

A CASE STUDY OF MOTIVATION THEORY ON THE WEB-BASED LEARNING

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Abstract — In last decades, Motivation theory is mostly utilized on discussing the relationship between the satisfaction of instructors on jobs and the performance of traditional teaching. The rapid development of Internet and World Wide Web (WWW) provides an important resource for people to get various information and knowledge easily. Therefore, many educational institutions and companies apply these technologies on their current computer assisted learning system, including Computer Assisted Instruction (CAI), Distance Learning, and etc. Many researchers combined multimedia to develop CAI system, and some integrated WWW to develop synchronous or asynchronous Internet learning system. Most of them focused on the advantages of the fantastic user interface, which included pictures, images, and sound of hyper link of the WWW, to improve the learning performance. However, rare of them discussed influencing factors of individuals when they were learning via the WWW.

The purpose of this research is to explore the motivation and hygiene factors of individuals when they were learning via the WWW. It included three major tasks:

1. Explore hygiene factors of individual before and after the web-based learning.
2. Trace the behaviors of individuals' web-based learning.
3. Collect common influencing factors (motivation and hygiene factors) of students when they were learning via the WWW. Then, categorize the influencing factors and stored in the case library by case study.

We believed that a well-designed WWW learning environment with the most adequate factors would improve individual's performance.

keywords $\frac{3}{4}$ Motivation theory, Web-based learning, WWW, Behavior

INTRODUCTION

The development of the networking technology has improved dramatically. Now a day, the Internet and the World Wide Web (WWW) are widely used in the industry and academic. Meanwhile, they have been proven to be useful tools for improving learning performance between the instructors and students because of using multi-media, short response time, and etc. Comparing with the traditional learning environment such as paper and pencil work,

problem-solving course, the web-based learning system is a helpful tool to enhance individuals' learning interesting and motivation. It is difficult to realize the attitudes, beliefs, and behaviors of each individual during the web-based learning process. However, the realization of learning behaviors could be used to develop a specific in which to explore motivation factors that influence individuals' learning performance.

Over past decades, researchers had been attempted to identify motivation factors of managers or instructors rather than exploring individuals' needs of each student during their traditional learning process. However, the learning interesting and behaviors of each individual are important factors that influence individuals' learning performance directly [5].

The theory of motivation-hygiene has been successful in examining satisfying and hygiene factors during works. Frederick Herzberg and etc. [4] found that the influencing individual's satisfying and unsatisfying factors were totally different during work. Therefore, they defined satisfying factors as follows:

- Employees will satisfy their jobs when there exists individuals' motivation factors.
- Employees would not feel satisfy with their jobs when there doesn't exist individuals' motivation factors. However, they don't feel unsatisfied.

Meanwhile, they defined hygiene factors as follows:

- Employees would not feel unsatisfied with their jobs, when there exists individuals' hygiene factors. However, they don't feel satisfied.
- Employees will feel unsatisfied with their jobs when there doesn't exist individuals' hygiene factors.

From the above discussion, the learning, satisfying and hygiene factors could be defined as follows:

- Students will satisfy their courses when there exist individuals' motivation factors.
- Students would not feel satisfy with their courses when there doesn't exist individuals' motivation factors. However, they don't feel unsatisfied.

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- Students would not feel unsatisfied with their courses, when there exists individuals' hygiene factors. However, they don't feel satisfied.

- Students will feel unsatisfied with their courses when there doesn't exist individuals' hygiene factors.

On the other side, from the results of pilot study, the researchers found that only motivation factors could result in satisfaction and hygiene factors could avoid the generation of unsatisfied. Therefore, the motivation-hygiene proposed by Frederick Herzberg was adopted in this research.

The purpose of this research was to explore the motivation and hygiene factors of individuals when they were learning via the WWW. The following presents the methodology and architecture of the research. Secondly, the method of tracing behaviors of individuals' web-based learning is described. Thirdly, the way of described collecting the common influencing factors (motivation and hygiene factors) of students when they were learning via the WWW is introduced. Also, the method of case study for categorizing the influencing factors is indicated. Finally, the results of this research is discussed.

Research Method

In this research, the learning behaviors of individual would be traced recorded on-line and stored in the database. Then, the case study of qualitative research method was applied to collect and categorize influencing factors from them. The purpose of the case study was to explore the hygiene factors that could improve individuals' performance when they were learning via WWW.

Subjects

The sample for this study consisted of 56 students enrolled in an Introduction to Computer during the Spring Semester of 2000. Two weeks in the Spring Semester, an on-line survey was given to ascertain what concepts the students developed from their experiences with web-based learning and also to understand their hygiene factors during the web-based learning processes. During the two weeks prior to the final week of the spring semester, the post survey was administered to all students to ascertain what web-based learning abilities and thinking processes the students had gained from their experiences and to measure changes in influencing factors (motivation and hygiene factors) of students when they were learning via the WWW.

Architecture

The architecture of the research is shown in Figure 1.

On-Line Pre Survey

An on-line survey was conducted to all 56 subjects before they started the web-based learning of the course of introduction to computers to identify each individuals'

motivation and hygiene factors. Then, these factors were stored in the database. The survey included three questionnaires: (a) a background questionnaire to obtain data about personal and hygiene factors of students when they were learning via the WWW; (b) an on-learning abilities and behaviors the students had gained from their experiences; (c) a dairy frequency questionnaire designed specifically for this study based on influencing factors (motivation and hygiene factors) of students when they were learning via the WWW. All questionnaires were reviewed for completeness when turned in by students.

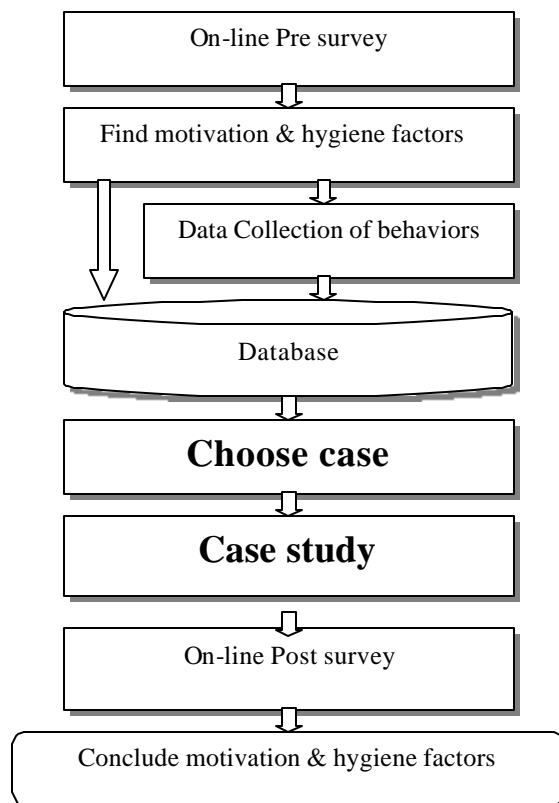


Figure 1. The architecture of the research

Data Collection

The on-line classroom observations were conducted in the first month. The learning behaviors of each individual such as the staying time of each section, access times to the section, how many times of miss answering the practices are recorded in the database.

Case Study

After identifying students' hygiene factors and compare record of the learning behaviors stored in the database, four different students were selected and observed during the second two weeks. Then, one was selected for case study. The researchers observed their learning behaviors throughout the semester in order to get more information

about the subjects based on their web-based learning.

During interviews, case study participant was encouraged to provide reasons why the subject selected specific methods to solve problems and how the subject controlled himself/herself while doing problems. According to the method of Buchanan [1] and Choi [2], the researchers should interact with each subject by encouraging, guiding, questioning, and searching during the interviews. The interview situations included classification of the subject's meanings by the researchers and reflections from the subject, who was engaged in the problem solving process. In all, five 30-minute interviews per participant were audio taped for subsequent analysis.

Dezin [3] state that, "Triangulation as the combination of methodologies in the study of the same phenomenon can guide the design" (p. 297). Triangulation refers to the use of multiple data collection methods in order to contribute to the trustworthiness of the data [3]. To ensure research credibility and consistency of findings, the researchers attempted to employ triangulation as follows:

- Data triangulation--Data was collected by observing the class throughout the semester, interviewing case study subjects at five different times.

- Methodological triangulation—Artifacts such as students' homework, quizzes, and tests, were combined with interview transcripts and researchers journal notes, surveys, and observation field notes to support data analysis and findings.

Data Analysis

The beginning data were collected from all students' pre-survey and classroom observations for the first month of class. After the researchers selected one student, all data from on-line classroom observations and interviews concerned this student.

In order to record the development of an individual's thinking process, the researchers collected data from each subject during different learning periods. The analysis consisted of influencing motivation and hygiene factors of each participant when he/she was learning via the WWW.

The interview situations included classification of the subject's meaning by the researchers and reflections from the subject, who was engaged in the problem solving process. The purpose was to keep the subject on the right track and help her/him expresses her/his ideas more clearly. Some examples are described below:

- Encouragement-- I believe you can do this question. You did a good job on the previous one. Do you want to try another one?

- Guidance-- Is this a way to explain the problem? Give me an example of why it does not work. Is this enough to guarantee that the

condition holds? Does this make sense?

- Questioning--Why do you think this works? Was this not true before?

- Searching--Why are you doing the problem in this way? What are you doing now? How does this method help you?

Findings and Discussion

Students' background of the Case Study

Based upon results of the pre-survey, a classroom observation of students' reactions to the instructor, and their performance in web-based learning during the first month of class, one student was selected to participant in the study. The following indicates why Carrie was selected.

Carrie was a 22-year old Asia student in her senior year at university. As the only college student in her family, Carrie received strong support and encouragement from her parents. Although she received financial support from her parents, Carrie worked eight hours per week outside of school.

Findings

In the following, the factors that influence Carrie's learning during the semester is discussed:

- Style of web-based instruction

Step by step instruction: Carrie mentioned that the web-based learning was difficult because the instruction was not clear:

I thought that if we can have a step-by-step instruction to help students when they are doing on-line learning, it would be much easier to use the system. (Interview 1, week 4)

One-way instruction: Carrie thought that this kind of one-way learning style was hard to have any interaction between instructor and students.

For example, when I learned about computer networks, I would like to ask some related question in my life. However, I cannot and some of my curios were interrupted at that moment. Interview 3, week 9

Flexible learning style: Carrie liked the way of learning because she can come back to the difficult sections whenever she needs.

I liked the way of learning. I can reach the material whenever I need it. Also, I can makeup the materials if I missed the class. Research note, week 10

On-line assessment: Carrie mentioned that the on-line assessment helps her a lot on correct her miss understanding of the content:

I liked the on-line assessment because I can find out what I don't know immediately. Interview 2,

week 7

■ Content of materials

Multimedia materials: Carrie thought that the multimedia materials can improve her learning performance:

The multimedia materials are really helpful. For example, I understood the working theory of the Token Ring because of its animation picture. (Interview 3, week 9)

Electronic documents: Carrie mentioned that she saved a lot of time from taking notes:

I can download all materials of instruction. That is really helpful for me to review. Interview 2, week 7

■ Encouragement

Award and oral encouragement: Carrie mentioned that the award or oral encouragement could push her to study hard. However, the WWW was difficult to provide either of them.

I thought the encouragement from the instructor always encourage me to study hard. Unfortunately, the on-line system didn't provide this kind of function. Interview 3, week 9

■ Attitude of Carrie

Confidence: According to the interview, we found that Carrie didn't have any confidence and she doesn't care about herself.

I don't know whether I understood the content of the material or not. Also, I don't care what I can learn from the class. Interview 2, Week 7

Emotion: Carrie liked the on-line assessment. However, she disliked that she could know the results of questions immediately.

If I did all the questions correctly at once, I think...I will feel happy but... it is impossible [laughing]. However, I don't like to learn again, if I missed most of the questions. Interview 4, Week 12

The habit of relying upon instructors: Carrie was used to relying on her instructor because she will push her to follow the schedule.

I always lacked of motivation. However, my instructor will always push me to do things. So, Maybe it is helpful to me. Interview 2, week 7

■ Environment

Carrie liked the learning environment with air condition because her emotion will be stable. Therefore, the web-based learning environment is the important factor that may influence her. Research note, week 10

Conclusions

In the research, we found that if students didn't do well in web-based learning, they always lay the blame on the style of instruction or the materials. However, rare of them would examine themselves for the real reason. In the case study, the motivation or hygiene factors that encourage students could be concluded into three: style of instruction, contents of materials, and encouragement. There are concluded as follows:

1. Style of instruction:

On-line observations revealed that instructor played an important role in individuals' learning process. The interaction between the instructor and individual students affected their attitudes, emotions, dependency, confidence, and motivation when they were learning via the WWW. For example, Carrie claimed that on-learning tests let her feel more comfortable because she could get her grade immediately without asking the instructor.

2. Content of materials:

Multimedia materials have a positive effect on Carrie's learning confidence, because she did not need to worry about missing some important materials. However, in some cases, the on-line learning materials provided too many cues that influenced students to think during problem solving process. For example, in one case the on-line materials provided an example that Carrie adapted as a specific proof.

The researchers found out students seemed believe that download all materials of instruction would help them to review, follow the instructor's ideas and earn the good grade. However, how to connect the previous knowledge to the current knowledge and establish their own knowledge would be the big issue to students.

3. Encouragement:

In Carrie's mind, the encouragement is the most important thing to motivate her overcome and her challenge. She felt that if students could understand why they got confused or missing on specific topics, then they could learn the concepts again and again until they wouldn't forget. She mentioned that if the instructor allowed them redid all the missing or mistake questions when taking the on-line tests, it would encourage them to study again. "The meaning of grade to students are really...something...I will feel cool if I got all points."

Overall, the case study showed that the development of an individual's thinking and reasoning skills depends heavily on affective characteristics including attitudes, emotions, motivation, personal interest, and on-learning environment.

Limitation of the study

The sample for this study was an intact class of Introduction to computer at a mid-sized university in the south region of Taiwan. Therefore, generalizations made

from the findings of this study may be restricted to college students who are business majors in Taiwan.

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