The Information Density of School Mathematics

15. Literacy Research Network

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Abstract
Previous research emphasizes that language is used differently in different subjects. The development of a familiarity with the subject language is an important part of learning the particular subject (Shanahan & Shanahan, 2012). Therefore, the aim of this planned study is to contribute to the knowledge of the mathematical subject language´s progression through Swedish compulsory school. More precisely we will investigate how frequently long words and nouns, two linguistic features central within an academic language, are used in Swedish national tests in grade three, six and nine.

The theoretical point of departure is Systemic Functional Linguistics (e.g. Halliday & Matthiessen, 2004) where the analysis will use the meta-function “Packing”, previously elaborated by Persson (2016) and Bergvall (2016). Packing concerns the information density as realized by nouns and long words, which both has been described as typical features of academic and formal language (e.g. Halliday & Matthiessen, 2004).)

In this study, the level of information packing in three Swedish national tests (grade three, six and nine) is measured by the proportion of nouns and long words, and subsequently analyzed in order to describe the nature of the progression of the subject language through the school years.

The preliminary outcomes shows that there is a higher frequency of long words and nouns, thus a higher degree of packing, in grade nine. Translated examples of subject specific long words present in test tasks for grade nine are *equality*, *expression*, *equation* and *simplify*. Such long words are often also nouns. Examples of subject specific short nouns from the grade nine test are *mean* and *value*. Grade three tasks shows a lower level of packing. The nouns and long words present in grade three tasks are more often of an everyday character, for example *chocolate*, *lottery*, *garden* or *fence*. There are also subject specific long words and nouns such as *perimeter*, *square* and *distance*, but such words are not frequently used. Thus there is a progression in the mathematical subject language regarding the packing of information.

This study is highly relevant for Nordic educational research focusing on literacy and subject languages. The Nordic languages, as well as the Nordic school systems, have great similarities, and therefore the results of this study is highly applicable in a general Nordic literacy research context.

References

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