

What is technology in music instrument education good for: a survey for violin and drum teachers on technology use

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Background

Researchers increasingly explore the potential of technologies in music instrument training such as virtual environments, wearable devices or multimodal interactive systems that could enhance learning processes and support teaching methods (Ramirez et al., 2018; Johnson et al., 2019). However, studies that investigate technology use in education suggest that teachers are more likely to employ it for communication and organization rather than for the transfer of technical and musical skills (Waddell & Williamon, 2019). Hence, more research is needed to investigate how teachers deal with technologies in instrumental training and whether there are specific technical skills and musical aspects that might facilitate technologically driven applications.

Aims

The aim is to explore drum and violin teachers' attitudes towards the use of technology such as AR/XR/VR and wearable devices for educating beginners, as such bridging the gap between designers and users.

Method

We distributed an online survey (in Dutch, English and Polish) that collected information on methods and exercises used by violin and drum teachers during classes with beginners. Questions concerned most common mistakes made by beginners; challenges encountered by teachers while transferring knowledge to new pupils; teaching methods as well as teachers' experiences with technology.

Results

In total, 73 valid responses were recorded. 32 drummers (4 females, 27 males; one preferred not to disclose) and 41 violinists (29 female, 11 male, one preferred not to disclose) participated in the survey. 66% of the respondents taught in Belgium, 19% in Poland, and 15% in the UK. 88% had more than 11 years of experience and 48% gave more than 20 hours of instrument lessons per week.

The four biggest challenges encountered by drum teachers included students' lack of understanding of rhythmic values (mentioned 5 times), insufficient concentration (3), lack of regular home practice (3), and incorrect posture (3). Preferred wearable devices could be divided into three categories: devices 1) to support posture, 2) to stimulate drumstick grip and movement, and 3) for feedback/mirroring. A major concern regarding wearable device employment is that it could also damage the learning process in the sense that the learner could trust the device rather than his own motor and mental processes. Furthermore, 28% of drum teachers agreed that postural support devices could facilitate beginners' fatigue and discomfort reduction after a music class, 19% disagreed, 22% was undecided, while 31% did not have an opinion.

The four biggest challenges encountered by violin teachers while training beginners included insufficient concentration (mentioned 9 times), lack of regular and correct home practice (9), incorrect posture (7), and lack of motor control (5). Preferred wearable devices should 1) stabilize overall posture, 2) relax shoulders and other joints, 3) keep left wrist in correct position, and 4) prevent fingers of the left hand from being clenched. Possible design ideas included a device for straight bowing or a restrictive device so that only elbow and forearm can move. The main concern regarding wearable device use was that once these devices are removed, bad habits could return. Furthermore, 12% of violin teachers agreed that postural support devices could facilitate beginners' fatigue and discomfort reduction after a music class, 39% disagreed, 17% was undecided, while 32% did not have an opinion.

Regarding use of VR: 79% of all respondents had never used VR technology in any context; 19% believed VR could assist instrumental skill development, 23% was against VR use, 27% was undecided, while 30% did not have an opinion. The specific examples in which VR could be useful included exercises for straight bowing (for violin) and posture control, stimulation of stage experience, movement demonstration, error indication, as well as exercises to improve coordination.

Conclusions

According to our findings, several problems need to be solved before innovative technologies can be widely applied in music education. This research suggests specific application niches, and it will eventually help increase the basis for technological innovation amongst music educators. In further research, we will propose new technological applications based on our findings,

for example a device that supports the development of correct posture and movements required for violin or drum playing, enhancing the learning processes through direct tactile feedback.

References

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