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## Case Study Two

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### NUMBEAT APP

With a fall in numeracy skills among Australian children, ECU Professor of Psychology Craig Speelman looked for a solution that could improve problem-solving skills and increase the speed children could acquire a grounding in arithmetic.

Speelman conducted research to see if it would be possible to create a game that, after repeated use, would improve a child's mathematical problem solving skills.

The result is creation of Numbeat, an app that Speelman hopes will help educate children and address low numeracy levels, in a way that engages students.

"Problems with poor numeracy begin early in life," Speelman says.

"Because students learn at different rates and require different amounts of practice to master a particular skill it is difficult for a teacher with 20 to 30 students to pace

their instructions to keep every child at the same point in the curriculum."

While the intention of the app is to assist in increasing a child's mathematical ability, it is unique in that it integrates both educational and game elements.

It is not simply a mathematics app with flashing lights and colours but is designed as a fully functioning game. Speelman says, to ensure children are motivated to play the game consistently.

Speelman designed the game using the premise that lower skill levels needed to be acquired and mastered before moving on to higher skill levels.

Throughout the game players solve problems using their mathematical knowledge in order to defeat bad characters.

As the game advances, with more than one hundred levels and five different worlds, the problems increase in difficulty, facilitating the development and retention of automatic maths skills.

Speelman says his research showed that an app like Numbeat allowed children the opportunity to practise solving problems over a period of time and only advance when they were ready.

Children could also work through the game at their own pace – something a classroom environment is not always able to provide.

Numbeat was tested in several primary schools and results showed most children increased in speed and accuracy when solving general mathematical problems after having played the game for as little as a few hours.

Numbeat is available to download from the Apple App Store.

"The results show that educational games have a role to play in complementing traditional classroom lessons," Speelman says.

"If students don't master the basic skills it will often result in them being turned off maths for life."