On Modeling Collaborative Talk During Computer-Mediated Music Composition: A Case Study in Primary School Peers

Georgia N. Nikolaidou
Graduate School of Education, University of Bristol, UK
G.Nikolaidou@bris.ac.uk

Abstract

The proposed paper aims to model the dialogue that occurs during a computer-mediated music composition process between pupils in primary school within a collaborative framework. The different types of talk when children compose working in pairs are explored and modeled. Experimental results from a case study from a primary school in Greece reveal significant changes in children’s collaborative talk between an Information and Communication Technologies-based environment and the traditional one that could be used in the enhancement of the music education collaborative learning.

1: Introduction

Computers, communication technologies, and multimedia have gained ground and reputation in lately. Incorporation of Information and Communication Technologies (ICT) in a contemporary educational curriculum reflects the potential of ICT in the area of education. One aspect of this is a greater appreciation of how technology can enter into the field of education. In this way, within the context of collaborative learning, ICT would provide a new path for the development of learning process amongst learners. So far, no modeling of children’s collaborative talk during computer-mediated music composition has been reported in the literature. To this end, the present paper is centered on modeling the collaborative talk that occurs during peers’ composition activity within the classroom. The mediation of the music computer-based environment is conceptualized as an integrative component of the child’s musical development and the type of dialogue in peers’ collaboration is logged and analyzed. Preliminary results show the clear potential of the proposed model in identifying the supporting role of the ICT-based composition environment towards collaborative learning of children.

2: Educational background

Composition sets the framework wherein collaboration can help children to communicate and create together, and through common creation to learn better (see Fig. 1).

3: Modeling of collaborative talk

These interactions can be expressed through their dialogue (discourse, gestures and expressions of emotional arousal), and their activity on musical notation (e.g. scoring notes, tempo markings, dynamics, articulation, and so on). Using the dialogue, at the beginning, the pupils externalize and share their general ideas for the composition. Then, through discussion, they have an opportunity focus on these ideas to the specific compositional task and explain them to their peers in detail, reasoning every step of their thought. Finally, upon agreement, they realize common thoughts through musical symbols, i.e., notes, dynamics, etc. In this way, collaboration through the compositional context provides impetus for partners to develop greater understanding and establish common pathways between alternative views. As a result, the final product of the compositional task is an enhanced version of what is already conceived in peers’ mind, and involves a creative process in which the effort to collaborate propels pupils together to develop new solutions that bridge their own understanding and thinking.

ICT can formulate an efficient mixture of educational context that transforms the music composition into a collaborative learning procedure. In particular, ICT support pupils’ collaborative composition as: a) the common screen between them is a shared public workspace where they can work jointly using different music symbols, b) pupils can get a playback feedback provoking re-evaluation and re-work of their ideas until they reach a common decision, and c) pupils can save their work progressively and test new ideas later on, varying instrumentation, notation, tempo, etc.
During a collaborative task, different types of discourse occur when children reason together to solve problems [1]. This is also true for problem solving in activities mediated by computers [2]. The proposed modeling adopts the following three main types of talk, outlined by Mercer [1]: a) the disputational, which is characterized by disagreement and individualised decision-making, b) the cumulative, where speakers built positively but uncritically on what the other has said, and c) the exploratory, where partners engage critically, but constructively with each other, resulting in negotiation and rationale debate. Moreover, knowledge is made publicly accountable and reasoning is more visible in the talk. These ways of talking are identified by locating discourse features in an interaction [1], [3]. The discourse features associated with the types of talk, adopted also in the present study, are summarised in Table 1 [1], [3], [4].

<table>
<thead>
<tr>
<th>Type of talk</th>
<th>Associated discourse features</th>
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<tbody>
<tr>
<td>Disputational</td>
<td>Disagreements • Individualized decision-making • Short-assertions • Counter-assertions</td>
</tr>
<tr>
<td>Cumulative</td>
<td>Repetitions • Confirmations • Elaborations</td>
</tr>
<tr>
<td>Exploratory</td>
<td>Justifications • Alternative hypotheses • Consensus reaching</td>
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Table 1. The discourse features associated with the types of talk [1], [3], [4]

By measuring the frequency of the discourse features of Table 1 met in the interaction instances related to the compositional task, the changes in the way children talk when collaborate with traditional or ICT-based environment could be monitored. For instance, changes in the predominant and/or the infrequent way of talking when shifting from traditional to ICT-based collaboration could reveal the role of ICT in supporting children’s tendencies to explore, negotiate, and debate conflicting ideas, i.e., to adopt exploratory talk. In fact, ICT help children learning to express and share their ideas; to respect each others’ point of view; to argue and justify their viewpoints; to criticize constructively and ask others for justifications of their opinions, and to try to reach joint conclusions [5].

4: A case study: results and discussion

A case study was carried out in a public primary school in Greece (Thessaloniki). Pairs of pupils (mixed gender) aged 11, were asked to compose twofold, i.e., in a traditional way and by using a music notation software (Finale 2002, Coda Music, Inc.), a short melody for setting some verses (simple in language and with a descriptive character). During the task, pupils left unsupervised and the teacher acted as a participant observer supporting them only in the case of a software difficulty. During composition, pupil’s communication is scaffolding through their collaborative talk, their turn taking, their body behavior, as well as their gestures. Analyzing the above features there are evidences of pupils’ engagement in collaborative composition.

Although this is just a preliminary implementation, experimental results have shown a noticeable difference among the contributions that are developed when pupils work collaboratively on a compositional task with the traditional way and within an ICT-based environment. In particular, the pupils who compose in a traditional way had more difficulty in manipulating their ideas about the composition. Although they made a significant number of proposals based on their creative ideas the other kinds of contributions were frankly limited and two of them did not take place at all. On the other hand, children using ICT based composition seem to come up with more creative ideas and bring their suggestions into the group. This increases the information between them, enhancing their decision-making and, therefore, improves their quality of thought in composition during the collaborative learning process.

5: Conclusion

This paper has attempted to examine the potential role of ICT in music composition in primary school through modeling of collaborative talk. Preliminary results have shown that pupils’ talk during composing in a traditional way was limited, while when using ICT compositional environment pupils’ dialogue shifted towards exploratory talk, fostering, thus, their creative thinking.

6: References