Web-based Self-directed Learning Environment and Online Learning Apply on Education

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Abstract: The purpose of this study is to develop the theoretical framework on the perception of web-based self-directed learning environment. The research objectives are to identify the structure categories, dimensions, and aspects for the perception of the environment. An extensive literature review was conducted as the research method. The results include 3 system categories, 5 dimensions, and 13 aspects in the framework. The 3 system categories are system environment, interactive relationship, and personal development. The 5 dimensions are internet resources, web-based functions, peer interaction, learning content type, and self-directed learning. The study also presents the 13 aspects of the structure in the system model. The findings and recommendations can be provided for further related studies and teaching references.

Key-Words: Environmental perception、self-directed learning、web-based learning

1 Beginning

Students are not only passive receivers in several studies environment. They should be positive participators, and also be the initiative team members of establishment study system.

Besides computer soft hardware coordination, good several learning environments aim at the present teaching material, the teaching method, the learning environment and so on. They also perform the suitable adjustment and the transformation, but then display the function sufficiently.

Many theories like the research confirmation, the group cooperation study, regard the news video and music conversation, study diary writing and so on may assist with on-line teaching way. The development study society group, the enhancement study multiplication and the initiative communication exchange effect can have the positive effect to the teaching and the study function to display Fruit, and also increase the choice space in passing which the student studies.

Goal of the this research namely lies in correlation between the discussion consciousness theory which is in web-based self-learning environment and the construct consciousness theory which is overhead in the construction web-based self-learning environment. Specifically says, goals of the this research are as follows:

First, system categories of the determination Perception of Web-based Self-directed Learning Environment.

Second, dimensions of the construction Perception of Web-based Self-directed Learning Environment.

Third, aspects of the development Perception of Web-based Self-directed Learning Environment.

2 Environment perception theory

2.1 Reciprocal determination

Albert Bandura is a social psychologists. He thought the human behavior contains three kinds of the determining factors: 1.personal determinism; 2.environment determinism; 3.interactionism[1].

His theory indicates the person, the environment and person's behavior are correlation and have person's following behavior. The complex behavior

cannot simply relate to the environment and the individual. Because the environment influences the behavior a lot, and involves to each kind of intrinsic individual factors, these individual factors can affect the function of the environment behavior. Therefore, Albert Bandura advocated reciprocal determination.

The reciprocal determination is one kind of complex behaviors, the synthesis human behavior theory. Paying attention to Yu Jen's function, one notes each kind of home affair and the external event reciprocity. The internal condition, the external condition and the individual behavior mutually depend on each other for existing.

Therefore, in the reciprocal determination, the person, the environment and person's behavior interact with each other.

In advocated view of point , the environment is the most important factor. Therefore, this research relates to "the interactive determinism" took category of the discussion environment consciousness. In the process of study, one can understand that the environment of consciousness student is very important.

2.2 Study environment theory

The publication, evaluating educational environments[10], emphasized that the environment to the student behavior and the manner influences a lot, and proposes the concept overhead construction.

The environment concept showed person's study is under environment stimulation to achieve the behavior change and the goal, but produces change and influence. In the environment, the individual thinks the environment consciousness is strong and the weak, and the all types of sensitivities can affect its change scope. Based on this theory, one may know that the external environment lies in the study environment of consciousness which is regarded as influence factor and indirectly is discussed the correlation factors. Therefore, discussion study environment consciousness is necessary.

3 Web-based learning environment study pattern and characteristic

The learning environment appraisal origins from Harvard Project Physics[10]and Social Climate Scales [9].After this, there are many published papers about the learning environment correlation research.

The traditional study pattern may discover that the teacher affiliation competes by the associates to promote the study motive, but constructs the construction principle to emphasize through the associates cooperation and the social interaction in the study process to arouse student's interest and promote the study effect. The web-based study process could not be separated from the above two kinds of studies pattern.

Therefore, the web-based learning environment is mainly divided into three: Behaviorist Internet-based Learning Environment (BILE), Constructivist Internet-based Learning Environment (CILE), Hybrid Internet-based learning environment (HILE).

Chou, C.J, & Tsai, C. C. [5] thought the characteristic of the web-based learning environment is to construct the construction to promote the student to progress independently exploration study, and cooperation study opportunity in the dissemination of science and technology. Because the web-based teaching system is an open learning environment, the students may carry on the web-based study at any time and place.

Several learning environments conform to the teachers' teaching, and the students' study can make teachers and students be easy to link up with each other. The promotion study atmosphere achieves the highest result of the study. Therefore, the web-based self-learning environment should understand the relation of study consciousness regarding the learning environment. The person, the environment and the behavior carry on the discussion together. One can understand the study environment consciousness.

4 Self-Directed Learning theory

The self-guidance study is mainly responsible spirit for one's own study. Most widely definitions are proposed by Knowles:

> *Self-directed learning has been described as "a process in which individuals take the initiative, with or without the help of others," to diagnose their learning needs, formulate learning goals, identify resources for learning, select and implement learning strategies, and evaluate learning outcomes[7].*

Knowles[7] thought the study is the intrinsic course, and the individual self-guidance may create the best study.

Individual orientation mainly emphasizes the study self-guidance of the personality special characteristic, and also is one kind of abilities. Guglielmino[6] thought people all have the self-guidance of the personality special characteristic,

and such special characteristic for each person is totally different.

Brokckeet & Hiemstra [3] are in conformity with process orientation and personal orientation, but propose Personal Responsibility Orientation Model (PRO). PRO pattern emphasizes: (1) Personal responsibility; (2) Self-directed learning; (3) Learner self-direction; (4) Self-direction in learning; (5) Social context. One may know the PRO pattern pays great attention to individual the intrinsic factor and the external factor combined from Self-directed Learning. Specially, social context has suddenly revealed the study that is the environment influence.

The comprehensive survey from above definition, the scholar respectively has the different angle view to the self-guidance study. No matter from any angle view, its study must personally carry on by study itself, coordinate various aspects of guidances and the supports, such as the oneself intrinsic study wish, the motive and the personality special characteristic, and the external study situation, the study demand and the interpersonal relationship and so on, and strengthen the self-study ability and own study responsible ability.

We may induce that "the self-guidance study is possible one kind of courses, like personality or the psychological special characteristic, and also is commonly expressed as one plant of the study conditions". In the web-based self-learning environment, the study self-study is the important manner. Therefore, it must be friendly with oneself lead in the education. The study strategy may refer to the way of the self-guidance study course - contract study, and the consideration different self-guidance ability uses the different guidance. The way enables the study to grasp the learning environment, the study process, to understand self- guidance with the study result, to perform to understand study environment of consciousness, to depend on the relational operation, and to let the study be even more progressive.

5 Theoretical Framework on the Perception of Web-based Self-directed Learning Environment

5.1 System Categories

Albert Bandura [1] thought the complex behavior cannot simply relate to the environment and the individual. Because the environment influences the behavior a lot, and involves to each kind of intrinsic individual factors, these individual factors can affect the function of the environment behavior. Therefore, he proposed "the interactive determinism" in its pattern. The behavior, the individual and the environment all achieve mutually to determine factor.

Moss [10] emphasizes it is important for the environment to influence the student behavior and the manner. He thought "the environment-study" has contained the environment system, individual system, the intermediary factor and adjusts suitability and the adaption. However, one may discover the intermediary factor appraises and intensifies individual for the individual cognition and the environmental factor. Moving suitably with the adaption for the individual is to adapt to circumstances or environment which are formed by the study behavior. Therefore, its intermediary factor and suitable move may induce with the adaption which forms a line for the system.

In summary, one may know the actual factors of influencing environment consciousness are the environment, the individual and the behavior. The boundary consciousness theory overhead construction may analyze its category to be supposed for the environment, the individual and the behavior to constitute, showing in Fig 1.

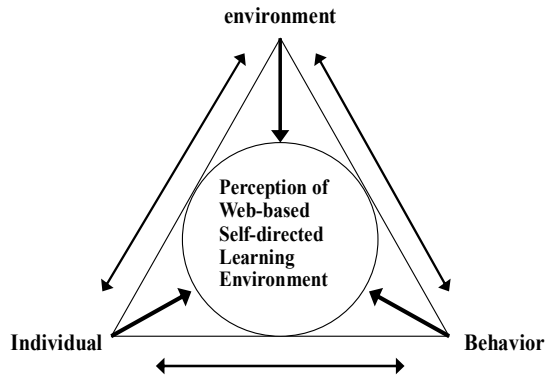

Fig 1. Perception of Web-based Self-directed Learning Environment form factor

This research based on Ban Tula touching Si's theory, and based on the self- guidance study and the web-based learning environment performs three big categories to revise. In order to conform to category of the web-based self-learning environment consciousness theory overhead construction, it forms the system environment, the interaction relations and individual development study, showing in Fig 2.

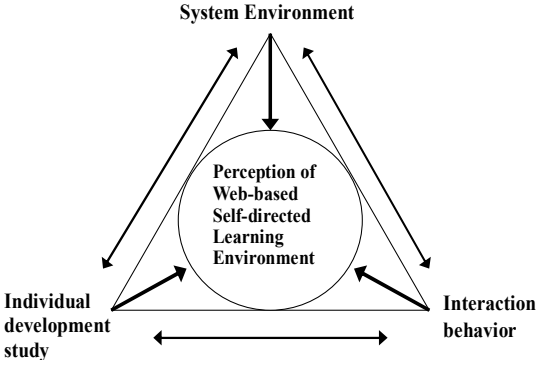

Fig 2. Perception of Web-based Self-directed Learning Environment system categories

5.2 Dimensions

This research mainly discusses for general study of web-based self-learning environment consciousness theory overhead construction, and refers to other scholars' literature to propose the argument - (1) The design of web-based learning environment must let the students obtain from the problem solving activity. (2)The web-based learning environment should encourage the students in the solution question process to make the abstract content. (3) The web-based learning environment should take the students as a center, and must coordinate the students' real living conditions.[4][5][8] reorganizes 5 dimensions which contain the web-based resources, the web-based function, the associates interacts, the study content condition, the self- study, and revise 3 system categories for the system environment, the interaction relations and individual development study, showing in Fig 3.

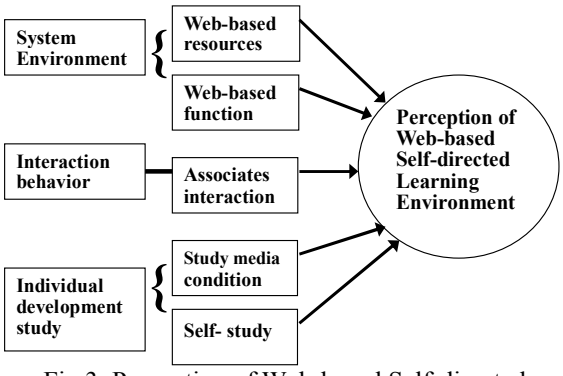

Fig 3. Perception of Web-based Self-directed Learning Environment influence factor

5.3 Aspects

Several studies need the affiliation by several tools to take the answer position of teaching material, carring on the on-line or the off-line learning activity. Regarding the study, the web-based study has provided the study to have more study opportunities. Therefore, the study must first establish the interest of the study, be initiative from the on-line gain information, and raise to explore and innovate the spirit.

On the above definition, one may analyze the web-based resources. One is to aim at the objective external environment which influences the hardware equipment. Another is to use influence resources easily by the user.

The web-based function dimensions have two aspects. One belongs to the bidirectional form, and another is the unidirectional form. The bidirectional form stresses the interaction, and the unidirectional form stresses the straight transmission. This two types of line web-based tools need to look how the users utilize the teaching .

Interacting dimensions in the associates, the study through web-based platform bidirectional form and the associates carries on the share to construct the construction. It can study and provide diverse knowledge.

In summary, it is possible for the associates to interact to differentiate 3 aspects. The first one is the team cooperation study. The second one is that group discussions carry on the study. The third one forms the web-based study society group. Those three aspects mutually transmit the know with exchanging experience, cooperation study and the group discuss in the traditional teaching. The utilization ratio is high. It has divided into the cooperation study form and the group competition form.

The study media condition refers to the study to accept of regarding the web-based learning environment. Although several studies may achieve the session of study, it has not been able to achieve the effective study.

Therefore, study media condition dimensions differentiate several aspects, the degree and the study take the homepage as the discrimination. The institute may decide as the study in this stratification plane likes to tend to aspects.

Finally, the self-study part aims at the study self-guidance study the custom. The self- guidance study viewpoint respectively has the different angle view. In any event, its study must personally carry on by itself, and coordinate the oneself's intrinsic study wish, the motive and the personality special characteristic. The various aspects of guidances and the supports, like the external study situation, the study demand and the interpersonal relationship, strengthen the self-study ability and own study responsible ability.

Receiving states, self- study dimensions should carry on the discussion from the individual as well as the behavior. Therefore, the discrimination has two big aspects in individual. The aspects may differentiate for the motive as well as the goal. The behavior aspects also may differentiate the study method. Therefore, oneself study aspects form the individual motive, the individual goal, the behavior study method, and the behavior has continued this four aspects.

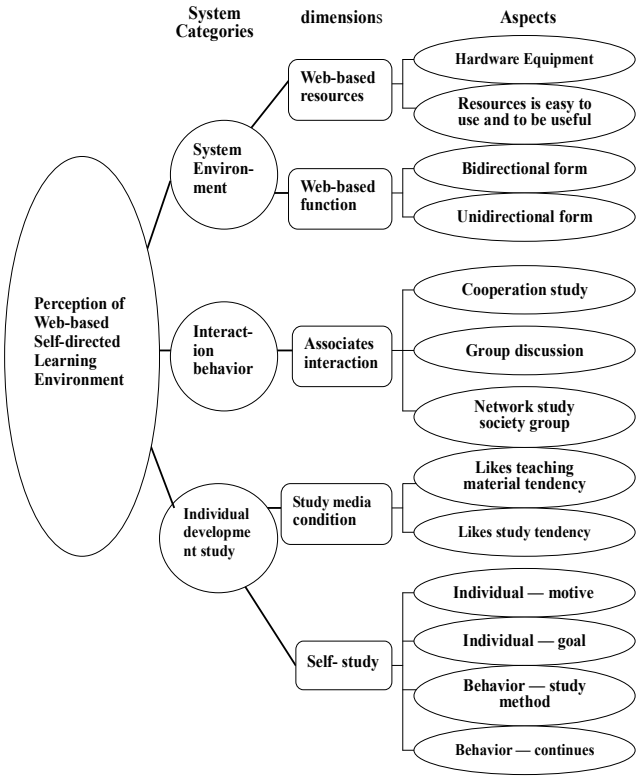

Fig 4 Perception of Web-based Self-directed Learning Environment composition

6.Online Learning

In the past decade, the Internet and World Wide Web (WWW) have been considered important in the schools as part of the learning environment. The value of online learning has become widely recognized with development of information technology so as to accept gradually by instruction in the schools. Through the network, everyone can learn anytime and anywhere. This kind of learning convenience completely changes the traditional teaching model. But it is seldom understood about the principals' behavioral intentions to use WWW.

In 1989, [12]proposed the Technology Acceptance Model (TAM) to address how other factors affected perceived usefulness, perceived ease of use, attitudes toward use, behavioral intentions to use and actual system use. In other words, TAM was made use of expressing the potential user's behavioral intentions to use a technological motivation. Factors contributing to the acceptance of a new information technology (IT) varied with the network, users' belief, and online context. Thus, research on the acceptance of the online learning would enhance researchers' understanding of the principals' beliefs or motivation to use the WWW and to show how these factors affected the principals' use acceptance of the online courses.

6.1Technology acceptance model (TAM)

In 1989, [13]has shown that TAM could explain the usage of IT. He indicated that perceived usefulness and perceived ease of use represented the beliefs that lead to IT acceptance. According to TAM, perceived usefulness was the degree of which a person believed that using a particular information system would enhance his or her job performance. Perceived ease of use was the degree of which a

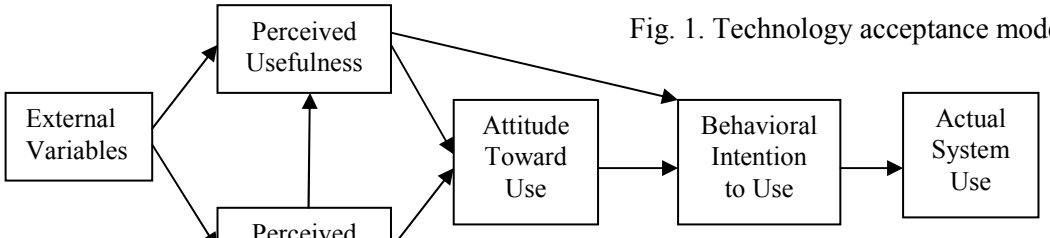

Fig. 1. Technology acceptance model[12]

person believed that using a pa would be free of effort. Two other constructs in TAM were attitudes toward use and behavioral intentions to use. Attitudes toward use were determined by the user's beliefs and attitudes toward using the system. Behavioral intentions to use were determined by

these attitudes toward use the system [13].

TAM's dependent variable was actual system use. Behavioral intentions to use lead to actual system use. It had been a self-reported measure employing the application in IT. Fig. 1 showed the origional TAM model. Some authors had studied the effect of ease of use or usefulness directly on behavioral intentions to use [14]. Some had considered adding new additional relationships factors to attitudes towards use [15]. Hence, to maintain instrument briefly and permit the study of perceived ease of use and perceived usefulness to attitudes towards use, the current research similarly studied the direct effect of ease of use and usefulness on behavioral intentions to use.

However, in the context of online learning and the school's factors, they were the principals in the schools, were considered additional variables. Online learning was proposed as a motive for learning online experience here. Additionally, the school's factors were defined that the principals led teachers to participate online learning activities. Therefore, to increase external validity of TAM, it was necessary to further explore the nature and specific influences of administration at schools and online learning context factors that may alter the principals' acceptance. Fig. 2 showed the model in the current study.

6.2Research model

Fig. 2 illustrated the extended TAM examined here. It asserted that the intentions to manage via online learning were a function of: their perceived usefulness by course contents, learning activities and planning course of online learning, perceived ease of using online learning and attitudes toward using

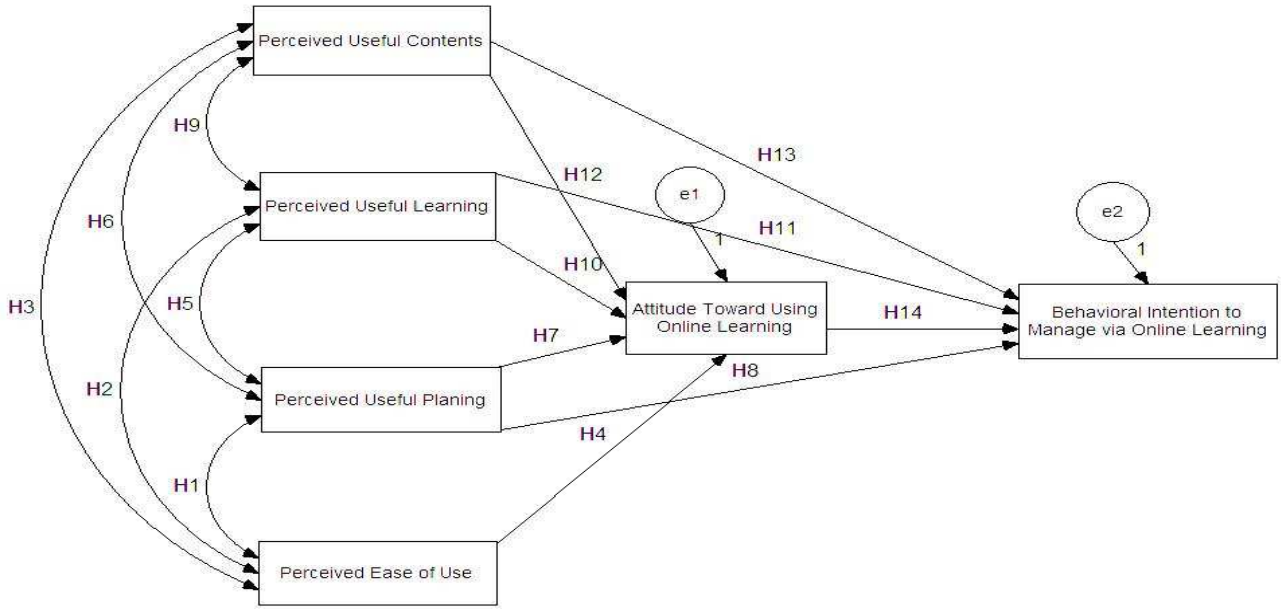

Fig. 2. The research model in online learning

online learning. Intentions were the extent to which the principals would like to manage via online learning in future. Moreover, perceived usefulness was defined as the extent to which the principals believed that online learning would fulfill the purpose. Additionally, perceived ease-of-use was the extent to which the principals believed that online learning was effortless.

6.3 Hypotheses

This research model adopted the TAM usefulness – attitude – intention – behavior relationship, so the following TAM hypothesized relationships were proposed in the context of online learning:

Hypothesis 1. Perceived ease of use is positively related to perceived useful planning in online learning.
Hypothesis 2. Perceived ease of use is positively related to perceived useful learning in online learning.
Hypothesis 3. Perceived ease of use is positively related to perceived useful contents in online learning.
Hypothesis 4. Perceived ease of use is positively related to attitudes toward using online learning.
Hypothesis 5. Perceived useful planning is positively related to perceived useful learning in online learning.
Hypothesis 6. Perceived useful planning is positively related to perceived useful contents in online learning.
Hypothesis 7. Perceived useful planning is positively related to attitudes toward using online learning.
Hypothesis 8. Perceived useful planning is positively related to behavioral intentions to manage via online learning.
Hypothesis 9. Perceived useful learning is positively related to perceived useful contents in online learning.
Hypothesis 10. Perceived useful learning is positively related to attitudes toward using online learning.
Hypothesis 11. Perceived useful learning is positively related to behavioral intentions to manage via online learning.
Hypothesis 12. Perceived useful contents are positively related to attitudes toward using online learning.
Hypothesis 13. Perceived useful contents are positively related to behavioral intentions to manage via online learning.
Hypothesis 14. Attitudes toward using online learning are positively related to behavioral intentions to manage via online learning.

7 Research method

7.1 Data collection

Empirical data were collected by conducting a survey of the principals' conference in Pingtung, Taiwan. Subjects were the principals in elementary schools and junior high schools. The questionnaires survey yielded 91 usable responses. 76.9% of the respondents were male, and 23.1% were female; 81.3% of the respondents were principals in elementary schools, and 18.7% were principals in junior high schools.

7.2 Data analysis

The questionnaires were adopted from the thesis on master of education [16]. The internal consistency (Cronbach's α) was 0.9469. The validity and reliability of the scales were deemed adequate. The scale items for perceived ease of use, perceived useful contents, perceived useful learning, perceived useful planning, attitudes toward using online learning, and behavioral intentions to manage via online learning were developed from the study of Yang [16]. The scales were slightly modified to suit the context of online learning. Each item was measured on a five-point Likert scale, ranging from ''disagree strongly'' (1) to ''agree strongly'' (5).

To test these proposed hypotheses, data was collected and analyzed using the structural equation modeling (SEM), which combined multiple regression with a series of interrelated dependence relationships. The number of IT studied that use the SEM approach to examine empirically the proposed model was increasing (e.g. [14, 17]).

8 Results

The intent of our study was to extend TAM by adding perceived useful planning, perceived useful learning, and perceived useful contents concepts in online learning. We hoped to explain principals' acceptance of the online learning. The hypothesized relationships were tested using path analysis presented in Fig. 3.

8.1. Hypothesis testing

Hypotheses 1, 2, 3, and 4 examined the links between perceived ease of use and perceived useful planning, perceived useful learning, perceived useful contents, and attitudes toward using online learning: perceived ease of use was significantly related with perceived playful planning (path coefficient= 0.53, t-value= 4.418, $p<.01$) and perceived useful learning (path coefficient= 0.58, t-value= 4.742, $p<.01$) and perceived useful contents (path coefficient= 0.59,

t-value= 4.823, p<.01) and attitudes toward using online learning(β = 0.32, t-value= 3.598, p<.01). Therefore, hypotheses 1, 2, 3 and 4 were all not rejected.

Hypotheses 5, 6, 7 and 8 examined the links between perceived useful planning and perceived useful learning, perceived useful contents, attitudes toward using online learning and behavioral intentions to manage via online learning: perceived useful planning was significantly related with perceived useful learning (path coefficient= 0.77, t-value= 5.791, p<.01) and perceived useful contents (path coefficient= 0.71, t-value= 5.477, p<.01) and attitudes toward using online learning (β =0.40, t-value=3.505, p<.01).

But perceived useful planning was not significantly related with behavioral intentions to manage via online learning (β = 0.02, t-value= 0.161, p= .872). Therefore, hypotheses 5, 6 and 7 were not rejected.

Hypotheses 9, 10 and 11 examined the links between perceived useful learning and perceived useful contents, attitudes toward using online learning and behavioral intentions to manage via online learning: perceived useful learning was significantly related with perceived useful contents (path coefficient= 0.69, t-value= 5.373, p<.01) and behavioral intentions to manage via online learning (β = 0.30, t-value= 2.725, p<.01). But perceived useful learning was not significantly related with attitudes toward using online learning (β = 0.10, t-value= 0.835, p=.404). Therefore, hypotheses 9 and 11 were not rejected.

Hypotheses 12 and 13 examined the links between perceived useful contents and attitudes toward using online learning and behavioral intentions to manage via online learning: perceived useful learning was not significantly related with attitudes toward using online learning (β = 0.08, t-value= 0.756, p=.450) and behavioral intentions to manage via online learning (β = 0.14, t-value= 1.388, p<.165). Therefore, hypotheses 12 and 13 were rejected.

Hypotheses 14 examined the links between attitudes toward using online learning and behavioral intentions to manage via online learning: attitudes toward using online learning was significantly related with behavioral intentions to manage via online learning (β = 0.42, t-value= 4.380, p<.01). Therefore, hypothesis 14 was not rejected.

8.2. Technology acceptance model testing

AMOS 5 was used to test our measurement model. The overall model fit was assessed using three kinds of goodness-of-fit indices: absolute fit measures, incremental fit measures, and parsimony fit measures. Absolute fit measures were a direct measure of how well the model specified by the observed data [18]. **Absolute fit measures** included χ^2, comparative fit index (CFI), root mean square residual (RMSR) and root mean square error of approximation (RMSEA). Incremental fit measures assessed how a specified model fits relative to some alternative baseline model [8]. **Incremental fit measures** included adjusted goodness of fit index (AGFI), normalized fit index (NFI), relative fit index (RFI), non-normalized fit index (NNFI), and goodness of fit index (GFI). The third indices, parsimony fit measures, provided information about which among a set of competing models was best [19]. **Parsimony fit measures** include parsimony goodness of fit index (PGFI), Hoelter's critical N and χ^2/ df. The results showed that all fit indices had clearly exceeded the minimum recommended values that were suggested for a good model fit except parsimony goodness of fit index, as shown in Table 1.

TABLE 1 Fit indices for measurement model

Fit indices	Recommended value	Measurement model	Acceptable on Unacceptable fit
Absolute fit measures			
χ^2	p>.05	0.839(p>.05)	yes
GFI	>0.90	0.997	yes
RMSR	<0.08	0.080	yes
RMSEA	<0.08	0.000	yes
Incremental fit measures			
AGFI	>0.90	0.935	yes
NFI	>0.90	0.998	yes
RFI	>0.90	0.965	yes
NNFI	>0.90	1.007	yes
CFI	>0.90	1.000	yes
Parsimony fit measures			
PGFI	>.50	0.047	no
CN	>200	412	yes
χ^2/df	<3.00	0.839	yes

8.3 Path analysis

A path analysis of the TAM (see Fig. 3) showed acceptable fit to the data (see Table 1). The percentage of the variance explained (R^2) of attitudes toward using online learning was 59% and behavioral intentions to manage via online learning was 61%. Based on our hypothesis 11 and 14, perceived useful learning and attitudes toward using online learning had significant direct effects on behavioral intentions to manage via online learning. However, the perceived ease of use, perceived useful planning, and perceived useful contents also had indirect effects,

mainly through perceived useful learning and attitudes toward using online learning, on behavioral intentions to manage via online learning, as shown in Table2.

Perceived ease-of-use was significantly related with **attitudes** toward using online learning. They involved both direct and indirect paths:

- Direct path: perceived ease-of-use → attitude = 0.32
- Indirect path: perceived ease-of-use → perceived useful planning → attitude = 0.53 × 0.40= 0.21
- Total: Direct+ Indirect= 0.32 +0.21=0.53

Perceived useful planning was significantly related with **attitudes** toward using online learning. They involve both direct and indirect paths:

- Direct path: perceived useful planning → attitude = 0.40
- Indirect path: perceived useful planning → perceived ease-of-use→ attitude = 0.53 × 0.32= 0.17
- Total: Direct+ Indirect= 0.40 +0.17=0.57

P**erceived useful learning** was not significantly related with **attitudes** toward using online learning, but they still had indirect paths:

- Indirect paths:
  perceived useful learning → perceived useful planning → attitude = 0.77 × 0.40= 0.31
  perceived useful learning→ perceived ease-of-use→ attitude = 0.58× 0.32= 0.19
- Total: Indirect= 0.31 +0.19=0.50

Perceived useful contents were not significantly related with **attitudes** toward using online learning, but they still had indirect paths:

- Indirect path:
  perceived useful contents→ perceived useful planning → attitude = 0.71 × 0.40= 0.28
  perceived useful contents→ perceived ease-of-use→ attitude = 0.59× 0.32= 0.19
- Total: Indirect= 0.28 +0.19=0.47

Perceived ease-of-use was not significantly related with behavioral **intentions** to manage via online learning, but they still had indirect paths:

- Indirect path:
  perceived ease-of-use→ attitude → intention = 0.32 × 0.42= 0.13
  perceived ease-of-use→ perceived useful planning→ attitude → intention = 0.53× 0.40× 0.42 = 0.09
  perceived ease-of-use→ perceived useful learning→ intention = 0.58×0.30 = 0.17
- Total: Indirect= 0.13 +0.09+0.17=0.39

Perceived useful planning was not significantly related with behavioral **intentions** to manage via online learning, but they still had indirect paths:

- Indirect path:
  perceived useful planning→ attitude → intention = 0.40 × 0.42= 0.17
  perceived useful planning→ perceived ease-of-use→attitude → intention = 0.53× 0.32× 0.42 = 0.07
  perceived useful planning→ perceived useful learning→ intention = 0.77×0.30 = 0.23
- Total: Indirect= 0.17+0.07+0.23=0.47

Perceived useful learning was significantly related with behavioral **intentions** to manage via online learning. They involve both direct and indirect paths:

- Direct path: perceived useful learning → intention = 0.30
- Indirect path:
  perceived useful learning →perceived useful planning→ attitude → intention = 0.77 × 0.40 × 0.42= 0.13
  perceived useful learning→ perceived ease-of-use→ attitude → intention = 0.58× 0.32× 0.42 = 0.08
- Total: Indirect= 0.30+0.13+0.08=0.51

Perceived useful contents were not significantly related with behavioral **intentions** to manage via online learning, but they still had indirect paths:

- Indirect path:
  perceived useful contents →perceived useful learning→ intention = 0.69 × 0.30= 0.21
  perceived useful contents → perceived useful planning→ attitude → intention = 0.71× 0.40× 0.42 = 0.12
  perceived useful contents →perceived ease-of-use→ attitude→ intention = 0.59×0.32 ×0.42= 0.08
- Total: Indirect= 0.21 +0.12+0.08=0.41

Attitudes toward using online learning were significantly related with behavioral **intentions** to manage via online learning. They just had direct path:

- Direct path: attitude → intention = 0.42

TABLE 2 Effects on attitudes toward using online learning and behavioral intentions to manage via online learning

Independent variables	Dependent variables	Direct effects	Indirect effects	Total effects
Perceived ease-of-use	attitude	0.32	0.21	0.53**
perceived useful planning	attitude	0.40	0.17	0.57**
perceived useful learning	attitude	n.s.	0.50	0.50**
perceived useful contents	attitude	n.s.	0.47	0.47**

R^2=0.59				
Perceived ease-of-use	intention	n.s.	0.39	0.39**
perceived useful planning	intention	n.s.	0.47	0.47**
perceived useful learning	intention	0.30	0.21	0.51**
perceived useful contents	intention	n.s.	0.41	0.41**
attitude	intention	0.42**	n.s.	0.42**
R^2=0.61				

Note: n.s. means no significant; ** P < 0:01.

9 Conclusion

An extensive literature review was conducted as the research method. The results include 3 system categories, 5 dimensions, and 13 aspects in the framework. Therefore, the theoretical framework on the perception of web-based self-directed learning environment shows in Fig 4.

The study on the education is the future inevitable development tendency. When the study utilizes web-based self-study, its environment consciousness to its study inevitably will have the influence. This research may know the web-based self- study knows theory of overhead construction the environment consciousness.

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