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AN INVESTIGATION OF GROUPS COMPOSING MUSIC
IN A COMPUTER LEARNING CULTURE USING
MICRO-PROCESSOR BASED MIDI SYSTEMS.

by

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ABSTRACT

Composing music appears to have been marginalised in many secondary school music programmes. Music research on composition and student learning fares no better. The advent of information processing technologies and knowledge based systems offer powerful compositional tools with the potential for transforming the face of music education. However, if the context for this change is overlooked these tools may be wasted.

By themselves micro-processor based MIDI systems can do nothing. When viewed as part of a learning culture, computers, teachers and students interact together to enhance student learning. Cognitive gains may depend on the type, extent, and quality of interaction taking place within the computer learning culture which surrounds the use of educational software tools. The role of the teacher is to create socially interactive and reflective learning environments.

This study explores how groups compose music with computers in such an environment. It aims to observe what happens - or can be made to happen - under natural conditions where powerful roles are played by the cultural, social, and institutional contexts. The emotional aspects of student learning, attribution theory and metacognition are discussed in more depth.

It is not enough, however, to simply use composition tools in the classroom. Effective thinking and learning should be accompanied by direct teaching of efficient strategies and problem solving techniques. Recently several researchers have drawn attention to the importance of social factors in the development of thinking skills. The following research follows this line of enquiry.

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INTRODUCTION

The following study examines how students learn to compose music with computers and the conditions under which this learning takes place. Factors that contribute to an understanding of the learning process are explored. This focus on a process oriented curriculum considers the interaction between students, teacher and computer, rather than one particular factor.

Recent Heylen research shows that although the basic skills of reading, writing and arithmetic are regarded by many New Zealanders as important, so to are other skills such as the ability to communicate well, work with others, learn new skills quickly and be self-disciplined. These social skills are rated as highly and in some cases more highly than skills gained in traditional subject areas (QA News, 1992).

In keeping with the above research it is suggested that significant learning gains may be made through direct teaching of social skills. The reason for this is that awareness of a student's own thinking and self-regulatory activities often develops through social interactions with other learners (Vygotsky, 1978). Promoting social skills through interactive groupwork and encouraging thinking skills through problem solving strategies provides the research context. Intervention within this context emphasizes strategy use from the lowest level of strategy acquisition (teacher-imposed) to the highest level of acquisition (student directed).

The multi-faceted nature of the learning environments surrounding computer tools highlights the relevance of ethnographic methodologies and techniques for analysing affective and cognitive processes. The teacher-researcher like the anthropologist seeks to understand which cultural materials are relevant to cognitive development.

In portraying the learning culture of which the computer is a part, the researcher will want to know how computers assist the process of cognitive development. The use of holistic, open-ended methods characteristic of ethnography, allows the researcher to study the computer as a cultural element - "something that can be powerful when it is integrated into a culture but is simply isolated technical knowledge when it is not" (Papert, 1987 p.24). It is suggested that how students use the available technology to support their learning is critical to understanding the learning process.

A variety of information gathering measures are employed ranging from group interviews to document analysis. The types of interaction and approaches to problem solving that emerge from these measures may give clues for more effective learning. Two overlapping areas of concern are considered. These focus on: 1) thinking skills and learning strategies, and 2) social interaction and peer learning. Several related process oriented questions are examined, including:

What are the characteristics of a computer learning culture?

- how do students, teacher, and computer interact in such a culture?
- how significant is student perception of control to learning?
- how are the students initiated into "adult" activities?
- how does strategy use aid learning in this culture?
- which students use more advanced thinking and metacognitions? Why?

In what ways does a computer culture help students learn to compose music?

- how does the way the groups are structured influence student interaction and learning?
- how influential are factors like innate musical ability, student interest, peer interaction, previous computer or musical experience, on students learning to compose music?

do micro-processor based MIDI systems help bridge a musical 'knowledge gap' for students without a background in music theory?

which students :

monitor, plan and self-regulate during problem solving activities?

interact more with peers and exchange more information?

explore more and show greater creativity in compositions?

engage in more self-evaluation, or editing of compositions?

how do students compose music?

aurally; with conventional notation (on screen); or with pencil and paper?

do these techniques require skills which are the same or different?

How do other factors influence learning ?

how does: culture, background, physical setting, and the wider environment?

A number of music teachers have expressed caution against accepting computers. "Many have not begun to take advantage of the computer as teachers in other subject areas" (Steinhaus, 1987 [b] p.23). In light of this the potential of micro-processor based electronic equipment for enhancing learning is discussed and the place of music composition software in the classroom is evaluated.

A review of some recent process orientated composition software is provided in an attempt to map this largely uncharted territory. It is apparent from this review that there are few studies relating music composition with computers to student learning. This research attempts to address this imbalance.