ASSESSING EARLY NUMBER LEARNING USING THE LEARNING FRAMEWORK IN NUMBER

Maria S.Weitz

University of the Witwatersrand

TARGET AUDIENCE: Foundation Phase: teachers/ mentors/ policymakers

DURATION: 2-hour workshop

MAXIMUM NO. OF PARTICIPANTS: 30

MOTIVATION

Whilst the 2012 ANA report (DBE, 2012) indicates improvements in Grade 3 learner performance, mean attainment is still low. Specific problems have been identified around learner strategies for working with early number (Schollar, 2009). Recent work has pointed to issues in the teaching of early number (Ensor et al., 2009; Venkat & Niadoo, 2012). This work suggests that teachers continue to have difficulties in terms of understanding the nature of progression in early number learning, and assessing learner responses in relation to this progression.

Given this evidence, I aim, in this workshop, to introduce and discuss the Learning Framework in Number (LFIN) model (Wright, Martland, & Stafford, 2006) and its associated diagnostic tests with Foundation Phase teachers. The LFIN provides detail on the trajectory of early number learning based on a small range of aspects. In the workshop, my aim is to share data on learner responses (anonymised video or summarized transcript data), and work together with the group to assign LFIN levels to this data. This will help teachers to diagnose learners' current strategies, in order to constructively follow up in teaching.

CONTENT

I will begin by sharing and explaining the detail of the Learning Framework in Number (LFIN), drawn from the work of Wright et al (2006; 2010). We will then watch anonymised video of a learner responding to LFIN test tasks. In groups, participants will then discuss and decide on which LFIN Stage the child is predominantly working at. This will then be shared across the whole group. The final activity is based on thinking about what good follow up teaching might look like.

The worksheets/handouts will have tables on, where we will code the learners levels and stages.

ABSTRACT

This workshop is intended to support number teaching amongst Foundation Phase teachers. It is based on the data drawn from a research-based early number test. The purpose of the workshop is to share understandings of the ways in which early number learning progresses towards more sophisticated strategies. This involves moving away from a sole focus on the production of correct answers to broader attention to HOW

Weitz, M. (2013). Assessing early number learning using the learning framework in number. In Z. Davis & S. Jaffer (Eds.), *Proceedings of the 19th Annual Congress of the Association for Mathematics Education of South Africa*, Vol. 2. (pp. 75 – 77). Cape Town: AMESA.

these answers are produced. Specifically, more sophisticated strategies involve higher levels of working with abstract conceptions of number.

Within this workshop, my focus is on working with teachers to share the research-based framework (Wright et al, 2006) that describes progression in the strategies that children use in counting, addition and subtraction tasks. This framework, is specified in terms of 11 aspects. In this workshop, the 5 aspects that are used by the authors to provide a summary profile of learner understandings are introduced and discussed. These are:

a) The Stages of Early Arithmetical Learning (SEAL)
b) Base-ten Arithmetical Strategies
c) Forward Number Word Sequence and Number Word After
d) Backward Number Word Sequence and Number Word Before
e) Numeral Identification (Wright et al., 2006, p. 17).

Wright et al provide levelled descriptions for these aspects, drawing from the work of Steffe and colleagues (for example: Steffe, 1992; Steffe and Cobb, 1988; Steffe et al., 1983) – which are shared within the workshop. Wright et al. (2006) see counting as a developmental process, which they break down into 6 stages: emergent; perceptual; figurative-counting; initial number sequence; intermediate number sequence; and facile number sequence. Progressing through the SEAL stages entails a shift from more concrete to more abstract conceptions of number, with this shift broken down into a staged set of development indicators.

The central section of the workshop is based on analyzing the responses of one learner on a selected group of items drawn from Wright et al's diagnostic tests, and deciding where to place her in relation to the developmental trajectory seen in the LFIN model. This activity leads into a follow up discussion of ways to support the further learning of this child going forward.

The workshop is intended for Foundation Phase teachers, mentors and policymakers, who may be interested in developing ways of supporting learners to progress to more sophisticated and more efficient ways of working with early number tasks.

Content of the workshop and timeframes are detailed below:

Section	Content	Timeframe
1	Explanation of the LFIN framework – the Stages of Early Arithmetical Learning (SEAL) that are at the centre of this framework, and the sub-aspects feeding into SEAL	20 mins
2	Introducing the tests – selected items	15 mins
3	Sharing and coding data excerpts based on learner responses to selected items	45 mins
4	Discussing the coding of 5 aspects based on the LFIN	20 mins
5	Discussing next teaching steps based on analysis and the progression seen within LFIN	20 mins

REFERENCES

DBE. (2012). *Report on the Annual National Assessments 2012- Grades 1-6 and 9*. Pretoria: DBE.

Ensor, P., Hoadley, U., Jacklin, H., Kuhne, C., Schmitt, E., Lombard, A., et al. (2009). Specialising pedagogic text and time in Foundation Phase numeracy classrooms. *Journal of Education*, 23, 1, 5-29.

Schollar, E. (2009). *Towards Evidence-Based Educational Development in South Africa*.

Venkat, H., & Naidoo, D. (2012). Analyzing coherence for conceptual learning in a Grade 2 numeracy lesson. *Education as Change* 16(1), 21-33.

Wright, R. J., Martland, J., & Stafford, A. K. (2006). *Early Numeracy*. London: Sage Publications.

Wright, R. J., Martland, J., Stafford, A. K., & Stanger, G. (2010). Teaching Number: Advancing children's skills and strategies. London: SAGE Publishing Ltd.