

Better Rehabilitation Through Play

By Malene Mølgaard, Journalist - 13 February 2018, Physiotherapist Magazine

Glowing, digital fitness training tiles make rehabilitation fun for the elderly, at the same time improving their strength and balance. These are the findings of a study, which Professor Henrik Hautop Lund has carried out at the Centre for Playware at the Technical University of Denmark (DTU).



Moto tiles are glowing, digital fitness training tiles that make rehabilitation fun. Moto tiles also improve strength and balance.

How can the element of play be incorporated into fitness training and rehabilitation for the elderly? And why should something as serious as rehabilitation be subject to interference by play, and fun and games? Professor Henrik Hautop Lund's answer is clear: Because of the powerful force of the dynamic of play.

At the Centre for Playware at DTU, he was in charge of the development of a set of digital fitness training tiles, which can be assembled in various ways. The tiles act rather like puzzle pieces or LEGO bricks and can form a path on the floor, be clicked together to make an entire surface or shaped into a horseshoe.

A mini computer makes the inside of each tile light up in blue, red, green, yellow or purple, encouraging interaction and physical play. The tiles have been designed to activate the elderly by means of a variety of games, which can be selected and controlled on a tablet.

The work of developing the so-called 'Moto' tiles was executed and fine-tuned in collaboration with physiotherapists in training centres and activity centres for the elderly, thereby ensuring that the play would trigger the right movements and fitness training. Henrik Hautop Lund reports that the effect of this playful training is surprisingly big.

"Qualitatively, we can see from impact measurements that it is actually hugely effective. We carried out studies of elderly men and woman with an average age of 83, who jumped around on these tiles in group fitness sessions twice a week for ten weeks. They alternated between being on the tiles and taking breaks, and every time they actively jumped around, they did so for 12 minutes. Overall, it amounted to four hours of fitness training. When we tested them for balance and leg strength, their

balance test score had significantly improved by about 150%. It's amazing! And their leg strength had improved by around 25%," says a thrilled Henrik Hautop Lund.

Play Helps Us Forget

According to the DTU professor, the explanation is obvious. The elderly people become engrossed in the game. Playing on the digital fitness training tiles simple draws the elderly people into stepping on the tiles, moving their feet and jumping around.

"When we observe the elderly people, we can see that when they're on the tiles, they forget everything about time and place. They play. They have fun. They laugh. And they get to do all the movements that are good for training dynamic balance. And that's what's so appealing, if you want to prevent falls," he emphasises.

"You get drawn in by these tiles, because they light up, and you can hardly stop yourself jumping on them," he smiles enthusiastically.

"The power of play helps people forget their limitations and fear," says Henrik Hautop Lund, who has observed the tiles being used for training the balance of post-operation patients, for rehabilitation after accidents and for training the balance and strength of ordinary elderly men and women.

"When you see the elderly people coming in for their very first Moto tile training session, they often arrive shuffling or walking with the use of zimmer frames. But, as they start moving and dancing around, they forget their cautiousness, because they get engrossed in playing and want to score the next point. Sometimes there are even people sitting watching them and cheering. So they laugh and have fun and forget all about any fear they might have of physical movement. And then they can suddenly do much more than usual. That's something that can be difficult with traditional physical training," explains the Professor, who is impressed how the physiotherapists who use the tiles have taken the concept on board and developed it even further.

A Big Hit in Japan

"It's quite amazing to see the way physiotherapists build new kinds of interventions with the interactive LEGO bricks, which is what the Moto tiles are. They don't need to know all about technology and software. They just pick up one of the pieces and then apply their professionalism to what they want to achieve for their patients," he says, returning to the fact that the most important way of achieving motivation to move is play.

"If we let people play, it leads to by-products such as these," says Henrik Hautop Lund, who has just returned from Japan, where the Moto tile technology is a hit and has been described as the latest anti-ageing technology.

"It's big in Japan. Using brain-scanning headbands, the technology company Hitachi has measured the cognitive effect that playing with the Moto tiles has on the brain. The tests show improved spatial awareness, decision-making ability and cognitive functional capacities after just a short period of training. In terms of physiotherapy, it is also interesting that physical activity has a significant impact on the body and brain. Particularly because we have some large elderly populations, in which many people are at the risk of contracting dementia. So, if by applying something motivational, fun and social, we can train both the body and the brain, that's absolutely wonderful," he says, while acknowledging that the little, blue-glowing plastic training tile probably comes across as somewhat trite.

"It is ultra trite. But good ideas often are, when you see them realised. All the way through, I wanted it to be as simple as possible," says the Professor, pointing to a pile of the old, clumsy and heavier prototype tiles in a corner of his office at DTU.

"As Leonardo Da Vinci once said: 'Simplicity is the ultimate sophistication.'"