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Development of Augmented Reality Application for Exercise to Promote Health among Elderly

Paweena Bangkerd, Thosporn Sangsawang*

Faculty of Technical Education, Rajamangala University of Technology Thunyaburi, Thailand

Correspondence: E-mail: Paweena_b@mail.rmutt.ac.th

ABSTRACTS

This research aimed to: (1) develop and find the effectiveness of augmented reality application for exercise to promote health among elderly, (2) compare physical fitness in terms of flexibility of the elderly before and after exercising by augmented reality application for exercise to promote health among elderly, and (3) study elderly satisfaction towards the use of augmented reality application for exercise. The samples were 30 elderly in Bueng Namrak, Thailand. The samples were selected through a purposive sampling technique. The instruments were augmented reality application for exercise to promote health among elderly, physical fitness test in terms of flexibility, and satisfaction form. The results showed that learning and using augmented reality application for exercise to promote health among elderly was effective according to KW1 80.80 at KW1 80/83.33. The physical fitness in terms of flexibility after using the application was higher than before using the application. The physical fitness in terms of flexibility before using the application was 5.91 in average, with standard deviation of 6.76, whereas the average after using the application was 6.15, with the standard deviation of 6.53. The t-test value after using the application was 2.80 at a statistically significant level of .05. The satisfaction of the elderly towards the use of augmented reality application for exercise to promote health among elderly was 4.64 in average, which was at the highest level.

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1. INTRODUCTION

The 2nd National Economic and Social Development Plan 2017 - 2021 sets on the framework, vision, and goals aimed at transforming Thailand from middle-income to high-income countries, stable and sustainable countries, society coexists with happiness, personality development to support country growth, building a quality aging society, reducing social inequality. Income distribution, and social services are of high quality and widely distributed, in which the promotion of physical activities is in line with the 2nd National Economic and Social Development Plan by promoting physical activity (Galvin & Sunikka-Blank, 2018). People of all age groups, especially the elderly in the community, feed each other more ill. Nowadays, the world is fully digital, advancing technology and expanding urban society. That gives people access to electrical appliances and lifestyle facilities as well as the nature of the work that shifted from manual labor to machines and labor-saving machines in every trade Utilizing a private car, home delivery service, use of computer cell phones and, the internet, has resulted in a decrease in human movement and movement (Fróna *et al.*, 2019).

Yoga exercise is suitable for the elderly; it strengthens the body and relaxes the muscles by stretching. A research study related to exercise activity in a yoga style studied the effectiveness of exercise. Hatha Yoga, Silver Yoga, and Iyanga will help promote the health of the elderly (Tulloch *et al.*, 2018). This results in physical strength, physical strength, the flexibility of muscles and joints, balance, and body proportions. Only some researchers found to be effective on the endurance of the lungs and heart and suggested that further study physical fitness for pulmonary endurance and heart, the clinical results were not yet seen.

From the above problems and essential conditions, researchers have realized the importance of enhancing exercise performance for the elderly along with the advancement in technology developed and released in the form of applications. To add comfort and flexibility, therefore research was conducted on the development of exercise applications using augmented reality technology to promote the health of the elderly to help the elderly (Ni *et al.*, 2019). Most of the problems are the stretching of the muscles of the arms and legs. Due to the deterioration of the body, older age to promote the physical fitness of the elderly in joint muscle flexibility. The researchers created yoga exercise poses, and design a posture that is easy to follow. It is easy to remember, simple, by using the principle of stretching movement concerning the slow and deep breathing in the rhythm, regularity and meditation when exercising with yoga pose regularly; older people have physical fitness for flexibility of muscles and joints (Nolan & Rochester, 2019), as well as durability of the lungs and heart.

2. METHODS

The subject was 30 people from the Elderly Club in Bueng Nam Rak Sub-district, Thailand. The experiment was done in the Bueng Nam Rak Sub-district area due to location and the manifestation of the elderly. There are older adults from many villages in the Bueng Nam Rak Sub-district doing activities together **Figure 1** shows the activity area of Green Garden Home Village. The research tool is an augmented reality exercise app to promote the health of the elderly. Physical fitness tests for frailty satisfaction assessment forms was carried out the statistics used in this research are percentage, mean, and standard deviation. Furthermore, the t- test of the independent sample.



Figure 1. Photos of the softness measurement activities and the use of the application.

3. RESULTS AND DISCUSSION

Table 1 Shows that the physical fitness test (softness side) during the uses of an augmented reality exercise app to promote the health of the elderly. The physical fitness test results of 30 people were the mean of 80.00%, and the mean percentage of the physical fitness test after use of the application was 83.33. The results of the exercise application using augmented reality technology to promote the health of the elderly were effective following the criteria of 80.80, i.e., KW1 was 80.00 / 83.33 therefore according to the hypothesis.

Table 2 shows that the results of exercise applications using augmented reality technology to promote the health of the elderly are as follows in testing, before using the application, the average score was 5.91, an SD. value of 6.76. After the learners learned from using augmented reality technology exercise apps to promote the health of the elderly, and run the test after using the application. Older adults can bend more forward than before using the application. The mean score was 6.15 with an SD. Value of 6.51. The t-test analysis between before and after using was at 2.80 had a statistically significant difference level of .05.

Table 1. comparison of the physical fitness test in softness during and after testing with the augmented reality-enhanced health-enhancement exercise application.

List	Number of People	%	Standard	KW1
Testing during application use	30	80.00	80	80.00
Testing after using the application	30	83.33	80	83.33

Table 2. comparison of the physical fitness test. (Softness) before including after testing with augmented reality technology exercise applications to promote the health of the elderly.

ITEM	Number of people	Average score	SD.	t	Sig (2-tailed)
Physical fitness test (before)	30	5.91	6.76	2.80	.0089
Physical fitness test (after)	30	6.15	6.51		

4. CONCLUSION

This makes it possible to get a guideline for application development using joint learning on the development of an Augmented Reality application for exercise to promote health among the elderly with the use of modern technology in learning. The system has quality in both content and media. It is also interesting and people can learn from the application media anywhere, anytime, easy to use, easy to learn for the elderly.

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6. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

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