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# Training Effect on Acceptance of Technology (The Difference between Skilled User and IS Novice)

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## Abstract

Tremendous amount of organizational budget is allocated to information system training. Such training is conducted with the expectation of having higher level of technology adoption from users, rendering higher usage of computer technology and task effectiveness. Past literatures suggest that user characteristics play the important role in IS training success. However, there appears to be none of the past studies empirically validating the characteristic of skilled users and IS novice. The technology acceptance model (TAM) is used as the underlying theory for measuring technology adoption for both skilled users and IS novices. The scale measurement survey of perceived ease of use and perceived usefulness from TAM is provided to the subjects before and after the training. MANOVA and MANOVA repeated measure are used to test the research hypotheses.

## Introduction

Training was found to be one of the key IS issues by IS academics and practitioners (Kim and Kim, 1999). IS workers have to keep themselves up-to-date with the rapid change in technology. One avenue to acquire the new knowledge in computer technology is to have training. Training can be obtained either from the organization or individual. Investment in training is commonly considered a key factor to sustain the competitive success in organization (Finegold and Soskice, 1988; Ashton, Green, and Hoskins, 1989). The organizations have invested significant amount of resources in training human resources. It is found that American firms spent approximately \$50 billion on training cost in 1994 (Diamond, 1995). In addition, the 4.3 percent of such budget is allocated to IS training (Tristram, 1995). IS training cost is mainly distributed to personnel in the IS department and IS personnel costs 48 percent of the total IS department. Such high costs of IS training and IS personnel indicate the urgent need to examine whether or not the training will increase the acceptance level of IS users.

The technology acceptance model (TAM) proposed by Davis (1986) has been used extensively for measuring IS adoption. The model asserts that the level of

adoption can be affected by several of external factors. One of which is the training. Training has long been one of the important research issues in MIS area. It is found that training enhances the success in end-user computing environment (Bostrom et al, 1990). However, most of IS researches to date paid too little attention to user characteristic factors which is very likely to influence the success of training.

The objective of this study is to examine the different effects that training has on different kinds of users. Based on the users' past experience, the respondent in the study will be divided into two groups, the skilled users and IS novice. The similar training will be given to both users at the same time and in the similar environment. In addition, the study attempts to find the difference of the user's perceived ease of use and perceived usefulness between the two types of IS users before and after training is given.

## Literature Review

System usage is one of the primary dependent variables of information systems (Delone and McLean, 1992). It is widely acknowledged that the usage of information technology (IT) is an important variable in evaluating the impact of IT (Davis 1989; Straub et al. 1995). The Technology Acceptance Model (TAM) is often used by both IS researchers and practitioners to gain a better understanding of the adoption and use of information systems. It is one of the most influential research models in studies of the determinants of information systems acceptance.

Based on the theory of reasoned action (TRA), Davis (1986) introduced an adaptation of it, TAM, for predicting IT usage. While TRA is "designed to explain virtually any human behavior" (Fishbein and Ajzen 1975), the goal of TAM was "to provide an explanation of the determinants of computer acceptance that is general, capable of explaining user behavior across a broad range of end-user computing technologies and user populations, while at the same time being both parsimonious and theoretically justified" (Davis et al 1989). The general model of TAM is presented in Figure I.

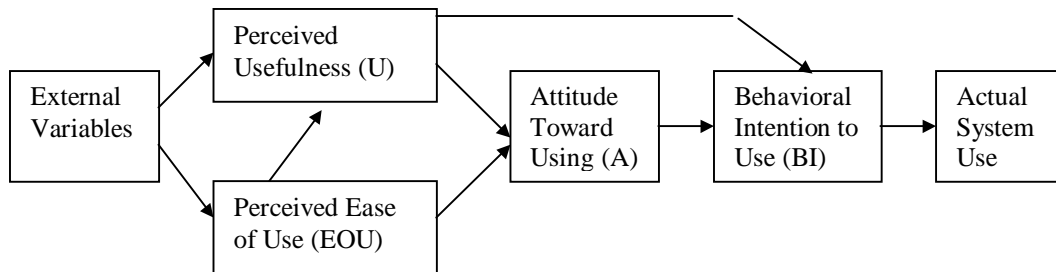


Figure 1: Technology Acceptance Model (Source: Davis et al. 1989)

The model posits that perceived usefulness (U) and perceived ease of use (EOU) affect the system use. Perceived usefulness is defined as "the prospective user's subjective probability that using a specific application system will increase his or her job performance within an organizational context." Perceived ease of use refers to "the degree to which the prospective user expects the target system to be free of effort" (Davis et al. 1989). The model hypothesizes that the actual system use is determined by users' behavioral intention to use (BI), which is in turn influenced by users' attitudes toward using (A). Finally, attitude is directly affected by beliefs about the system, which consists of U and EOU. TAM theorizes this belief - attitude - intention - behavior relationship to predict user acceptance of technology.

The TAM model has been extensively used and validated in several kinds of technology. The robustness of the model has been proven in numerous studies (e.g. Rose and Straub, 1998, Igarria et al. 1997; Taylor and Todd, 1995). Consequently, it is not our purpose to conduct such redundant validation in this study. However, most of the past studies tested the causal relationship of TAM model without including the external factors in their study designs. Consequently, it is our purpose to test the training effects on TAM.

The benefits of training have been witnessed in several literatures. It is found to improve the flexibility and adaptability of organizational environment (Steedman, Mason, and Wagner, 1991; Mason, Van Ark, and Wagner, 1994). In addition, it potentially enhances the employee motivation and commitment to organization (Rainbird, 1994). However, the effect of IS training on the acceptance of technology has been given in adequate attention in MIS literatures.

One of the empirical studies of training on the TAM model was conducted by Venkatesh (1999). However, the study investigates the effectiveness of different types of training on technology acceptance

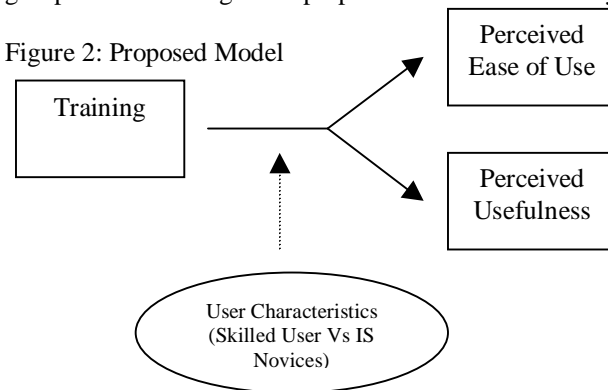
without considering the user characteristics. User characteristics are found to be critical factor, influencing the success in end-user computing environment. There appears to be one study examining the nature of IS novices in training (Bostrom et al, 1990). Such study, however, investigated only the learning style of the users, not the users type.

There is no found study conducted to test the effect of training on different types of IS users (skilled and novice users). This study strives to examine such effect based on the TAM model. Perceived ease of use and perceived usefulness are employed as the dependent variables in our study. The subsequent section delineates our proposed research model and research design.

## Proposed Model and Research Design

In the study, we argue that the user characteristics (skilled user or novice user) play the moderator role in the technology acceptance model (See figure 2). The normative belief in training suggests that training will enhance both perceived ease of use (EOU) and perceived usefulness (U) of technology. Nonetheless, we argue that even though the training provides both types of users with the new knowledge, the enhancement of U and EOU will be significantly higher in the novice group. The following is the proposed model for our study.

Figure 2: Proposed Model



Sprague and Carlson (1982) have classified the training in IS into seven categories. They are tutorial, courses/lectures/seminars, computer-aided instruction, interactive training manual, resident expert, help component, and external training. Our research chooses to adopt the second method of training, namely courses/lectures/seminars. The major reason behind that is such training allows the study to employ the repeated measure technique, which will be used to test the hypothesis of difference between before and after training effects on our dependent variables.

The students are the subjects in our study. The scale measuring EOU and P proposed by Davis (1986) is adopted. Various software applications are used for the training of both skilled users and IS novices. The subjects are asked to fill out the survey instrument before and after training of each software application. However, before filling the survey, the introduction of each application is given to the subjects, rendering the preliminary understanding of the task that each application can perform. The applications include, Netscape, MS Word, MS Excel, and MS PowerPoint.

The study divides the hypotheses into two groups. The first one is the hypotheses that will be tested before giving the training. The second is the group of hypotheses that will be tested after the training. All hypotheses are presented herein.

#### **Before-Training Hypotheses**

H1: Perceived ease of use is not significantly different between the skilled user and novices.

H2: Perceived usefulness is not significantly different between the skilled user and novices.

#### **After-Training Hypotheses**

H3: There is no significant difference of perceived ease of use before and after the training for both types of users.

H4: There is no significant difference of perceived usefulness before and after the training for both types of users.

H5: There is no significant difference of change in perceived ease of use (before and after training) between the skilled users and IS novices.

H6: There is no significant difference of change in perceived usefulness (before and after training) between the skilled users and IS novices.

### **Data Analysis and Expected Results**

MANOVA and MANOVA repeated measure will be employed in this study, due to the characteristic of multi dependent variables. Interestingly, the preliminary analysis of data demonstrates the decrease in perceived ease of use after the training, which is contradicting to the

normative belief. The in-depth analysis of this issue will be conducted in order to test if such pattern occurs for all kinds of applications. However, the logical explanation is the training generally provides the trainee with the new functions, which the trainees are unfamiliar. This issue and the test of above hypotheses will be available for presentation at the conference.

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