

# Education, reregistration, and recommendation effect of iPhone Poomsae education app in Taekwondo academy

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**Abstract**— This paper analyzed the effect of a smartphone application in Taekwondo Academy. The iPhone app was self-developed to display Taekwondo education contents for Poomsae training. From the viewpoint of education, reregistration and recommendation effect, it showed statistically significant difference in 196 trainee sample survey. Therefore, the research suggest that the use of smartphone technology in Poomsae education would be a great help to the trainee for the acquisition of Taekwondo knowledge and make a great contribution to the growth of Taekwondo.

## I. INTRODUCTION

The use of smart phone applications for Taekwondo education is expected to contribute to the development and effectiveness of education contents in mobile education distribution, which is expanding rapidly [1], and furthermore, to promote the quantitative and qualitative enhancement of mobile learning that enables researchers to analyze the relation between the educational effects of Poomsae education app based on iPhone and trainees' intentions to reregister and recommend, and to maximize trainees' learning abilities in mobile environment without the limitation of time and space.

Taekwondo is the name of the martial art, which turned to modern international sports. It has been independently developed over 20 centuries (2000 years) in Korea. The main feature of Taekwondo is that it is a free-fighting using both strikes with hands and feet. The most important fact about Taekwondo as a martial art sports is that it is not only a superior art of self-defense, but it adds remarkable mental discipline to its practitioners. Self-confidence makes people generous in their attitudes toward weaker people. They can stand equally against of force [2].

Taekwondo Poomsae is meant to be training by "Form" in

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which self-practice is devised to be performed in following the series of movements in a systematic and consecutive way against an imaginary opponent or multi-opponents by using various Taekwondo techniques of hands and foot. Through practicing Taekwondo Poomsae, we can apply the techniques of hands and foot and the changes of stance learned from the basic techniques adaptable to an actual fighting. It also provides us with the positive effect of improving flexibility of body, strength control, balance control, breathing control, eye control, mental control and concentration of spirit. Furthermore, Poomsae cultivates a martial art spirit through repetition, which develops mental discipline. A Taekwondo Poomsae comprises various stances, each with its peculiar nature but each blending into the other. A 'poomsae' consists of approximately two dozen stances interconnected. These consist of blocking, punching, striking, thrusting and kicking with each developed through the Taekwondo Poomsae with the purpose of developing proper methods of use of hands, fists and feet which are vital to the sports. The Poomsae develops the body control, targeting and movement based upon stances including forward stance, back stance, cat stance and horse-riding stance which are necessary when required. The typical Poomsae are Palgwe I-VIII, Taeguk I-VIII, Koryo, Kumgang, Taeback, Pyongwon, Shipjin, Jitae, Chunkwon, Hansoo and Ilyeo.

The researchers designed a Poomsae education app based on iPhone technology for Poomsae knowledge acquisition which is achieved through repeated practice of postures and motions systematically [3], and such an app may promote qualitative improvement in the effect and management of Poomsae education.

Thus, this study purposed to enhance the educational effect of Taekwondo Poomsae learning using a Poomsae education app based on iPhone technology, which covers both theoretical and practical aspects, and furthermore, to provide basic information to help establish strategies for the management of Taekwondo training centers. The intended outcomes are increased Poomsae knowledge acquisition, increase interest in sports of Taekwondo, and associated spread of sports through user recommendation to their network.

## II. MATERIALS AND METHODS

For this study, we sampled 196 people experienced in Poomsae education and introduced the Poomsae app based on iPhone among the members of Taekwondo training centers in Gwangju, Korea. The random sampling method was used, and the survey was conducted using a self-administered questionnaire. The questionnaire contained 7 questions on demographic characteristics, 10 on Poomsae education app, 8 on the effects of education, 3 on reregistration, and 3 on intention to recommend. The collected data were analyzed with SPSS Win Ver. 17.0. The major functions of iPhone app developed in this study: How to use (Figure 1-4), and Environment of development (Table 1) are as follow:

TABLE I  
DEVELOPMENT INVIROMENT

Usable models	iPhone 4, iPod touch 4, iPad
Used O/S	iOS 4
Used language	Objective-C

A. Major function

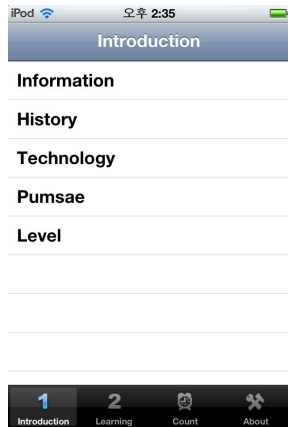


Fig. 1. Screen for the main menu

This app shows Taekwondo Poomsae videos through an iPhone. It shows: 1) General information about Taekwondo, 2) History of Taekwondo, 3) Techniques used in Taekwondo, 4) Taekwondo Poomsaes and 5) Levels. Each video watched includes a counter to measure the number of views in order to monitor the progress of the Poomsae education.

B. How to use

Touch the icon of Taekwondo Education app on the iPhone main screen and the first screen for the Main Menu (Fig. 1) appears. Select one of the five items on the table, and detailed information is displayed on the screen (Fig. 2).

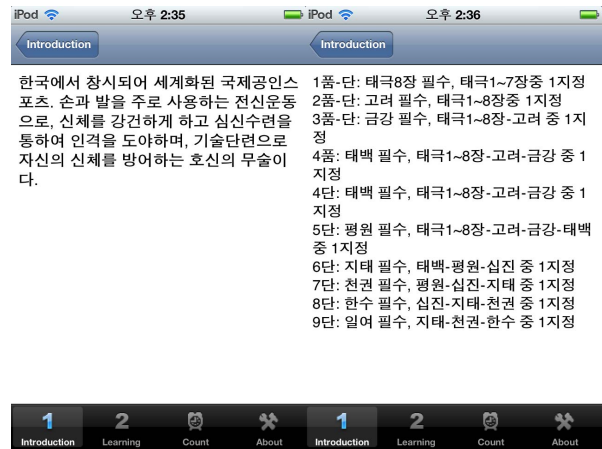


Fig. 2. Screen for the detail information



Fig. 3. Screen for moving picture selection

Select the second tab and a list of Taekwondo Poomsae videos appears on the Pickerview as in Fig. 3 on the top of the screen. The size of video screen can be enlarged by double tap and its video dimensions can be changed by the direction of holding of the iPhone, as in landscape screen or portrait screen.

Tap the third tab, and the numbers of views for the video appear as in Fig. 4.

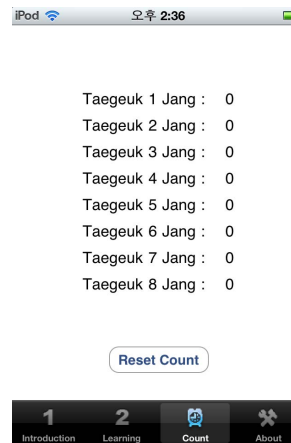


Fig. 4. Screen for trainees' view counting numbers

### III. RESULTS

#### A. Poomsae education app and the effects of education outcomes

TABLE II  
MULTIPLE REGRESSION ANALYSIS ON THE EDUCATIONAL EFFECTS OF THE POOMSAE EDUCATION APP

Variable		Effects on education			
		Unstandardized coefficient		Standardized coefficient	t
		B	S.E.	$\beta$	
Poomsae education program	(Constant)	1.113	.184	-	6.032***
	Entertaining	.215	.048	.249	4.454***
	Useful	.485	.046	.595	10.650***

$F = 131.424^{***}$ ,  $R^2 = .577$ ,  $adj.R^2 = .572$ ,  $^{***}p < .001$

As to the relation between the Poomsae education app and the effects on education in Table II, the entertaining factor ( $t=4.454$ ,  $p < .001$ ) of the app had a statistically significant positive effect on the education, and the beta coefficient ( $\beta = .249$ ) showed the relative entertaining effect of the independent variables. The useful factor ( $t=10.650$ ,  $p < .001$ ) of the Poomsae education app also had a statistically significant positive effect on the education, and the beta coefficient ( $\beta = .595$ ) showed the relative useful effect of the independent variables.

On the other hand, the Poomsae education app explained 57.7% ( $R^2 = .577$ ) of the total variation in the effects of education, and F-value was 131.424 showing a significant ( $p < .001$ ) difference.

#### B. Poomsae education app and reregistration

As to the relation between the Poomsae education app and reregistration in Table III, the entertaining factor ( $t=2.247$ ,  $p < .05$ ) of the app had a statistically significant positive effect on the reregistration, and the beta coefficient ( $\beta = .180$ ) showed the relative entertaining effect of the independent variables. The useful factor ( $t=2.898$ ,  $p < .01$ ) of the Poomsae education app also had a statistically significant positive effect on the reregistration, and the beta coefficient ( $\beta = .232$ ) showed the relative useful effect of the independent variables.

On the other hand, the Poomsae education app explained 13.1% ( $R^2 = .131$ ) of the total variation in reregistration, and F-value was 14.598 showing a significant ( $p < .001$ ) difference.

TABLE III  
MULTIPLE REGRESSION ANALYSIS ON THE EFFECT OF THE POOMSAE EDUCATION PROGRAM ON REREGISTRATION

Variable		Effects on reregistration			
		Unstandardized coefficient		Standardized coefficient	t
		B	S.E.	$\beta$	
Poomsae education program	(Constant)	2.824	.290	-	9.750***
	Entertaining	.170	.076	.180	2.247*
	Useful	.207	.072	.232	2.898**

$F = 14.598^{***}$ ,  $R^2 = .131$ ,  $adj.R^2 = .122$ ,  $*p < .05$ ,  $**p < .01$ ,  $^{***}p < .001$

#### C. Poomsae education app and intention to recommend

As to the relation between the Poomsae education app and intention to recommend in Table IV, the entertaining factor ( $t=5.398$ ,  $p < .001$ ) of the app had a statistically significant positive effect on the intention to recommend, and the beta coefficient ( $\beta = .388$ ) showed the relative entertaining effect of the independent variables. The useful factor ( $t=3.155$ ,  $p < .01$ ) of the Poomsae education app also had a statistically significant positive effect on the intention to recommend, and the beta coefficient ( $\beta = .227$ ) showed the relative useful effect of the independent variables.

On the other hand, the Poomsae education app explained 29.8% ( $R^2 = .298$ ) of the total variation in the intention to recommend, and F-value was 40.976 showing a significant ( $p < .001$ ) difference.

TABLE IV  
MULTIPLE REGRESSION ANALYSIS ON THE EFFECT OF THE POOMSAE EDUCATION APP ON INTENTION TO RECOMMEND

Variable		Effects on recommendation			
		Unstandardized coefficient		Standardized coefficient	t
		B	S.E.	$\beta$	
Poomsae education program	(Constant)	1.897	.266	-	7.143***
	Entertaining	.375	.069	.388	5.398***
	Useful	.207	.066	.227	3.155**

$F = 40.976^{***}$ ,  $R^2 = .298$ ,  $adj.R^2 = .291$ ,  $**p < .01$ ,  $^{***}p < .001$

### IV. DISCUSSION

In conclusion, the Poomsae education app developed in this study was found to have a significant effect on the education, reregistration, and intention to recommend. However, the explanatory power of the Poomsae education app analyzed in this study was highest for effect on Education and less for Reregistration and Intention to recommend. This suggests that the Poomsae education app using iPhone technology is most important as a necessity in the meaning for education rather than in terms of the management of Taekwondo Training Center. This study showed significance of the Poomsae education app for iPhone as contributory to the knowledge acquisition of the Poomsae and to a lesser degree toward the user's reregistration and intent to recommend Taekwondo to others.

#### ACKNOWLEDGMENT

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