
Why class size matters

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SMALL CLASSES IMPROVE LEARNING AT SECONDARY SCHOOL LEVEL

- Reliable studies link smaller class sizes in secondary school years to higher achievement.
- Controlling for student background, the only objective factor linked with higher student success is class size.
- Achievement gains are most strongly linked to smaller classes in the upper rather than the lower grades.

McLaughlin D & Drori G (2000), US Department of Education sponsored study of achievement in 2,561 schools across the US.

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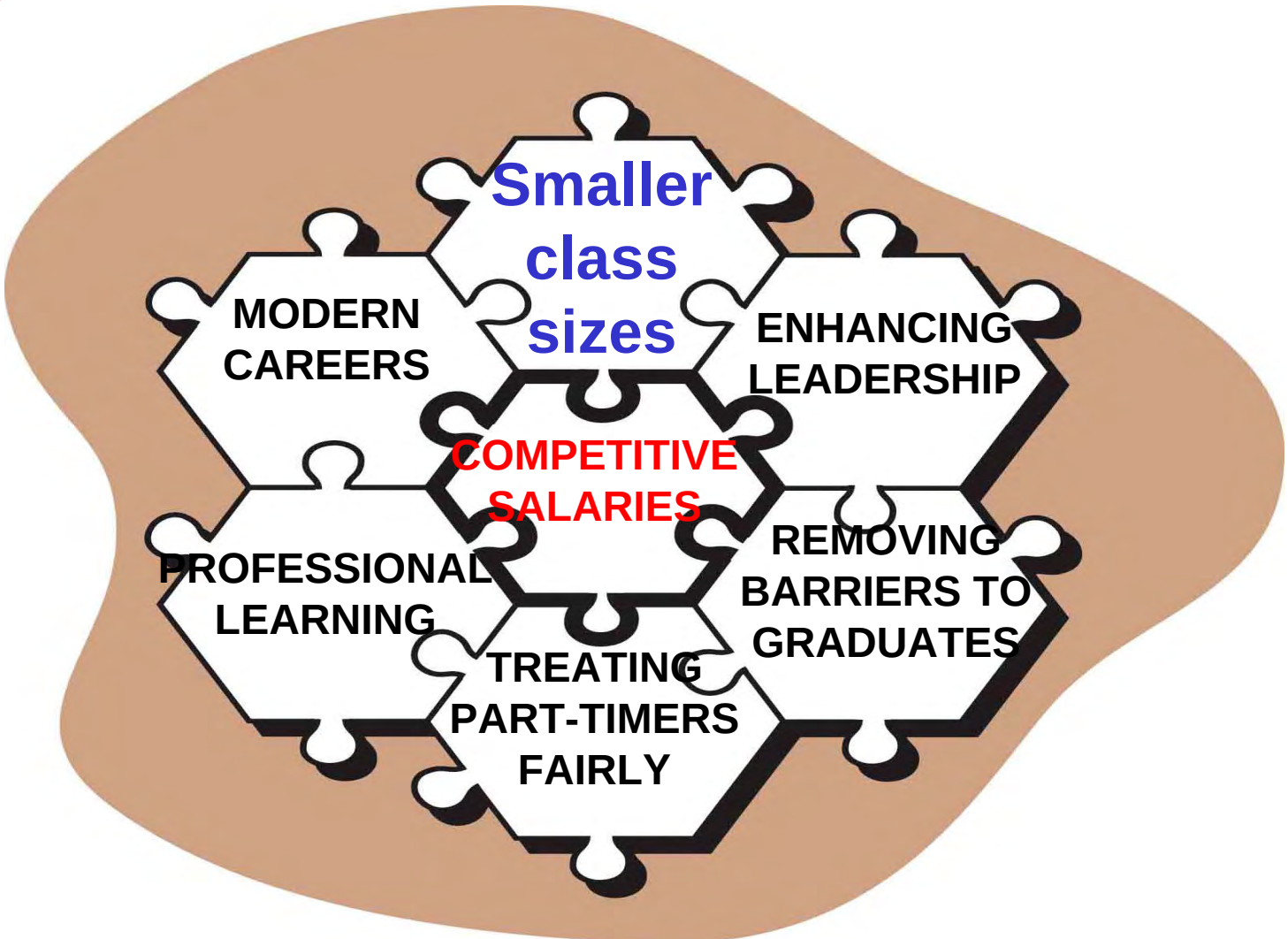
SMALLER CLASS SIZES: A KEY COMPONENT OF STCA CLAIM



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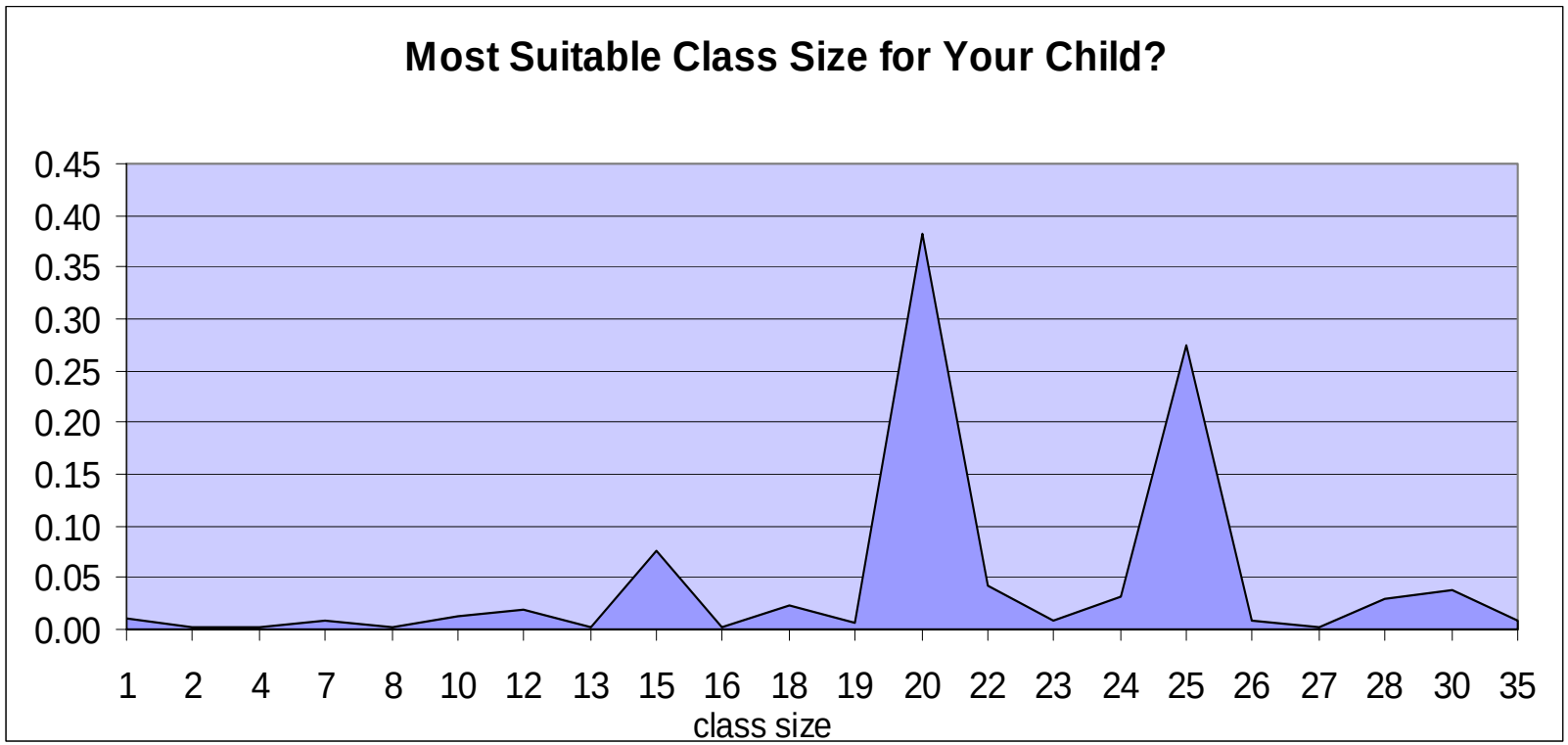
PARENTS WANT SMALL CLASSES

- Parents of teenagers want classes of 20-25



(Windshift 2007)

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SECONDARY TEACHERS WANT SMALL CLASSES

- Secondary teachers want classes of 20-25

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SMALLER CLASSES ARE PART OF A PARADIGM SHIFT IN TEACHING AND LEARNING

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Large vs small classes

Teacher centred classrooms

'Chalk and talk' passive learning

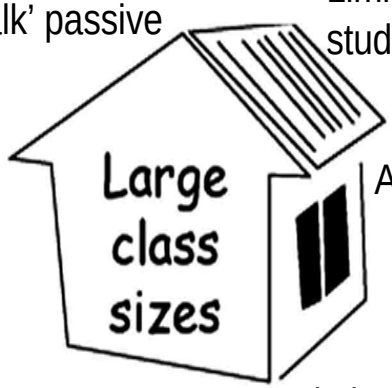
Limited knowledge of students as individuals

One-off exams

Content based programmes

Behaviour management issues

Infrequent, generalised feedback



Age organised learning

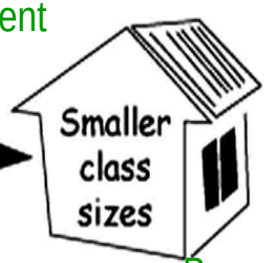
Limited options choice and common pathways

Student centred classrooms

Active student learning

Detailed knowledge of each student

Ongoing assessment



Developmentally organised learning

Skills based programmes

Broad options choice and differentiation

One-on-one time with students

Regular, detailed feedback

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KEY PROBLEM WITH LARGE CLASSES

- Insufficient time for necessary individual student attention

NZPPTA survey 2004

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BUT THERE ARE OTHER PROBLEMS #1

- Class management issues increased
- Marking pressure hinder feedback to students
- Range of teaching methodologies limited
- Not enough resources for the class
- Practical work often not done or limited

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BUT THERE ARE OTHER PROBLEMS #2

- Constructive student interactions inhibited
- Lack of safety and inadequate physical space
- Problems in managing formal assessment NZPPTA survey (2004)
- High stress levels and high levels of job dissatisfaction.

Allen & Helming (1991)

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PARENTS WANT QUALITY TIME

- Most parents want each subject teacher to spend at least 15 minutes one-on-one time per week with their child.

  (Windshift 2007)

- Currently, a student in an average sized class can expect up to 4 minutes.

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SMALL CLASS IMPACTS ARE LONG TERM

- Students in smaller high school classes are more likely to graduate from school.

- Smaller high school classes have a significant positive effect on wages later in life.

Dunstan C. et.al, 2003

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SMALL CLASSES IMPROVE LEARNING

- Small classes = higher achievement at all year levels.
- Benefits greater when in small classes for 100+ hours.
- Small classes superior in terms of students' reactions, teacher morale and quality of teaching environment.

Glass and Smith (1979), analysis of 77 empirical studies of class size and student achievement

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SMALL CLASSES IMPROVE TEACHING

- Teachers change methods with smaller classes:
  - More individual attention
  - More monitoring of individual progress
  - More creative activities
  - More problem-solving activities
  - More projects and written assignments
  - More attention to gifted children
  - More field trips.

Allen, (1992), Wisconsin Class Assignment & Teaching Assignments Study

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TEACHERS ENGAGE STUDENTS MORE

- "Teachers in small classes pay greater attention to each pupil. Students in these classes experience continuing pressure to participate in learning activities and become better, more involved students. Attention to learning goes up, and disruptive and off task behaviour goes down"

American Educational Research Association (Zurawsky, 2003)

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SMALL CLASSES INDIVIDUALISE LEARNING

- "*We view education … as a personal and individual experience.*

- *Class-size research… at its best it is an effort to find appropriate casework loads, because much of sound educational practice consists of individual instruction, coaching, mentoring, and tutoring*."

Helen Pate-Bain (1992)

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SMALL CLASSES GOOD FOR STUDENTS #1

- More opportunity to cater for diversity and difference
- Greater engagement in learning
- Better monitoring of student progress
- Earlier diagnosis of student difficulty
- It is more inclusive and more personal
- Reduction in bullying
- Higher levels of physical safety

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SMALL CLASSES GOOD FOR STUDENTS #2

- More immediate rewards for achievement
- Students more likely to be 'on-task'
- Test results improve
- Group work more easily managed
- More opportunity for student interactions
- Improved attendance figures
- Students more positive about themselves
- Easier to maintain a good physical learning environment

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SMALL CLASSES GOOD FOR STUDENTS #3

- Gains from small class size are greater for minority and disadvantaged students

- Lower class sizes improved the school social environment that, in turn, leads to higher achievement. The largest effects are in below average socio-economic districts.

Wenglinksy (1997)

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SMALL CLASSES GOOD FOR TEACHERS

- More engaged in professional development
- More engaged in school reforms
- Less stressed
- Absenteeism & illness reduced
- More accountable
- Morale is better
- Retention is improved
- Group work more easily managed

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SMALL CLASSES GOOD FOR SCHOOLS

- Increased capacity to offer curriculum options
- Students more positive about school
- Lower rates of school vandalism
- More effective use of limited classroom resources
- Parents more likely to be involved
- Easier to maintain a good physical learning environment
- Noise levels are lower

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WHAT ARE CLASS SIZES ACTUALLY LIKE IN NEW ZEALAND SECONDARY SCHOOLS?

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RATIOS ARE MEANINGLESS

- *Pupil-teacher ratios … reveal little or nothing about the actual classroom conditions in which pupils are learning.*

- *… large urban districts tend to have low pupil-teacher ratios because of the large numbers of … remedial teachers, yet often have badly overcrowded classrooms.*

(Finn, 2002)

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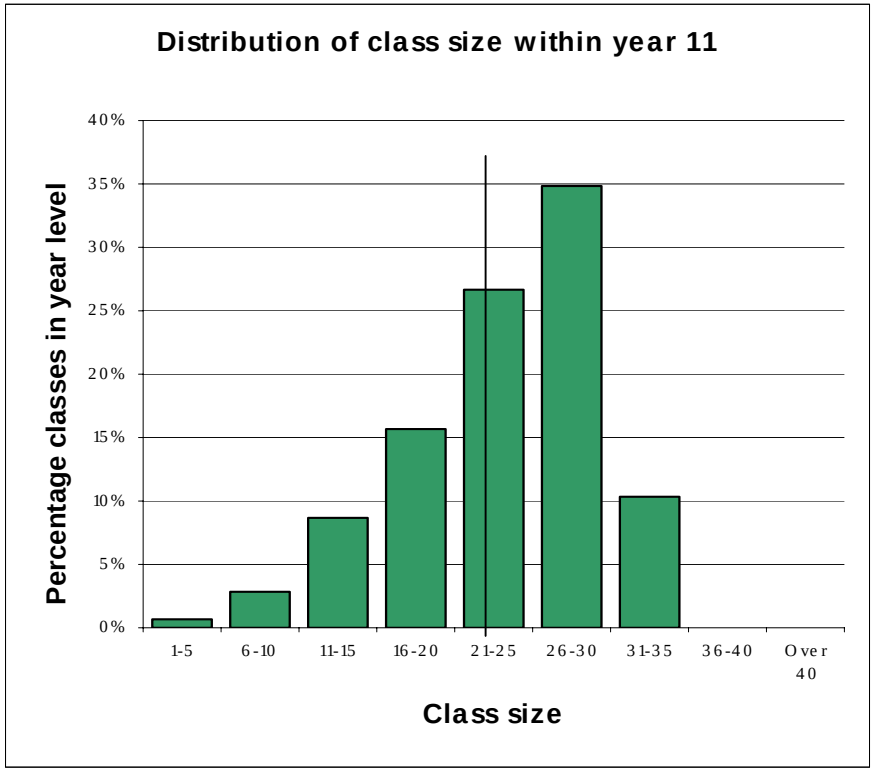
PUPIL:TEACHER RATIO IS NOT CLASS SIZE

For Year 11 the roll-generated PTR =

23 students per teacher

- Actual class sizes:

NZPPTA survey 2004



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AVERAGE SIZE IS NOT ACTUAL CLASS SIZE

Averages hide complexity - a mix of large and small classes.

Scenario	Class 1	Class 2	Class 3	Class 4	Average
1.	23	23	23	-	23
2.	32	32	5	-	23
3.	28	28	13	-	23
4.	40	25	4	-	23
5.	22	22	22	3	17.25
6.	28	27	10	4	17.25

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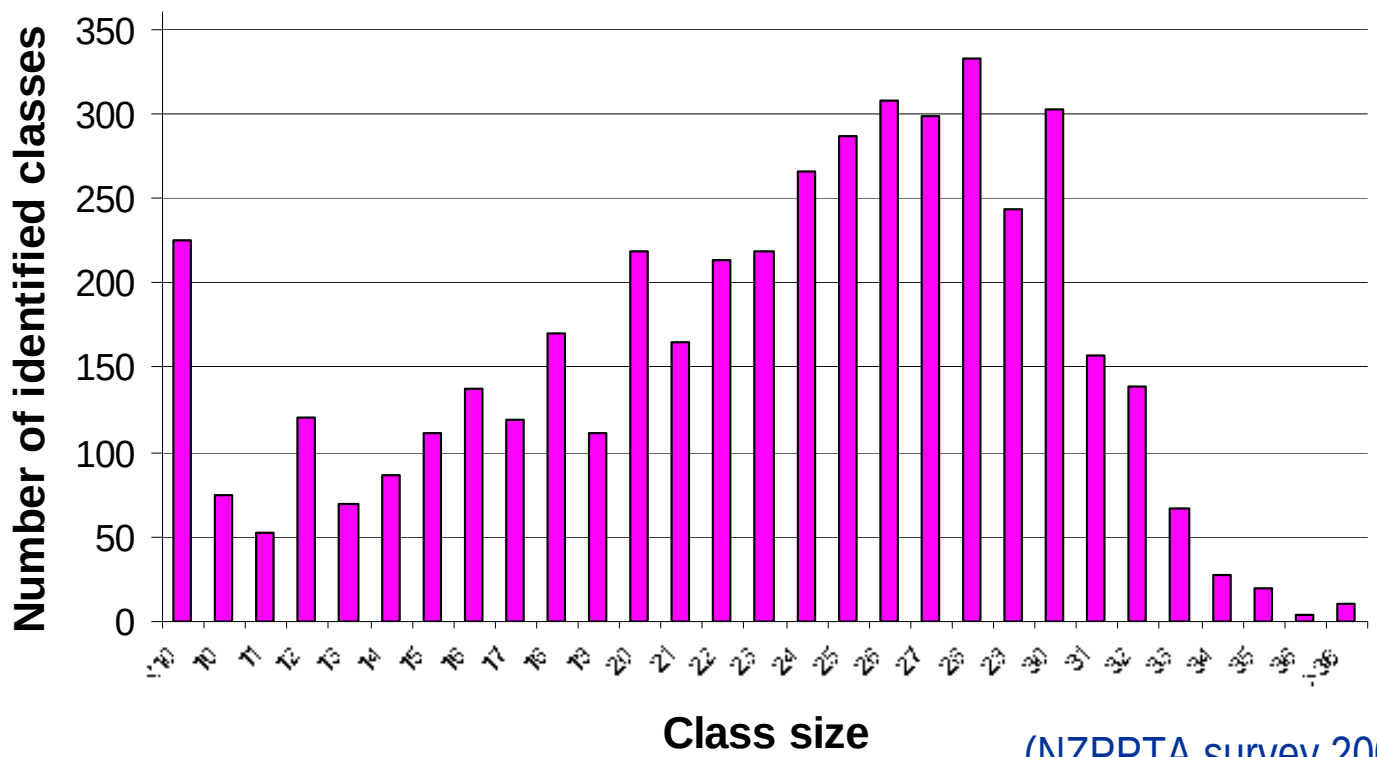
CLASS SIZE IN NZ SECONDARY SCHOOLS #1



(NZPPTA survey 2004)

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CLASS SIZE IN NZ SECONDARY SCHOOLS #2

Learning time spent in large classes by year cohorts (NZPPTA 2006)

Class size	Year 7&8	Year 9&10	Year 11	Year 12	Year 13-15	Composite
Over 25	39%	66%	53%	32%	19%	15%
Over 30	13%	12%	10%	5%	2%	3%

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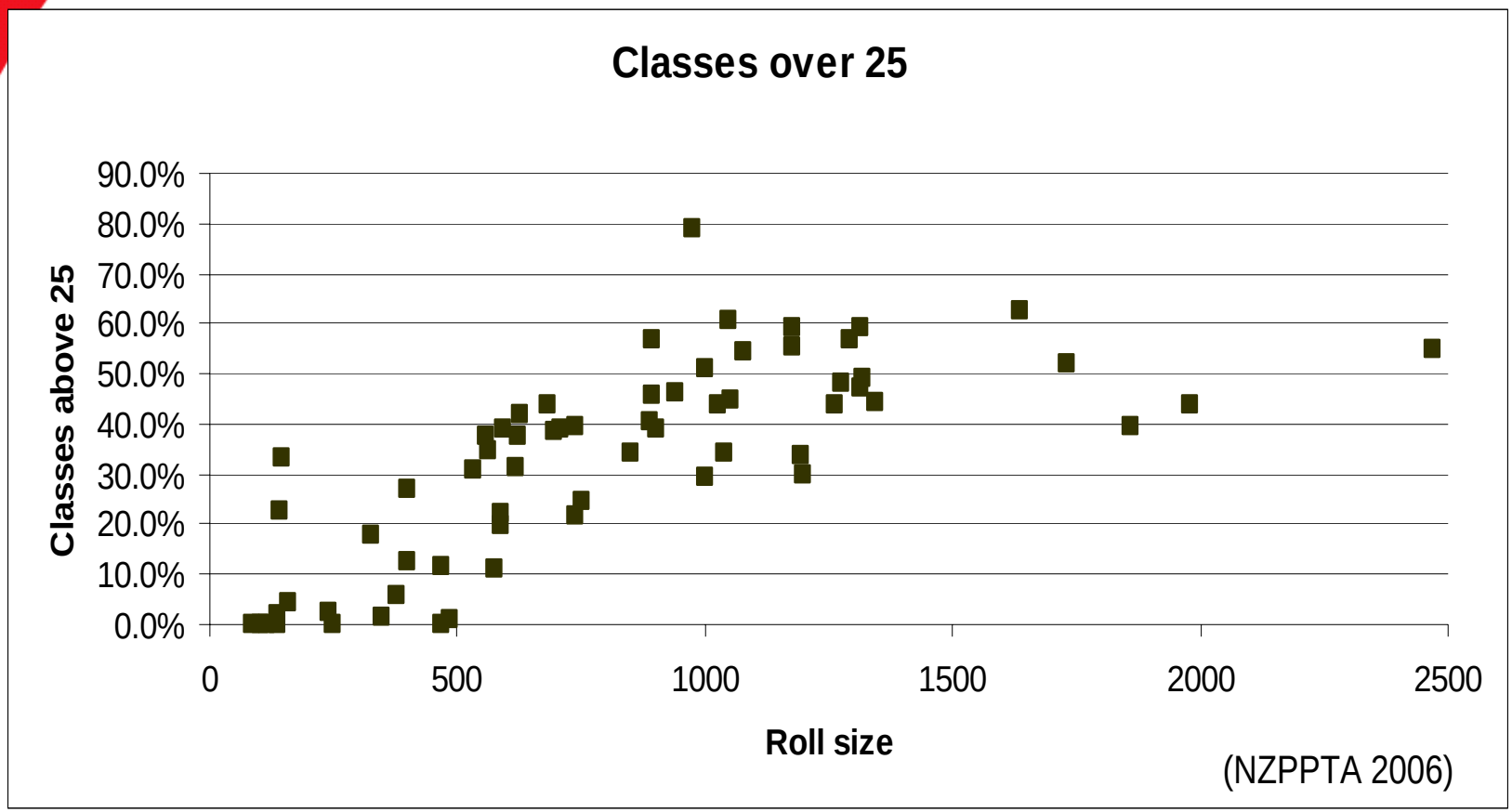
CLASS SIZE IN NZ SECONDARY SCHOOLS #3

Distribution of large classes by roll size



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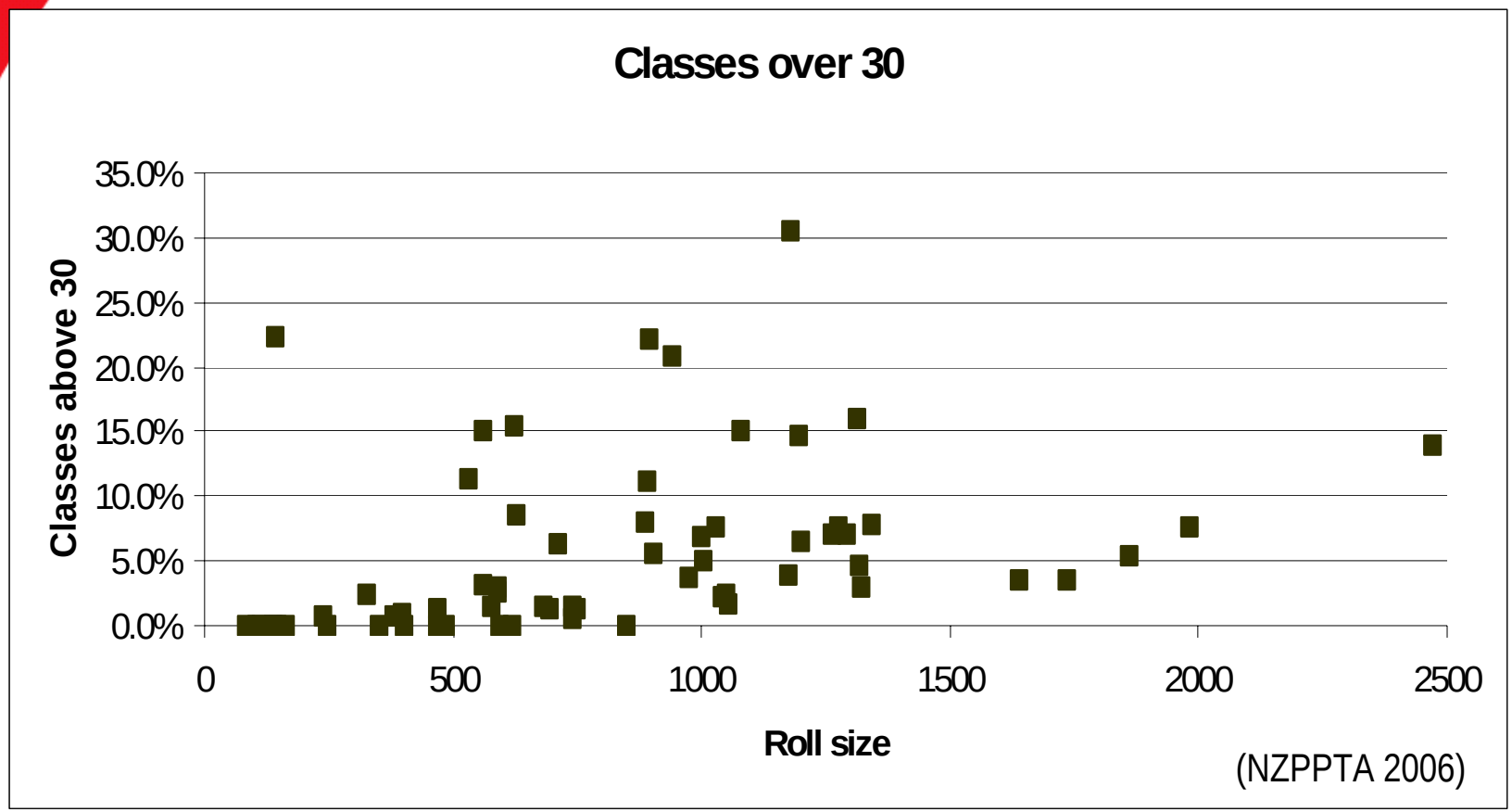
CLASS SIZE IN NZ SECONDARY SCHOOLS #4

Distribution of large classes by roll size



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RECOMMENDATIONS AND POLICIES RELATING TO CLASS SIZE

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MINISTERIAL STAFFING REVIEW GROUP

- Recommendation 3.6

  - Reduce pupil:teacher ratio by 2 per yr level.

  And:

  - 400 FTTE for management staffing
  - More pastoral/guidance staffing

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PPTA CLASS SIZE POLICY

First:

- Maximum class size 30
- Smaller practical class sizes (health and safety)
- Maximum average class size/teacher = 26

Then:

- Fully implement SRG recommendation 3.6, and
- Phased reduction in maximum class size

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THE COST OF SMALL CLASSES

- The staffing cost of SRG rec 3.6 would have been $78M or $283 per student in 2006.
- *This would have cut average class size to 20 students and allowed secondary schools to virtually eliminate classes over 25.*
- As rolls fall, keeping total teacher numbers at current levels would eliminate large classes within 5 years.

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WHAT DOES RESEARCH SAY?

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GETTING IT RIGHT IS IMPORTANT

- Actual class size data is available to researchers who study small numbers of classrooms but data on pupil:teacher ratios or numbers enrolled in classes is more readily available.

- "*These "class size" measures typically contain considerable measurement error. If this measurement error is random, estimates of the relationship between schooling outcomes and class size will be biased towards zero."*

(Ehrenberg, Brewer, Gamoran, Willms, 2001)

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CLASS SIZE IS THE MEASURE

"*Class size is a (more) direct measure of the teaching resources brought to bear on a child's development*."

Report of Alberta's Commission on Learning (2003):

Research using pupil:teacher ratios is consistently marginal. (e.g. *Hanushek, Hoxby*)

Research using actual class size is consistently positive on many variables. *(e.g.Glass&Smith, Boozer & Rouse, Borman & D'Agostino, Wong & Meyer, Krueger, Mosteller, Orlich, Blatchford & Goldstein)*.

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GIGO

- Most papers on class size are not research but reviews of a relatively small number of actual research exercises.
- Some papers are *meta-analyses* which combine the results of research exercises which can repeat or even amplify errors in the design and findings of the original research.

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META-ANALYSIS (MA)

- MA is a tool to assess the outcomes of several independent studies by 'combining' results. It is not original research " *more .. a perspective than a statistical technique*"(Turner P, 1997)
- The validity of a meta-analysis depends on the:
  - validity of research techniques in studies included
  - quality of the review it is based on
  - accuracy of weightings applied
  - absence of bias (including selection, statistical and researcher)
  - a high degree of homogeneity in the studies examined

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META-ANALYSIS (MA)

- MA is most often used to assess clinical effectiveness of health interventions by combining data from randomised control trials designed to scientific standard. A lot of 'class size' research does not meet these standards.
- The studies included must be similar. "*… if the studies are too heterogeneous, meta-analysis is either not possible, or unwise*." Andrews & Harlen (2006)
- MA cannot compensate for poorly designed experiments. When studies in the MA are flawed so are MA outcomes.

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GOOD METHOD TELLS A STORY

- *"One well designed experiment should trump a phalanx of poorly controlled, imprecise observational studies based on uncertain statistical specifications"*

(Kruger 1999)

ACHIEVED WITH EXCELLENCE

- In a controlled experiment in first year university economics classes using the same instructors for all sections and controlling for variation in:
  - » instruction,
  - » lecture material,
  - » topic coverage
  - » student abilities, etc

and repeating the study over several semesters

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ACHIEVED WITH EXCELLENCE

statistically significant evidence is found that small class size has a positive impact on student performance.

(Walker and Arias, 2004)

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NOT ACHIEVED #1

- "*Despite the … strong evidence of their value… Hanushek has engaged in a vigorous campaign to convince … the public that small classes are not an efficient way to improve student performance.*
- *Few researchers take this position."*

(Finn, 2002)

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NOT ACHIEVED #2

- *Hanushek's reviews include many studies that used small and/or inappropriate samples or did not employ controls for other school characteristics.*
- *In addition, most of the studies examined* student-teacher ratios, *which invalidates conclusions about class size.* *(Biddle & Berliner,2002)*

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NOT ACHIEVED #3

- *"… studies cited by Hanushek are … of pupil-teacher ratios (PTRs), … at … district, state, or national level. PTRs … do not reveal … how many students are actually in classrooms. PTR includes regular teachers, special education and … teachers who don't have … classrooms (e.g, remedial teachers…), administrators, and other staff members…*

(Finn, 2002)

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NOT ACHIEVED #4

- *Researchers at Chicago University noted Hanushek's analyses did not take into account that some studies were more informative than others because they were based on larger samples.*

- *They reanalyzed his data with meta-analysis methods that weight studies by sample size, and reached the* ***opposite conclusion*** *– that resources (including class size) do impact on academic achievement.*

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NOT ACHIEVED #5

- Krueger found 277 "studies" Hanushek cited were really 277 statistics from 59 studies.
- Some studies contributed far more than others. Two, contributing 48 statistics, accounted for most negative findings.
- Several studies misinterpreted or mis-coded.
- Krueger reanalysed Hanushek's work, counting each study once, accounting for higher quality of some studies than others, and for some samples being more atypical than others.
- In all cases his results were the reverse of Hanushek's.
- He concluded *"resources in general, and class size in particular, are significantly related to academic performance..."*

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A NZ PAPER

The paradox of reducing class size and improving learing outcomes, (Hattie 2005), concludes that class size reduction can be worthwhile, if certain conditions are met, but:

- *Not new research - a review of existing papers and meta-analyses, with reference to differences in class size and PTRs measurements but no attempt to separate them in looking at previous research.*
- *No definition of learning outcomes and terminology changes - hard to be sure if achievement, performance, engagement, students attention, students retention etc, or only some of these have been included in effect size in relation to learning outcomes. E.g. references to Blatchford, Bassett and Brown (2005) seem to suggest that improving the climate of the classroom isn't a learning outcome.*
- *Decontextualised – no allowance for distinct settings (country, age group, cultural and social domain).*
- *Appears to be researcher bias (e.g. "if **we** cannot stop the tide of parent and teacher lobbying for smaller class size...").*
- *Seems to be selection bias, e.g. no critique of Hoxby study and 'teaching methods' section emphasises literature from the 80's (only one from 2004).*
- *Appears to promote the role of teacher quality on student outcomes – notion lacks currency if class size has significant impact on student outcomes.*
- *Conclusions introduce new ideas - including disruptive students and that class size needs to placed into the wider social and cultural domain of the educational system - without discussion of these in body of paper.*

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SIZE DOES MATTER

- Education is not a mass- production effort, but a personal and individual experience.

- Class-size reduction is about finding appropriate casework loads, because much of sound educational practice consists of individual instruction, coaching, mentoring, and tutoring.