THE EFFECTS OF COMPUTER-MEDIATION AND PHYSICAL SPACE ON COLLABORATIVE MUSIC COMPOSITION

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ABSTRACT

Background. In the UK, composition is an integral part of music in the National Curriculum. Research (Tarrant, North & Hargreaves, 2002) highlights the important role that music plays in the lives of adolescents, yet Harland et al (2000) found that adolescents regard school music as predominantly irrelevant to their lives. However, computers tap into adolescents' natural interest in technology and could enhance their motivation to engage in music-making activities that are more relevant for them. Music technology provides access to sophisticated sounds and the work of professional musicians relevant to adolescent musical culture whilst at the same time making musical composition accessible to adolescents of all musical abilities. Collaborative learning in classroom settings is often enforced as a result of resource limitations, yet research (Crook, 2000) has revealed that collaborative learning, when effective, can facilitate the enrichment of personal meaning and understanding through interpersonal exchanges. Research is therefore required to identify effective groupings that will enhance learning through computer-based collaborative musical composition. The Internet can facilitate wider collaborative environments to include cross-cultural exchanges.

Aims. The research was designed to investigate the effects of computer mediation, prior musical experience and culture on the process of cross-cultural collaborative computer-based music composition.

Method. Eight participants (4 Norwegian, 4 English) aged 13-14 years formed 4 composition pairs one from each country. Pair 1, both non-FIMT, Pair 2, both FIMT, Pair 3, one FIMT (UK) one non-FIMT(NOR) and Pair 4, one FIMT(NOR) one non-FIMT (UK).

Results. The results showed that all participants enjoyed the process and were pleased with their compositions. It was established that communication took place on both 'musical' and 'text' levels. The composing pairs employed different styles of text and musical communication. Musical and text dialogue styles were related to the combined prior musical training of the composing pairs. 'Adolescent' preferences were reported more often than 'cultural' influences as reasons for effective collaboration.

Conclusions. An effective method of data collection and analysis for future research was established. However, it was concluded that future research should be 'naturalistic' in design removing time constraints and allowing the participants a) more choice in the selection of their composing partner and b) more time to establish a 'cyber-relationship' via email prior to commencing composition.

1. METHOD

Procedure. After a brief period of technology training each participant was invited to participate in an interview designed to reveal expectations of engagement in the study. Each composing pair had 6 composition sessions (3 in each country) after each session the evolving compositions were saved and emailed between UK and Norway until completion. This process produced six music and six embedded text files for analysis. After composing each participant was invited to participate in an interview designed to reveal his or her reflections on engagement in the study.

Analysis. The pre and post composition interviews, embedded text and music files were analysed adopting a qualitative approach based on 'Grounded Theory'. Different themes emerged from the interviews and text communication which were categorised and interpreted by the researchers. Music files were subjected to repeated listening and viewing by the researchers which revealed different composition strategies adopted by the composing pairs. Comparisons were made between the music and text files within each composing pair and between each composing pair.

2. RESULTS

Results will be presented in three sections based on the three stages of data collection: 1) the pre-composition (post-training) interviews, 2) the collaborative composition process and 3) the post-composition interviews.

2.1. Pre-composition interviews

There were 2 main overall themes common to both the UK and Norwegian participants that emerged from these pre-composition interviews. All participants displayed high levels of confidence in their ability to be able to use the equipment. All participants expressed expectations of fun and excitement while collaborating with an unknown person from another country.

'Probably we'll find this fun and it…it's more… interactive like we get to do it with someone else. And it's not even like somebody we actually know. And it's across the world so it's going to be rather fun you can make friends as well, so it will be rather fun' (UK FIMT).

'I don't know I haven't been like erm…talking so much to guys in England but I think it will be fun' (Norway FIMT).

All participants expressed concern regarding the collaborative nature of the task. Concern was based on the possibility of conflict over deleting each other's work and/or partners' preferred styles of music.

'I don't know…I think just trying to agree on like say they take a bit of my work out of it I'll probably get really annoyed but then if I understand their way of puttin' it then I will be alright' (UK Non-FIMT).

'I don't know. It depends on who they are, if they like my kind of music or they like another kind of music' (Norway FIMT).

Individual themes also emerged with one international pair (Pair 2, both FIMT) separately expressing a view that differences in music preferences might result in a positive collaboration.

'We could like different music so it could make a difference to what we have in our composition. As like I might like pop and she might like rock, or he might like rock and then…. So we would have to like try and work together and make it into a poppy-rock or something like that' (UK FIMT).

'….if they like my kind of music or they like another kind of music then we can maybe make a whole new kind of music' (Norway FIMT).

One UK participant (Non-FIMT) expressed that there would be less 'social pressure' because his Norwegian partner was unknown to him and they would be working outside of the physical space of the school.

'I just think erm…it's like….they haven't like seen you before and you haven't seen them before so it's really kind of erm….just getting together to do like one thing there's no like pressures or you know social groups in like school where whenever you work with someone at school….The kind of usual thing at school' (UK FIMT).

Another UK participant (FIMT) made an interesting speculation about how working with this particular technology in this situation would impact upon collaborative communication during the composition process.

'If you know someone and they are like next to you, you can talk and then do it. Here we have to do it and write what we do and then they have to change it or keep it the same. And we can't really decide together, or we can but it will be a longer time to wait. And we might have to like do some things wrong and them put them back in. And, but if you have it next to you, the person next to you erm….it would be easier because first you can talk then do it but here you have to do it and then talk, and then do it and then talk. So it's going to be a bit harder than if you are sitting next to them' (UK FIMT).

Summary. The main overall themes for all participants that emerged from the pre-composition interviews were, 'Fun and confidence', 'concerns about conflict while composing', Other individual themes were 'differences in music preferences could produce better compositions', 'reduced social pressure' and 'influence on the sequence of events during collaborative communication'

2.2. The collaborative composition process

Communication during the composition process was taking place on two levels (i.e. text and music). The participants in the post-composition interviews validated this observation.

Text communication. Most of the embedded text communication is relatively short and can be categorised as being 'descriptive' (e.g. 'I recorded a sound on the keyboard and used a loop'), 'active' (e.g. 'Put some beat between 40 and 70'), 'evaluative' (e.g. 'I think it sounds OK but could sound a bit better') and 'social' (e.g. 'I tried to make the song build up').

| Comment style	Pr. 1	Pr. 2	Pr.3	Pr. 4
Descriptive	**6**	**3**	**5**	**5**
Description of action	6	3	5	5
Active	**1**	**4**	**1**	**5**
Invitation to add	0	3	0	3
Invitation to change	1	1	1	2
Evaluative	**2**	**4**	**4**	**0**
Self-evaluation	0	2	2	0
Partner-evaluation	1	1	2	0
Seeking evaluation	1	1	0	0
Social interaction	**2**	**1**	**2**	**8**
Greeting	1	1	1	1
Use of name	0	0	0	3
Thanks expressed	0	0	1	1
Explanation	1	0	0	3

Figure 1: Distribution of Comments

The distribution of the styles of comments among the pairs was plotted which allowed us to define the relative text communication for each pair in terms of 'descriptive', 'active', 'evaluative' and 'social' categories. This revealed that the text communication in Pair 1 (both Non-FIMT) was largely descriptive, in Pair 2 (both FIMT) was largely active and evaluative with little social interaction, in Pair 3 (UK FIMT: Norway Non-FIMT) was largely descriptive and evaluative, in Pair 4 (UK Non-FIMT: Norway FIMT) was largely descriptive active and social with an absence of evaluative comments.

2.3. Musical Communication

Space restrictions will only allow the consideration of two composing pairs in any detail so it was decided to focus on Pair 1 (both Non-FIMT) and Pair 2 (both FIMT) in order to highlight some of the differences between the composing pairs in relation to prior musical experience.

Pair 1

UK Non-FIMT   Pair 1   Norway Non-FIMT

Day 1

Day 2

Day 3
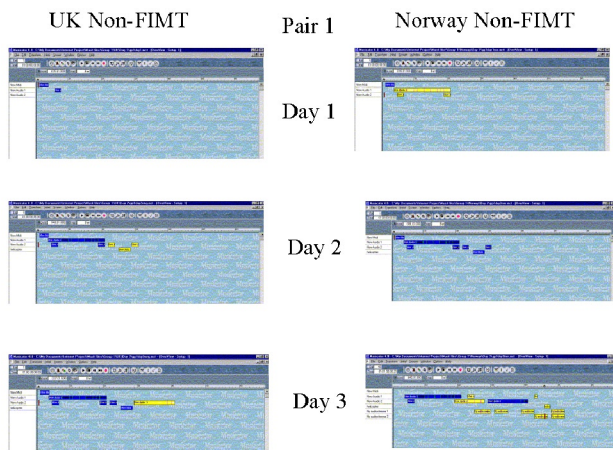
When the musical dialogue in this pair was compared with their largely descriptive text dialogue certain similarities were revealed. Consecutive musical additions follow on from what has been previously stated. There is very little evidence of interaction between the musical parts until the changes made by the Norwegian participant on the last day. Even then, the musical dialogue consists of 'filling in the gaps/silences' left by previous musical statements. The only non-descriptive text dialogue consists of 'I don't really mind what is done' (invitation to change), 'I like what has been done to the project' (partner evaluation), and 'I hope you like this too' (seeking evaluation). There is an 'explanation' provided for deleting the gunshots, 'I didn't like the gunshots that well so I deleted it'. This text dialogue was interpreted as 'confrontation avoidance'. One interpretation of the style of this composing pair's combined music and text dialogue is that there was little creative collaboration occurring revealing co-operation to complete the composition task without conflict.

Pair 2

UK FIMT   Pair 2   Norway FIMT

Day 1

Day 2

Day 3
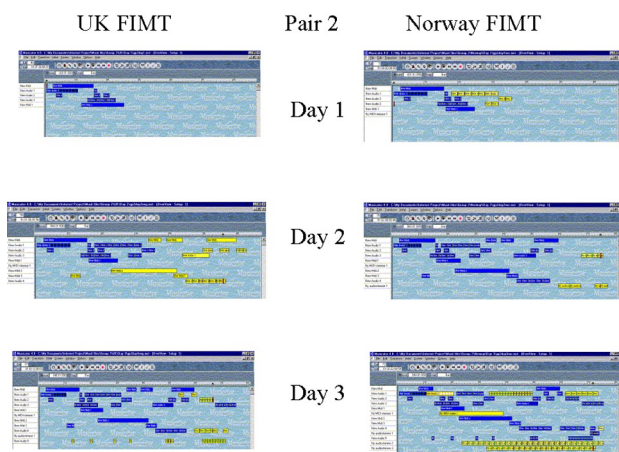
When the musical dialogue in this pair was compared with their text dialogue certain similarities were also revealed. There was more interactive musical dialogue with almost all musical additions overlapping. This pair's text dialogue is active and evaluative, it invites change (e.g. 'Put some beat between 40 and 70') with the work constantly being evaluated (e.g. 'On the midi bit, I like the end of it'). The musical dialogue is complex with a relatively long initial musical statement and overall length. Based on the complexity of the musical dialogue and the lack of descriptive text dialogue it could be argued that the participants in this pair preferred to communicate via musical dialogue rather than text dialogue. Some support for this interpretation can be found in the post-composition interview for the UK participant.

'I think we communicated more through the music as that's what we mostly were actually supposed to be doing, doing a composition' (UK FIMT post composition interview).

One interpretation of the style of this composing pair's combined music and text dialogue is that they were willing to engage critically but constructively with each other's ideas revealing creative collaboration to complete the composition task.

2.4. Post composition interviews

Overall themes that emerged from the post-composition interviews can be categorized as relating to a) the process of composition b), the outcome of composition and c), the social relationship experienced. They also either supported or contradicted overall themes from the pre-composition interviews.

In relation to composition process, all participants expressed positive feelings about composing and a willingness to continue. The composition process was most often referred to as 'fun', 'interesting', 'enjoyable' and 'exciting'.

'Fun because I never did it before' (Norwegian Non-FIMT).

'It was very fun erm…If someone asked me if I would do it again then I would because it was very fun' (Norwegian Non-FIMT).

All participants reported enjoying working with someone they had never met before.

'I enjoyed it…. like doing something different like with the computer and I now know how to like use that and it was nice working with someone from a different country instead of working with someone here because it was an experience to remember' (UK Non-FIMT).

'Interesting 'cos I didn't know what music she liked.....he liked erm…what he liked or anything. It was very fun erm if someone had asked me if I would do it again?… I would…it was very fun.' (Norway Non-FIMT).

'It was interesting because like you had to do a lot of text. It was interesting working with someone completely different to what I'm used to like in Norway' (UK Non-FIMT).

In relation to the outcome of composition all participants reported being 'pleased' or 'very pleased' with the resulting composition even though some didn't expect to be.

The only negative reports were in connection to the limitations of text communication and time constraints. All participants

reported wishes to have more comprehensive communication, they gave examples that included telephone, video-conferencing or 'real-time' text. In other words they wanted to be able to see and hear their partners. All participants reported they would have liked more time to compose.

In addition to overall themes there were also individual emerging themes. One individual theme had participants expressing positive feelings of autonomy because the program was easy to use which resulted in minimum teacher supervision being required.

There were no reported cross-cultural problems in spite of some concerns expressed during the pre-composition interviews. It would seem that music adolescents engage with is 'universal teenager music' rather that 'culturally orientated'.

'It turned out that we both sort of had the same sort of rhythm to thing that worked out actually well' (interviewer 'Was that a surprise….or….did you think there would be differences?') 'I thought there would be diff…maybe on the culture…maybe that… but they're the same age as me so we're both sort….we're both teenagers so we probably like have a lot in common like we all have music at this moment in time and T.V. and all that…wanting to hang out so it works out the same.' (UK FIMT).

The second main overall theme from the pre-composition interviews 'concerns about conflict while composing' was reported as not being the problem that was anticipated.

'She deleted my 'heli' ... erm..my 'gunshots'…(Interviewer… 'yeah…how did that feel when she deleted your 'gunshots'?)…I wasn't bothered really…I just like put them in to see what they sounded like and if she didn't like them then she could change them, delete them.' (UK Non-FIMT).

'If you couldn't have had the text it might have gone a bit conflicting at changing the wrong bits and then them putting it back and then you taking it away and them putting it back again.' (UK Non-FIMT).

3. DISCUSSION

It is difficult to be certain what caused the high levels of motivation displayed by the participants in this study. It could be the 'technological environment' but it could also be 'Novelty value'. It is also unclear whether the 'technological environment' or the combined prior musical experience of the composing pairs influenced the different styles of musical and text dialogue and composition strategies. The number of participants involved in the current study and the analysis procedures employed make it impossible to generalise from the results. However, although exploratory in nature, the results provide a useful framework for future studies. The study provides method and analyses procedures that could be developed in a future large-scale study. It would be interesting to adopt a more naturalistic and longitudinal design still with a small number of participants but over a longer period of time. This could reveal the effects of familiarity of the participants with each other and the technology over time on the process and outcome of engaging with computer-mediated collaborative composition.

The results of this study provide interesting similarities between the current study's participant text and musical dialogue and 'Cumulative' and 'Exploratory' talk (Mercer, 1994) which Mercer believes helps us to understand how children 'think together'. These are areas of study that to my knowledge have not yet been investigated within this particular context. There were two interesting themes that emerged from the pre-composition interviews relating to 'social pressure' and 'sequence of events'. Further research could investigate the effects of working in this environment on these phenomena.

4. IMPLICATIONS FOR PRACTICE

The technology employed in this study requires relatively unsophisticated computers to be able to engage in this kind of activity. It is also very user friendly, which means both staff and students, should have no problems learning to use it with only limited assistance. Employing technology in this way makes collaborative creative music making possible for all adolescents regardless of their musical ability. This could have the effect of increasing adolescent motivation in school music through their interest in technology, access to sophisticated musical sounds and growing use of text as a form of communication. Composing within this technological environment takes collaboration beyond the classroom and year grouping to include national and international possibilities. Although this study was conducted with adolescents the simplicity of the computer-based process makes it easily adaptable for use in primary schools. This would make it possible to form a 'bridge' for music education between primary and secondary schools which is often a problematic period (O'Neill, 2002) as pupils transfer from one to the other.

5. REFERENCES

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