Piano: Thermal-imaging cameras

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The pianos are wired with infra-red sensors that can create a computer sequence of whatever is played, so it can be played back electronically.

Students get to see their errors, analyse them in 3-D and then watch an identical playback by the piano. If they hit a key too softly, even that will be mimicked as they watch the replay.

"Once they can see that happening, when they become aware of it, they almost instantly correct it," says Mr. Comeau.

The video-conferencing room can be used to teach lessons remotely. Mr. Comeau has a class in Finland and one in Kangiqsualujjuaq, a remote Inuit community in Northern Quebec.

The researchers' studies extend to areas of health, as well. Sixty-one per cent of classically trained professional pianists and 45 per cent of piano students will experience an illness, such as carpal-tunnel syndrome, from playing.

Using thermal-imaging cameras and movement analysis, the researchers can identify positive and negative movements and see what is happening to the body.

"When we say warming up (before playing), does it really warm up, or is it just an expression?" says Mr. Comeau.

Mr. Comeau also wants to create user-friendly learning software that can be used by piano students and teachers who don't have access to a million-dollar facility.

"The possibilities are endless right now, with the technology that is there," he says.

Just one of the lab's projects is a study of what motivates some piano players, like Robbie, to keep playing — despite long hours practising — while others drop out.

Mr. Comeau's team of researchers are studying a number of factors, including internal dedication, family support and natural musicality, in an international sampling of students. The results may help them find new ways of encouraging and appealing to students.

Mr. Comeau says he never found practising easy, either.

"Every day I was hoping I wouldn't have to practice," he laughs. "It's a very big dilemma."

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