Hitachi High-Technologies Corporation has validated cognitive functional improvement by use of the "MOTO Tiles" offered by Senoh Corporation.

- Applied Brain Science to Healthcare Training Products -

Hitachi High-Technologies Corporation (President & CEO: Masahiro Miyazaki, and called hereinafter as "HHT"), as part of efforts to utilize the brain science to the products, has cooperated in the validation of exercise cognitive function improvement by use of the new exercise system "MOTO Tiles" to be distributed by a Mizuno Group Company Senoh Co., Ltd. (President and CEO: Tetsuya Ozaki, and called hereinafter as "Senoh").

"MOTO tiles" *[1] were developed by Dr. Henrik Hautop Lund in Technical University of Denmark in Denmark, a country well-known as one of the most advanced welfare countries in the world, for maintaining athlete function as well as cognitive function of elders, and began sales in Japan in April by Senoh. Moto Tiles have embedded sensors and LEDs, and by placing them onto the floor, users can perform a variety of games and practices with fun, such as stepping the lighting tile and turning it off, making sounds by steps, etc. The use of Moto tiles amongst elders in Denmark have shown remarkable effects of physical abilities in clinical effect studies, for instance for increasing balancing skills.

In recent years, while the population ratio of aging is drastically increased in Japan, the attention to the extension of healthy life expectancy is noted, and the need for training not only the physical side, but also in the mental side, has emerged.

HHT has been promoting the application of brain science knowledge into various products, and this time, it has verified seniors' cognitive function improvement by the use of "MOTO Tiles" provided by Senoh.

Utilizing a portable brain activity measurement system (HOT-1000), which is developed aiming at measuring brain activity in the daily life environment, the validation was conducted to check the brain activity in the part of prefrontal cortex. Three focusing points of the validation were done. One was the comparison of brain activity between before and after the workout, the second was the brain activity change (blood volume change) during the exercise, and the third was the comparison of scores. The subjects were 22 healthy male and female elders, whose ages are from 62 to 80 years of age, and

they took the exercise in 60 seconds, by stepping on one of the 4 MOTO tiles, which lit a different color compared with the 3 other tiles lighting up in the same color. The tiles were placed diagonally on forward right/left and horizontally right/left to the subject.

The analysis of the results of the exercise with the Moto tiles found that the subjects who had higher number of the correct answers in the MOTO tiles game have higher brain activities.

Also, by comparing the cognitive test scores before and after the exercise (pre- and posttest), the after exercise scores showed higher percentage of correct answers in the cognitive tests after MOTO tiles exercise. The cognitive tests that were conducted were the spatial cognitive capability test (spatial working memory task＊[2]), and decision making capability test (color word matching task＊[3]).

These results showed that the cognitive function abilities were improved in the short term by the "MOTO Tiles" exercise. And by continuing further MOTO tiles exercising, longer term improvement of cognitive functions is expected.

This examination was done with the cooperation of Hitachi, Ltd. Research and Development Group, and Niigata Medical Welfare University Faculty of Medical Technology Kodama Naoki Professor (at that time, Takasaki University of Health and Welfare).

Furthermore, Hitachi, Ltd. is operating the Brain Science Committee, inviting third-party professionals, for reviewing the adequacy of verification results and its representation. Based on their inspections and verification, the committee can approve to grant Brain Science Mark onto the particular products.

This time, after the careful inspection in the Brain Science Committee, it is decided to grant the Brain Science Mark to "MOTO Tiles".

With the experience and knowledge of brain science accumulated over the years, HHT is continuingly promoting the brain-science-based consultation to enterprises as well as its own brain measurement product development.

By the collaboration with business partners in the various fields, HHT will put effort to promote brain-science-based Monozukuri (Product development).

MOTO Tiles

*1 MOTO Tiles: www.moto-tiles.com
*2 Spatial working memory task: a challenge to remember the location.
*3 Color words matching challenges: challenges to determine the coincidence of color and character.

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