

## Young children's improvisations on a keyboard: How might reflexive technologies support the processes of learning to improvise?

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### ABSTRACT

#### Background

How do young children improvise music? Research to date has focused on children's vocal improvisations and the use of percussion instruments either solo or with an adult partner (Brophy, 1999; Glover, 2000; Reinhardt, 1990). Despite the fact that young children today grow up surrounded by technology and interact with it easily and naturally, very little research into the uses of music technology in early years settings has been carried out to date (Young, 2003). In this paper we introduce a study conducted as part of the MIROR Project (Musical Interaction Relying on Reflexion).<sup>1</sup> The technology is based on an interactive system in which a keyboard or other electronic instrument produces musical responses that are based on the player's own ideas (Addressi & Volpe, 2011).

#### Aims

This investigation into the use of Sony's MIROR software to support young children's keyboard improvisation asks several questions: does the software engage the children through its capacity to reply, and if so, does their engagement differ with age, with changes in the type of response from the system, or with increased familiarity with using the equipment? Does playing in dialogue with the system help to develop children's understanding of musical phrases and structures, as well as building confidence and self-awareness by reflecting back to the children the kinds of sounds that constitute their own playing style?

As part of the spiral development process in conjunction with Sony partners, a further aim was to report on the performance of the equipment in pedagogical situations.

#### Method

The study was carried out in two settings: a children's centre and a primary school, both located in areas of low socio-economic status in the city of Birmingham, Central England. Six children aged 4 and six aged 8 were individually introduced to the keyboard and software. After a short time trying out the keyboard, children were then encouraged to play freely, and asked to lift their hands off the keyboard in order to let the system reply to them. They continued for some time, with the researcher changing the setting for the responses at a suitable moment. A total of three sessions was recorded for

each child, over three weeks. All the sessions were video-recorded; supporting data, in the form of short interviews, children's drawings and teacher interviews and school reports were also collected. The video footage was analysed using The Observer software, a tool which allows for fine-grained qualitative and quantitative analysis. The analysis was cross-referenced with the music visualisations which the MIROR software produces.

#### Results

Children were able to grasp the turn-taking pattern in their interactions with MIROR. Various different levels of interaction were observed, from basic turn taking, with just one or two notes from the child and MIROR in turn, through a more purposeful second level, in which small similarities in rhythm, pitch or dynamics could be identified between MI's response and the child's next input, to a third level, a more extended interaction in which the child's follow-on playing input showed similarities with the response so that a similar style could be identified across several turns. Level three was quite rarely observed, however, and was more common near the beginnings of all sessions and also more common in the first session than in the last. The melodies played by the 8-year-olds in particular became much longer over the three sessions, to the extent that MIROR was given few opportunities to respond.

#### Conclusions

The playing of children's improvisation was observed to be multi-faceted, seemingly arising from a number of generative sources, or modes: bodily movement; instrument morphology; social interactions; musical memories of songs or performed music; interest in numbers and patterns; dramatic play and story. Children moved freely back and forth between these different modes during their improvisation sessions. A possible reason for the scarcity of level three interactions may be that such dialogues arose most successfully from one type of playing, the most gestural, and that only when this type of playing is foregrounded is there the potential to develop interactive play that fully incorporates the MI responses. When the children's attention shifts kaleidoscopically and dynamically, as in the nature of children's play, it is likely that periods that focus on this one dimension, as with any dimension, will be infrequent.

#### Keywords

Improvisation, music technology, reflexive technology, early years.

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