

# Investigation of Learner Recognition to Introduction of Mobile Learning: A Study Targeting Officers at the Ministry of Health and Welfare in Korea

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## ABSTRACT

*Mobile learning is a practical learning method for busy adult learners because the mobility of digital devices can overcome the drawbacks of e-learning. However, research is strongly lacking in the theoretical exploration of mobile learning effects and functions and its empirical research. Moreover, the research of learning characteristics and learners' requirements must be considered before applying and disseminating mobile learning into the educational field. To address this shortcoming, this study conducted an online survey with 1,542 officers of the Ministry of Health and Welfare Affairs (MHWA) regarding learner recognition to mobile learning. The analysis of learners' attitudes toward mobile learning, based on age and position, indicated that subordinate workers appeared to place more value on mobile learning. Many participants preferred mobile learning because of its mobility and the effectiveness of anywhere and anytime. However, some participants continue to misunderstand mobile learning and its necessity. Therefore, consideration of learning effectiveness, the form of the content, and learner-centered learning must be reviewed in advance. This study could lead to practical implications of mobile learning.*

**Key words:** Mobile Learning, Recognition of Learner, Case Study.

## 1. INTRODUCTION

The mobile learning has been significantly important in higher education with cutting-edge information communication technology available throughout the world. Especially the mobile devices and the web have changed the world in a very short period of time [1]. With the development of wireless internet and various mobile communication devices, one can have access to the internet in order to search and acquire the information one needs [2]. Thus, e-learning based on cable internet is currently transforming into the mobile learning environment [3] - [5].

Recently, the spread of the smart phone and the development of its application have led to increasing attention toward mobile learning services. Smart phone users increased from 80 million in late 2009 to 1000 million by March 2011. Smart phone users are expected to increase to 2,000 million (Korea Communication Commission), which occupies 40% of mobile phone users [6]. As it can incorporate the busy life style

of users into the era of 'one-man-one-mobile device', mobile learning is likely to receive more attention in the near future. Mobile technology allows one to access the internet without time and space limits, and this leads to a new technological paradigm. Mobility, accessibility, individual recognition, interaction, and synchronous interaction can maximize effective learning in the teaching-learning process. Mobile learning incorporates the merits of e-learning. At the same time, mobile learning overcomes the drawbacks of e-learning, thus, opening the possibility of a new educational paradigm. However, this is still a new development, and therefore a thorough investigation is needed.

Even though a newly introduced learning method is innovative, a careful investigation and a gradual introduction should be required into the educational field. Researchers also should consider learner characteristics and needs. Especially, within the changed paradigm of movement from a supplier-based environment into a consumer-based environment, a broad understanding about various learners and their needs is needed. This means a thorough understanding about learners' thoughts, attitudes, and pre-required needs is required. Consequently, these principles can be applied into new and innovative educational trends [7]. To do this, a broad analysis of learners' mobile learning and pre-required needs is required

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in order to develop this educational system. To conduct this, a specific learner group should be chosen. In a specialized officer education training institute such as the Human Resources Department at the Ministry of Health and Welfare, learner characteristics and needs vary; thus, it would be possible to conduct a cross-tabulation regarding learner recognitions according to learner characteristics [8]. Therefore, the current study aims to analyze learners' awareness of mobile learning and explores the concept of mobile learning. In so doing, it elicits the practical implications of introducing mobile learning.

## **2. LITERATURE REVIEW**

### **2.1 Mobile learning**

Mobile is defined as 'portable', 'active', and 'easy to move' and it is currently receiving much attention as an ideal learning device. Cell phones, smart phones, personal computer handheld devices, Tablet PCs, lap tops, and personal media players are commonly used devices. Through mobile devices and wireless networks, mobile technology has the characteristics of mobility. This is one of the biggest strengths and features of mobile learning. Through the mobility of the smart phone, one can have access to information he or she needs and communicate it to colleagues without time and space restraints [9].

By applying the mobility of mobile technology into education, learning can be possible without time and space restraints. This is defined as mobile learning (mobile learning: m-learning) [10], [11]. Mobile learning is one of the alternatives to e-learning. Mobile learning can be considered as a type of distance learning and it can overcome the limits of computer learning based on a wire based network [12] - [14]. Moreover, this can be categorized as a Computer Assisted Instruction (CAI). However, in both studies, through the mobility of the mobile device, learning space is extended and learners can participate in situated learning using location based information. Also, through Social Network Services(SNS) of cell phones, interactive learner based learning is integrated [15], [16]. Recently, an understanding of transforming learning progress through mobility and interaction with various and different people is another characteristic and merit of mobile learning [17]. To sum up, the present study defined mobile learning as a learning portal that links learners' formal learning and informal learning and allows learners to form their own knowledge through interactions with various learners including peers and professionals. Thus, mobile learning can have various forms, including being an alternative to e-learning as well as face-to-face learning. However, mobile learning methods should be designed and managed based on the features of learning fields [18].

### **2.2 Survey of learner awareness toward acceptance of mobile learning**

In the initial stage of the introduction of mobile learning, several trials and errors can occur if it does not have a systematic plan [12]. Such trials and errors already took place with the introduction of e-learning and it can be blamed on political, social, and economical features. Also, structure and organization of education and training institutes, attitudes,

compensation systems, officers' values, individual political power, and standards based on the end-product can be other reasons that cause such trials and errors [19]. These features can be viewed according to several aspects including organizational, social, personal, and political. Considering such aspects, at the stage when a new technology is introduced, one of the most common features that receive attention is how well it is accepted and spread based on the user's decision making process [20].

The importance of the individual can be viewed from several angles. In the field of educational technology, factors that interrupt the spread of innovation are learners' recognition and application rather than lack of hardware and software [21]. Moreover, the selection of new educational methods should be based on individual choice rather than enforcement because it is more effective for individuals to make their own decision regarding the utility of a new educational method. Recognition toward acceptance of a new learning method can vary from strongly positive attitudes toward strongly negative attitudes. Such variations of recognition can be obvious when one can accept and spread new learning methods based on one's decision making process. Therefore, in order to use and spread new innovative mobile learning, investigation of learners' recognition based on individual decision making factors is needed. Therefore, the analysis of learners' recognition and attitude toward the introduction of mobile learning would be necessary.

In terms of learner aspects, learner background, motivation, and usability should be analyzed. Regarding the spread of learning methods based on new tools, learners' skills to use software, preparation of hardware, and familiarity toward this learning method should be reviewed. Types of mobiles, one's proficiency of using the mobile, and the familiarity of learning method influence the effects of learning because one's initial experience of a new learning method can play an influential role on one's recognition toward mobile learning [22]. Therefore, before introducing a mobile learning method, an investigation into learner recognition of the above categories is needed.

## **3. RESEARCH METHOD**

### **3.1 Participants**

In this study, 1,543 participants who were interested in mobile learning voluntarily completed a cyber-learning project. We chose 1,543 participants because they have experienced of e-learning and have basic knowledge of the cyber-learning so they can compare e-learning with mobile learning' advantages.

980 of participants are female(65.5%) and 563(36.5%) were male. The dominant age group was 40 years(685 participants, 44.4%), followed by 50s(454, 29.4%), 30s(329, 21.3%) and 20s(75, 4.9). The dominant job position was 968 action officers(62.7%), followed by 255 others(16.5%), 249 degree8-degrees(16.1%) and 10 deputy directors(4.6%). Basic information of the participants can be seen from the following Table 1. The survey was completed and conducted by online e-mail from June 16th to July 15th in 2011.

Table 1. Description of sample

Variables		Frequency(N)	Percent (%)
Gender	Male	563	36.5
	Female	980	63.5
Age	20s	75	4.9
	30s	329	21.3
	40s	685	44.4
	over 50s	454	29.4
Position	Deputy director	71	4.6
	Action officer	968	62.7
	Degree8-degree10	249	16.1
	Others	255	16.5
Total		1,543	100.0

### 3.2 Instruments

This study covered the following areas: understanding of the mobile learning, usability of mobile devices, experience of mobile learning, factors affecting the use of mobile learning methods and learning contents, the availability of mobile learning, and a plan for mobile learning distribution to the participants.

The survey questionnaire consisted of 29 items was including closed questions and open-ended questions on a five-point Likert rating scale to collect and analyze quantitative and qualitative information at the same time. The initial questionnaire was developed by two educational technologists and then reviewed and refined for validity of the items by two doctoral researchers for reliability of measurement. The collected data was analyzed by descriptives, frequencies, t-test, and one-way ANOVA.

### 3.3 Procedure

First, the investigation of the learner recognitions toward the introduction of mobile learning was conducted based on the literature review and preceding research.

Second, based on previous research, the survey of questionnaire was developed and refined by two educational specialists and two doctoral researchers regarding a mobile learning service, previous experience of mobile learning, factors affecting the use of mobile learning, the availability of mobile learning, and a plan for mobile learning distribution to the participants.

Third, 1,543 subjects who were completed the cyber learning of MHWFA answered e-mail version of the survey.

The form of the survey was based on five-point Likert-Scale. The Cronbach's  $\alpha$  of the instrument in the present study is .933. Results of reliabilities coefficients for satisfaction scale are presented in Table 2.

Table 2. Reliabilities Coefficients of Satisfaction Scale

Cronbach's Alpha	N of items
.933	54

Finally, SPSS 18 for the collected data was used to perform all statistical analysis, Mean, SD, t-test, one-way

ANOVA, and Scheffe for post-hoc analysis to identify significant differences between gender, age and positions.

## 4. RESULTS

In responding to the question whether learners have experience of using mobile learning, 1,479 (95.9%) participants responded that they had not experienced it and only 64 (4.1%) replied that they had experienced mobile learning. Targeting those who had not experienced mobile learning, the researchers asked the question whether those learners had plans to use mobile learning in the future. Among 1,479 (95.9%), 984 (66.5%) answered they do not plan to use mobile learning whereas 495 (33.5%) showed their willingness to use mobile learning in the future.

### 4.1 Mobile learning service and learning method

As mentioned earlier, in responding to the question whether learners have experience of mobile learning, 1,479 (95.9%) responded that they had not experienced mobile learning. According to those participants, 497 (33.6%) did not use mobile learning because they did not see the necessity of it. Also, 334 (22.6%) did not use mobile learning because of the small and uncomfortable devices. 262 (17.7%) responded that they did not even know about the concept of mobile learning and 250 (16.9%) did not use mobile learning because of the expensive price. Considering these responses from the participants, in order to introduce mobile learning effectively, explanation about the utility of mobile learning and an operation manual using flash animation is needed.

Table 3. Reasons for not using mobile learning

Category	Percent (%)
expensive price	250 (16.9%)
unsatisfied contents	8 (0.5%)
do not see the necessity of mobile learning	497 (33.6%)
slow speed of wireless internet	55 (3.7%)
do not know the concept of mobile learning	262 (17.7%)
small and uncomfortable device	334 (22.6%)
others	73 (4.9%)

Table 4. Mobile learning service and learning method

Category		Percent (%)
wanted mobile learning service	view new learning contents	802 (52.0%)
	review previous learning contents	384 (24.9%)
	test learned contents	43 (2.8%)
	check learned concepts through game	116 (7.5%)
	problem solving with peers	24 (1.6%)
	question about the learned contents	152 (9.9%)

	others	22 (1.4%)
wanted mobile learning method	game	109 (7.1%)
	cartoon	203 (13.2%)
	text message	228 (14.8%)
	quiz	158 (10.2%)
	animation	824 (53.4%)
	other uses	21 (1.4%)

## 4.2 Experience about mobile learning

### 4.2.1 Commonly used mobile learning contents

Targeting the participants who had experienced mobile learning, the researchers asked the questions about their commonly used mobile learning contents, learning method, place of conducting mobile learning, reasons for using mobile learning, and factors that interrupt mobile learning. In responding to the question about the commonly used mobile learning contents, 21 (32.8%) participants responded that they use mobile learning when they study language; while 17 (26.6%) replied that they use it for duty-related education, 11 (17.2%) responded for hobbies, nine (14.1%) use mobile learning for cyber and degree-related learning, four (6.3%) take advantage of mobile learning for certification-related education, and only two (3.1%) replied for other uses.

### 4.2.2 The most commonly used mobile learning method

In responding to the question regarding the most commonly used mobile learning method, 21 (32.8%) responded that they used mobile learning through the form of synchronous video lecture, internet lecture, and web-based searching; while 16 (25.0%) downloaded files (video/audio). Such responses imply that learners use the mobility of mobile learning as a form of e-learning. Moreover, 13 (20.3%) answered that they downloaded educational applications, ten (15.6%) replied they accessed wireless internet, and only three (4.7%) replied they used the internal learning contents of the mobile devices, and one (1.6%) responded to other uses.

### 4.2.3 Place to use mobile learning

In responding to the question regarding the place to use mobile learning, 24 (37.5%) responded at home whereas 20 (31.3%) answered on transportation (subway, bus, and car). Moreover, 16 (25.0%) replied they would use mobile learning while they are at their work. Also, three (4.7%) use it outdoors such as in the mountain, parks, and resort areas, and only one (1.6%) replied for other places.

Table 5. Performance of mobile learning

	Category	Percent (%)
mobile learning contents	language	21 (32.8%)
	certification-related education	4 (6.3%)
	cyber/degree-related education	9 (14.1%)

	duty-related education	17 (26.6%)
	hobby	11 (17.2%)
	others	2 (3.1%)
commonly used mobile learning method	download educational applications	13 (20.3%)
	access to wireless internet	10 (15.6%)
	download files(video/audio)	16 (25.0%)
	form of synchronous video/internet lecture, and web-based search	21 (32.8%)
	use internal learning contents in the mobile device	3 (4.7%)
	others	1 (1.6%)
place to use mobile learning	home	24 (37.5%)
	work	16 (25.0%)
	outdoor area	3 (4.7%)
	transportation	20 (31.3%)
	other places	1 (1.6%)

## 4.3 Factors affecting mobile learning

### 4.3.1 Reasons for mobile learning

In responding to the question of underlying reasons for using mobile learning, 34 (53.1%) responded that they use mobile learning because of the good accessibility. This response implies that the participants placed value on the mobility of mobile learning. Furthermore, 13 (20.3%) answered that they used it because they can enjoy their leisure time through mobile learning. Six (9.4%) showed they used mobile learning because it can maximize learning effect. Moreover, four (6.3%) answered they used mobile learning because it is interesting. Those four participants also placed values on mobile learning due to its updated learning contents.

### 4.3.2 Factors that interrupt mobile learning

In responding to the question regarding the factors that interrupt mobile learning, 17 (26.6%) responded that the small screen of the device and difficult operation of the device are the main interrupting factors. 16 (25.0%) answered for slow speed and unstable status of the internet. Ten (15.6%) responded for expensive internet fees and nine (14.1%) replied for limited learning contents. five (7.8%) answered that complicated usage of the mobile device is the main factor that interrupts mobile learning, and seven (10.9%) responded for other reasons.

Table 6. Factors of using mobile learning

	Category	Percent (%)
reasons of using mobile learning	maximize the effects of learning	6(9.4%)
	accessibility (time and place)	34(53.1%)
	easy to operate	4(6.3%)

	use one's leisure time	13(20.3%)
	select one's learning progress	3(4.7%)
	view updated learning contents	4(6.3%)
interrupting factors of mobile learning	expensive mobile internet fee	10(15.6%)
	small screen of the device difficult usage of the device	17(26.6%)
	complicate to operate	5(7.8%)
	limited learning contents	9(14.1%)
	slow speed and unstable status of the internet	16(25.0%)
	other reasons	7(10.9%)

**4.4 Availability to use mobile learning device and plans to use**

**4.4.1 Availability to use mobile learning device**

Regarding the availability to use mobile learning device, the participants showed 3.03-3.13 in responding to the question of one's ability to use mobile learning device. This implies that mobile learning ability is not an interrupting factor in mobile learning.

Table 7. Availability of mobile learning device

Category	Mean±SD
I believe using mobile device in learning is easy.	3.13±0.943
I believe ability to use mobile device in mobile learning is sufficient.	3.03±0.962
I believe operation to use mobile learning device and related software is easy.	3.03±0.902
I can easily download and save the learning contents I need.	3.08±0.933

The following is the difference in the respondents' availability to use mobile learning according to gender. In all the categories, a significant difference is shown according to gender. More specifically, males showed higher means than females.

Table 8. Availability of mobile learning use according to gender

Items	Male		Female		t	p
	M	SD	M	SD		
I believe the operation to use mobile learning is easy.	3.21	0.963	3.09	0.930	2.38	0.017*
I believe my ability to use mobile learning device in mobile learning is sufficient.	3.12	0.972	2.98	0.952	2.75	0.006**

I believe downloading mobile device menus and related software is easy.	3.12	0.900	2.97	0.900	3.06	0.002**
I can easily download and save learning contents I need.	3.16	0.935	3.04	0.929	2.46	0.014*

\*p<.05 ” and “ \*\*p<.01

The following is the analyzed result of the availability of mobile learning according to age. In all the categories, a significant difference is shown. More specifically, those in their 20s showed higher means compared to other age groups.

Table 9. Availability of mobile learning according to age

Dependent variable	Age	M	SD	F/p-value	Scheffe
I believe the operation to use mobile learning is easy.	20s(a)	3.48	0.794	13.151 /0.000	d<c<a d<b
	30s(b)	3.31	0.903		
	40s(c)	3.13	0.917		
	above 50s(d)	2.95	0.994		
I believe my ability to use mobile learning device in mobile learning is sufficient.	20s	3.51	0.860	19.632 /0.000	d<c<a d<c<b
	30s	3.25	0.927		
	40s	3.01	0.948		
	above 50s	2.83	0.964		
I believe downloading mobile device menus and related software is easy.	20s	3.45	0.843	17.381 /0.000	d<c<a d<c<b
	30s	3.22	0.865		
	40s	3.01	0.888		
	above 50s	2.84	0.912		
I can easily download and save learning contents I need.	20s	3.48	0.875	18.444 /0.000	d<c<a d<c<b
	30s	3.28	0.883		
	40s	3.09	0.909		
	above 50s	2.86	0.959		
I believe using the contents of mobile learning is easy.	20s	3.56	0.740	22.261 /0.000	d<c<b<a
	30s	3.23	0.887		
	40s	3.06	0.903		
	above 50s	2.82	0.917		

The following is the analyzed result of the availability of mobile learning according to position. In all the categories, a significant difference is shown. More specifically, in the categories including 'I believe the operation to use mobile

learning is easy', 'I believe downloading mobile device menus and related software is easy', and 'I believe downloading mobile device menus and related software is easy', subordinates show higher means than middle-position managers. In the category of 'I believe my ability to use mobile learning device in mobile learning is sufficient', subordinates showed higher availability compared to managers and middle-position managers. Regarding others, middle-position managers showed higher means than subordinates.

Table 10. Availability of mobile learning according to position

Dependent variable	Position	M	SD	F/p-value	Scheffe
I believe operation to use mobile learning is easy.	manager(a)	2.99	0.978	4.460 /0.004	b<c
	middle manager(b)	3.08	0.943		
	subordinate workers(c)	3.28	0.912		
	other (d)	3.23	0.943		
I believe my ability to use mobile learning device in mobile learning is sufficient.	managers	2.86	0.960	9.679 /0.000	a<c b<c b<d
	middle managers	2.95	0.962		
	subordinate workers	3.25	0.943		
	other	3.18	0.930		
I believe downloading mobile device menus and related software is easy.	managers	2.86	0.915	6.056 /0.000	b<c
	middle managers	2.97	0.902		
	subordinate workers	3.19	0.889		
	others	3.13	0.886		
I can easily download and save learning contents I need.	managers	2.94	0.969	4.718 /0.003	b<c
	middle managers	3.03	0.925		
	subordinate workers	3.23	0.908		
I believe using the contents of mobile learning is easy.	others	3.18	0.955	7.327 /0.000	b<c b<d
	managers	2.93	0.915		
	middle managers	2.98	0.907		
	subordinate workers	3.21	0.909		
	others	3.20	0.915		

**4.4.2 Attitudes toward mobile learning**

Regarding attitudes toward mobile learning, all the categories showed scores range from 3.27 to 3.55. This implies that the mainly have positive attitudes toward mobile learning. More specifically, within the environment of qualified contents and mobile-friendly environment, the participants showed the strongest willingness to use mobile learning (score 3.55).

Table 11. Attitudes toward mobile learning

Category	Mean±SD
Using mobile learning, I believe I can maximize learning effects compared to previous learning method (offline, cyber).	3.27±.877
I believe I can easily learn the functions of mobile-learning device.	3.35±.850
I believe application of mobile learning would be easy because it is similar to web-based learning.	3.31±.85
Within the environment of qualified contents and mobile-friendly environment, I would actively use it.	3.55±.909
I have positive attitudes toward mobile learning.	3.54±.893
I would like to actively use mobile learning in the future.	3.41±.947

The following is the analyzed result of attitudes toward mobile learning according to gender. In responding to the categories of 'Using mobile learning, I believe I can maximize learning effects compared to previous learning method (offline, cyber)' and 'Within the environment of qualified contents and mobile-friendly environment, I would actively use it', the result showed significant difference. More specifically, males showed higher average points than females.

Table 12. Attitudes toward mobile learning according to gender

Item	Male		Female		t	p
	M	SD	M	SD		
Using mobile learning, I believe I can maximize learning effects compared to previous learning method (offline, cyber).	3.34	0.916	3.22	0.852	2.57	0.010*
I believe I can easily learn the functions of mobile-learning device.	3.40	0.865	3.33	0.840	1.61	0.107
I believe application of mobile learning would be easy because it is similar to web-based learning.	3.35	0.869	3.28	0.838	1.63	0.104
Within the environment with qualified contents and mobile-friendly environment, I	3.62	0.909	3.50	0.907	2.51	0.012*

would actively use it.						
I have positive attitudes toward mobile learning.	3.60	0.889	3.50	0.894	1.97	0.49
I would like to actively use mobile learning in the future.	3.50	0.934	3.37	0.952	2.58	0.10

\*p<.05

The following is the analyzed result of attitudes toward mobile learning according to age. Except for the category of 'Using mobile learning, I believe I can maximize learning effects compared to previous learning method (offline, cyber)', all the categories showed significant differences. More specifically, the categories of 'I believe application of mobile learning would be easy because it is similar to web-based learning', 'I believe I can easily learn the functions of mobile-learning device', and 'Within the environment with qualified contents and mobile-friendly environment, I would actively use it', those in their 20s showed higher scores than those in their 50s, and those in their 40s showed higher scores than those in their 50s. In responding to the category of 'I have positive attitudes toward mobile learning', those in their 20s showed higher scores than those in their 50s. Furthermore, those in their 20s showed higher scores than those in their 50s and those in their 30s showed higher scores than those in their 50s in responding to the category of 'I would like to actively use mobile learning in the future'.

Table 13. Attitudes toward mobile learning according to age

Dependent variable	Age	M	SD	F/p-value	Scheffe
Using mobile learning, I believe I can maximize learning effects compared to previous learning method (offline, cyber)	20s	3.47	0.741	1.751 /0.155	
	30s	3.28	0.893		
	40s	3.27	0.860		
	over 50s	3.22	0.909		
I believe I can easily learn the functions of mobile-learning device	20s	3.59	0.737	10.203 /0.000	d<a d<b d<c
	30s	3.46	0.800		
	40s	3.39	0.845		
	over 50s	3.18	0.884		
I believe application of mobile learning would be easy because it is similar to web-based learning	20s	3.61	0.804	13.676 /0.000	d<a d<b d<c
	30s	3.43	0.790		
	40s	3.33	0.843		
	over 50s	3.12	0.873		
Within the	20s	3.81	0.849	9.655	d<a

environment with qualified contents and mobile-friendly environment, I would actively use it	30s	3.68	0.889	/0.000	d<b d<c
	40s	3.56	0.889		
	over 50s	3.38	0.937		
	20s	3.79	0.759		
	30s	3.61	0.925		
I have positive attitudes toward mobile learning	40s	3.54	0.879	4.360 /0.005	d<a
	over 50s	3.44	0.901		
	20s	3.64	0.782		
I would like to actively use mobile learning in the future	30s	3.52	0.930	5.922 /0.001	d<a d<b
	40s	3.43	0.941		
	over 50s	3.28	0.978		
	20s	3.64	0.782		

The following is the analyzed result of attitudes toward mobile learning according to position. The categories of 'I believe application of mobile learning would be easy because it is similar to web-based learning' and 'Within the environment of qualified contents and mobile-friendly environment, I would actively use it', the significant difference is shown. More specifically, in responding to the category of 'I believe application of mobile learning would be easy because it is similar to web-based learning', subordinate workers showed higher scores than managers. Moreover, in responding to the category of 'Within the environment of qualified contents and mobile-friendly environment, I would actively use it', others showed higher scores than middle-position managers.

Table 14. Attitudes toward mobile learning according to position

Dependent variable	Position	M	SD	F/p-value	Scheffe
Using mobile learning, I believe I can maximize learning effects compared to previous learning method (offline, cyber)	managers	3.13	0.985	1.445 /0.228	
	middle-position managers	3.28	0.871		
	subordinate workers	3.32	0.867		
	others	3.20	0.877		
	managers	3.21	0.925		
I believe I can easily learn the functions of mobile-learning device	middle-position managers	3.32	0.852	2.828 /0.037	
	subordinate workers	3.47	0.793		
	others	3.38	0.865		
	managers	3.21	0.860		
I believe application of mobile learning	middle-position	3.27	0.841	4.153 /0.006	b<c
	managers	3.21	0.860		

would be easy because it is similar to web-based learning	managers	3.47	0.828		
	subordinate workers				
Within the environment with qualified contents and mobile-friendly environment, I would actively use it	others	3.30	0.882	4.717 /0.003	b<d
	managers	3.41	0.979		
	middle-position managers	3.49	0.892		
	subordinate workers	3.66	0.871		
I have positive attitudes toward mobile learning	others	3.68	0.967	1.134 /0.334	
	managers	3.45	0.953		
	middle-position managers	3.51	0.877		
	subordinate workers	3.59	0.899		
I would like to actively use mobile learning in the future	others	3.60	0.929	2.346 /0.071	
	managers	3.34	0.970		
	middle-position managers	3.37	0.945		
	subordinate workers	3.49	0.920		
	others	3.52	0.967		

## 5. CONCLUSIONS AND IMPLICATIONS

This study aimed to explore the learner recognition, experiences, and needs regarding mobile learning. The data was collected from the surveys of participants at MHWA. The following is the summary of this study.

First, participants responded that they have knowledge of mobile learning and they commonly used their cell phones as well as smart phones as learning devices. Second, the participants responded that they wanted contents of mobile learning which is related to their tasks at work. They replied that they also used mobile devices when they move from places to places. The main reason for using mobile learning is due to its mobility. Also, they used mobile devices because they can enjoy their leisure time. Third, the participants responded that they believe that mobile learning would be effective compared to e-learning. They would like to actively use mobile learning if the mobile environment is further developed. Based on the results of this study, the following implications can be drawn. First, some participants responded that they had already heard and knew about mobile learning. However, some of them did not see the necessity of mobile learning. Especially, aged people do not like high technology devices because they think that high technology is too complicated to use. This can be a cause of 'Digital Divide' which refers to inequalities between individuals, socioeconomic levels, other demographic

categories or geographic areas [23]. Therefore, strategies of diffusing mobile learning would be needed in order to reduce the gap between individuals, generations and so on. This implies that a broad and intensive introduction of mobile learning is needed. Since a majority of the participants use smart phones as well as mobile devices, a gradual introduction of mobile learning taking into consideration type of device and fees is needed.

Second, many participants used mobile learning when they have spare time. Consideration of learning time and the form of contents should be viewed in advance. In the research, short-form mobile learning is a good idea to reduce cognitive load and to increase learners retention [24]. Most busy people want to invest in a training process very quickly. Therefore, the short form of mobile learning needs to be studied for busy people. Especially, in order to maximize work-related capability, a systematic strategy elicited from officers' work is needed. Moreover, the majority of the officers at the MHWA work in the field rather than in offices, thus, work-related manuals and problem-solving forms in the field should be considered.

Third, with an environment of mobile learning, several participants responded that they would become actively involved in mobile learning. This result leads to an implication on how to create a mobile learning environment. Putting it differently, a user-centered mobile interface environment should be established. Since participants are likely to use mobile learning in their leisure time, transformation into previous learned contents is required.

Fourth, learners' attitudes toward mobile learning are different according to gender, age, and position. According to the analyzed contents of learners' attitudes based on position and age, subordinate workers are likely to place more value on mobile learning compared to managers. This is because subordinate workers are more likely to spend time in the field compared to managers, thus, subordinate workers showed their willingness to actively use mobile learning. Therefore, in introducing mobile learning, a gradual and intensive introduction is needed considering these learner groups.

In conclusion, mobile learning could give people new learning opportunities and emphasize on social interactions [25]. Therefore, in order to introduce mobile learning, the analysis of learner characteristics and learner needs toward mobile learning are required because tasks and educational needs of learners vary. In this study, those in their 20s and 30s who have sufficient knowledge of information communication, showed strong willingness to participate in mobile learning compared to their counterparts. However, this study collected only quantitative data regarding learners' mobility and education in introducing mobile learning. Therefore, a further study involving qualitative research, such as in-depth interviews and observations, relating to learners' educational needs and mobile learning is called for.



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