A TEACHING MODEL TO SOLVE ARITHMETIC WORD PROBLEMS

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INTRODUCTION

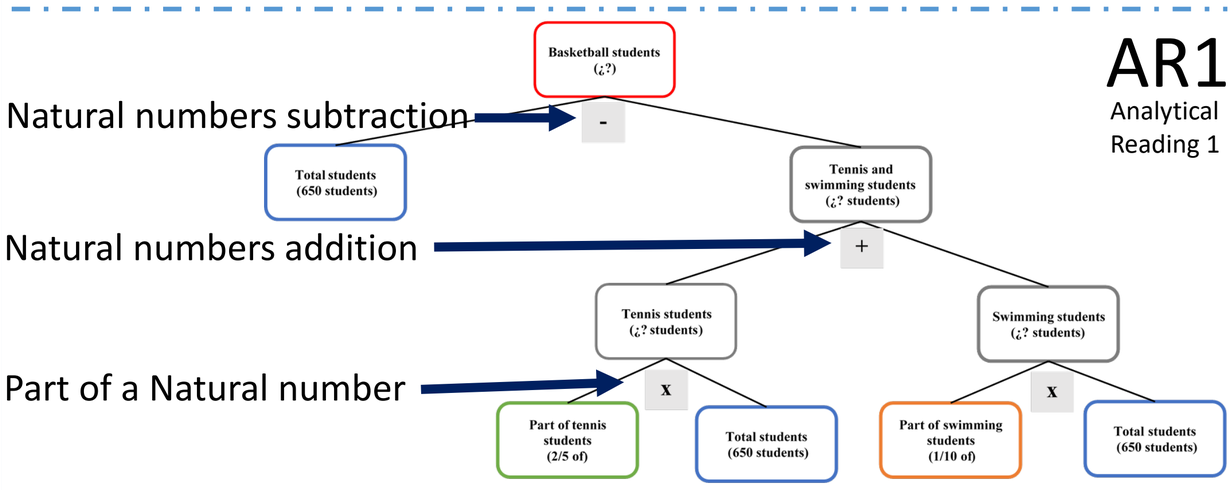
Arithmetic Word Problems (AWP) are mathematical tasks that have the potential to provide intellectual challenges for enhancing students' mathematical understanding and development (NCTM, 2000). It involves several cognitive operations such as reading and understanding the problem statement, detection of quantities and relationships between them (also known as Analytical Readings, AR), conversion of vernacular to mathematical language, or execution of a designed plan (Polya, 1945).

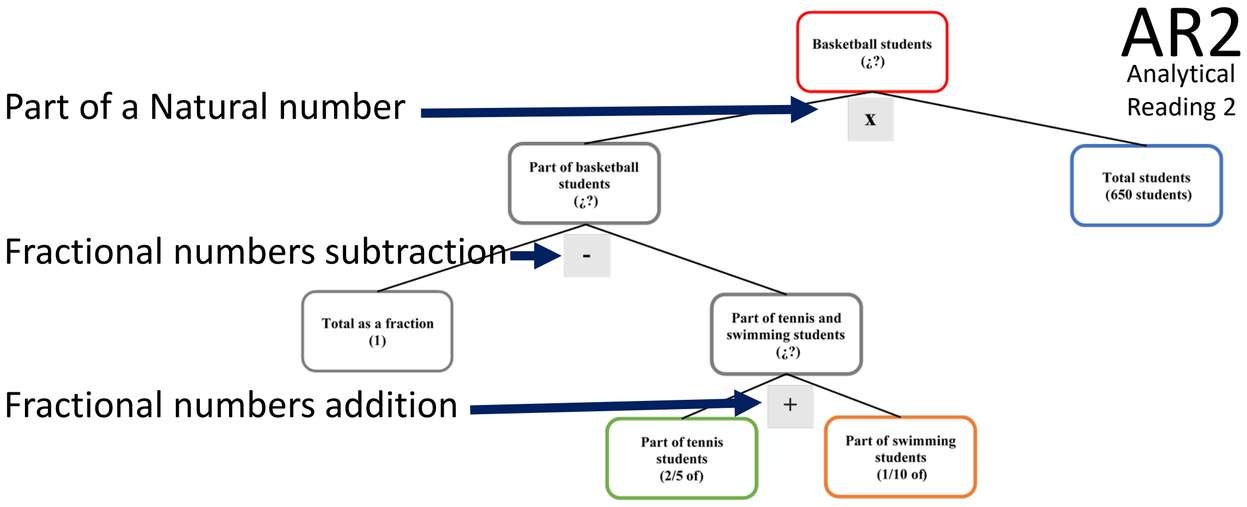
GOALS AND METHODOLOGY

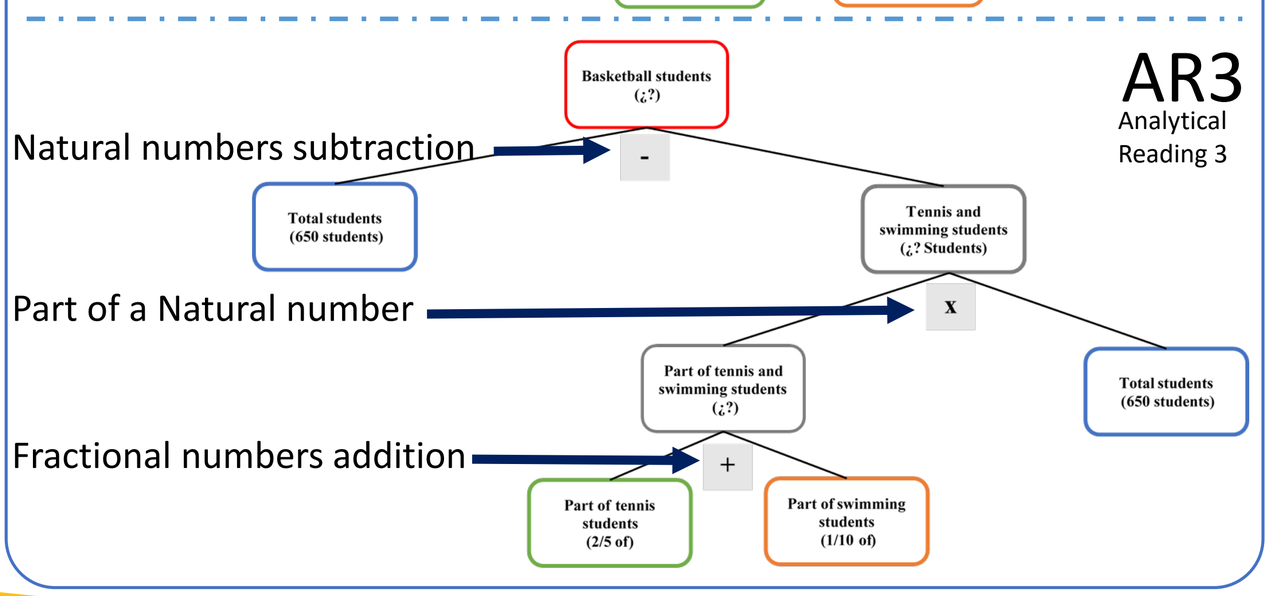
G1. To show a teaching model for primary school students, to improve the understanding of the AWP through reading mechanisms based on the division of the statement into different propositions using distinct colors and a graphic representation of causal-diagrams (Puig & Cerdán, 1988).

G2. To study the AR strategies developed by primary education students when solving AWP where the fraction concept is involved.

EXAMPLE of AWP: There are 650 students in a school. 2/5 of the students practice swimming; tennis 1/10 of the students, and basketball, the rest. How many students practice basketball?







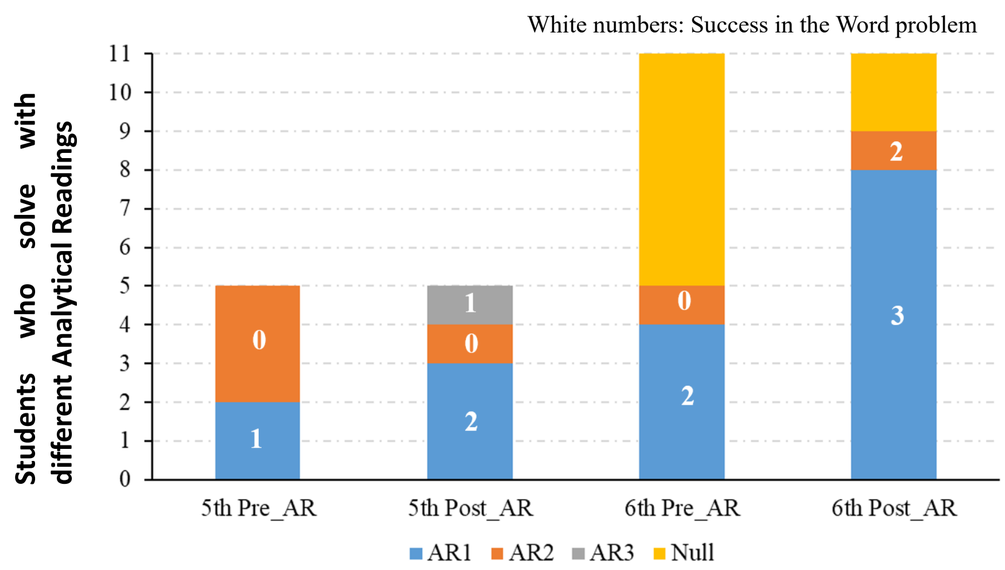
SAMPLE AND EXPERIMENTAL DESIGN

Sample: 16 primary students in 2 different ages groups (five students in grade 5 and eleven students in grade 6).

Pre-test and Post-test: 3 fraction AWP with mathematical concepts [we report only results from the example showed in Methodology].

Intervention: The researchers explained the method in 1 session (1 hour)

RESULTS AND CONCLUSIONS

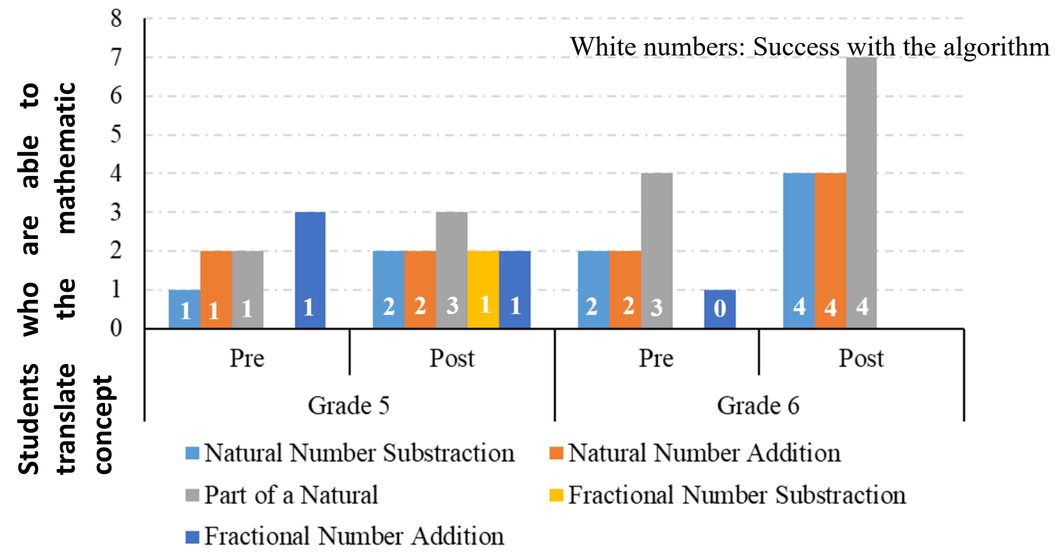


The total amount of students who solve through AR1 is greater than that who solve through AR2 or AR3 [BEFORE AND AFTER INTERVENTION].

The graphs changes the chosen analytical reading [AR1 increases. This translates from vernacular to mathematical language in the order shown in the sentence].

The methodology improve success probability in all cases (white numbers in the figure).

The students who have not successfully completed the graph have helped them to understand part of the problem.



The methodology increase the number of students who are able to translate the mathematic concept, specifically "part of“ (white numbers in the figure).

Students have trouble performing the algorithms involved in this problem, particularly “part of”.

REFERENCES

NCTM (2000). Principles and Standards for School Mathematics. Reston, VA: NCTM.
Polya, G. (1945). How to solve it. Princeton University Press. Princeton, NJ.
Puig, L. & Cerdán, F. (1988) Problemas aritméticos escolares. Madrid: Síntesis.

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