

Effects of a Number Line Intervention Using *DéCaLigne* Software on Number Accuracy and Arithmetic in Two Children with Mathematics Learning Disabilities

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CONTEXT

Significant correlation between number line estimation and mathematical competence (Schneider et al., 2018)

Mathematics Learning Disabilities (MLD)

- Difficulties in accurately estimating number position on number line (Marcon & Lafay, in press)
- Difficulties in arithmetic (Geary, 1993)

AIM

To investigate the effectiveness of an intensive and individualized number line intervention on number accuracy and arithmetic skill in children with MLD

METHOD

Design: Simple phase change across subjects



Participants: 2 French children with MLD (9 and 15 years old)

Intervention on number line estimation and calculation (+ and -)

- Computerized-assisted intervention: *DéCaLigne* (Helloin & Lafay, 2018)
- Three 30-minute sessions per week over 4 weeks
- Explicit instruction with corrective feedback (computer and researcher)

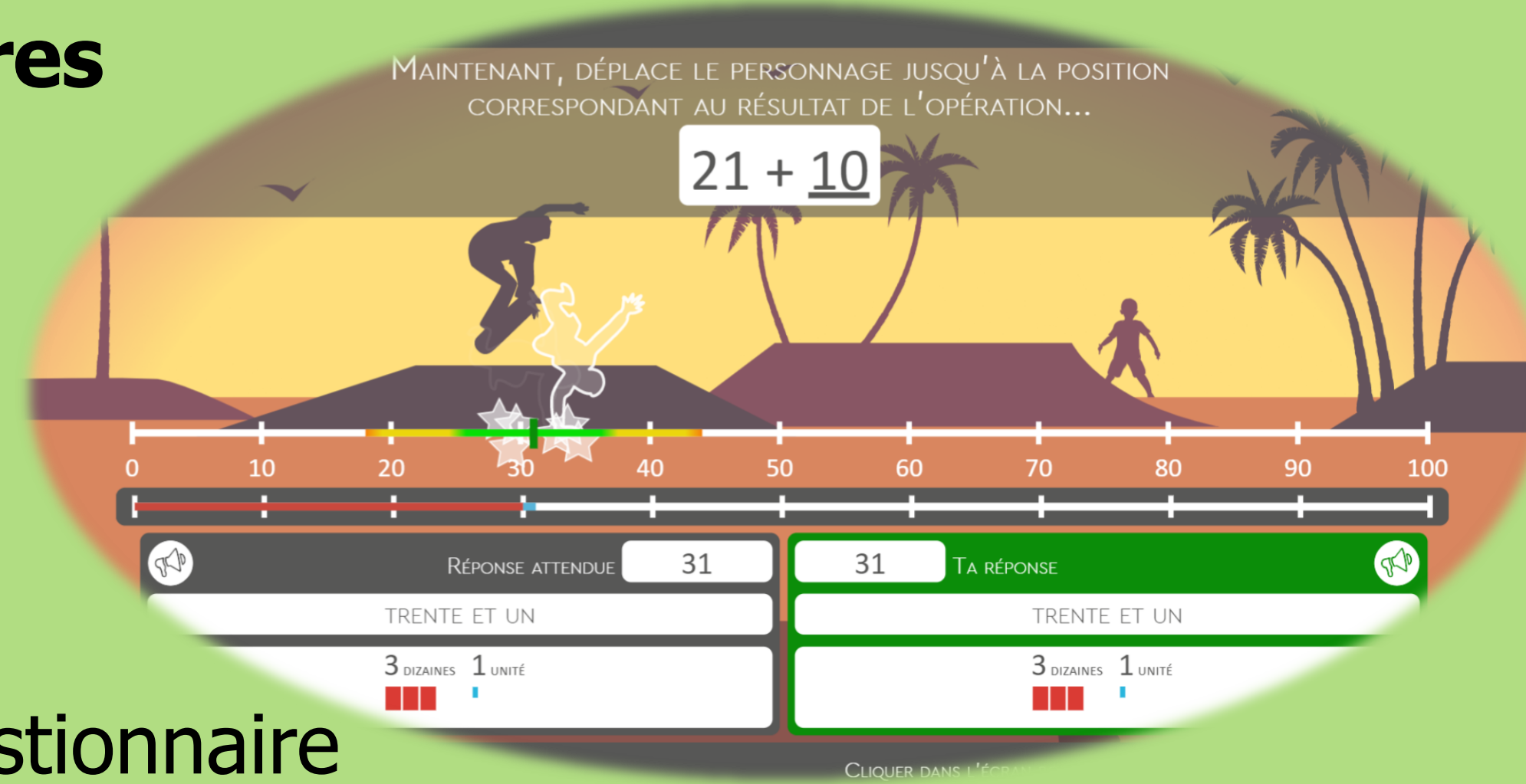
Learning and Transfer Measures

- Estimation on number line
- Calculation with number line
- Calculation without number line

Control Measures

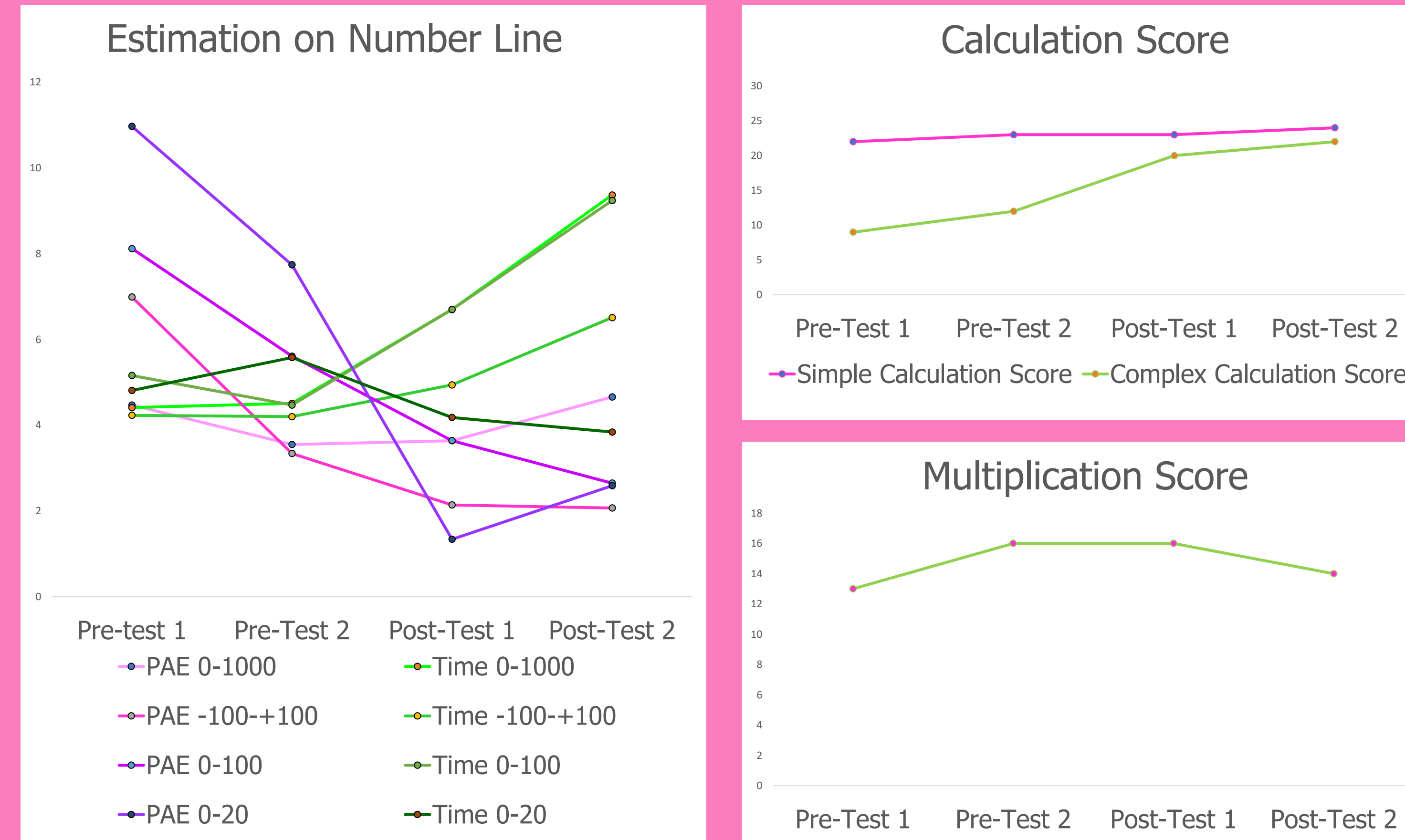
- Number reading
- Multiplication

Social Validity: Satisfaction questionnaire

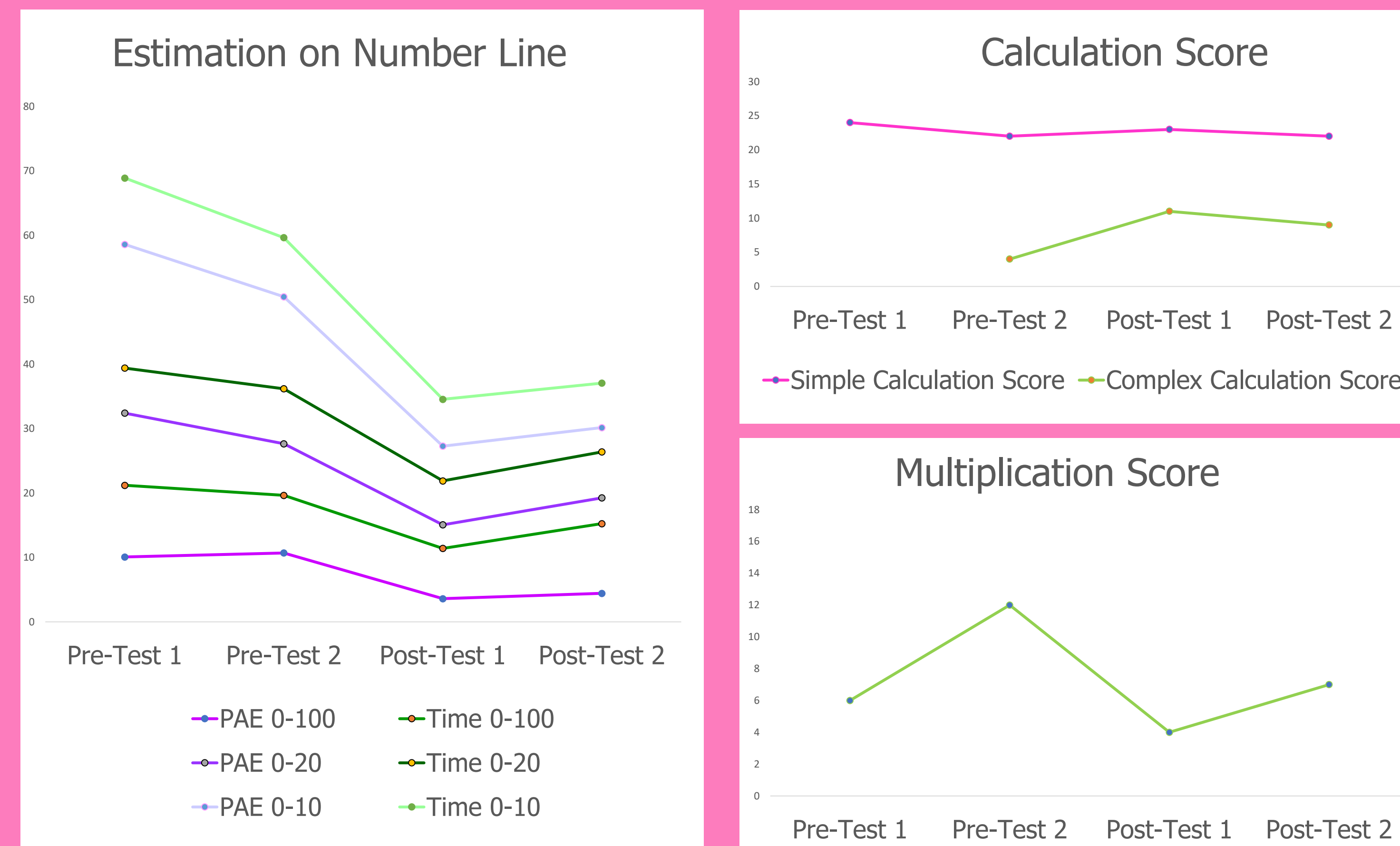


RESULTS

Child 1 : 15 years old



Child 2 : 9 years old



PAE : Percent Absolute Error = (child's estimate – number to be estimated) / number line scale

CONCLUSIONS

Improvement of children's number line accuracy and arithmetic performance (in complex calculation) immediately after intervention

Maintenance of children's number line accuracy and arithmetic performance one month later

Implications

Theoretical: Relationship between estimation and calculation using a number line and arithmetic skill in MLD population

Clinical: The number line intervention offers hopeful horizons to clinicians and teachers

Future Research

Findings are promising, but replications are needed to determine if intervention could be an evidence-based practice

To test the effects of different components of the current intervention (e.g., task, duration)