A Conceptual Model of Information Technology Training Leading to Better Outcomes

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Abstract

This paper describes a conceptual model of information technology (IT) training that is unique in three ways. First, the model establishes trainee’s reaction as one of the primary training outcomes rather than as merely an intervening variable in training. Second, the model is constructed in an organizational context to fully reflect organizational influences on the four training outcomes; namely, trainee’s reaction, learning performance, training transfer to workplace, and organizational performance. Third, the model integrates all the essential influential factors and performance measures in four major categories -- individual characteristics, organizational factors, motivational elements, and training outcomes. Overall, the conceptual model, which is built on a thorough review of the literature, provides a solid foundation for more in-depth research in the future. A number of research propositions are proposed based on the model for a longitudinal study to thoroughly examine, validate, and refine the various aspects of IT training.

Keywords: IT training model, trainee’s reaction, training transfer, training outcomes
1. Introduction

With the rapid advances in computer technology in recent years, information technology (IT) has become essential to the operational efficiency, cost reduction, and overall competitiveness of modern business. As a consequence, many companies provide IT training to their employees in order to facilitate transition to more technology-oriented business processes. In return, these companies want to know what contributions these training programs make to improved individual and organizational performance, and how to build on and expand the benefits of such training. To answer these questions, it is essential first to identify the factors that influence IT training and, second, to investigate how these factors can contribute to better training outcomes. Such insights will better enable training practitioners to deliver effective training programs that motivate trainees, promote training transfer, and ultimately improve organizational performance.

Training on different technologies varies, depending on the requirements and expectations regarding each technology [Hassan, 2006]. For example, training on a word processor or spreadsheet that is widely applied at work would require only very basic skills and knowledge. On the other hand, training on proprietary enterprise resources planning (ERP) applications would require enormous effort and commitment from trainees, and might also cause quite dramatic changes in the workplace after training. Because this research focuses on IT training impact on organizational performance at individual level, thus the scope of this research is the training of operational staff to use individual IT application software such as word processor.

Previous research on training has been focused mainly on trainees and the workplace, including topics such as trainee characteristics [Naquin and Holton, 2002; and Tracey, et al., 2001], training motivation [Mathieu, et al., 1992; and Wiethoff, 2004], and work environment [Tracey, et al., 2001; and Richman-Hirsch, 2001]. Other research studies investigate technology transfer in IT training, including, for example, Gist, et al., 1989; Martocchio, 1992; Nelson and Cheney, 1987; and Webster and Martocchio, 1992, but many of these studies focus on trainee’s characteristics and devote much less attention to organizational influences on IT training. In addition, IT training research has not sufficiently
investigated a number of IT-related characteristics such as IT playfulness and innovativeness.

To fully understand the various influences on IT training, it is essential to integrate these influential factors into a comprehensive model. Such a model would not only provide a foundation for more in-depth research in IT training, but also contribute greatly to training preparation and to motivation for better training outcomes. There has been little such systematic research in IT training, however, and no comprehensive IT training model has been built. Though some models can be found, they consider only a few aspects of IT training. For example, Lee, et al. [1995] built an extended end-user training model, which showed the influences of both individual characteristics and training environment on IS acceptance, but did not consider the influences of organizational factors and motivational elements. Similarly, Venkatesh [2000] built a theoretical model and tested it on perceived ease of use, but, again, no organizational factors were investigated.

By contrast, there are a few comprehensive models of management training. For example, Kirkpatrick [1994] developed a well-known and widely used four-level training evaluation model. Noe [1986] also proposed an integrated model of motivational influences on training effectiveness. Baldwin and Ford [1988] then built a model of training transfer. Based on the Kirkpatrick’s model, Holton [1996] produced an enhanced three-level training evaluation model. Later, Colquitt, et al. [2000] developed an integrated model of training motivation based on a meta-analytic path analysis of related research in the last 20 years. More recently, a number of refined models emerged, based mostly on the previously built models [Alvarez, et al., 2004; Kraiger, 2002; and Noe and Colquitt, 2002]. Though these models provide invaluable insight on IT training, they do not consider IT-related characteristics such as IT acceptance and usefulness.

It is essential, therefore, to develop a comprehensive model of IT training in its own right. In this paper, we discuss training outcomes (Section 2) and influential factors (Section 3), then construct a conceptual model (Section 4) and discuss its future implications in a number of research propositions (Section 5). We present our conclusions in Section 6.
2. Training Outcomes

This section focuses on trainee’s reaction, learning performance and training transfer, and organizational performance.

2.1 Trainee’s Reaction

Since the ultimate goal of training is to improve organizational performance, it is crucial to measure the success of a training program in terms of training outcomes. Trainee’s reaction was proposed as one of the outcomes in Kirkpatrick [1976]. It implied trainee’s satisfaction with, or enjoyment of, the program, which can be represented by three main components: expectation, desire, and perception [Tannenbaum, et al., 1991]. Trainee’s reaction plays an important role in building interest and attention and enhancing motivation to transfer [Patrick, 1992]. For instance, unmet expectation about one’s training may lead to low training transfer [Hicks and Klimoski, 1987; and Tannenbaum, et al., 1991]. Fulfillment of trainee’s expectation, therefore, is one of the main reactions often subject to investigation in training research, because satisfaction with one’s learning experience is regarded as a measure of performance, and because this factor received more attention from training practitioners.

Mathieu, et al. [1992] found, however, that trainee’s reaction functioned mainly as a moderator of the relationship between training motivation and learning. Moreover, it was found to be not directly related to learning and transfer to job performance, as in, for example, Alliger, et al. [1997], Noe and Schmitt [1986], and Warr and Bunce [1995]. Eventually, Holton [1996] dropped trainee’s reaction from the list of training outcomes in his training model, in which the reaction was treated merely as an intervening factor affecting learning and training transfer.

Whereas management research on trainee’s reaction to training mainly concerns satisfaction with the training material, instruction, instructors, and environment, IT acceptance research on users’ reaction tends to focus more on the trainee’s view of the particular technology. For example, in early studies, user satisfaction with IT was found to influence IT use in the workplace [Bailey and Pearson, 1983; and Doll and Torkzadeh, 1988]. In recent years, research of IT acceptance and adoption has been using the technology acceptance model (TAM)
to investigate and explain IT use [Davis, 1989], in which users’ perceived ease of use and the perceived usefulness of IT are the two determinants of users’ acceptance of a technology [for example, Davis, et al., 1989; Lee, et al., 1995; and Venkatesh, 2000]. In particular, these two reaction variables were used to determine one’s behavioral intention to use a technology, which has been linked to subsequent behaviors [Taylor and Todd, 1995]. In addition, perceived usefulness was influenced by perceived ease of use, whereas perceived ease of use was affected by many other factors such as computer self-efficacy, computer playfulness, computer anxiety, and facilitating conditions [for example, Venkatesh, 2000]. Moreover, user satisfaction can also be a measurable surrogate for IT acceptance and future adoption [Baldwin and Ford, 1988].

Based on the theory of TAM and related research, it is reasonable to believe that trainee’s reaction plays a more important role in IT training and should be considered a direct IT training outcome instead of just a moderating factor. The difference from research in management training is probably due to the different interpretation of reactions. The desired reactions, from the training point of view, should focus on the trained technology or IT skills rather than on trainers and training structure [Hasan, 2006]. For example, Alliger, et al. [1997] divided trainee’s reaction into affective reaction (enjoying training) and utility reaction (its perceived usefulness for one’s job). Surprisingly, little research has been conducted on the actual influences of trainee’s reaction in IT training to other training outcomes. Hence, trainee’s reaction is proposed as a direct training outcome in this paper.

2.2 Learning Performance and Training Transfer

Learning performance and training transfer are two of the potential training outcomes that are less investigated in IT training research. Learning performance is the trainee’s performance in a training program, which can be measured by asking trainees to recall trained materials immediately or shortly after completion of a training program [for example, Wexley and Baldwin, 1986]. Learning performance has been one of the major focuses of many management training programs because more successful trainees would likely feel better able to perform and more motivated to transfer [Baldwin and Ford, 1988; Holton, 1996; and Tannenbaum, et al., 1991]. Training would be useless, however, if it could
not be translated into both individual and organizational performance. Thus, several theories (e.g., expectancy, equity, and goal-setting) have been used to interpret behaviors that contribute to performance at work and to explain motivation to transfer. Whereas the expectancy theory articulates trainee’s perceived connection between effort and job performance, perceived relationship between performance and outcome, and perceived value or utility of training, equity theory is based on the belief that employees want to be treated fairly and would thus choose a method of inequity reduction that is personally least costly [Adams, 1963]. On the other hand, goal-setting theory deals with the intention to achieve certain goals, the choice or acceptance of the intentions, and subsequent commitment to those goals [Locke, 1968].

Based on these theories, many studies have been conducted to investigate the influence of various factors on training transfer and to develop their measurement constructs. For example, Noe and Schmitt [1986] found that job involvement and career planning are influential on training transfer. Similarly, Tannenbaum, et al. [1991] found that a trainee’s positive job attitude could lead to better transfer of learning to job performance. In addition, organizational climate can significantly affect a trainee’s ability and motivation to transfer learning to job performance [for example, Mathieu, et al., 1992; and Tracey, et al., 1995]. Furthermore, pre-training briefing, accountability for learning by supervisor, and perception of a training program as mandatory, all have a positive impact on intention to transfer learning to the workplace [Baldwin and Magjuka, 1991]. In some studies, transfer design, which implies whether trainees have the opportunity to practice learned skills in a job context, was also found influential on training transfer [for example, Werner, et al., 1994; Wexley and Baldwin, 1986; and Xiao, 1996].

### 2.3 Organizational Performance

Improved organizational performance in terms of productivity, efficiency, effectiveness, and customer satisfaction could be the ultimate objective and the most desired training outcome in an organization. However, besides individual improvement through training, organizational performance can be influenced by many other factors that are completely outside the realm of training, such as equipment, material supplies, and economic environment. It could be difficult to isolate the effect of training from other influences, and measures should be taken
to discount those influences when measuring the effect of training on improvement in organizational performance. Furthermore, in order to obtain an objective assessment, efforts to measure improvements in organizational performance may require a longitudinal study as well as the participation of trainees, their supervisors/peers, and top management.

Some research has been conducted on modeling organizational performance in management training. Holt [1996], in particular, proposed three influential factors independent of the learning outcome and individual performance improvement: link to organizational goals (ability), expected utility or payoff (motivation), and external factors (environment). Training programs that are not linked to organizational mission, goals, and strategy are unlikely to produce performance that is valued by the organization, even with positive learning and individual performance improvement [Swanson, 1994]. Thus, greater linkage to organizational goals would tend to produce training programs that promote training transfer [Holt, 1996].

All these requirements have made evaluation and assessment of the impact of training programs on organizational performance very difficult [Brinkerhoff, 2005; and Nickols, 2005]. It is probably because of these difficulties that less research has been conducted at this level. However, research findings in this aspect would make major contributions to training research in general [Kraiger, et al., 2004; and Rowden, 2005].

3. Influential Factors on IT Training Outcomes

The influential factors on training in general can be grouped into two main categories: individual characteristics and organizational factors. Some of these factors have been studied in both IT and management training research, whereas others have been investigated mainly in management training research. Other factors that could be relevant to and potentially influential on IT training, however, have not been studied in either type of research.

Individual characteristics have long been found influential on training effectiveness. Some of these characteristics, such as age, educational background, work experience, IT-related ability, and self-efficacy, have already been studied in IT-related training research. Other characteristics, such as job tenure,
organizational commitment, job involvement, and career planning, have been investigated in management training research [Mathieu, et al., 1992; Mumford, et al., 1988; Noe, 1986; Tracey, et al., 2001; and Warr and Bunce, 1995]. These factors have also been studied extensively in organizational and training research, and found to be influential on trainee’s motivation to learn and on skill transfer to the workplace [Birdi, et al., 1997; Mathieu and Farr, 1991; Naquin and Holton, 2002; and Noe and Schmitt, 1986].

In addition to the previously named characteristics, there are a few IT-related factors that can also affect IT training, such as computer playfulness, innovativeness, and computer attitude [Agarwal and Prasad, 1998; Venkatesh, 2000; and Webster and Martocchio, 1992]. These factors have been studied extensively in IT/IS adoption research, in which the technology acceptance model (TAM) was often the theoretical foundation [Agarwal and Prasad, 1998; Davis, 1989; and Venkatesh, 2000]. They were found influential on user acceptance of technology, but their influence on IT training has not been investigated adequately. In particular, their actual impact on trainees and organizations is still relatively unknown.

Computer playfulness represents the degree of cognitive spontaneity in microcomputer interactions, characterized by creativity and exploration [Webster and Martocchio, 1992], whereas personal innovativeness in IT can be defined as the willingness of an individual to try out any new IT [Agarwal and Prasad, 1998]. It has been found that computer playfulness positively relates to computer attitudes, competence, and efficacy, and has a positive impact on training outcomes in terms of learning, mood, involvement, and satisfaction [Gardner, et al., 1993; and Webster and Martocchio, 1992]. Innovativeness in IT was also found to exhibit moderating effects on individual perceptions of IT, such as ease of use and intentions to use new technologies [Agarwal and Prasad, 1998].

Furthermore, computer attitude can be represented by four subset factors: computer anxiety, computer confidence, computer liking, and computer usefulness [Loyd and Loyd, 1985]. These factors have been found influential on computer adoption and use. For example, computer attitude was found positively related to effective computer use [Loyd and Loyd, 1985; and Rafaeli, 1986]. Also, a high rate of computer-related anxiety was associated with a low rate of computer use at work [Pancer, et al., 1992; and Rosen and Weil, 1995], and was even used to predict achievement in learning computers [Marcoulides, 1988].
Conversely, computer anxiety was found inversely related to computer experience, playfulness, and organizational support [Bradley and Russell, 1997].

Organizational factors have been studied quite extensively in management training research; namely, supervisory/peer support [Tannenbaum and Yukl, 1992; Tracey, et al., 1995; and Xiao, 1996], accountability [DeMatteo, et al., 1994], organizational culture/climate [Tracey, et al., 1995], reward/appraisal [Tracey, et al., 2001], choice of training/training assignment [Brown, 2001], pre-training briefing [Werner, et al., 1994], opportunity of applying learned skills to task on job [Ford and Weissbein, 1997], and post-training intervention [Richman-Hirsch, 2001; and Werner, et al., 1994]. These factors were found to be influential on management training. It has only been in recent years, however, that the importance of organizational factors has been recognized in both research and practices [Gallivan, et al., 2005; Goulding and Alshawi, 2002; Salas and Cannon-Bowers, 2001; Smith and Dowling, 2001; and Spitler, 2005]. As stated earlier, their applicability to IT training needs to be further investigated.

4. Conceptual Model of IT Training

This section focuses on construction of the model and the constructs and measures of variables in the model.

4.1 Construction of the Model

Based on the prior discussion of past research on training and evaluation models, a conceptual model of IT training (Figure 1) was constructed which incorporates eight variables. These include individual characteristics of the trainee and organizational factors of the work environment, which are independent variables that have been discussed earlier in this paper. These independent variables can exert various influences on training effectiveness at either the individual or organizational level.

Training motivations are intermediate influential factors to training outcomes that are borrowed from the management research camp [Mathieu and Farr, 1991; Naquin and Holton, 2002; Noe, 1986; and Warr and Bunce, 1995]. In the model presented here, they are divided into pre-training motivation (motivation to learn) and post-training motivation (motivation to transfer). Motivation to learn is a
trainee’s desire to learn the trained skills or technologies before and during the training. On the other hand, motivation to transfer, which has attracted comparatively more research attention because of its importance from a management perspective, is the trainee’s desire to eventually transfer the learned skills back to the workplace after the training. Both variables are dependent on individual characteristics and organizational factors.

As stated earlier, four training outcomes are incorporated in the model in this paper. The first primary outcome is trainee’s reaction, which is the trainee’s view regarding the particular technology or skills involved, as well as the training itself. Learning performance is what the trainee has learned throughout the training, which can be measured by quiz, exam, or practical test. The more significant outcomes, however, are training transfer/individual job performance and organizational performance. Training transfer/individual job performance indicates how the trainee has transferred the learned skills back to the workplace, and whether job performance has been improved accordingly. It can be measured by directly observing the trainee and talking to her/his superiors. Ultimately, the most desired training outcome would be improvement of organizational performance in terms of productivity, revenue, or sales. The last two outcomes, which are the most difficult to measure, are usually not checked in actual training.
practices [Brinkerhoff, 2005; and Nickols, 2005].

The relationships among the four training outcomes, as shown in the model, imply that better trainee’s reaction can lead to the better learning performance of individual trainees, which, in turn, will contribute to better training transfer/individual job performance, and eventually lead to better organizational performance. These outcomes are also subject to the influences of other intervening factors, such as individual characteristics, organizational factors, and motivational factors. Details of the measurement instruments of these variables are presented in the next section.

Overall, the model is unique in mainly three aspects. First, the model establishes trainee’s reaction as a primary training outcome rather than an intervening variable. Second, the model, which is constructed in an organizational context, reflects organizational influences on IT training. Third, the model, which represents an integrated effort of IT training research, incorporates factors in all aspects; namely, individual characteristics, organizational factors, motivational elements, and training outcomes.

4.2 Constructs and Measures of Variables in the Model

Since most of the variables in the conceptual model were studied either in training or other related research such as technology acceptance, their measurement constructs and the associated measures were already available. However, the applicability of these constructs and the associated measures to IT training may need further validation, reliability testing, and refinement in in-depth empirical research. Details of these constructs and their measures of all the factors in the constructed model are shown in Table 1.

The variables are divided into four major groups; namely, individual characteristics, organizational factors, motivational elements, and training outcomes. For both comprehensiveness and conclusiveness, most of the factors discussed earlier in the paper are included in the table. For example, individual characteristics include trainee’s age, educational background, IT experience/ability, IT anxiety, IT attitude, IT playfulness, IT self-efficacy, job involvement, organizational commitment, and career planning.
Table 1: Measures and Variables of Some of the Factors in the Conceptual Model

<table>
<thead>
<tr>
<th>Motivational Elements</th>
<th>Training Outcomes</th>
<th>Other Elements</th>
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<tbody>
<tr>
<td>Motivation to Learn</td>
<td>Motivation to Transfer</td>
<td>Training Transfer/Job Performance</td>
</tr>
<tr>
<td>Motivation to Learn</td>
<td>Motivation to Transfer</td>
<td>Training Transfer/Job Performance</td>
</tr>
<tr>
<td>No surrogates are available</td>
<td>Detailed measures can be found in (Noe, 1986)</td>
<td>- Intention</td>
</tr>
<tr>
<td>Training Outcomes</td>
<td>Learning Performance</td>
<td>- Satisfaction</td>
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<td>Job Performance</td>
<td>- User</td>
<td>- Perceived</td>
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<tr>
<td>- Acceptance</td>
<td>- Ease of Use</td>
<td>- Perceived</td>
</tr>
<tr>
<td>Detailed measures can be found in (Noe, 1986)</td>
<td>- Usefulness</td>
<td>- Perceived</td>
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Though there are no specific measures yet for motivation to learn, Noe [1986] produced 18 questionnaire items to measure such motivation, which have been thoroughly tested and applied in management training research. For motivation to transfer, two potential measures are included in Table 1; i.e., intention to transfer and user acceptance. Intention to transfer is a measure often used in management training research, which represents trainee’s intention to transfer the learned skills to the workplace. By contrast, user acceptance is adopted from IT acceptance research, which indicates the degree that users are acceptable of a technology and are willing to adopt it in the workplace in the future. Indeed, both intention to transfer and user acceptance are representatives of motivation to transfer, and their respective measurement items can be drawn from the past research.

Measures with measurement items are also available for each level of
outcomes. Specifically, training fulfillment, perceived ease of use, perceived usefulness, and satisfaction with IT are potential representative factors of trainee’s reaction. Learning performance can be measured by test results in terms of immediate post-training knowledge, knowledge retention, and behavior/skill demonstration [Alliger, et al., 1997]. Training transfer can be observed some time after training by on-the-job performance with new skills/behavior/attitudes learned [Alliger, et al., 1997]. Finally, organizational improvement can be shown in productivity gains, customer satisfaction, cost savings, employee morale, and profitability, albeit organizational constraints may limit the opportunities for gathering data at this level [Shelton and Alliger, 1993; and Tannenbaum and Woods, 1992].

5. Research Propositions

The conceptual model presented in this paper represents a comprehensive effort to integrate all the potentially critical elements in IT training. It is important to recognize, however, that many of the factors shown in the model -- as well as the indicated relationships -- were drawn from past research findings in either management training or IT acceptance. Thorough validation and testing of their applicability in the context of IT training context are needed, therefore. In this regard, we propose a number of research propositions for future research. Trainee’s reaction was long considered one the major outcomes in management training, but several training studies subsequently found that it is not directly related to training transfer and job performance. In the context of IT training, however, IS/IT acceptance research has found users’ reaction to technologies to be a determinant of users’ eventual acceptance/use of the technologies in the workplace, and should be playing a significant role in trainee’s reaction for training effectiveness. Therefore, trainee’s reaction was established as one of the major training outcomes in this research. Proposed below are two propositions regarding the influence of trainee’s reaction on trainee’s learning/job performance, and ultimately organizational improvement.

**Proposition 1 (P1): After training, trainee’s positive reaction toward the trained technologies is positively related to his/her learning and job performance.**
Proposition 2 (P2): Through IT training, trainee’s better learning results or improved job performance will have a positive impact on organizational performance.

As two dependent variables, both motivation to learn and motivation to transfer are playing intermediate roles in the conceptual model. In past training research, motivation to transfer was not studied as thoroughly as motivation to learn, because traditional training programs paid more attention to the learning aspect of training rather than to the actual training transfer to the job. In addition, it would take more time and effort to measure motivation to transfer, which is subject to the influences of many other factors. However, according to the TAM [Davis, 1989], motivation to transfer should play a key role in IT training research and practice to determining user acceptance of a technology and its future adoption at work. Furthermore, it is also important to consider how and to what extent the variables, such as individual characteristics, organizational factors, learning performance, and training reaction, influence motivation to transfer. As such, the following propositions are proposed:

Proposition 3 (P3): In IT training, trainees with higher motivation to learn will perform better in learning, and have more positive reactions toward training and the trained IT.

Proposition 4 (P4): After IT training, trainees with more positive training reactions will be more motivated to transfer the learned IT skills to the workplace.

Proposition 5 (P5): After IT training, trainees with higher motivation to transfer will more effectively transfer the trained IT skills to the workplace, and achieve better job performance.

There is less research on the impact of training on organizational performance, probably because of the difficulties involved in data collection and objective assessment of both individual and organizational performance. Furthermore, at the organizational level, it can be difficult to separate the training effect on organizational performance from influences generated by other external events. Nonetheless, the impact of improved individual performance on organizational performance is projected in the following propositions.

Proposition 6 (P6): Better training transfer and improved job performance will contribute to better organizational performance.
As shown in Table 1, many variables were incorporated into the two categories of individual characteristics and organizational factors. Most of these variables have been studied extensively in management training and other related research, in which their influences on training have been examined and well recognized. However, most of these studies were conducted in management training context, and there was less research on their respective influences on various aspects of IT training effectiveness in an integrated context, since many studies investigated only one or merely a few of these variables. Without such an integrated effort, it would be difficult to know the intervening effects of these factors, or to understand how the mix or combination of these variables would influence training outcomes. Therefore, many propositions, such as the two examples shown below, can be produced in line with the previous research regarding the influences of both the individual characteristics and organizational factors on IT training motivations and outcomes. At some stage, it is necessary to examine these propositions altogether in a single study. The practical implication of such an integrated effort is enormous, since training practitioners can focus on those critical aspects in order to improve training effectiveness especially in financially constrained situations.

**Proposition 7 (individual characteristic) (P7):** In IT training, trainee’s IT playfulness will positively affect his/her reactions to the trained technology.

**Proposition 8 (organizational factor) (P8):** Throughout IT training, supervisor/peer support will improve trainee’s motivations to learn and transfer, his/her reactions to training, and training transfer to the workplace.

Since most of the variables in the model were already investigated, validated, and widely used in other related studies, the instruments used to measure them can be borrowed from past research, albeit minor adjustments may be needed to accommodate different training programs. Furthermore, these propositions are to investigate the influences of the identified variable for effectiveness on IT training outcomes; thus, longitudinal studies should be better conducted at different intervals (i.e., before, right after, and a period after the training to observe the four training outcomes). For example, learning performance can be assessed toward the end of, or right after, the training program, and training transfer can be observed in a certain period of three months or half a year after the training. In this regard, the trainee, trainee’s supervisor at the workplace, and company
management should all get involved in the study.

To test all eight propositions in a single study would take quite substantial time and effort. Particularly when Structural Equation Modeling (LISREL) is used to examine the causal relationships among the variables in the conceptual model, a relatively large sample would be required to conduct reliable empirical analysis in a longitudinal study. However, the challenges are not insurmountable. Given sufficient resources and in view of the potential gains of the proposed research, the validation of such a comprehensive model is not impossible. The outcomes of this research can not only provide a base for more in-depth research in IT training, but also shed light on practical implications toward training design, motivation, and evaluation for better organizational performance. Moreover, the conceptual model and its constructs can be used as diagnostic tools to measure the influences of various factors on the four training outcomes in order to determine the actual impact of IT training. Furthermore, the conceptual model can be revised to incorporate more applicable factors with more precise measures.

6. Conclusions

The conceptual model presented in this paper shows the relationships between the influential factors – namely, individual characteristics and organizational factors -- and the four outcomes of IT training. The model is an integrated effort to make IT training more measurable and understandable, and ultimately more effective and beneficial to organizations. Overall, the model makes three major contributions to IT training research and practice. First, it adopts the technology acceptance model (TAM) to elaborate the role played by trainee’s reaction and motivations to learn and transfer in IT training. By introducing TAM into the context of IT training, trainee’s reaction is further defined, and emerges as one of the four primary training outcomes instead of merely as an intervening factor affecting IT training. Such a change can bring practical insight into IT training program design, motivation, and evaluation in terms of perceived ease of use and perceived usefulness of IT leading to eventual training transfer.

Second, the model considers IT training in an organizational context in view of the fact that organizational factors are also major contributors to training
success. Most of the IT training and acceptance research conducted earlier has focused on the influences of individual characteristics on training transfer and technology acceptance. However, organizational factors do exert significant influences on IT training outcomes as they do in management training programs. Therefore, they deserve much more attention in both research and practice in IT training.

Third, the conceptual model incorporates all the essential influential elements relevant to IT training, such as the individual characteristics and organizational factors, and it provides a comprehensive platform for further research study of IT training in an integrated context. Several propositions are proposed for such purpose.

The limitation of this research is that the conceptual model was built largely on the basis of a thorough analysis of past research results in both management and IT training. The model needs to be rigorously tested in empirical studies in the future to further validate and refine the proposed research propositions. Particularly, it is essential to further validate the various attributes of trainee’s reaction because of the critical role projected in this research and also because of contradictory results in past research.

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