

## MODELLING BUNGY JUMPING: WHY IS IT SO DIFICULT?

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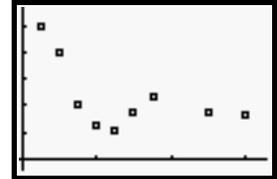
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*Mathematics curriculum orientations of many countries recognise the importance of developing students' capacity to use mathematical knowledge to better understand reality (Niss, 1996). But mathematical modelling is not a simple activity for students — neither for teachers. To model situations of reality we all need to develop competencies that were not present in maths classroom for many years. It involves new conceptions of mathematics classroom as a powerful knowledge that really applies to reality; the capacity of looking for a mathematical model that really explains the situation to model; the capacity of working critically with technology.*

### THE TASK PROPOSED AND THE ANSWERS OF THE STUDENTS

Bungy jumping is a radical sport. We can obtain data from websites that allow us to determine points of the trajectory of the jumper (time of the jump in seconds, distance from ground). A class of 30 upper level students was given a table with data from a jump and was asked to model it and describe it in several aspects. Students used graphic calculators to visualise the scatter plot and to experiment different possibilities of functions for models. But only one student obtained a good function, from the family of  $y = a + (\sin bx + c) / x$ . The others used polynomial functions grade 3 or 4, or simple trigonometric functions, despite many of them were aware that this kind of model does not describe the jump in real life (Canavarro, 2004).



### SOME QUESTIONS TO REFLECT ON

While working on that task, students seemed to be highly worried about obtaining a graph of a function that exactly fits the scatter plot of the real points given. The majority of students proposed as a model a function directly provided by graphic calculator, no matter if the function is a reasonable one to explain the jump. So, what are students' conceptions of mathematical modelling? Do they really value the power of mathematics to better understand and explain reality? Do they recognise modelling activities as important mathematical activities of the classroom?

### REFERENCES

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