International Business Management 4 (2): 57-66, 2010
ISSN: 1993-5250

Evaluation Teaching Cocktail with the Instructional Module of Cocktail

[1]Lin Cheng-Chang, [3]Lin Chih-Ting, [4]Giorgio Fadda and [2]Wu Mu-Lin
[1]Department of Hospitality Management, [2]Department of Information Management,
Diwan University, Tainan 72153, Taiwan ROC
[3]Urban and Regional Planning, Faculty of Architecture,
Design and Planning, The University of Sydney, Sydney
[4]Associazione Italiana Barmene Sostenitori, Italy

Abstract: Alcohol industry contributes in the world economy importantly. Bartender plays a key role in supporting this market. Education in cocktail traditionally supports the business and acts the important role. For improving the education, the key factors to success are no doubt needed to have good training material and a proper approach teaching bartender to make the perfect cocktails keeping up with the international trends of the cocktail. Cocktail teaching is not just training student pouring the best ingredients mixed together or just teaching a skill of performance to mixing. Preparing the successful cocktails, student is required more knowledge behind the skills. The purpose of this study is to develop an instructional module for the field of cocktail especially focusing on the topics of well realize resources for designing a recipe calculating cost and alcohol. Qualitative and quantitative were used for developing the model. Computer-based training system is easily transferred to real-world industrial operation skill. The computer cocktail training system model that consists of a training standard-cocktail module which concludes photos, recipes and regulations of 65 official cocktails of the IBA and an instruction module was reported. The model was created to simulate in teaching cocktail and schedule to design cocktails. The evaluation was preceded when the model applied in training student. Student from the controlled class learning cocktail with the module was investigated to analyze the effectiveness of model. The result was compared to the contrast class learning cocktail without the module. The one way ANOVAs were performed for all this measurements. After study, the study concept or ability of student is able to familiar with the full scale ability which are the name of cocktail, category, glass, ingredient, price of bottle, content of bottle, required volume of cocktail, the classification of cocktails families to calculate the cost and alcohol concentration of cocktail, the alcohol unit of cocktail to familiar with the basic rules of cocktail mixing, method of preparation to realize how to make a successful cocktail, to operate the model and to familiar with model to make a recipe. The cocktail training system has demonstrated the feasibility and effectiveness of the proposed framework and approach. The results suggested that student was satisfied with the user interface of model and the module were shown effectiveness of learning cocktail. To compare with numbers of errors, student was less fail learning cocktail with module than without module. Teaching cocktail with the system is efficient, cheap and convenient way for both teacher and student. The advantages of computer-based cocktail training system were evaluated and found it was superior than the traditional training environment. This system is an economic, convenient and efficient approach for teaching and learning cocktail. Using this system study, student is able to familiar with ability of full scale bartender. All of these objectives are progress the cocktail education keeping up with the development of the world. This is also the way to promote the cocktail education which only focuses on training student technique ability to full scale ability of cocktail.

Key words: Cocktail, family tree, trend, model, student, module

INTRODUCTION

Bar industry has been an important and valued activity of people in many countries for very long. Cocktails are working as a part of daily life and a vital trading commodity in the world economy. Bartenders play a key role in supporting this market and can make consumer enjoying drinks. Education in cocktail is important key factor to improve success of this industrial business. For improving the education, the key factors to success are no doubt to need have good training material and also approach to make the perfect cocktails keeping

Corresponding Author: Lin Cheng-Chang, Department of Hospitality Management, Diwan University 87-1, Nanshi Li, Madou Town, Tainan 72153, Taiwan, ROC

up with the international trends of the cocktail. Vocational education has played a successful actor in industrial development of Taiwan. In this moment, food and beverage class in school is playing the same actor for the requirement of future developing in hospitality industry. Cocktail is one of the most favorite classes of student. The several problems for young student learning cocktail are: student who is age <18 years old is illegal to drink, the expensive materials for practicing cocktail is a heavy burden for student, student drinks during the class should affect student's next class study, student drinking in class is concerned for campus and transportation safety and more importantly student needs to realize how to control the cost and calculate alcohol concentration of cocktail. Owing that the cocktail education is not only needed to focus on technique training but also teaching cost control and characters of cocktail.

Cocktail business is not just training student pouring the best ingredients mixed together. Knowing the successful cocktails, student is required more knowledge behind the skills (Castellon, 2005; Ueda, 2009). First of all, student needs to well understand the history of cocktails, the families of cocktails, a chronological overview, ingredients, bar equipment, the basic rules of cocktail mixing, cocktail preparation. To explore and learn the fine business of cocktail, it is necessary to understand all of these theories (IBA, 2008, 2009). Therefore, the simulation of model is a proper way teaching cocktail at the very beginning study. The purpose of this study is to develop an instructional module for the field of cocktail especially focusing on the topics of well realize resources for designing a recipe calculating cost and alcohol. This study was summarized to find: a model and a set of procedures for the development of instructional module was established with which an instructional module of training cocktail. Evaluating the set of teaching procedures of the instructional modules to train cocktail was set up. Results from the evaluation indicate that the instructional module of natural resources was well-prepared, thereby suggesting that this instructional module of training cocktail can be applied in the college or professional training.

For the needs to develop the model, qualitative and quantitative researches are used to realize the characters of cocktails. Qualitative research is based on reference review, document analysis and group discussions. Quantitative research is used to calculate the cost, volume, alcohol concentration and alcohol unit and to analyze the relation among them. Finally, the model is created to simulate in teaching cocktail and schedule to design cocktails. Using the model studying cocktail, student firstly needs to learn the classification of cocktails, then learns the basic rules of mixing cocktail, the conditions for a successful cocktail, trends of drink and finally simulation of model to determine recipe. After study, the study concept or ability of student is able to familiar with the full scale ability which are the name of cocktail, category, glass, ingredient, price of bottle, content of bottle required volume of cocktail, the classification of cocktails families to calculate the cost and alcohol concentration of cocktail, the alcohol unit of cocktail, to familiar with the basic rules of cocktail mixing, method of preparation, to realize how to make a successful cocktail to operate the model and to familiar with model to make a recipe.

The advantages of computer-based cocktail training system compared with the traditional training environment are the followings:

- Model is effective and efficient for students to practice a new recipe before it is installed and perhaps more importantly is allowed the results of improper composition of alcohol concentration, volume and cost to be simulated without incurring the associated costs
- By using photos of materials and final products in computer can potentially provide more realistic methods of training than simple oral explanation
- Model is safer than physical work which causes from student dinking too much
- Training systems that use computer-based training system are reconfigurable and portable
- Computer-based cocktail training system is especially valuable in where real-life practice is expensive materials
- Students can learn to perform collaborative or competitive tasks together using networked computer-based training system
- The procession of create a new cocktail is simplified by choosing 5 components
- Student can save money about 5,000 NT dollars to release economic burden
- Student is convenient learning by personal schedule without time limited without the danger in campus because of no drinking without drinking effect on the other classes

MATERIALS AND METHODS

The cocktails which are still used in current drinks are reviewed and compared with ingredients and historical data (Castellon, 2005; Kerr, 2006; Galliano, 2008; Graham, 2009; Boiron, 2008; Slinkard, 2009; Martell, 2008; Mozart Distillery, 2009). Collection of recipes and

regulations of cocktails are reviewed. The group discussions were preceding during participation the elite bartender training courses of International Bartender Association (IBA) in 2008 and 2009 which hold in Singapore and Italy individually. When there have different among the recipes, the IBA official recipes and regulations are used as the standard (IBA Official Cocktails, 2009).

The simulation of model teaching cocktail: The 65 recipes and regulations of the IBA are used as the standard. The specific characteristics of cocktails are calculated with a soft program designed by Giorgio Fadda. Calculation of the IBA official recipes obtains the specific characteristics of cocktails. Total volume (mL) of cocktail is neglect water from melted ice. Concentration (%) of alcohol is obtained from sum of alcohol (mL) divided sum of total volume. Sum of alcohol is equal to amount of drink (mL) multiplied by strength of drink (% abv). Concentration of alcohol in the drink presents the strength of drink which is the most effect factor on taste. One unit of alcohol is equivalent to 10 mL alcohol. The alcohol unit is meaning hour to digest alcohol by human body (IBA, 2008, 2009).

According the trends and regulations which come from the study, we suggest the model to teach cocktails. All recipes of IBA (IBA Official Cocktails, 2009) are used to detect the model. Simulation of model is used teaching cocktail. Using the model, student firstly practices to familiar with the list of materials then to operate the model, to familiar with a recipe of IBA to able to calculate the concentration of cocktail and the unit of cocktail and to realize and able to calculate the cost of cocktail.

The basic rules of cocktail mixing: By the way of analysis the data of the IBA official cocktails, three plots, which are made by volume to cocktails, alcohol concentration to cocktails and alcohol unit to cocktails are used to analyze the composed regulations of cocktails.

Studying with the basic rules of mixing cocktail, 1 student is able to calculate the concentration of cocktail and the unit of cocktail to familiar with the basic rules of cocktail mixing.

Schedule to design cocktails: Using the model, students schedule to design cocktails according to the trends and regulations. All recipes of IBA and the recipes of the World championship of the competition of IBA from 2006-2009 (IBA Official Cocktails, 2009) are used to detect the model. The composition of the recipes is clarified into 5 factors: strong, sweet, sour, weak and bitters. An approach of decision a cocktail by the model is:

$$C = S1 + S2 + S3 + W + B$$

Analysis of the effectiveness: Student from the controlled class learning cocktail with the module was investigated to analyze the effectiveness of model. The result was compared to the contrast class learning cocktail without the module. Group discussion was also used to analyze the effectiveness of result of student which practiced with or without the model learning cocktail.

Satisfaction for using the model: The participants were investigated with 10 questions to ask: model approach is acceptable for training purpose; model objects coincide with reality; model operation is easy after brief introduction; model environment has high fidelity in virtual and audio; model response time is acceptable; model permits you to control the order as personal requirement; the training task with the model fast enough; the sense involving in the model environment; the model with self-confidence; the training task of the model feel freedom; likert-scale of 1-5 was used with 5 representing a high likelihood of the measure and 1 indicating a low likelihood.

Evaluation criteria and result for the effectiveness of the module: The participants were investigated with 5 questions to ask and answer with yes or no:

- The module provides trainee with effective directions so that user always knows what to do the next step?
- Does the module correctly interpret trainee deviation from the default procedure when there are no situational factors requiring the deviation?
- Does the module interpret trainee deviation from the default procedures when they are in reaction to situational factors?
- Does the module recognize the trainee failed to achieve a goal and explain its failure?
- Does the module recognize all actions of constraint violations and explain its constraint violation?

Efficiency of using the model: After learning, students of two classes are required to completely finish the test included two parts. One is student in ten minutes capable to identify the name of ten alcoholic beverages which are randomly drawn from 24 brands of liqueurs and base liquors (Cognac VSOP, Brandy, Scotch Whisky, Bourbon Whiskey, Canadian Whisky, Irish Whiskey, Vodka, Vodka Vanilla, Vodka Citron, Gin, Tequila (Color is an option), Dark Rum, White Rum, Cachaça, Absinthe, Dry Vermouth, Dubonnet Red, Grand Marnier, Creme de Cassis, Cointreau (Triple Sec), Amade, Benedictine, Creme de Cacao (Dark) and Tia Maria) and 8 brands of wines (Cabernet Sauvignon, Merlot, Pinot Noir, Syrah (Shiraz),

Sauvignon Blanc, Chardonnay, Riesling and Muscat (Moscato; Moscatel)). Another, student in 40 min needs to finish the report with six recipes of cocktails which is also randomly drawn from 65 official recipes of IBA. In the report, student was required to calculate the cost and the alcohol concentration of every single cup to descript the garnish, preparation, cup to used and drink type. Numbers of errors compared with students learning cocktail with and without module. The one way ANOVA was used to analyze performance.

RESULTS AND DISCUSSION

Simulation of model for teaching cocktail: Student able to recognize the classification of cocktails families is the first thing for learning cocktail and then well knows cocktail recipes. The 65 recipes of IBA official cocktails and regulations of the IBA are used to learning as the standard. The model has function to operate calculating specific characteristics of cocktails of the IBA official recipes. The fundament frame of the model is composed of main parts as: the name of cocktail, category, glass, ingredient, concentration of alcohol, price of bottle, content of bottle required volume of cocktail, drink cost, total volume of cocktail, total alcohol volume in cocktail, alcohol concentration of cocktail, specific gravity of cocktail, gram of alcohol in cocktail and method of preparation (Fig. 1). First, student needs following the step keying the important message as: the name of cocktail, category, glass, ingredient, concentration of alcohol, price of bottle, content of bottle, required volume of cocktail and method of preparation. Students will learn the important factors as soon as they key in the data. When student finished the required data, the program will automatically produce total volume of cocktail, total alcohol volume in cocktail, alcohol concentration of cocktail, specific gravity of cocktail and gram of alcohol in cocktail.

All of these items are required knowledge for student to learn. At the beginning, student practices through analyzing the data of the IBA official cocktails to familiar with the international standard drink. The important objectives of teaching cocktail with the model student are:

- Familiar with materials
- Able to operate cocktails
- Familiar with model to make a recipe
- Able to calculate the concentration of cocktail and the unit of cocktail
- Realize and able to calculate the cost of cocktail. The model is developing for teaching to achieve these purposes by convenient and cheap way

What is the trend of volume, the trend of alcohol concentration and the trend of alcohol unit of cocktails? After students operating the model to learn the concentration of cocktail, the unit of cocktail and to familiar with the basic rules of cocktail mixing, they have already realized the official standard drink. The specific characteristics of 65 IBA official cocktails are list together Using these data, advance analysis is needed to find out the proper proportion of the specific cocktail for advance analysis the basic rule of mixing cocktail (Table 1). The

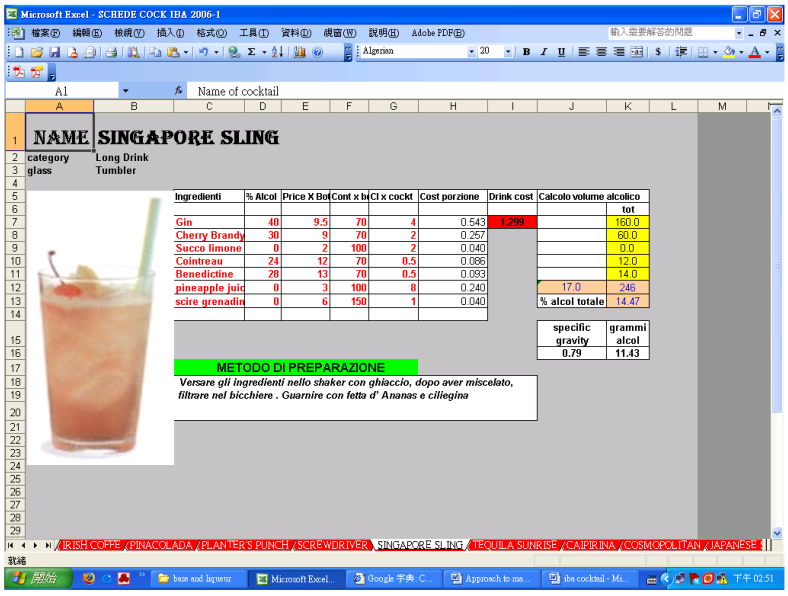

Fig. 1: The fundament frame of the model, the example using the model showing the characters of Singapore sling

Table 1: The specific characteristics of IBA official cocktails

Cocktails	Volume[1] (mL)	Concentration[2] (%)	Unit alc[3]	Type[4]
B 52	60	13.33	0.80	Shot
Orgasm	60	32.00	1.92	Shot
Apple martini	70	36.57	2.56	Pre
Black Russian	70	34.29	2.40	Pre
Dry martini	70	35.29	2.47	pre
Gibson	70	36.86	2.58	pre
Manhattan	71	33.24	2.36	pre
Perfect martini	50	32.00	1.58	pre
Rob roy	70	31.44	2.20	Pre
Adamy Eva	70	25.71	1.80	Pre
Americano	90	13.67	1.23	Pre
Bacardi cocktail	70	25.71	1.80	Pre
Bacardi symphony	70	25.71	1.80	Pre
Bronx	70	23.14	1.62	Pre
Caipirina	75	26.67	2.00	Pre
Daiquiri	70	25.71	1.80	Pre
Harvey wallbanger	70	2.57	1.80	Pre
Japanese slipper	90	22.00	1.98	pre
Kamikaze	90	26.67	2.40	Pre
Kir	100	11.50	1.15	pre
Madam	70	25.71	1.80	Pre
Margarita	70	31.43	2.20	Pre
Negroni	90	26.33	2.37	Pre
Old fashioned	82	20.00	1.64	Pre
Paradise	70	26.86	1.88	Pre
Rose	70	24.43	1.71	Pre
Smile	70	25.71	1.80	Pre
Summer queen	70	25.71	1.80	Pre
Whisky sour	90	20.00	1.80	Pre
Brandy Alexander	90	21.33	1.92	After
Cosmopolitan	100	22.00	2.20	After
Grass hopper	60	16.00	0.96	After
French connection	70	34.00	2.38	After
Golden cadillac	60	18.00	1.08	After
Golden dream	70	20.00	1.40	After
Irish coffee	100	16.00	1.60	Hot
Japanese slipper	90	22.00	1.98	After
Porto flip	70	21.11	1.48	After
Rusty nail	70	40.00	2.80	After
Bellini	150	7.67	1.15	Long
Bloody mary	151	11.92	1.80	Long
Brandy egg nogg	70	25.71	1.80	Long
Buck's fizz	150	8.00	1.20	Long
Bull shot	101	11.88	1.20	Long
Champagne cocktail	111	13.69	1.52	Long
Cosmopolitan	100	22.00	2.2	Long
Cubalibre	170	17.76	2.00	Long
Horse's neck	150	10.67	1.60	Long
Irish coffee	100	16.00	1.60	Long
John Collins	151	12.09	1.82	Long
Gin fizz	160	10.00	1.60	Long
Long island ice tea	110	21.82	2.40	Long
MaiTai	100	27.60	2.76	Long
Mimosa	150	7.67	1.15	Long
Mojito	120	13.33	1.60	Long
Pinacolada	150	8.00	1.20	Long
Planter's punch	130	18.46	2.40	Long
Salty dog	140	11.43	1.60	Long
Screwdriver	150	13.33	2.00	Long
Sea breeze	190	8.42	1.60	Long
Sex on the beach	140	14.86	2.08	Long
Singapore sling	170	14.47	2.46	Long
Tequila sunrise	150	12.00	1.80	Long

[1]Sum of volume (mL) of ingredient adds 10% water of melted ice.[2]Concentration (%) of alcohol = sum of alcohol (mL) /sum of total volume. Sum of alcohol = amount of drink (mL) x strength of drink (abv) %. Concentration of alcohol in the drink presents the strength of drink which is the most effect factor on taste. [3]Unit of alcohol is equivalent to 10 mL alcohol. The unit alcohol is meaning hour to digest alcohol by human body. [4]Drink types, shot is shot drinks, a kind of short drinks; pre is pre dinner drinks; after is after drinks and long is long drinks

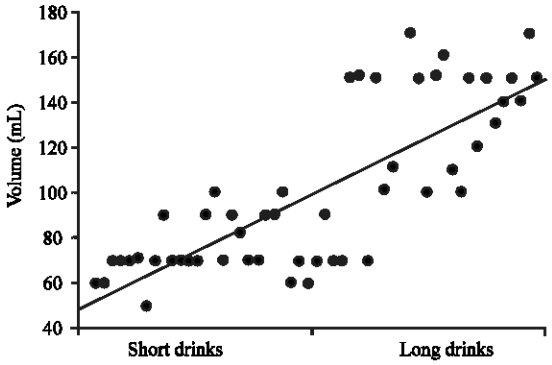

Fig. 2: The trend of volume of cocktails. The most popular drinks volume are 70 mL (short drinks), next with 150 mL (long drinks) and 90 mL (short drinks). The slop is going up showing different volumes of two drinks

favorite taste, effect of volume, concentration of alcohol and unit of alcohol of the cocktail on its taste is regarding consideration of study. Using these data, advance analysis is needed to find out the proper proportion of the specific cocktail. In IBA, cocktails are classified by volume into three types: short drinks, fancy drinks and long drinks or by service purposes into another three styles: pre dinner after dinner and long drink. Whatever, it is depend on drinking volume or alcohol concentration or alcohol unit. What is the trend of volume, the trend of alcohol concentration and the trend of alcohol unit of cocktails?

From data of Table 1, comparison volume with different cocktails, the result shows the volume of short drinks (70 mL) and long drinks (150 mL) (Fig. 2). To compare alcohol concentration with different cocktails shows the most popular alcohol concentration which is 10-15% for long drinks, 20-25% for short drinks and 30-35% for classic short drinks (Fig. 3). Finally, to compare alcohol unit with different cocktails shows all cocktails almost having the same unit 1.9 (Fig. 4). In conclusion, the basic rules of pre dinner drinks are the most popular volume 70 mL, proper alcohol concentration 20-25% but 30-35% for classics, content of alcohol unit 1.9. Principles of after dinner drinks are the most popular volume 90 mL, proper alcohol concentration 20-25%, content of alcohol unit 1.9. Principles of long drinks are proper volume 150 mL, proper alcohol concentration 10-15%, content of alcohol unit 1.9.

Concentration of alcohol is the most effect factor on drinking taste that is individually decided by person. However, its meaning is different from the unit of alcohol. The unit of alcohol shows the actual amount of alcohol. The same unit of alcohol mixing with higher volume of drink produces lower concentration of alcohol when it

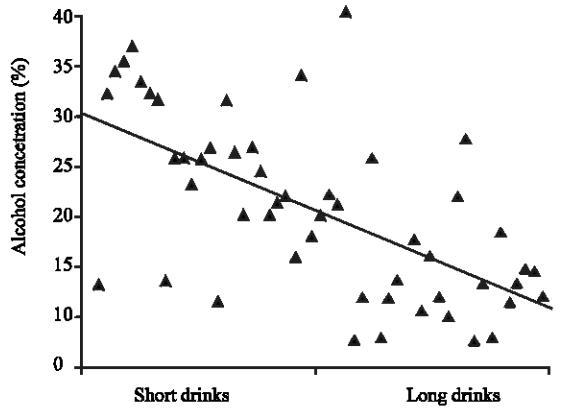

Fig. 3: The trend of alcohol concentration of cocktails. The most popular alcohol concentration of the drinks are 10-15% (long drinks), next with 20-25% (short drinks) and 30-35% (short drinks). The slop is going down showing higher concentration of short drinks and lower concentration of long drinks

compares with lower volume to produce higher concentration of alcohol. For example, Singapore sling and dry Martini have similar units of alcohol 2.46 and 2.47 but their concentrations of alcohol are very different with 14.47 and 35.29% because they have different volumes of 170 and 70 mL. Bartender has the responsibility to know these two cups with same effect on human body despite they are strong or weak, larger or smaller because they are content the same unit of alcohol.

Schedule to design cocktails: The model is also applied in teaching student schedule to design cocktails. According the rules, mixing three components which need to consistent with the base, modifier and flavor or color agent, create the cocktail with colorful and clarity sight, bouquet and aroma smell and favorite taste (IBA, 2008, 2009). The base which is the most significant ingredient that contributes the organoleptic qualities and is responsible for the first impression can be choose >1 of the 6 spirits such as whisky, rum, tequila, brandy, gin and vodka (Castellon, 2005). The proportion of the alcohol base is usually 50-70% in a short drink and only 20-30% in a long drink. The modifiers are the gradients which offer the most effect on the consistency of the cocktails and also contribute extra flavors that complement those of the base. According experience, wine is modified with a sparkling wine as Champagne or a fortified wine as port or sherry for keeping consistency of the cocktail in a short drink. Champagne is unusual used in a long drink. Furthermore, the modifier is used to form the body of the long drink as mineral water or still or

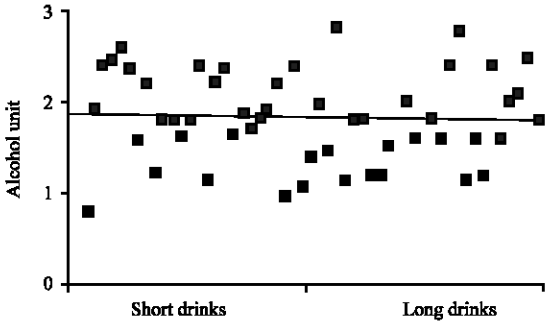

Fig. 4: The trend of alcohol unit of cocktails. The average alcohol unit is 1.9 in all drinks. There are not different between short drinks and long drinks

sparkling or soda water or cola or tonic water or lemon soda or ginger ale or ginger beer can or fruit or vegetable juice or lemon juice or lime juice or milk or cream or the white egg or yolk egg. Finally, the flavoring and coloring ingredient are the complementary elements that gift cocktail with sweetness or bitterness or color. Sweeteners can use syrups, liqueurs or others. Bitters are usually used Campari and Angostra bitters.

According to the latest survey by chefs (National Restaurant Association, 2009), the trends of drinking habit has changed without artificial additives instead with organic, natural, flavored, enhanced substances materials.

The trends of cocktails are preferred to make with fresh mint, lemon grass, raw sugar cane, fresh herbs, fresh fruits and vegetables to replace the brand liqueurs. Anyway, a local grown harvest fresh fruit and vegetables can be a prior choice to mix with the perfect drink because of fresh. In addition, making a perfect way, natural sparkling waters, organic teas and flower water drinks can top up with a cocktail instead of soda water to avoid the dangerous of increasing sodium.

For the reasons following the world trend, the compositions of cocktail with containing three components (base, modifier and flavor) are changed to fit the trend with more clarified into 5 factors: strong, sour, weak and bitters. To comparison, base means strong; modifier is divided into 3 parts sweet, sour and weak; bitters means flavor. An approach of decision a cocktail by the model is:

$$C = S_1 + S_2 + S_3 + W + B$$

Where:

C = Cocktail
S_1 = Strong

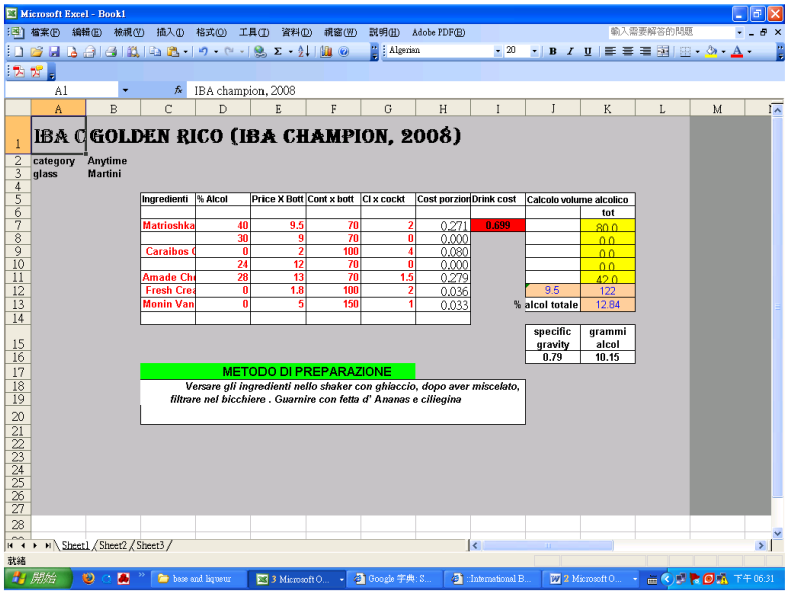

Fig. 5: The characters of Golden Rico, IBA (2008)

S_2 = Sweet
S_3 = Sour
W = Weak
B = Bitters

Cocktail: Volumes for shot 60 mL for short drinks 70-120 mL and for long drinks 120-180 mL.

Strong: Means alcohol concentration required 30-70 mL which are included one or two of the six bases (whisky, rum, tequila, brandy, gin and vodka).

Sweet (option): Supply from syrups and (or) liqueurs, because liqueurs contain sugar and alcohol, the alcoholic part needs to combine to strong.

Sour (option): Lemon or lime.

Weak (option): Mineral water or still or sparkling or soda, water or cola, tonic water or lemon, soda or ginger ale, ginger beer can or fruit, vegetable juice or lemon juice, lime juice or milk, cream or the white egg or yolk egg.

Bitters (option): Campari or Angostra bitters or flavor or color. The suggestion determining a cocktail is following the step: serviced style, base, sweet, sour, weak, bitters. Anyway, this is a convenient way for making the cocktails. First, deciding base and its volume, student picks up one or two bases from the list of base writing its names in C7 and C8 and volumes in G7 and G8 (Fig. 1). Then, choosing liqueurs, student picks up one or two liqueurs from the list of liqueurs writing its names in C10 and C11 and volumes in G10 and G11. And then, choosing sweeter, student picks it up from the list of syrups writing its name in C13 and volume in G13, next to decide sour, writing its name in C9 and volume in G9. Finally, a weak is chosen writing its name in C12 and volume in G12. As soon as finishing it, the program will show up all the characters of this cocktail such as concentration of alcohol, price of bottle, content of bottle, drink cost, total volume of cocktail, total alcohol volume in cocktail, alcohol concentration of cocktail, specific gravity of cocktail and gram of alcohol in cocktail.

When the cocktail is decided, student finally needs to learn giving the name to the cocktail, glass to use and method of preparation. All of these are very important factors of management of bar. After making recipe, the standard of IBA principles of cocktail is used to judge the receipt by group discussion.

The examples of the IBA official cocktails (Fig. 1) and the recipes of IBA championship are used to detect the model to explain the schedule determining the recipe of the cocktails. The characters of Golden Rico (IBA, 2008) are alcohol concentration 13%, alcohol unit 1.22 and the cost of euro dollars 0.699 (Fig. 5). Another IBA champion in 2006, characters of cool sweet heart are alcohol concentration 14%, alcohol unit 2.43 and the cost of euro dollars 1.696 (Fig. 6).

Analysis and commentary of the effectiveness

Satisfaction for using the model: The research showed that the participants agree the model benefit them learning

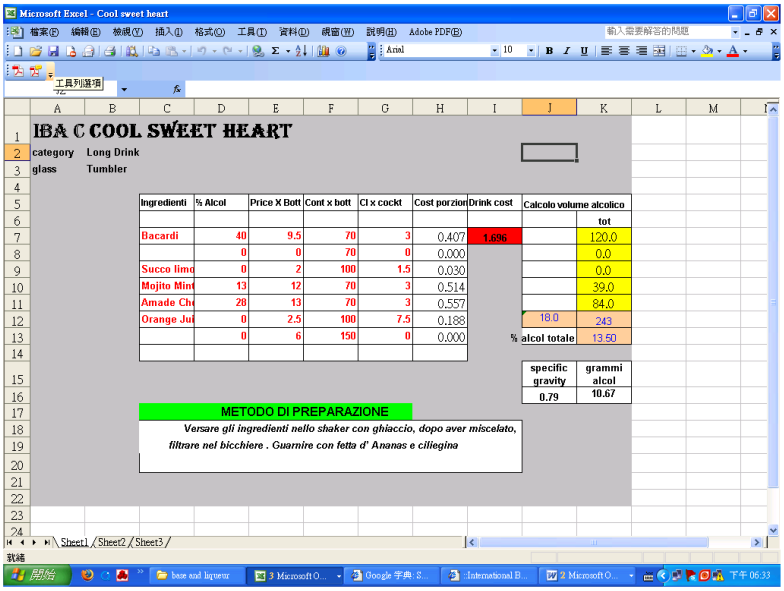

Fig. 6: The characters of cool sweet heart, IBA (2008)

Table 2: Response of user interface evaluation

	Agree					Disagree				
Survey questions	SA	A	%	M	%	D	SD	%	AV	D
Model approach is acceptable for training purpose	16	21	84.1	6	13.6	1	0	2.3	4.182	0.747
Model objects coincide with reality	14	19	75.0	11	25.0	0	0	0.0	4.068	0.751
Model operation is easy after brief introduction	12	18	68.2	12	27.3	2	0	4.5	3.909	0.848
Model environment has high fidelity in virtual and audio	16	21	84.1	6	13.6	1	0	2.3	4.182	0.747
Model response time is acceptable	6	20	81.8	7	15.9	1	0	2.3	4.159	0.767
Model permits you to control the order as personal requirement	9	27	81.8	8	18.2	0	0	0.0	4.023	0.621
Complete the training task with the model fast enough	13	19	72.7	12	27.3	0	0	0.0	4.023	0.753
The sense involving in the model environment	14	22	81.8	7	15.9	1	0	2.3	4.114	0.745
Learn from the model with self-confidence	13	19	72.7	12	27.3	0	0	0.0	4.023	0.753
Operate the training task of the model feel freely	12	21	75.0	10	22.7	1	0	2.3	4.000	0.769

SA: Strong agree, A: Agree, M: Neither agree nor disagre, D: Disagree, SD: Strongly Disagree, AV: Average, D: standard Deviation

cocktail (Table 2). Model approach is acceptable for training purpose agree 84.1% and average 4.182. Model objects coincide with reality agree 75.0% and average 4.068. Model operation is easy after brief introduction agree 68.2% and average 3.909. Model environment has high fidelity in virtual and audio agree 84.1% and average 4.182. Model response time is acceptable agree 81.8% and average 4.159. Model permits you to control the order as personal requirement agree 81.8 and average 4.023; The training task with the model fast enough agree 72.7% and average 4.023. The sense involving in the model environment agree 81.8% and average 4.114. The model with self-confidence agree 72.7% and average 4.023 and the training task of the model feel freedom agree 75.0% and average 4.000.

Evaluation criteria and result for the effectiveness of the module: The model designed to be able to recognize and interpret students when they failed and that the result would help student the required skills and acknowledges for cocktail operations. The goal was to determine how well the model to understand student's behavior in making a decision of whether or not to provide tutoring.

To evaluate the effectiveness of model, the result of investigation was classified into 5 questions such as to provide them with effective directions, to interpret their deviation from the default procedure with or without situational factors to recognize them failed to achieve a goal and explain its failure and to recognize all actions of constraint violations and explain its constraint violation (Table 3). Three of five factors were 100% agreed by all of student. The achievements were the module able to provide them with effective directions to interpret their deviation from the default procedure without situational factors to recognize them failed to achieve a goal and

Table 3: Evaluation criteria and result for the effectiveness of the module

Questions statement	Yes (%)	No (%)
The module provides you with effective directions so that you always know what to do the next step?	100.0	0.0
Does the module correctly interpret you deviation from the default procedure when there are no situational factors requiring the deviation?	100.0	0.0
Does the module interpret you deviation from the default procedures when you are in reaction to situational factors?	93.3	6.7
Does the module recognize you failed to achieve a goal and explain its failure?	100.0	0.0
Does the module recognize all actions of constraint violations and explain its constraint violation?	88.6	11.4

Table 4: Numbers of errors compared with students learning cocktail with and without module

Item	With module	Without module
Numbers identification error	1.3	3.4
Numbers report error	0.7	3.2

explain its failure. Other two factors were 93.3% agree it able to interpret their deviation from the default procedure with situational factors and 88.6% agree it able to recognize all actions of constraint violations and explain its constraint violation.

Efficiency of using the model: Model efficiency was evaluated by two metric dependent variable measures (numbers of identifying errors and numbers of reporting errors) between two group with and without model having significant different.

The average errors for training with and without assistance of module were 1.3/10 and 3.4/10 for identification errors and 0.7/6 and 3.2/6 for report errors (Table 4).

The one way ANOVA was used to analyze performance. The group training with model is significantly performing fewer errors of identification and report. For completely finished the assigned tasks under satisfaction, mean recovering time of trainee from fails under the assistance with model is significantly shorter than its without the model. We supposed the model is efficient for trainee using the model that resulting from it tutoring help trainee the required skills and acknowledges for making cocktail.

Using this system in teaching has found that student can individually operate the model with samples of 65 official recipes of IBA to attain teaching objectives effectively: learning the concentration of each cocktail, the unit of each cocktail calculating cost of each cocktail, familiar with the basic rules of cocktail mixing, realize the trend of drinks and learning making a recipe. The several benefits for using this system learning have found: student learning by personal schedule without time limited without pay the cost of material of ingredients, without the danger in campus because of no drinking, without drinking effect on the other classes. During this processing, each of students can save money to buy material about 5,000 NT dollars which is relatively high to compare with their personal maintenance. Anyway, the most important thing for using this system is high efficiency.

Therefore, it is not necessary for student to drink to familiar with the mixing principle, to calculate alcohol concentration, alcohol unit, drink volume and cost. After the first learning, student may need to try when they are learning about wine knowledge and characters of variety ingredients. From the practical point, this is also a convenient way to use the model training student familiar with the knowledge and principles of mixing cocktail before practice making a cocktail at the very beginning study.

CONCLUSION

Student was satisfied with the user interface of model when they learned cocktail with the model. Evaluation criteria and result were shown effectiveness of the module. To compare with numbers of errors, student was less fail learning cocktail with module than without module. Teaching cocktail with the system is efficient, cheap and convenient way for both teacher and student. Specially, student can familiar with the cost of cocktail, conception of alcohol concentration and unit, knowledge and principles of mixing cocktail through this system before practice making a cocktail at the very beginning study. And the model is also a good way to train student designing a new recipe of drink by model Cocktail = Strong + Sweet + Sour + Weak + Bitter. Volume is 70 mL for pre dinner drinks, 90 mL for after dinner drinks and 150 mL for long drinks. Alcohol concentration is 20-25% for pre and after dinner drinks, 30-35% for old fashion of pre dinner drinks and 10-15% for long drinks. Alcohol unit is 1.9 for all drinks.

The benefits are model is effective and efficient for students to practice a new recipe before it is installed and perhaps more importantly is allowed the results of improper composition of alcohol concentration, volume and cost to be simulated without incurring the associated costs. By using photos of materials and final products in computer can potentially provide more realistic methods of training than simple oral explanation. Model is safer than physical work which causes from student dinking

too much. Training systems that use computer-based training system are reconfigurable and portable. Computer-based cocktail training system is especially valuable in where real-life practice is expensive materials. Students can learn to perform collaborative or competitive tasks together using networked computer-based training system. The procession of create a new cocktail is simplified by choosing 5 components. Student can save money about 5,000 NT dollars to release economic burden. Student is convenient learning by personal schedule without time limited without the danger in campus because of no drinking, without drinking effect on the other classes.

REFERENCES

Boiron, L.V., 2008. Drink'art. Les Vergers Boiron, France.

Castellon, F., 2005. Larousse Cocktails. Hamlyn, Canale, Cuneo CN, Italy.

Galliano, 2008. Galliano Guide. Via Delle Industry, Treviso, Italy.

Graham, C., 2009. 5 Steps to better cocktails-don't forget the basics. http://cocktails.about.com/od/mixology/tp/cocktail_tips.htm.

IBA Official Cocktails, 2009. World competitions of cocktail and flairtending: The drink for 2010. International Bartendres Association. http://iba-world.net/english/index.php.

IBA, 2008. Training Manual of the Elite Bartenders Course-JWC 2008. International Bartenders Association, Singapore.

IBA, 2009. Training Manual of the Elite Bartenders Course-JWC 2009. International Bartenders Association, Venice, Italy.

Kerr, W.P., 2006. Viva Vodka. Chronicle Books, San Francisco, CA US.

Martell, 2008. Martell Cocktails. Martell and Co., Paris.

Mozart Distillery, 2009. Choctails. Mozart Distillery Co. Ltd., Austria.

National Restaurant Association, 2009. Chef survey: What's hot in 2009. http://www.restaurant.org/pdfs/research/2009chefsurvey.pdf.

Slinkard, S., 2009. Basic sangria recipe. http://wine.about.com/od/redwines/r/basicSangria.htm.

Ueda, K., 2009. Making the greatest cocktail. Cocktail Academy. http://www.cocktail-academy.co.jp/cocktail/index.html.