

Best Practices in Handwriting Instruction

Benefits of an OT/Teacher Model for First Grade Handwriting Instruction

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Key Questions

- What handwriting instruction methods are optimal?
- What best practice handwriting interventions emerge from the research evidence?
- Using the evidence, how can we develop educational standards for when, what, and how handwriting should be taught?

Rationale for Handwriting Instruction Standards

1. For most children to develop automatic, legible handwriting, specific instruction in handwriting is needed. 23-25% of students struggle in handwriting ^{1, 2, 3}
2. When the mechanics of handwriting become automatic, students can better focus on writing content and composition. ^{4,5}

1 Graham et al., 2008; 2 Volman et al., 2006; 3 Weintraub et al., 2009;
4 Berninger et al., 1997; 5 Berninger et al., 2000

Rationale for Handwriting Instruction Standards

3. Linking handwriting instruction to authentic writing helps students become fluent and competent writers. ^{6, 7}

6 Graham et al., 2007; 7 Jones & Christensen, 1999

What Theory-based Principles Have Been Instituted in Handwriting Curricula?

- A continuous, vertical stroke in manuscript handwriting is easiest to learn.
- Letters should be taught developmentally from easiest to form (circles) to most difficult to form (diagonal lines).
- Terms to describe letter formation should be simple and consistently used.

What Handwriting Interventions Demonstrate Efficacy?

1. Teacher modeling of letter formation ^{1,2}
2. Visual/verbal cueing that is faded ^{1,2}
3. Encouraging students' self-direction (verbal self-talk) ^{3,4}
4. Providing a context for repeated practice ^{1, 2}
5. Giving students immediate, specific feedback ³
6. Encouraging student self-evaluation ^{2,4,5}

1 Berninger et al., 1997; 2 Graham et al., 2000; 3 Jongmans et al., 2003; 4 Graham et al., 2005; 5 Weintraub et al., 2009

What Handwriting Interventions Complement Instruction and Are Effective with At-risk Students?

1. Strategies to promote motor planning ¹
2. Activities to improve visual motor skills ^{1,2,3}
3. Sensory processing interventions ^{1,2,3}
4. Cognitive strategies such as self-evaluation ^{4,5}
5. Motor learning strategies ^{4,5}

1 Peterson & Nelson, 2004; 2 Denton et al., 2006; Jongmans et al., 2003; Weintraub et al., 2009

Phases of Handwriting Instruction

- Instructor presents and models letters
 - Visual model (near and far)
 - Use verbal terms that become simple mnemonics for remembering letter formation.
- Students practice
 - Repeated practice of targeted letters
 - Wide lined paper
 - Consistent cueing (visual or verbal) as needed
 - Some practice without model (by memory)

Phases of Handwriting Instruction

- Feedback
 - Immediate, specific adult feedback
 - Encourage and reinforce self-evaluation
 - Peer feedback
- Link to writing
 - Continue peer modeling and reinforcement; self-regulation strategies, self-evaluation
 - Remind students of letter formation in writing
 - Reinforce organization, handwriting, and mechanics during writing workshop
 - Continue to use mnemonics for letter formation reminders for good handwriting

Best Practices: How to Implement Strategies

- A co-teaching model with teacher, intervention specialist, and occupational therapist
 - Students benefit from different skill sets
 - Instruction for struggling students is easily embedded in the classroom instruction
 - Allows groups of diverse learners to be better served
 - Enables use of small group instruction and activities
 - Allows for individualized instruction and feedback

Planning Meetings

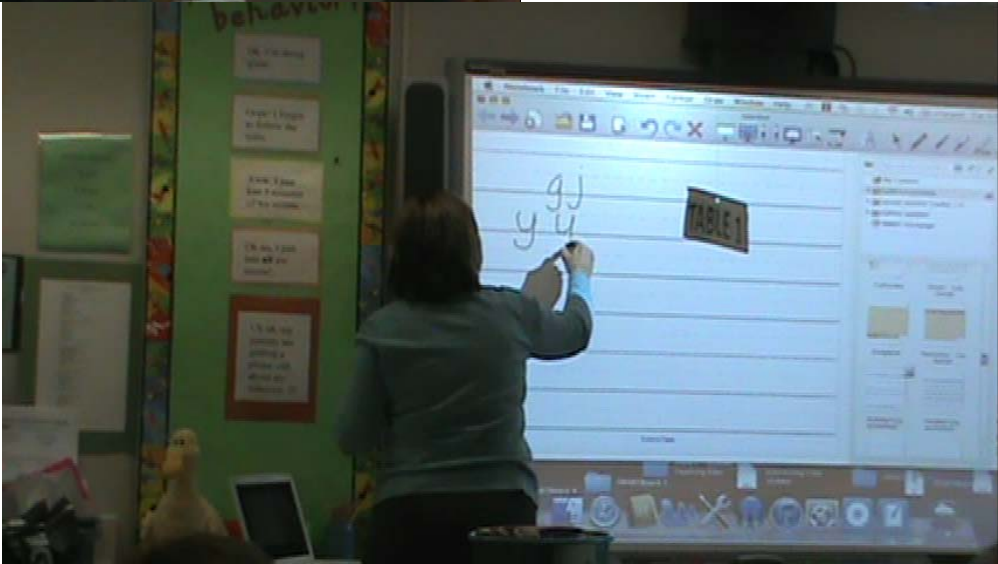
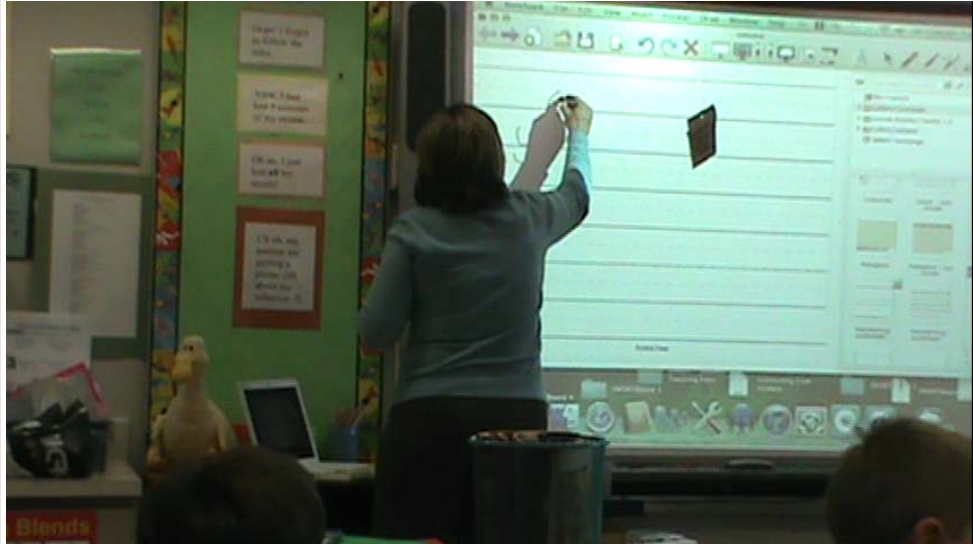
- The OT and teachers met weekly to review the students' writing samples, discuss potential strategies, and plan instruction.
- The team also planned accommodations and interventions for the students who were struggling.

Format for Handwriting Instruction

- Handwriting Instruction
 - Smart board with students practicing on small white boards
 - Self-evaluation and peer-evaluation
- Small-group activities (6-7 students)
 - Motor planning
 - Visual motor integration
 - Cognitive strategies
- Writing workshop



Example of Instruction



Example of Small Groups



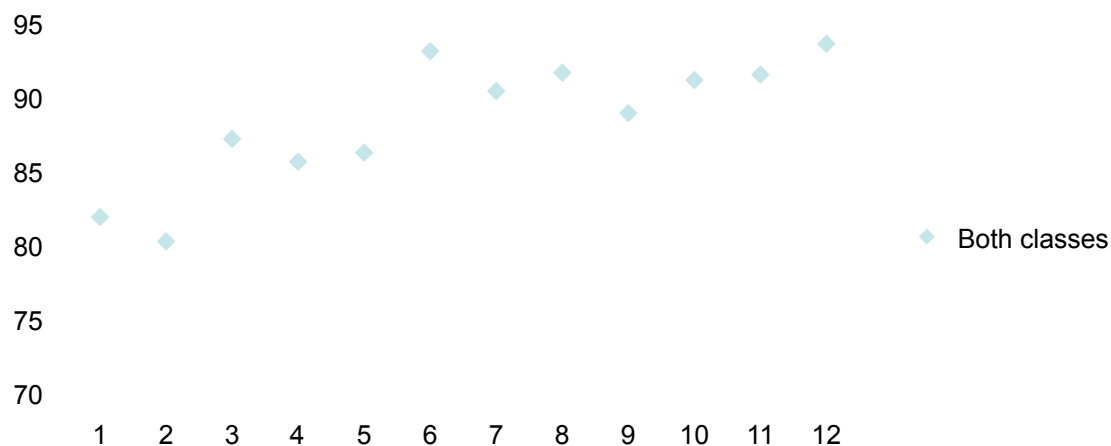
Small-group Activities



Writing Samples

- Students' weekly writing samples during the program.
- Week 1 (m=82%) to Week 12 (m=94%).

**Weekly Averages for Legibility:
Classes Combined**



Findings From Trial

- Compared effects of Write Start to Standard Handwriting Instruction
- Characteristics of Students by Group (n=65)

Characteristics	Write Start	Standard Handwriting
Number	36	29
Age Mean	77.4 mo	79.2 mo
IEP	5	3

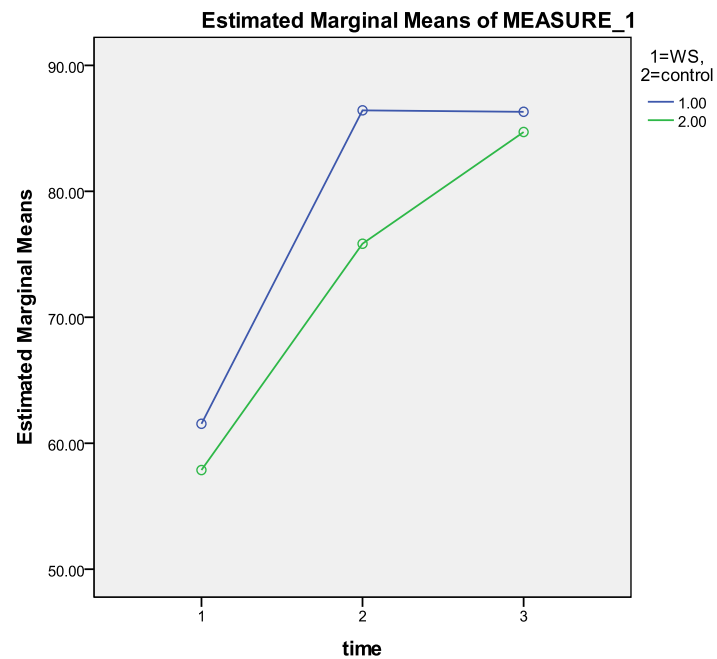
Results of Program for Students' Handwriting and Writing

- The Write Start program provided instruction in handwriting/writing twice a week (for 45-50 minutes).
- The comparison classrooms taught handwriting every morning for ~20 minutes, and integrated handwriting instruction into writing assignments.



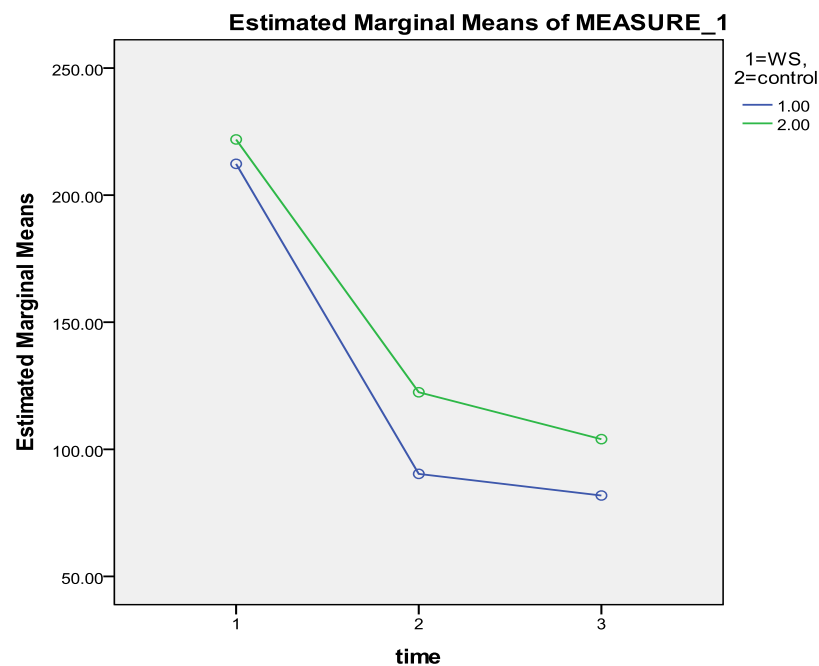
ETCH: Legibility Writing the Lower-case Alphabet: Percent Legibility

Time	Write Start	Comparison
Pre test	61.5 (3.7)	57.9 (4)
Post test	86.4 (2.8)	75.8 (3)
Follow up	86.3 (2.4)	84.7 (2.6)



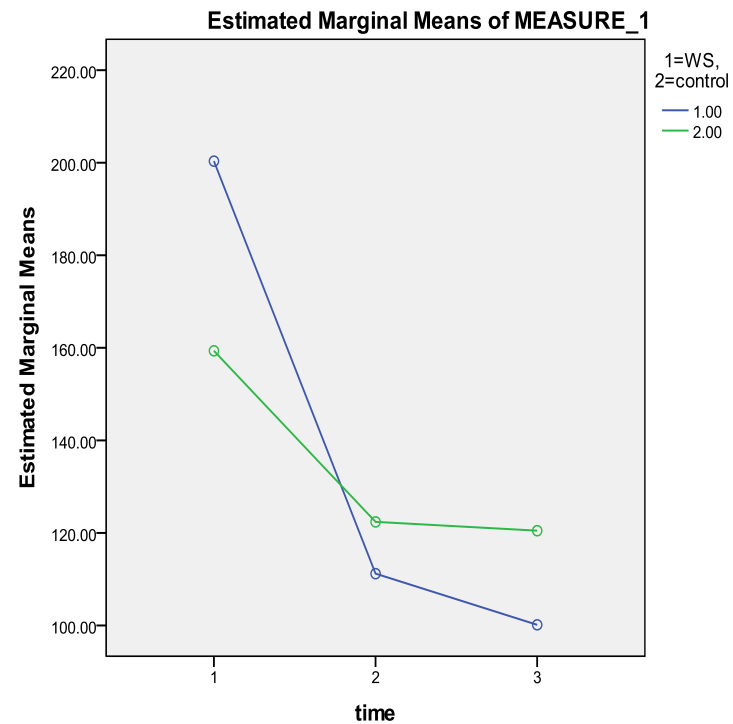
ETCH Time (Seconds) to Complete Alphabet Lower-case

Time	Write Start	Comparison
pre	212.3 (18.6)	221.9 (19.7)
post	90.3 (7.3)	122.452 (7.7)
Follow up	81.8 (6.6)	104 (7.0)



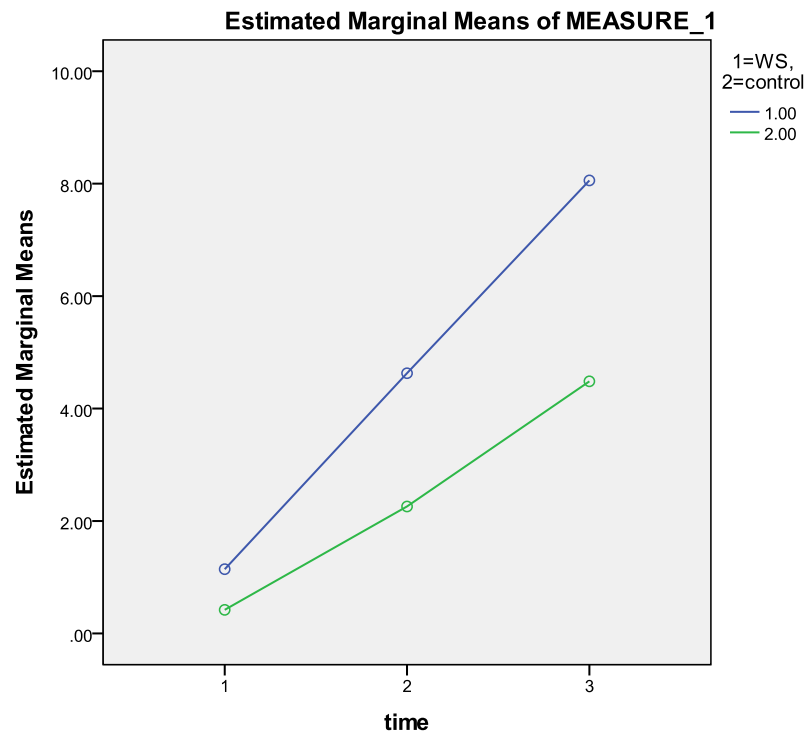
ETCH Upper-case Alphabet Time

Time	Write Start	Comparison
Pre	200.3 (14.3)	159.3 (15.2)
Post	111.2 (7.9)	122.4 (8.4)
Follow up	100.1 (6.7)	120.5 (7.2)



Fluency (Woodcock Johnson)

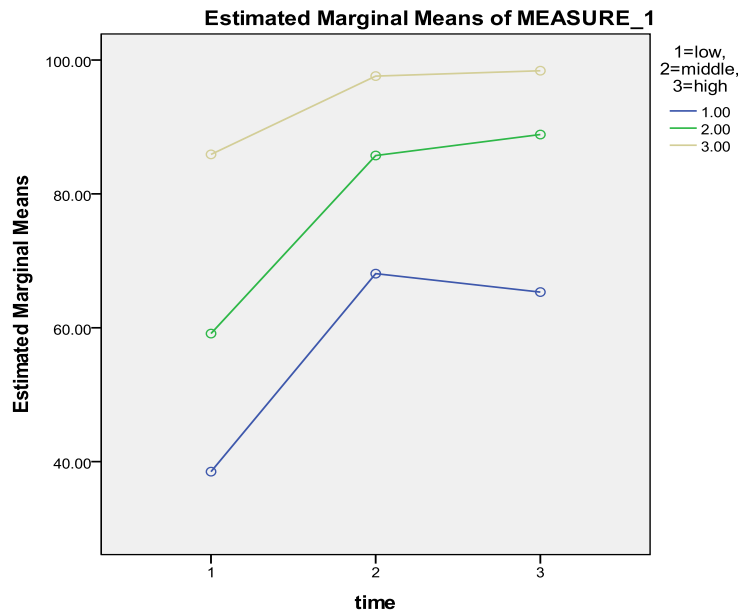
Time	Write Start	Comparison
Pre	1.1 (.25)	.42 (.26)
Post	4.6 (.63)	2.3 (.67)
Follow up	8.1 (.77)	4.5 (.81)



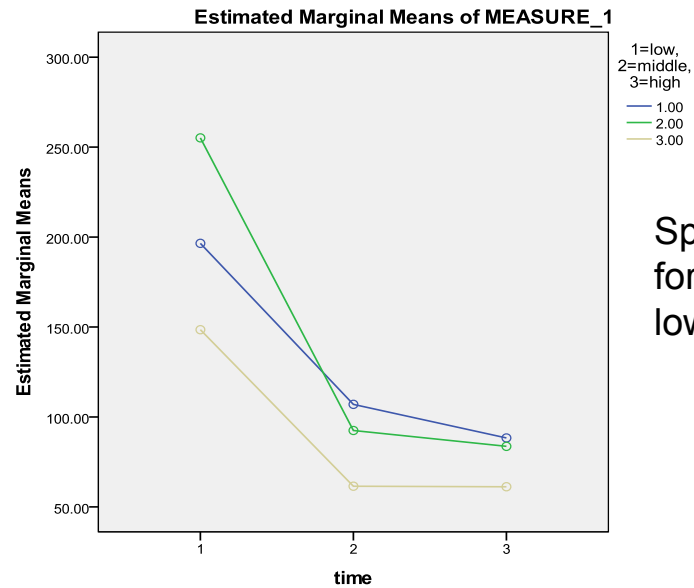
Comparison of Three Ability Groups

- High ability: 80% or higher at baseline
- Middle ability: 50% or higher at baseline (students struggling with handwriting)
- Low ability: Under 50% at baseline (often child had IEP)
- We compared the progress made by each group. The focus for this program was the two lower groups.

Comparison of Child Progress at Different Ability Levels: ETCH Scores

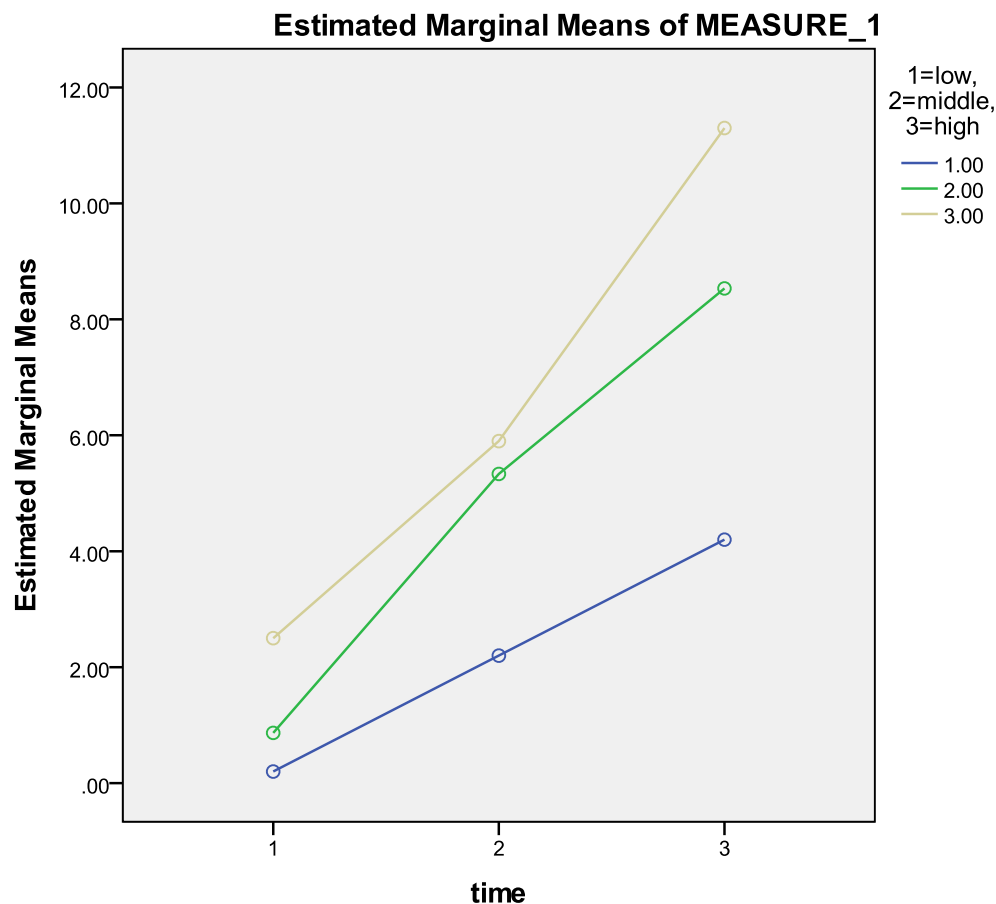


Lower case
alphabet
legibility %



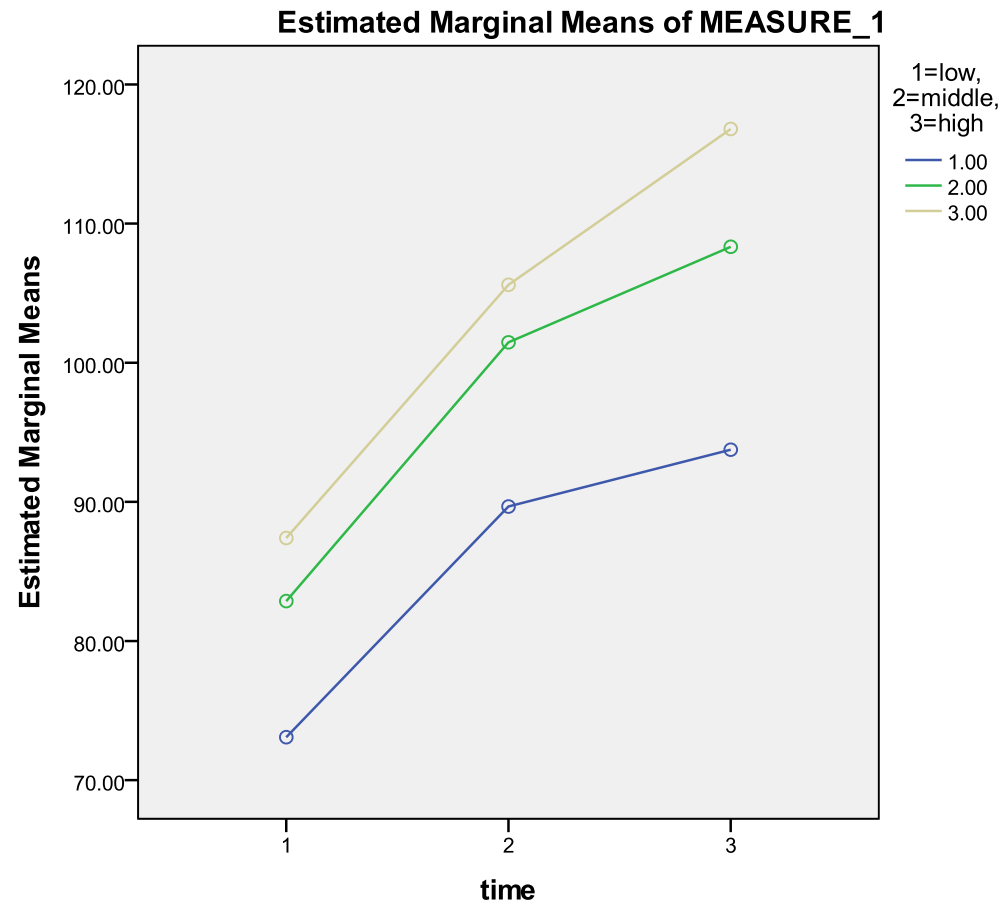
Speed in seconds
for writing the
lower case alphabet

Woodcock Johnson Fluency Raw Scores



Those with good handwriting made rapid and significant gains in fluency. The at-risk group made similar gains.

Woodcock Johnson Fluency Standard Scores



Teacher and OT Feedback About Program

- The teachers and students were enthusiastic about the program.
- The students liked the novelty of each session and enjoyed the additional attention.
- They were very engaged in the handwriting practice and the writing workshop.
- The teachers appreciated learning from OT, particularly in strategies to accommodate students with special needs.
- The OT appreciated learning about the curriculum and classroom management.
- The planning time seemed to be particularly valuable and was essential to the success of the sessions.

Summary of Findings

- Given the number of students who will struggle to learn handwriting, well designed instruction is needed.
- Strategies for teaching handwriting have been developed, tested, and found to be effective.
- Instruction should include supports for at-risk learners.
- Review of students' work and planning for individualized supports was key to the program's success.
- Strategies linked to handwriting improvement (e.g. simple script, visual cues, self-regulation, self-evaluation, peer-evaluation) set the stage for writing competence.