



Using Standardized Assessment to Identify and Teach Prerequisite Numeracy Skills to Learners With Disabilities Using Video Modeling

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INTRODUCTION

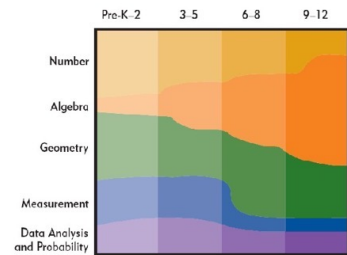
- Identifying missing prerequisite skills is important for successfully teaching mathematics skills
- The National Longitudinal Transition Study (NLTS2) found that having the ability to read and do basic math leads to more opportunity for employment and independent living.
- A review of the literature shows little attention is given to mathematics interventions for students with moderate and severe disabilities.
- Video modeling has been effective in teaching a wide range of skills to students with moderate to severe disabilities. Breaking the skill down into its component steps and teaching each one is an evidence-based practice that can be applied to academic targets

RESEARCH QUESTIONS

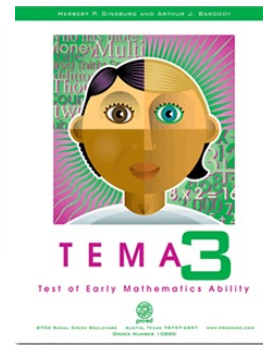
- To what extent can the pre-test responses on a standardized, normative assessment be used to select a target skill to teach?
- Can a selected skill be taught to participants using video modeling?
- Does teaching the identified missing skill lead to statistically significant improvements in mathematics scores on a post-test?

METHOD

- Learners were assessed for missing mathematics prerequisite skills using the Test of Early Mathematics Ability (3rd edition) (TEMA-3)
- Skills were determined based on TEMA-3 pretest scores
- A pretest/posttest and multiple baseline across participants single case design was used to assess progress
- Skills targeted: Double digit addition with carrying, more/less, which is closer, and number identification
- Video models based on task analysis of the skill were created for each student and loaded onto an iPad Mini
- During intervention sessions, learners were given a worksheet with 5 problems, a pencil, and the tablet and directed to complete the worksheet using the videos
- If the learner made an error, the researcher reset the scene and instructed the learner back to the videos a second time. Further errors resulted in least-to-most prompting to complete the problem



National Council for Teachers of Mathematics (2000)



RESULTS

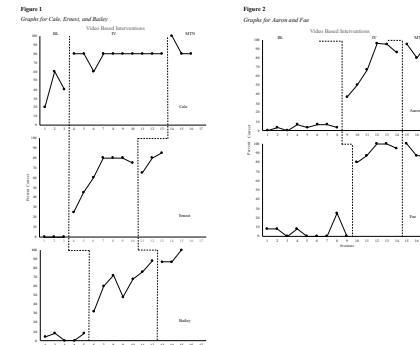
- Visual inspection showed an immediate change in level from baseline to intervention across all participants
- All learners faded the videos on their own once they learned the skill
- Fading of the videos resulted in no skill loss
- Maintenance of the skills was high for all learners
- Teaching the missing preskill resulted in overall improvement in each learner's overall math ability scores on the posttest

TAKEAWAYS

- Assessments can be used to identify missing mathematics preskills
- A standardized assessment, like TEMA-3 is nice to use but not necessary
- Providing a task analysis of the skill guides the students through the process
- Video modeling can be used to teach missing mathematics preskills
- No professional video editing skills are required to produce effective videos
- Teaching missing mathematics preskills can lead to general improvement in mathematics
- Using a video model may reduce the need for extended individual instruction

SELECTED BIBLIOGRAPHY

<https://onlinelibrary.wiley.com/doi/abs/10.1002/pits.22473>



To assess the effect of the intervention, Tau-U was calculated for each learner and as an omnibus figure by combining all learners (Lee & Cherney, 2018). Parker and Vannest (2009) suggest that any Tau-U value between +/- 0.66 and +/- 0.92 is a medium and above +/- 0.93 is a large effect.

Tau-U Values for Individual Students and Combined Across Students

Students	Confidence Interval (90%)		
	TAU	P Value	
Aaron	1	0.0019	0.469<-1
Bailey	1	0.0045	0.421<-1
Cale	0.9667	0.0142	0.318<-1
Ernest	1	0.0167	0.313<-1
Fae	1	0.0055	0.408<-1
Combined	0.9943	0	0.726<-1

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