APPLYING LINGUISTICS: DEVELOPING COGNITIVE SKILLS THROUGH MULTIMEDIA

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This paper examines the effectiveness of linguistic analysis in developing scientific thinking skills and scientific attitudes. It reports on a project established at a South Africa university in South Africa which engaged students in the analysis of code-mixed data. Students who participated in the project showed gains in being able to analyze linguistic data using problem solving skills. While transfer of such skills to mainstream science teaching was not investigated, the study confirms the effectiveness of linguistic analysis in engaging students in the activities associated with the development of skills for science.

Introduction

Within the New Zealand context the current emphasis on the need to develop a 'knowledge society' places the issue of knowledge of science amongst the broader New Zealand population on centre stage. In this regard, there are significant concerns in current debate relating to the status of science and science education in New Zealand.

1. In his book length treatment on New Zealand science education, Michael Mathews strongly criticizes the constructivist basis of the curriculum and its overemphasis on process over content (Matthews 1995). Such trends, according to Matthews, significantly undermine New Zealand science education as a whole. Picking up on a similar theme, Martin Hames, in his book *The Crisis in New Zealand Schools,* notes that the constructivist, learner-centered approach misleadingly encourages learners to use existing ideas and common sense as the basis of scientific enquiry and results in a "dumbed down" curriculum (Hames 2002: 95). In reviewing recent literature on the subject, Hames notes, however, that much of science is not only alien to common sense, but very often in direct conflict with everyday expectations and that the science curriculum's central focus on learners 'making sense' of the world is therefore too simplistic and strongly misguided.

2. Results of the Third International Mathematics and Science Survey (TIMSS) carried out in 1999 indicate that New Zealand year 9 science students managed only 19th position out of 38 countries in terms of mean science region (for instance, Australia was placed 7th, Korea 5th, Japan 4tb, and Singapore 2ud). In addition, while 84% of countries show a significant improvement in the measure of science achievement since the last TIMSS in 1994, New Zealand was one of the few countries where no such improvement is evident (for data see Chamberlain & Walker 2001: 23-24).

3. Achievement in science amongst Maori and Pacific students has historically been poor. Results from the Programme for International Student Assessment (PISA) 2000 (which surveyed 32 countries) indicate that, amongst other measures, Maori and Pacific students as

Here we find the Afrikaans word 'maar' (meaning 'but'). Such words are called conjunctions. These are words or morphemes which link the parts of a sentence together. Other English examples are 'because', 'and', 'so' and 'while'. Mixing of such items is common in many languages.

a. Would you consider these morphemes to be content or grammatical?
b. Does your answer to a) suggest a need to revise the hypothesis? If so or if not, give reasons.