Does Standards-based Grading Work?

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What is PARLO?

Proficiency-based Assessment and Reassessment of Learning Outcomes

Primary Goal of PARLO Project
Improve attitudes, engagement, and achievement of 9th grade (Year 10) mathematics students
Background

• Young Women’s Leadership Charter School (Chicago)
  – School-wide PARLO system
  – Highest graduation rates of all non-selective schools, high college rates
    Farrington and Small (2008) at American Youth Policy Forum

• District in Greater Philadelphia Area using SBG
  – Positive trends in student data
    Clymer and Wiliam (2007) in Educational Leadership
  – Until...

• Villanova University Study
  – Two classes of introductory statistics – PARLO and Control
  – Same instructor, similar class time
  – Validated instruments - CAOS and SATS
CAOS = 17.7 + 6.2 proportion (p-value=0.014)

p>0.1, controlling for Math SAT
Attitudes

Dependent, non-paired t-test

\[ \text{Var(Gain)} = \text{Var}(X_2 - X_1) = \text{Var}(X_2) + \text{Var}(X_1) - 2 \text{ Cov}(X_2, X_1) \]

Cov determined through internal Vars and external Corr
No “Second Class” Learner?

Perfect!
NSF PARLO Study Timeline

Proposal Submitted to NSF
Mar 1, 2010
Funding Begins

2009-10
Cohort 1: Recruitment and PD

2010-11
Cohort 1: Year 1
Cohort 2: Recruitment and PD

2011-12
Cohort 1: Year 2
Cohort 2: Year 1

2012-13
Cohort 1: Optional Year 3
Cohort 2: Year 2

2013-14
Optional PLCs (PARLO only)

2014-15

Students: Pre/Post Content and Attitude
Teachers: Pre/Post Instructional Practice
Classroom/PLC Observation
Teacher/Administrator Interviews

Student Demographics
11th Grade PSSA
Data Cleaning
Analysis
Dissemination
PARLO Schools - Recruitment

• Study powered for 42 schools; got 29
• Presented to 5 IUs = 79 school districts
• Administrator support and teacher buy-in
Reasons for Joining or Not

• Reasons for Joining
  – It’s in line with what we’re doing.
  – Administrators are really behind it. Teachers would be compensated.
  – Need to increase math scores.
  – This is right for students.

• Reasons for Not Joining
  – Too much on our plate right now.
  – This interrupts instruction.
  – Our parents will never go for this.
  – This is too much work.
  – The [standardized tests] are coming and this distracts us.
Professional Development

• All teachers
  – Creating Learning Outcomes
  – Implementing Formative Assessment strategies

• Additional PD for PARLO teachers
  – Monitor evidence of learning & reassessment
  – Using software

• Ongoing PD for PARLO teachers
  – Monthly PLC meetings
  – Content experts visited teachers’ classrooms monthly for support & guidance (beginning in study year 2).
Study Design

• Randomized Control Trial (RCT)
  – “We should model ed research after clinical trials”
• Mixed Methods (quantitative & qualitative)
• 9th grade Algebra & Geometry classes
• 29 schools participated: 15 PARLO & 14 control, **83 teachers & 3,168 students**
• Diverse makeup
  – Public, private, parochial, & charter schools
  – Urban, suburban, & rural school districts
Quantitative Methods

• Analytic data
  – Year 1 (cohort 1) excluded: Active consent (29% response), software issues
  – Year 3 excluded for cohort 1—voluntary
  – Complete pre/post response
    • 65% for content (23% pre only, 7% post only)
    • 67% for attitudes (24% pre only, 6% post only)
  – HLM using student <> class <> teacher <> school

• Limitations
  – PARLO only for one year
  – No investment to take test seriously
  – Traditional, multiple choice test after PARLO “evidence”
HLM – Potential Covariates

• Student-level – 8th PSSA, Gender, ESL, Ethnicity, Disability, Gifted, IEP, SES Indic, Income by zip

• Teacher-level - Fidelity of Implementation (low, med, high), Algebra/Geometry, Years taught

• School-level – PARLO/Control, Cohort/Year, Public (vs. other), Urban (vs. other), School Characteristics (Attend, IEP, ESL, low SES, Male, White, Grad Rate, Dropout Rate, College Bound, PSSA, Teacher Experience, Spending/Pupil)
Results - Content Increase

PARLO students +13% (32% -> 45%)
Control students +8% (29% -> 38%)
5% higher increase (HLM p=0.03)
6% higher increase with full model (p=0.02)
Results - Student Attitudes

PARLO students vs Control:

- **ENJOYMENT** (-0.11, p=0.04)
- **SELF-CONFIDENCE** (-0.08, p=0.052)
- **MOTIVATION** (-0.07, p=0.19)
- **VALUE** (-0.04, p=0.42)

Enjoyment:
(Not) Mathematics is one of my most dreaded subjects.

Self-Confidence:
(Not) My mind goes blank and I am unable to think clearly when working with mathematics.

Motivation:
I get a great deal of satisfaction out of solving a mathematics problem.

Value:
I can think of many ways that I use math outside of school.
In the first year of PARLO: Control schools went up 2.1% and down 3% in terms of percent students proficient or better for the two cohorts, respectively, whereas PARLO schools went up 10.9% and 8.3%, respectively.
Qualitative Methods

• Qualitative Research Team
  – Nancy Lawrence & Kathleen Krier

• Data Sources:
  – PLC meeting observations
  – Classroom observations
  – Teacher interviews
    • randomly selected – yr. 1&2, All participating teachers – yr. 3
    • Coded/Analyzed using NVivo
  – Administrator interviews
  – Teacher questionnaire (instructional practice)
Q1) Has your instruction changed as a result of PARLO? If so, in what ways?

Q2) Have you adopted any new practices or routines to support PARLO? Can you describe them to me?

84% of teachers altered their instruction/assessment

Teacher Questionnaire – end of the study

– 96% indicated that their instructional practices had changed as a result of PARLO.

– 92% indicated that they plan to use some/all of the formative assessment/instructional practices in the future.
Feedback

3) Has the feedback you give to students changed as a result of PARLO? If so, how?

78% of teachers changed feedback practices during study

Teacher Comments:

– I try to give more specific feedback, for lots of reasons ... And because I’m trying to understand what’s at the root of their error, it forces me to look more deeply into their work.

– It is much more specific ... And I think that not giving them grades ... maybe they’re not quite as focused on grades ... as much as ‘What do you know and what do you not know’?
Differentiated Instruction

4) Did you have different goals for different students? If so, describe that to me.

5) Did you adjust your instruction in any way today? If so, tell me about it.

• 46% of teachers had different goals/adjusted instruction during the observed lesson.

• Teacher Comment:
  – The differentiation was not there two years ago ... not as much as it is here. And I think kids get to work at their own pace ... and it gets them less frustrated working at that pace and makes them feel much more confident.
Reassessment, Grades, & Grading

• Reassessment for full credit was not common practice before PARLO.
• All teachers allowed students to reassess (with certain requirements).
• 68% of teachers reported that grades & grading were the most challenging issues.
• Philosophical issues with grading
  – Letting go of the familiarity of grades towards Not Yet, Proficient, & High Performance
• Managerial/Logistical issues with grading
  – Overseeing reassessments
  – Providing feedback
  – Implementing formative assessments
  – Increased teacher workload
Student Engagement

Challenges

• The system was unfamiliar to students and demanded active, sustained participation.

• No other subject was using PARLO, nor would any math class in the future – difficult to get student buy-in.

• It was difficult to **motivate all** students to take advantage of reassessment & accept new **responsibilities for learning**.

• **Contentment** problem – too many students **okay** with Proficient; little incentive to try for High Performance

Successes

• **PARLO** gets the kids interested in math. It’s nice to see them work hard and feel confident and ...**feel in charge** of their math destiny.

• They are **finally understanding** that knowledge is gained and built over time. You have to work at it, and if you want to keep it, you have to continue to work at it.

• I think their **work ethic** is better. They realize they need to keep on top of stuff, keep working. If you fail one thing, don’t say, ‘Oh! It’s over!’ It’s not over!! You can still learn.
Parents/Guardians (Teachers’ Perspectives)

• Support traditional approach (teacher report): Control teachers didn’t change their view (-0.12); PARLO teachers felt Ps/Gs liked traditional grading (+1.17) (p<0.05)

• Ps/Gs minimally involved and wanted status quo.

• Ps/Gs appreciated reassessment (76%), but appreciation developed slowly, after confusion, skepticism &/or resistance. Interest in PARLO often spiked after 1st marking period (when grades were given).

• P/G Focus Groups attempted, no volunteers
Summary: Qualitative

• Teachers persisted despite challenges, indicating philosophical buy-in.
• Teacher’s instructional practices changed during the study and most reported they will continue all or some PARLO practices in the future.
• Teachers understand the content better and were more reflective.
• Teachers know better what their students know and what learning/understanding gaps exist.
• Teachers observed increased student ownership, responsibility, & motivation in many students but not all.
• Implementing PARLO in isolation is hard.
Summary: Quantitative

• Student performance
  – Slightly higher increase on PARLO vs. Control
    • Likely due to limitations
  – 11th grade PSSAs increased more for PARLO students

• Student enjoyment lower, self-confidence trending lower, motivation and engagement lower but not significantly
  – PARLO is work! It demands active participation from students.
The Future of PARLO (at least ours)

• Publications - forthcoming
  – Effects of PARLO vs. Control, Parent/Guardian, How Teachers Changed Their Instructional Practices

• Ohio – two STEM-focused charter schools using PARLO system school-wide and PARLO Tracker

• STEM Schools in Egypt
  – $25 mil World Learning/USAID grant
  – 5 STEM schools for high-performing students

• Core PARLO – under review at NSF
  – Fewer schools with additional training for students based on Carol Dweck’s work
Questions?

This talk is available on my website:

http://homepage.villanova.edu/michael.posner