A study about incorporating the mobile technology integration system of an orienteering tour into a sightseeing tour planning curriculum

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ABSTRACT: This study examines a mobile technology integration system of an orienteering tour (MTISOT) that can be designed by combining a smart phone with a QR code, Google Maps, Facebook and bicycle. This could be used in the college sightseeing tour planning curriculum. The innovative integrated model has been used to look for progressive teaching and to enhance the learning effect. This study comprised three stages for the MTISOT teaching system. The first is the portal page design stage, describing curriculum rules. The second is the checkpoint planning and design stage, combined with local cultural characteristics, enhancing the student's information ability to perform creatively. The third is the experience stage, implementing the curriculum goal of learning by doing, enhancing the learning effect by check-in Web page interaction. After the experience stage, 311 students (the system users) were surveyed by questionnaire. For this study on the curriculum involving a MTISOT system and local culture, the preference of 55.3% of those involved, was for four indicators: *performance expectancy*, *innovativeness*, *hedonic motivation* and *time value.*

INTRODUCTION

Learning as base, technology for use is the basis of using information technology in education. It has been shown that if teaching is integrated with information technology, the students' learning effectiveness and attitude in the field can be enhanced, and the students' information ability is enhanced [1][2]. In Taiwan's technological and vocational education system, the students' independent thinking and problem-solving abilities are emphasised, and teachers are expected to use information technology for curriculum design and teaching activities, so as to give students the concept and experience of information technology. How to use the advantages of technology to assist learning and innovate the teaching models is a new topic for current teachers.

Tourist route planning is always a subject receiving attention. According to the abstract of the Tourism Market Survey, 2013, Tourism Bureau, the Ministry of Transportation (MOTC), 62% of tourist information is from *Internet information media* [3]. Harder predicted that the electronic tourist guide with information regeneration capacity will replace traditional printed maps [4]. Therefore, the mobile tourist information application is convenient and instant, and it becomes an important tourist information application tool [5], enhancing also the students' learning interest and creativity.

A MTISOT is developed by combining a smart phone with a QR code, Facebook and Google Maps in the concept of an urban cultural characteristic tour in this study, to assist teaching and enhance the effect of learning. In order to find out the students' acceptance of the system, Venkatesh et al formulated the unified theory of acceptance and use of technology (UTAUT2) model [6], which is universally used in the studies, which explain using information technology at present [7][8]. Therefore, this study uses the extended technology acceptance model theory (UTAUT2) to discuss further the factors which influence the learners' use of this technology in learning, so that the teachers can have important reference indexes to follow in the future practical application of teaching.

TEACHING STAGE AND IMPLEMENTATION SYSTEM ARCHITECTURE

The teaching is divided into three stages: 1) the portal page design stage: this stage enables students to use the activity design theory and system application taught in the curriculum. The portal server home page introduces the orienteering tour experience rules and describes the competitive activity, aiming to enhance the students' ability to design mobile Web pages; 2) the checkpoint design stage: this stage enables students to learn how to encode the dynamic Web page link on the Web site of various checkpoints to QR code; the dynamic Web page program enables students to plan more diversified checkpoint changes and integrate fun into the tour lesson presentation principle; and 3) the experience stage: the student checks in Facebook when he/she reaches the specified checkpoint by bicycle, providing instant and interactive communication, increasing the novelty of the activity; and it can be used to judge the result. The architecture of the designed MTISOT is shown in Figure 1.

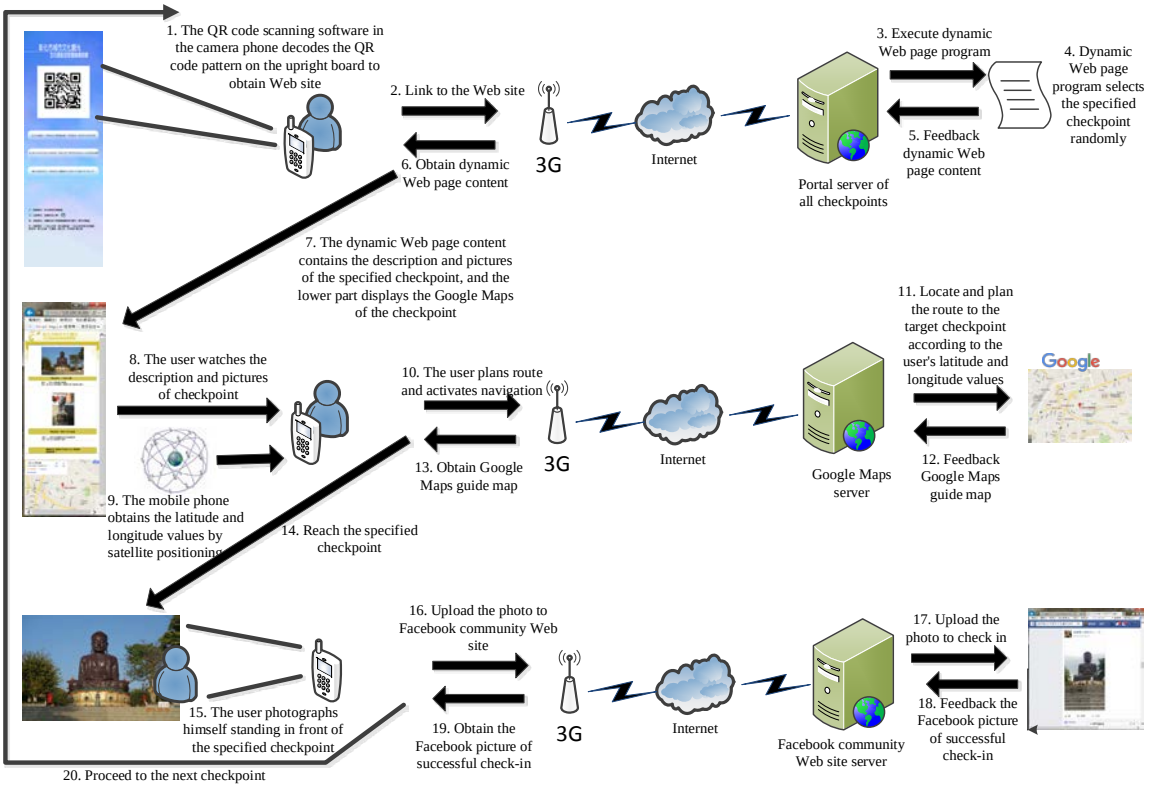

Figure 1: Architecture of MTISOT.

IMPLEMENTATION OF MTISOT

This system uses a smart phone which can be connected to the Internet via 3G or Wi-Fi. It is embedded with a GPS function and QR code decoding software. The implementation of MTISOT includes a portal home page, a checkpoint information board design and dynamic Web page program design. The design modes are described below:

Portal Home Page

The portal home page introduces the orienteering tour experience rules and activity competition description, so that the participants can know the details of the whole activity from the content on the portal page. The appearance of portal home page is shown in Figure 2.

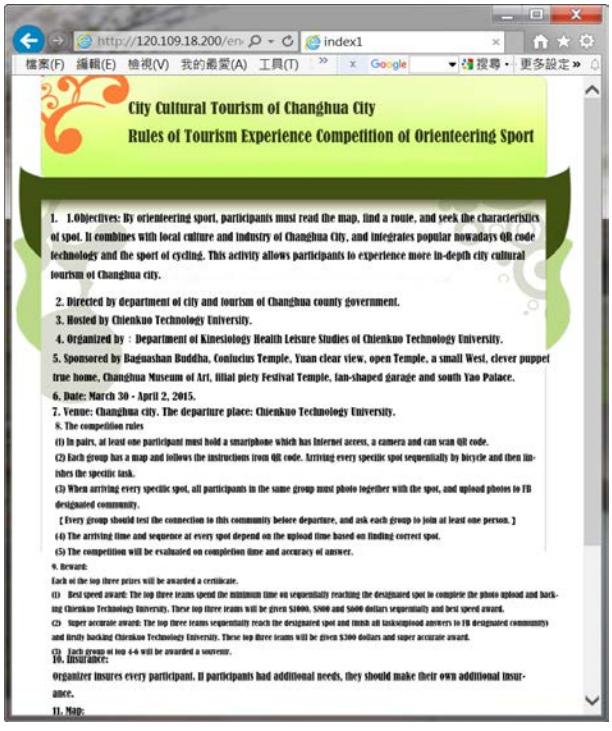

Figure 2: Portal home page.

Figure 3: Information board.

Information Board Design

The information board provides a QR code, as shown in Figure 3, the participating student uses the QR code scanning software in the phone camera to decode the QR code pattern on the board to obtain the Web site. Therefore, the on-line Web sites of various checkpoints must be made into QR code patterns in advance [9].

Dynamic Web page Program Design

The dynamic Web page implementation procedure is shown in Figure 4. Some checkpoints have two *looking for* designations. The first looking for designation is fixed, as shown in Figure 4 (2). The second looking for designation is a random number 1 or 2, as shown in Figure 4 (3). The graphics file of the second looking for designation is loaded according to the random number. For example, when the random number is 1, the graphics file of *looking for designation: look for Gold Face Guan Gong* is loaded. If the random number is 2, the graphics file of *looking for designation: look for Six-Tooth Big White Elephant* is loaded, as shown in Figure 4 (4). Afterwards, the graphics file of action specification and pass code are loaded to remind the player to take a picture for check-in when the assigned target is found, and to memorise the pass code of this checkpoint to prevent cheating, as shown in Figure 4 (5).

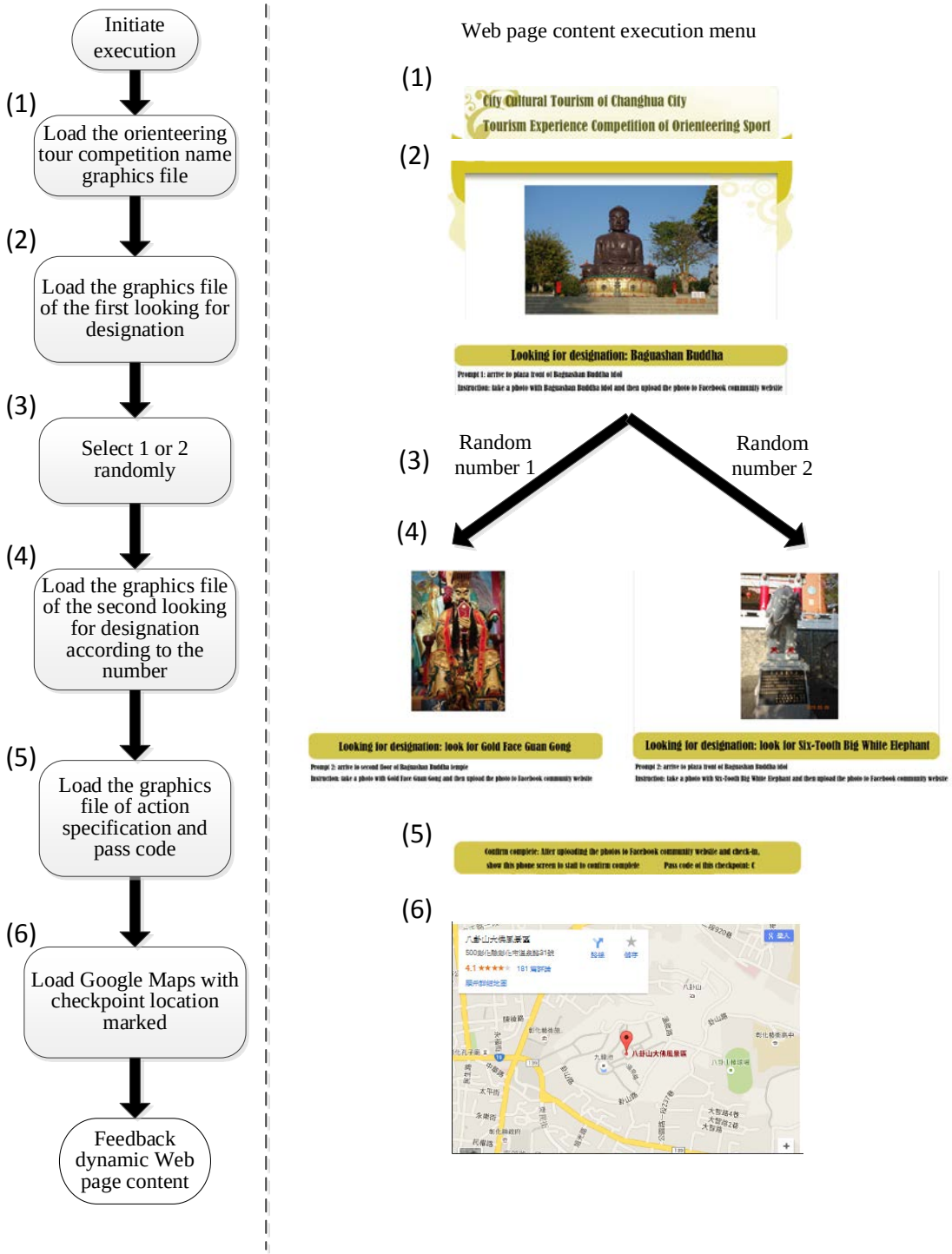

Figure 4: Dynamic Web page program execution process.

QUESTIONNAIRE SURVEY AND DATA ANALYSIS

Questionnaire Design and Hypotheses

This study refers to the methods with good reliability and validity in the literature, such as San Martín [10], Venkatesh [6], Jensen [7], Herrero and Rodríguez [8], and uses a Likert seven-point scale, 1 to 7 represent *strongly disagree* to *strongly agree*, respectively. The questions of the extended technology acceptance model refer to Escobar-Rodríguez and Carvajal-Trujillo [11], including six aspects: performance expectancy, payment anticipation, facility, hedonic motivation, time value and habit. There are 21 items and the total scale α value is 0.91. The innovative questions refer to the items from Goldsmith and Hofacker [12]. There are three items and the α value is 0.85. The place image scale questions refer to Goldsmith [13]; there are five items and the α value is 0.93. The research scope is a part of urban culture sightseeing process, with a place image as the factor which may influence the tour experience. The research hypotheses are:

- H1 UTAUT2 after taking part in MTISOT activity has a positively significant impact on the place image.
- H2 the innovativeness after taking part in MTISOT activity has a positively significant impact on the place image.

Research Subject and Sampling Method

This study used the purposive sampling method for surveys. Students from the Department of Sports and Recreation were surveyed by questionnaire. All the students completed the experience curriculum by riding a bicycle in classes and time intervals. Of the 350 questionnaires sent out at the destination, 335 were recovered, including 311 valid questionnaires. The recovery ratio for valid questionnaires was 88.85%.

RESEARCH RESULTS

Descriptive Statistics

The descriptive statistics are shown in Table 1: the proportion of males (62.4%) was higher than that of females, so the sex division plane was significant, the *hedonic motivation* ($t = -3.62$, $p < 0.05$) and *habit* ($t = -4.60$, $p < 0.05$) of males was greater than that of females, as the performance of males in fresh-air sports was greater than females; the grade division plane *performance expectancy* ($F = 5.15$, $p < 0.05$) and *payment anticipation* ($F = 5.15$, $p < 0.05$) were significant. Grade 3 was higher than Grade 1, because Grade 3 engaged more orientation movements than Grade 1.

Table 1: Analysis of basic characteristics (n = 311).

Basic data			Number of samples	%	Basic data		Number of samples	%
Gender	Male		194	62.4	QR code experience	Yes	228	73.3
	Female		117	37.6		No	83	26.7
Grade	Grade 1		106	34.1	FB usage time	Less than 6 months	26	8.4
	Grade 2		123	39.5		6 (included) months~1 year	11	3.5
	Grade 3		65	20.9		1 (included) year~2 years	37	11.9
	Grade 4		17	5.5		Over 2 (included) years	237	76.2
Participated in orientation movement or not		Yes	128	41.2				
		No	183	58.8				

In terms of the *extended technology acceptance scale*, the average score of total scale was 5.21 points, meaning the participants' technology readiness is fairly good. The *habit* score was higher (M = 5.3), followed by *hedonic motivation* (M = 5.28) and, then, *time value* (M = 5.27). In terms of *innovativeness scale*, the average score of total scale was 5.05 points, meaning the participants have fairly good participation in new activities. In terms of *place image scale*, the average score of total scale was 5.45 points, meaning the participants have fairly good acceptance for importing the place image into the tour. According to the aforesaid data, the students have considerably high acceptance of the MTISOT.

Correlation Analysis of the Extended Technology Integration Model, Innovativeness and Place Image

According to Pearson product-moment correlational analysis, the extended technology integration model was positively correlated with the place image ($r = 0.72$, $p < 0.001$), reaching a significant high correlation level. The innovativeness is positively correlated with the place image ($r = 0.61$, $p < 0.001$), reaching a significant moderate correlation level.

Regression Analysis of Extended Technology Integration Model, Innovativeness and Place Image

According to Table 2, four variables out of the seven predictor variables reached significance level. Four factors, including *performance expectancy*, *innovativeness*, *hedonic motivation* and *time value*, have a predictive effect. The participants' preference for the orienteering tour activity design with the place image is estimated at 55.3% ($F = 61.799$, $p < 0.05$). Therefore, hypotheses H1 and H2 are tenable. Result 1 *performance expectancy* shows the students are assisted effectively by using MTISOT to complete check-in pass activity design rapidly. Result 2 *innovativeness* shows that all of the participants want to experience the innovative tour design of MTISOT first. Result 3 *hedonic motivation* shows that for the convenience of MTISOT, the experience process is more recreational, so the participants can finish the tour with pleasure. Result 4 *time value* shows that the participants believe the MTISOT can save much travelling time, and they can know more unique sightseeing spots through the tour.

Table 2: Participants' multiple regression analysis abstract for extended technology integration model, innovativeness and the place image (N = 311).

Input variable	B	Std. error	Beta	*t* value	Sig.
Performance expectancy	0.625	0.42	0.651	15.064	0.000
Innovativeness	0.320	0.48	0.343	6.688	0.000
Hedonic motivation	0.167	0.45	0.224	3.710	0.000
Time value	0.168	0.53	0.175	3.154	0.000
$R = 0.730$, $R^2 = 0.553$ adjusted $R^2 = 0.527$, $F = 87.423$*					

DISCUSSION AND SUGGESTIONS

The implementation of MTISOT outlined in this study has three characteristics. The first is the portal page design stage; the second is the checkpoint planning and design stage; the third is the experience process stage, so as to enhance the students' learning effect. The system test results show that there are differences in sex and grade. The students have fairly good acceptance for importing *extended technology acceptance scale*, *innovativeness scale* and *place image scale* into the tour design. Finally, the *performance expectancy*, *innovativeness*, *hedonic motivation* and *time value* factors have predictive effect, the participants' preference for the orienteering tour activity design with the place image is estimated at 55.3%. Therefore, the students can obtain the following learning advantages from the curriculum:

- A mobile orienteering tour integration system is created. The innovative research and development of system is *dynamic Web page design*, different from general traditional orienteering activity design, so as to inspire the students' concept of design creativity.

- The system is integrated by using QR codes, Google Maps and Facebook technologies, and combined with an orienteering activity, the planning subject of the tour content is urban culture sightseeing, integrated with popular technology to provide a more interesting teaching experience process.

- The activity experience process is 90 minutes, but multiple cultural and innovative characteristics are imported, so that the students rapidly find out about local characteristics by check-in. They will make further explorations after the activity, so that the *place image* is imported. The students can further learn about the unique sightseeing spots of cities.

- Based on the Facebook check-in design, local characteristic cultural and creative industry pictures can be shared with community participants through the Facebook social network, so as to implement tour marketing.

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