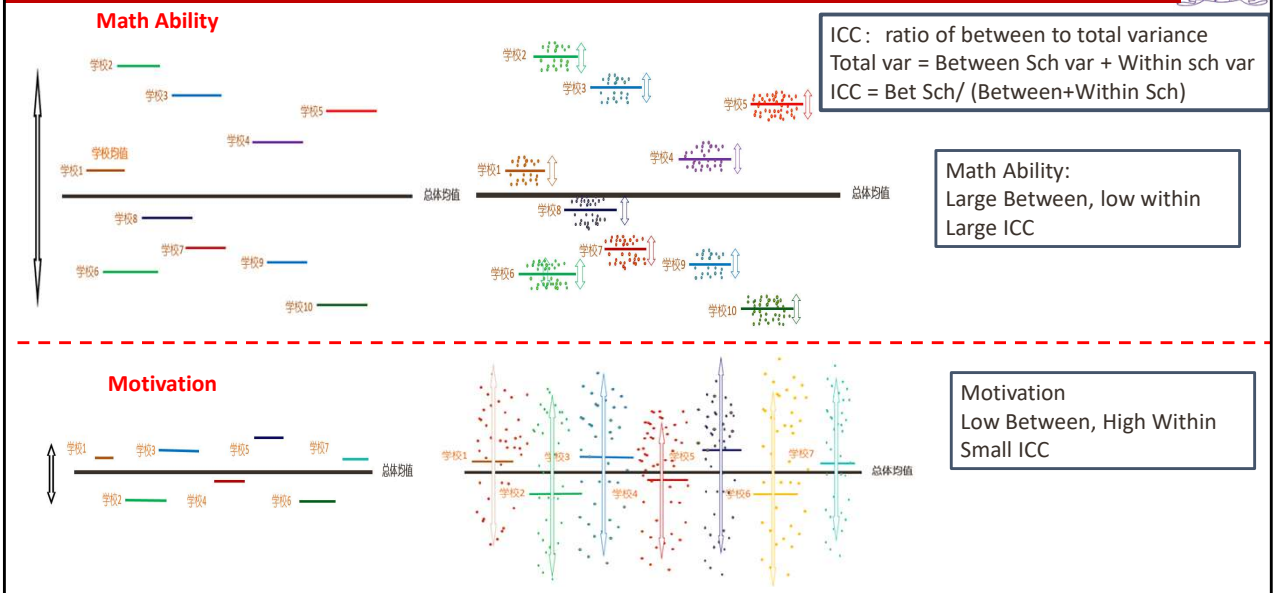


	ESCS	PV1MATH	PV1READ	PV1SCIE	Gender	MMINS	LMINS	SMINS	TMINS	UNDREM	METASUM	METASPAM	SCREADCOMP	SCREADDIFF	PISADIFF	PERFEED	STIMREAD	TEACHINT	TEACHSUP	DIRINS	DISCLIMA	ADAPTIVITY	JOYREAD	ATTLNACT	BEINGBULLIED	BELONG	COMPETE	MASTGOAL	EMOSUPS	EUDMO	GFOFAIL	RESILIENCE	PERCOMP	PERCOOP	SWBP	WORKMAST	Ave
B Sch	24%	23%	25%	24%	14%	11%	8%	11%	10%	8%	9%	7%	3%	3%	6%	5%	6%	8%	6%	6%	11%	5%	5%	3%	4%	4%	3%	4%	4%	3%	2%	3%	3%	5%	3%	4%	6%
B CNTY	25%	28%	23%	24%	0%	16%	13%	11%	8%	3%	5%	6%	7%	4%	8%	6%	5%	4%	7%	10%	8%	3%	9%	5%	5%	4%	4%	8%	3%	5%	5%	5%	6%	5%	5%	5%	6%

- SES, Math, Read, Sc, Time on Study: 21.7% B Sch, 32.8% B CNTY: 45.5% B Student (within Sch)
- Others: ave 4.9% Bet Sch, 5.6% Bet CNTY, 89.5% within Sch
- Within Sch >90% in each CNTY, most variance to explain;
- No variance ➔ nothing to explain; B CNTY: little to explain

Results show that variances of the questionnaire at country, and school level are all low, while 88% variance/variations are within each school, these are the relations commonly discussed in textbooks.

Between/Within Sch Difference: Math Ability, motivation



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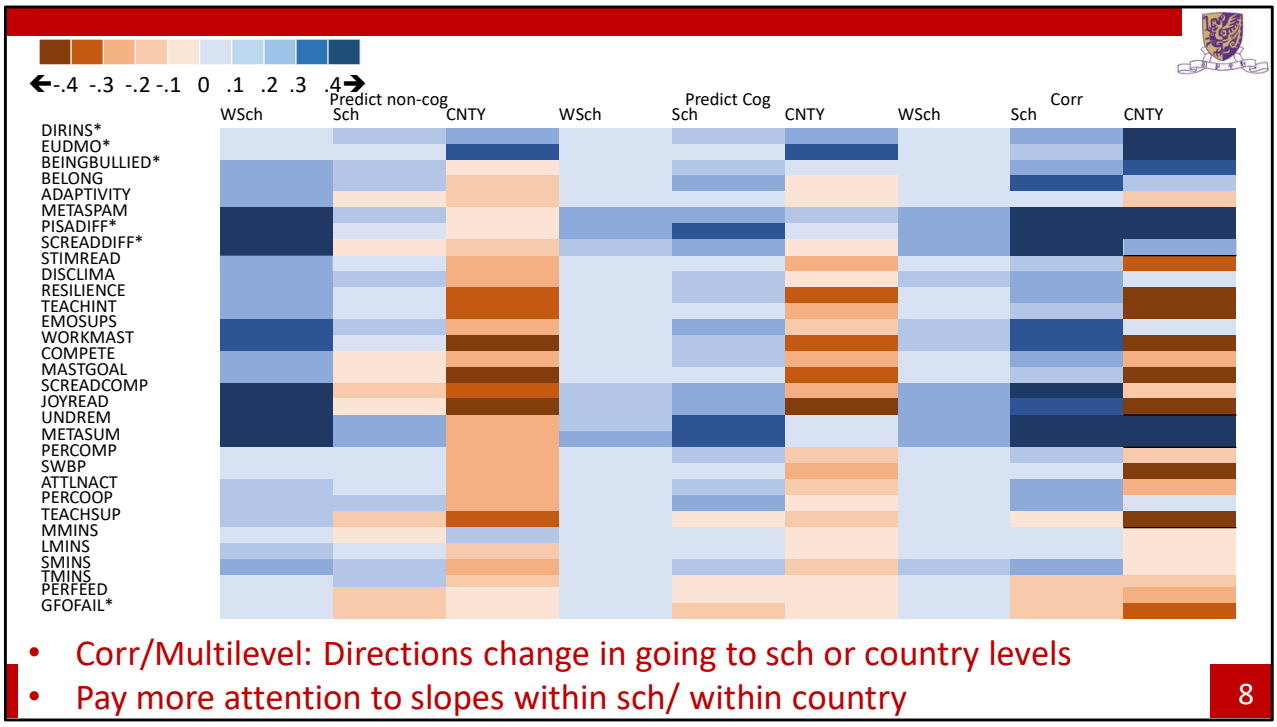
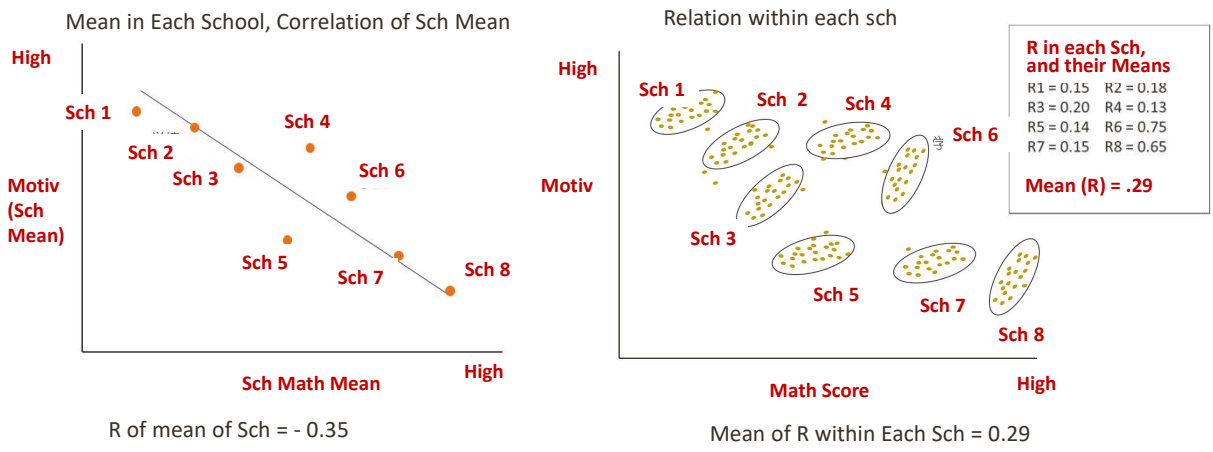
Picturally, it can be seen that math/reading/science has a much larger between country/between school variances/differences, but for questionniares, 88% of variances/differences are within schools.



Most astonishing is that if we move from lower (L1) to higher (L3), a lot of the relationship change direction, e.g., more motivated countries had lower reading scores

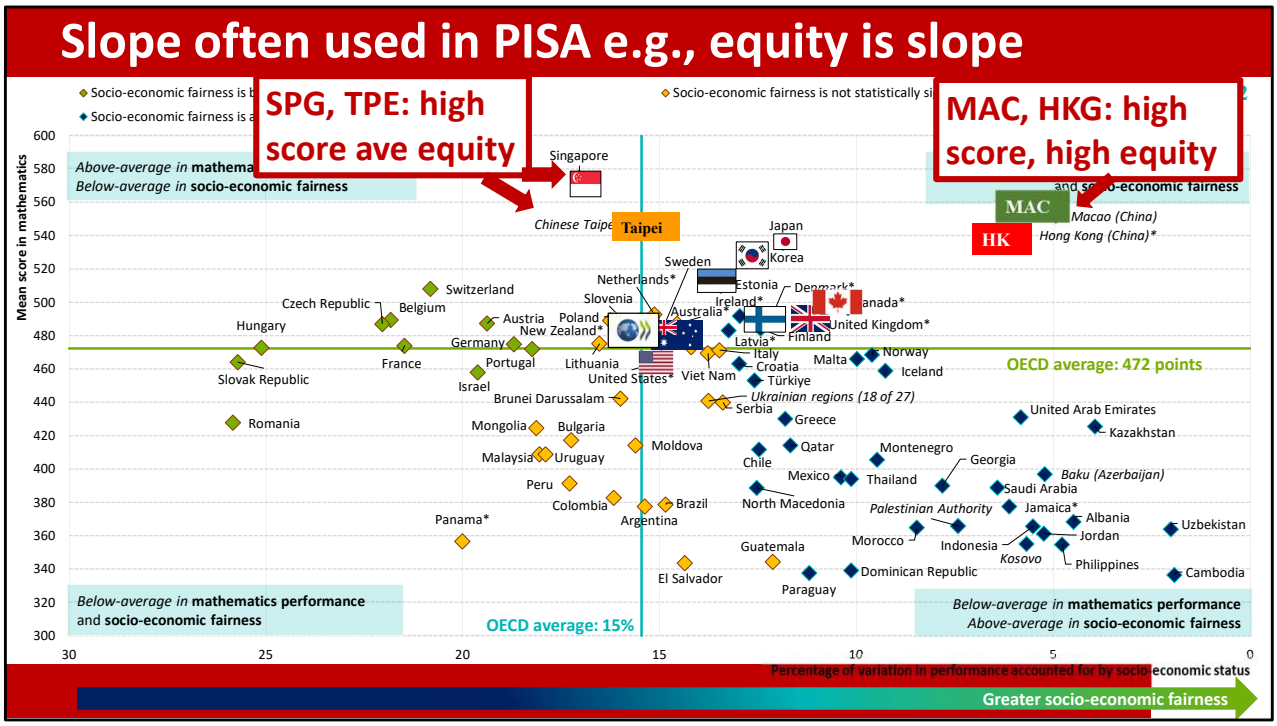
hypothetical, to show **mean of correlation ≠ corr of mean**

XX City 8 Sch Math Ability/Motivation Relation



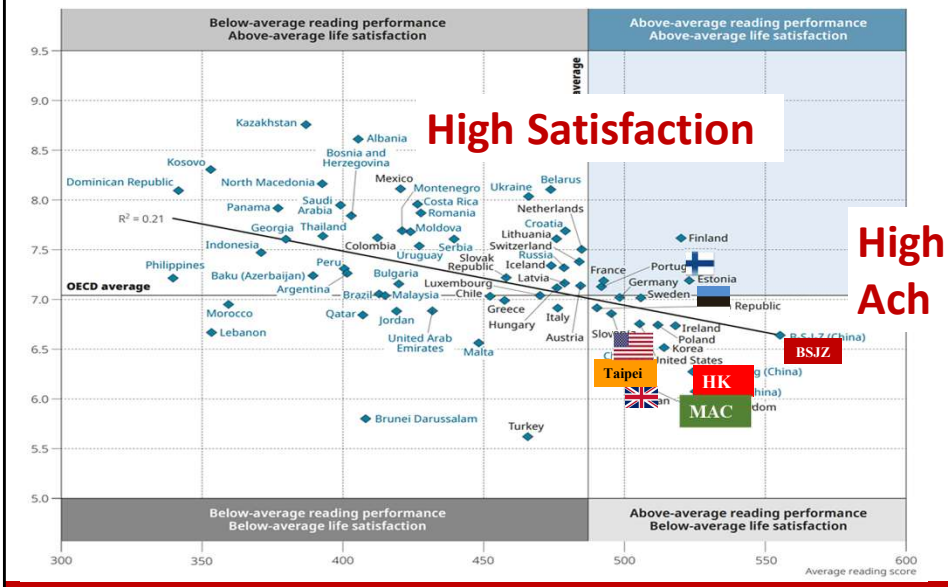
e.g., SES at Stu Lev is +ve, but –ve at Sch Lev

This is to show that L1 and L3 reversal can happen



The comparison of slopes rather than on means can be found in many PISA publication, et.c equity is a slope concept

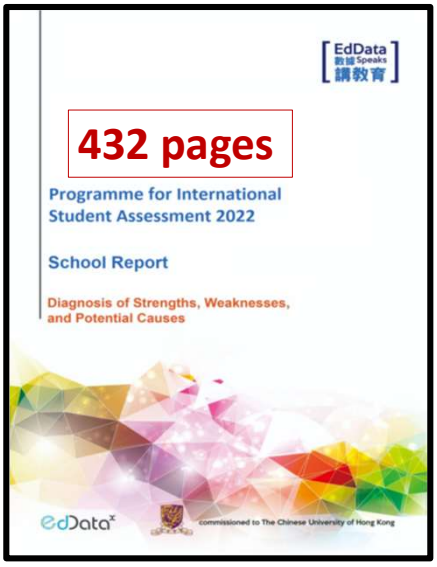
Slope reversed in PISA report, e.g., Well Being Life Satisfaction and Read



- 2018 Data shows: Reading high, life satisfaction low
- Generally negatively related to Reading
- Only FIN, EST high Ach + high Satisfaction

The reversal of relation is also found in many OECD publication, high life satisfaction countries had lower reading scores

III. Hong Kong PISA Sch Reports (432 pages) over 100+ constructs



I. Academic
A. Math
B. Science
C. Reading

II. Stu Back
A. Immigrati
B. Socioecon
C. Computer
D. Internet
E. Ed Aspirat
F. Career Exp

III. Other Measures
A. Subjectiv
B. Life Satis
C. Sch Belo
D. Fear of F
E. Meaning
F. BMI, Bod
G. Exercise
H. Motivati
I. Bullying
J. Feeling s
K. Empathy

IV. Other Measures
A. Parental Support
B. ICT Availability/Usage
C. Cultural/Ed Resource
D. Student-Teacher relation
E. Teacher Job Satisfaction
F. Student Truancy
G. Satisfaction
H. Growth Mind-Set
I. Creativity Q Measures

...100+ variables/constructs

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III. In our Hong Kong PISA report distributed to each school, there are 432 pages on over 100 variables/constructs

Easy to Read Summary in √ ✕ (cf HK, H Ach Eco, own sch)

	Mean	Ach Ad-vantage		SES Equity			Gender Equity	
Duration in early childhood education and care	√	√√√	H	√√√√			√	G
Expected occupation status (free response)- 4 digits	???	???	H	√	H		√√	B
Clear idea about future job	?	√√	H	??	H		√√	G
Quality of student-teacher relationships (WLE)	?	√	L	√√√√			??	G
Sense of belonging (WLE)	?	√	H	√√	L	S1	√√√√√	
Being bullied (WLE)	√	√√	L	√√√√			√√	B
Feeling safe (WLE)	?	√	L	√	L		√√√√	
School safety risks (WLE)	√√	√	L	S4 √√√√√		S2	√√√√√	
Perseverance (agreement) (WLE)	???	???	H	√	H	S5	√√√√√	
Curiosity (agreement) (WLE)	???	???	L	??	H		√√	B
Cooperation	?	√√	H	√√√√			√√	G

- Look for groups of strengths/weaknesses
- 4 kinds of comparison:
  - Mean
  - low/high Achievers
  - low/high SES
  - boys/girls
- × × × ➔√√√√√ (8 grades)
- S1 …= 1st within your sch
- H (L) = high (low) Ach/SES higher
- B/G = Boys/Girls higher)

We start with a summary showing 4 kinds of important comparisons: mean, low/high achievers, low/high SES, boys/girls.

For each construct: Distribution/Mean + 4 comparisons + recommendations in Graphs + simple words

4 comparisons (actionable):
A: Mean comparison (all positively coded, high is good)
B. Gender Difference (small is good, boys often lazier)
C. High/Low SES: equity (small is good)
D. High/Low achievers comparison: high often better (e.g., high ach late less)

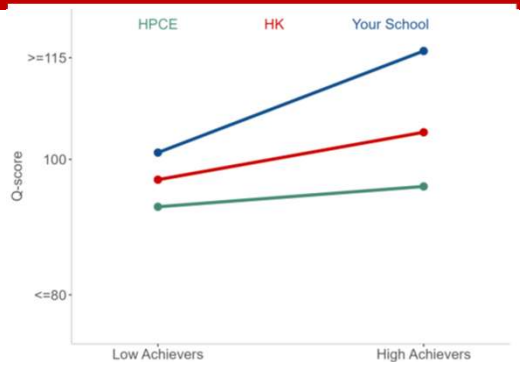
e.g., Exercise/Sport before/after school (in P-, Q-score and simple language)
- Your school has a Q-score 114, P-score 82.5
- In HPCE, the median school Q-score is 94, while the P-score is 34.5
- Recommendation (cf. HK): very good, KEEP on good work
- Recommendation (cf. HPCE): Average/slightly weak, IMPROVE

- **P-(percentile Score), higher better**
- **Q-(Quotient Score) mean of a country = 100, SD=15**

The reasons doing these 4 kinds of comparisons, a typical sch report, and explaining the differences of P- and Q-scores

Comparison: Graphs + simple language + recommendations, e.g., high/low achievers reading enjoyment

- In your school, high achievers (Q = 116) HIGHER THAN low achievers (Q = 101).
- In HK, high achievers (Q = 104) SIMILAR TO low achievers (Q = 97).
- In HPCE, high achievers (Q = 96) SIMILAR TO low achievers (Q = 93).
- Recommendation (cf. HK): Very good, keep up the good work or slightly improve low achievers.
- Recommendation (cf. HPCE): Average, improve the whole school.



	Low Achievers	High Achievers
HPCE	93	96
HK	97	104
Your School	101	116

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Everything is explained along 4 dimensions, means, 3 slopes, using graphs, and simple languages. They are all action-related dimneions