

# *The influence of knowledge sharing on transfer of training: A proposed research strategy*

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## **ABSTRACT**

Studies on transfer of training generally focus on training input factors such as trainee characteristics, training design and work environment. The Learning Transfer System Inventory (LTSI) conceptual model developed by Holton, Bates & Ruona (2000) is a more comprehensive model that accounts for the impact of primary intervening variables such as motivation, environment, ability and secondary influence factors such as performance self-efficacy and learner readiness. Nevertheless this model does not consider the influence of knowledge sharing on transfer of training. We argue that knowledge sharing could play a key role in understanding transfer of training. We base this hypothesis on the principles of the theory of planned behaviour (TPB), which predicts trainees' behavioural intentions and actual behaviour of sharing the learned knowledge, skills and attitudes in the workplace. Consequently, this paper proposes a research strategy to test the importance of knowledge sharing as a factor in predicting transfer of training by combining the LTSI and TPB.

## ***Introduction***

Training and development is an expensive investment for most organisations. It is fair to say that employers aim to ensure that investments in training provide maximum returns. Unfortunately, the extent to which transfer of skills learned in training are applied to the workplace have been shown to be somewhat limited (Baldwin & Ford 1988; Broad & Newstrom 1992). In a knowledge economy, knowledge sharing is becoming increasingly important. There is also groundswell of support for the notion that the return on investment of training expenditure is dependent on transfer of training occurring. Public sector organisations have been criticised for their lack of accountability for these factors but this is now changing. For instance, in Malaysia, although a study of government registered training providers demonstrated the use of formal evaluation techniques, the author nevertheless recommended further improvements (Hashim 2001). The researcher called for a greater focus on transfer of training outcomes in Malaysian public sector education programs. On a wider scale, the concept of transfer of training has attracted the attention of many training researchers and human resource development (HRD) practitioners, particularly in terms of how transfer may be enhanced (Wexley & Latham 1991; Holton, 1996; Holton, Bates & Ruona 2000).

Training may be defined as a planned learning experience designed to bring about permanent change in an individual's knowledge, attitudes, or skills (Campbell, Dunnette, Lawler & Weick 1970). As knowledge has become a key economic resource and a source of competitive advantage, effective training is most important to instil knowledge (Drucker 1995). In particular, organisations rely on learned knowledge and skills being applied to the job. To a large extent, this behaviour constitutes a transfer of training. By definition, then, transfer of training, is the degree to which trainees apply the knowledge, skills and attitudes gained in training to their job (Wexley & Latham 1991). It has also been described as the maintenance of those skills, knowledge and attitudes over a certain period of time (Baldwin & Ford 1988). In an HRD context, transfer of training represents a core element transforming learning into individual performance (Holton 1996).

In order to improve transfer of training, it is important for organisations to not only understand the factors that affect transfer, but also to ensure that the organisation's training evaluation model takes account of these factors. In a contemporary workplace dependent on knowledge management and the optimal application of skills by a leaner, more educated workforce, organisations need to turn to effective ways to ensure that knowledge generation and transfer are not overlooked. One of those ways is to design a training program that utilises the benefits of knowledge sharing. This paper outlines a research strategy to measure the elements, which contribute to transfer of training by combining the LTSI, a model used to examine factors affecting transfer of training (Holton, Bates & Ruona 2000) and TPB, a theory which predicts trainees' behavioural intentions and actual behaviour of sharing the learned knowledge, skills and attitudes in the workplace (Ajzen 1991).

By doing so, this research proposal will extend existing knowledge of transfer of training and provide trainers with an additional mechanism for evaluating successful workplace training programs, initially in the context of the Malaysian public sector but, we predict, with generalisable results for wider application.

### ***The evolution of the transfer of training concept***

Transfer of training is defined first, as the degree to which trainees apply the knowledge, skills and attitudes gained in training to their job (Wexley & Latham 1991). Second, transfer of training is measured by the maintenance of the skills, knowledge and attitudes over a certain period of time (Baldwin & Ford 1988). Rouiller and Goldstein (1993) expanded the research on transfer of training to include the concept of a 'transfer climate' consisting of situations and consequences that either inhibit or help to facilitate the transfer of what has been learned in training into a job situation. They suggested four types of 'situational' cues: goal cues, social cues, task cues, and self-control cues. These cues remind trainees of what they have learned, or at least provide an opportunity for them to use what they have learned. In contrast, 'consequence' cues were described as on-the-job outcomes which affect the extent to which training is transferred. The four consequence cues comprise positive feedback, negative feedback, punishment, and no feedback. According to Holton, Bates, Seyler & Carvalho (1997), accurately measuring transfer of training climate is important because it can help HRD move beyond the question of *whether* training works, to analysing why training works. Therefore, having a valid and reliable measure of transfer climate could help identify not only when an organisation is ready for a training intervention, but also when individuals, groups and departments are ready for such an intervention.

Another key factor identified by Holton *et al.* (1997) was the 'opportunity to use' which described the extent to which trainees learn to obtain resources that enable them to use their new skills on the job. Their study suggested that trainees perceive transfer climate according to referents to the organisation (for example supervisor, peer, task or self) rather than according to the psychological cues (goal cues, social cues), as proposed earlier by Rouiller and Goldstein (1993). The factor analysis in Holton *et al.*'s. (1997) study extracted 9 transfer climate constructs. These constructs were Peer Support, Supervisor Support, Openness to Change, Personal Outcomes Positive, Personal Outcomes Negative, Supervisor Sanctions, Content Validity, Transfer Design and Opportunity to Use. In 2000, Holton *et al* expanded their work by introducing the concept of a 'transfer system' which they defined as all factors in the person, training, and organisation that influence transfer of learning to job performance. For example, motivation to transfer is one of the factors affecting transfer but is not a transfer climate construct. Therefore, the concept of transfer system is broader than transfer climate used by Rouiller and Goldstein (1993).

Holton *et al.* (2000) used the earlier HRD Research and Evaluation Model (Holton 1996) as their conceptual framework. In that framework, three primary training outcomes were defined. These outcomes were learning, individual performance and organisational results, defined respectively, as achievement of the learning outcomes desired in an HRD intervention; change in individual performance as a result of the learning being applied on the job; and results at the organisational level as a consequence of the change in individual performance (Holton 1996, p.9). The term 'individual performance' is used in the model instead of 'behaviour' in the Kirkpatrick (1994) model because it is a broader construct and a more appropriate descriptor of HRD objectives. The authors first sought to incorporate the nine transfer climate constructs identified in Holton *et al.* (1997) study into the framework. They then searched the literature on transfer of training to identify 7 other constructs that had not been previously tested in Holton *et al.*'s. (1997) study but which, they believed, would fit into the model. The 7 additional constructs comprised: performance self efficacy (Gist 1987), expectancy related constructs (transfer effort performance and performance outcomes), personal capacity for transfer (Ford, Quinones, Segó & Sorra 1992), feedback-performance coaching, learner readiness (Knowles, Holton & Swanson 1998), and general motivation to transfer. Table 1 lists these final 16 constructs and Figure 1 shows how the 16 constructs fit in the LTSI model.

**TABLE 1**

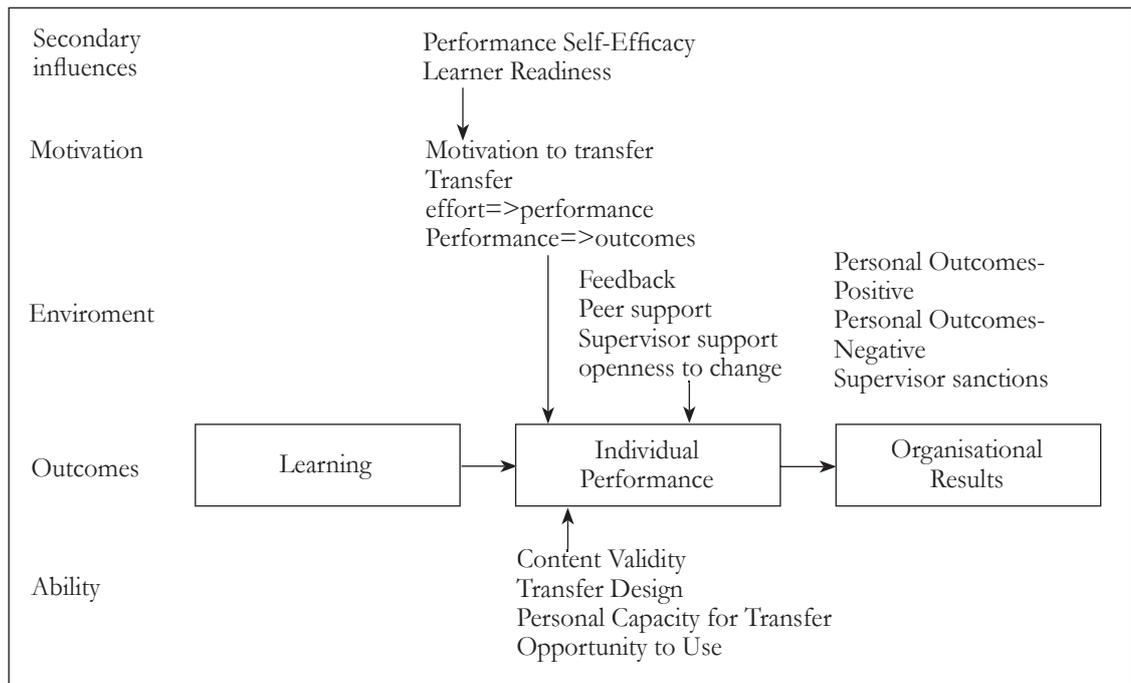
The 16 factors of the LTSI which affect transfer of training

No	Constructs	Definition
1	Learner Readiness	Extent to which trainees are prepared to enter and participate in training.
2	Motivation to Transfer	Trainees' desire to use the knowledge and skills mastered in the training program on the job.
3	Peer Support	Extent to which peers reinforce and support use of learning to the job.
4	Supervisor Support	Extent to which supervisors/managers support and reinforce use of training on the job.
5	Personal Outcomes-Positive	Degree to which applying training on the job leads to outcomes that is positive for the trainees.
6	Personal Outcomes-Negative	Extent to which individuals believe that not applying skills and knowledge learned in training will lead to negative personal outcomes.
7	Supervisor Sanctions	Extent to which individuals perceive negative responses from supervisors/managers when applying skills learned in training.
8	Content Validity	Extent to which trainees judge training content to accurately reflect job requirements
9	Transfer Design	Degree to which (1) training has been designed and delivered to give trainees the ability to transfer learning to the job (2) training instructions match job requirements.
10	Personal Capacity to Transfer	Extent to which individuals have the time, energy and mental space in their work lives to make changes required to transfer learning to the job.
11	Opportunity To Use	Extent to which trainees are provided with or obtain resources and tasks on the job enabling them to use training on the job.
12	Performance Self Efficacy	Trainee's general belief that they are able to change their performance when they want to.
13	Transfer Effort-Performance Expectations	Expectation that effort devoted to transferring learning will lead to changes in job performance.
14	Performance-Outcomes Expectations	Expectation that changes in job performance will lead to valued outcomes.
15	Feedback	Formal and informal indicators from an organisation about an individual's job performance.
16	Openness to Change	Extent to which prevailing group norms are perceived by trainees' to resist or discourage the use of skills and knowledge acquired in training.

Source: Holton, E.F. III, Bates R.A. & Ruona, Wendy E.A. 2000, "The Development of A Generalised Learning Transfer System Inventory," *Human Resource Development Quarterly*, vol.11, no. 4, pp.333-360.

Of the 16 constructs, the first 11, (learner readiness, motivation to transfer, peer support, supervisor support, personal outcomes-positive, personal outcomes-negative, supervisor sanctions, content validity, transfer design, personal capacity for transfer and opportunity to use) represent factors affecting a specific training program. Constructs 12 -16 (performance self-efficacy, transfer effort-performance, performance-outcomes, feedback and openness to change) were classified as general factors, affecting all training programs.

**FIGURE 1**  
The LTSI model



Source: Holton, E.F. III, Bates R.A. & Ruona, Wendy E.A. 2000, "The Development of A Generalised Learning Transfer System Inventory," *Human Resource Development Quarterly*, vol.11, no. 4, pp.333-360.

In order to measure these 16 constructs, Holton *et al.* (2000) identified 76 'items' to measure the 11 constructs representing specific training program factors and 36 'items' to measure the 5 general constructs affecting all training programs. Exploratory factor analysis was used by Holton *et al.* (2000), which revealed a clean interpretable factor structure of all 16 transfer system constructs. The findings from their study are important in HRD, and to the present research strategy, as any effort taken to develop a generalisable instrument to measure factors affecting training transfer must consider all factors as proposed by Holton *et al.* (2000).

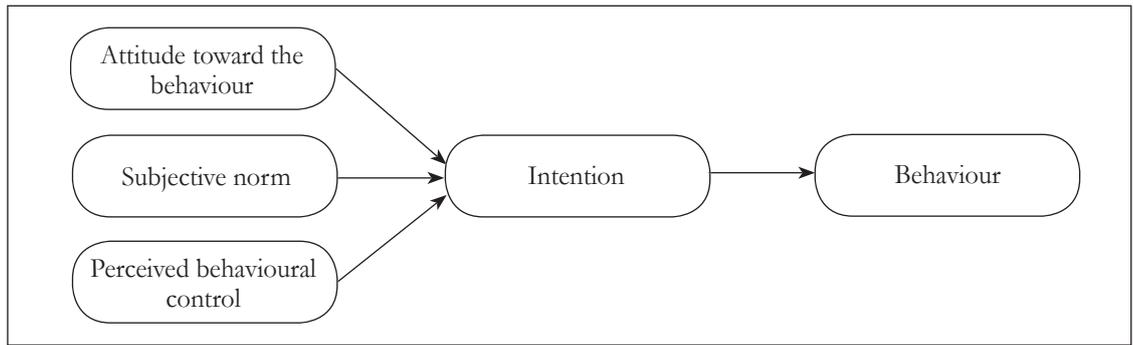
The model has been accepted as one of the most influential in measuring training effectiveness (Donovan, Hannigan & Crowe 2001). Further, it is valuable in expanding more traditional training effectiveness models by taking into account factors such as motivation, environmental elements and ability. Nevertheless, we argue that the model fails to consider the role of knowledge sharing as a further indicator of transfer of training. We begin this discussion with a brief exploration of the theory of planned behaviour.

### ***The theory of planned behaviour***

The theory of planned behaviour originated in the field of social psychology as a predictor for behaviour (Ajzen 1991; Ajzen & Fishbein 1980; Fishbein & Ajzen 1975). The TPB predicts that the most important determinant of a person's behaviour is behaviour intent. The individual's intention to perform a behaviour is a combination of his or her attitude toward performing the behaviour, the prevailing subjective norms and the perceived behavioural controls on the individual (Ajzen 1991).

Based on TPB, peoples' attitudes towards their own behaviour refers to the degree to which they have made a favourable or unfavourable evaluation of the behaviour in question (Ajzen 1991, p.188). Subjective norms are the perceived social pressures to perform or not to perform the behaviour and perceived behavioural control refers to the perceived ease or difficulty of performing the behaviour. According to Ajzen (1991), the more favourable the attitude and subjective norms with respect to the behaviour, and the greater the perceived behavioural control, the stronger should be an individual's intention to perform the behaviour under consideration. Figure 2 demonstrates the relationship between attitudes towards behaviour, subjective norms and perceived behavioural controls.

**FIGURE 2**  
The Theory of Planned Behaviour



Source: Holton, E.F. III, Bates R.A. & Ruona, Wendy E.A. 2000, “The Development of A Generalised Learning Transfer System Inventory,” *Human Resource Development Quarterly*, vol.11, no. 4, pp.333-360.

The TPB has been widely used in empirical research to predict human behaviours. For example, the theory has been used to predict hunting behaviours (Hrubes & Ajzen 2001), to predict dishonest actions (Beck & Ajzen 1991) and to predict teachers’ intention to provide dietary counselling (Astrom & Mwangisi 2000). TPB has also been applied in a workplace context to assess the extent to which senior managers intended to encourage knowledge sharing (Lin & Lee 2004). By using TPB, Lin and Lee (2004) found that the main determinant of enterprise knowledge sharing behaviour was the intention to encourage knowledge sharing behaviour. Additionally, they also found that senior managers’ attitudes, subjective norms, and perceived behavioural controls were found to positively influence their intention to encourage knowledge sharing. Table 2 outlines the five key indicators of knowledge sharing determined by the TPB.

**TABLE 2**  
The key indicators of knowledge sharing

1	Attitudes toward knowledge sharing	Refers to trainees’ positive or negative evaluations on sharing the learned knowledge and skills at the workplace.
2	Subjective norms toward knowledge sharing	Refers to trainees’ beliefs what their friends at the workplace will view about sharing the learned knowledge and skills at the workplace.
3	Perceived behavioural control toward knowledge sharing	Refers to how easily trainees’ can perform the sharing of learned knowledge and skills at the workplace.
4	Intention to share knowledge	Refers to the degree to which trainees believed that the learned knowledge and skills would be shared.
5	Sharing behaviour	The degree to which trainees’ actually share the learned knowledge and skills with others.

Source: Ajzen, I. 1991, The Theory of Planned Behaviour. *Organisational Behaviour and Human Decision Processes*. Vol. 50, pp. 179-211.

### Knowledge sharing

Knowledge sharing is a set of behaviours that involves the exchange of information or provision of assistance to others (Connelly & Kelloway 2003). Chua (2003) described the process of knowledge sharing as the manner in which individuals collectively and interactively refine a thought, an idea or suggestion in the light of their experiences. Knowledge sharing has been regarded as an important strategy for developing a competitive advantage for organisations (McEvily, Das & McCabe 2000). This is because shared organisational knowledge can be stored and integrated to form the basis for instilling competence, capability, or routine, and thus, it can contribute to creating competitive advantage.

The benefits of knowledge sharing have been reported in studies of firms such as Buckman Laboratories and Texas Instruments, which claimed significant gains in revenue (Chua 2003) while Dow Chemical and Chevron reported savings (Stewart 2001). Other companies such as General Motors and Skandia (a Swedish financial services firm) both recognised the benefits of knowledge sharing and instigated policies requesting their managers to share knowledge by teaching what they know about the business as a way of refining and improving existing organisational knowledge (De Long & Fahey 2000).

Knowledge sharing has been cited as improving individual performance. A qualitative study by Collison and Cook (2003) determined that knowledge sharing by teachers (of what they had learned in a middle school computer technology project) with their colleagues improved their teaching. The authors found that individual teachers learned more when they shared their learned knowledge and this resulted in improved teaching performance. For knowledge sharing to occur, a key criterion is the extent to which people are willing to share their knowledge. It has been argued that the level of trust in the organisation is an important factor affecting the willingness to share knowledge (Huemer, Von Krogh & Roos 1998; Sveiby and Simons 2002).

### ***A new model for knowledge sharing and transfer of training***

By combining Holton *et al's.* (2000) Learning Transfer System Inventory and the Theory of Planned Behaviour (Ajzen 1991) we aim to test factors affecting transfer of training including trainees' perceptions of sharing the learned knowledge and skills in the workplace context. The inclusion of knowledge sharing behaviour in our proposed research will contribute to a further understanding of transfer of training in a workplace-training context. Figure 3 provides the combined LTSI-TPB model.

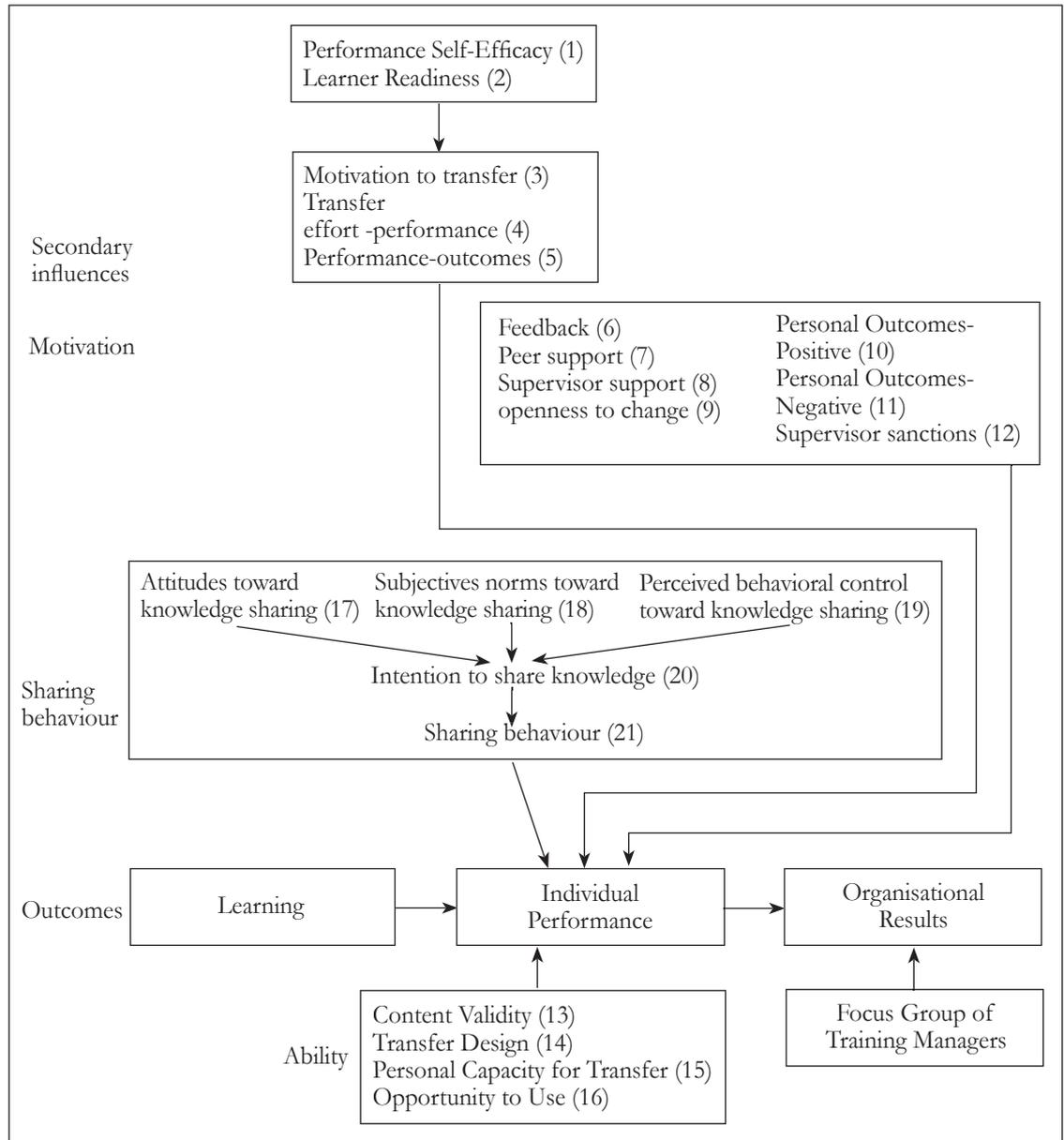
### ***Testing the combined model: A proposed methodology***

The authors have received agreement in principle to conduct this analysis in the Malaysian public sector. The model will be tested through a survey of managerial and non-managerial staff from government agencies in Malaysia who had attended any two types of training (technical or non-technical) not more than 3 months prior to the survey. Subjects within this time range are assumed to be more likely to avoid obsolescence of the learned training content. A survey questionnaire will be administered and follow-up interviews will be held to focus on key points identified in the analysis of the survey.

The minimum sample size for this study will be based on Hair, Anderson, Tatham and Black (1995) who suggested a ten-to-one ratio of observations to items. In the present study, the items will correspond to the constructs of transfer of training. Assuming that this study has developed a survey instrument of 80 to measure the 16 constructs, the minimum sample size required is 800. Therefore, a total of 1500 trainees will be targeted, given the difficulty in obtaining 100% response rate.

Following this, semi-structured interviews will be conducted with at least 20 subjects to provide important information regarding the influence of knowledge sharing on transfer of training from their own experience. Subjects will be asked to provide examples or documented evidence during the interview in order to develop case studies.

**FIGURE 1**  
The LTSI model



Source: Adapted from Holton, E.F. III, Bates R.A. & Ruona, Wendy E.A. 2000, "The Development of A Generalised Learning Transfer System Inventory," *Human Resource Development Quarterly*, vol.11, no. 4, pp.333-360; and Ajzen, I. 1991, The Theory of Planned Behaviour. *Organisational Behaviour and Human Decision Processes*. Vol. 50, pp. 179-211.

**Research questions**

The project will be driven by the following 5 research questions:

*Research Question 1: What are the critical factors affecting transfer of training?*

*Research Question 2: Is knowledge sharing a key critical factor affecting transfer of training in the government agencies in Malaysia?*

In order to answer these questions, factor analysis will be used as this study involves a large number of variables. Factor analysis is chosen because it is the best method of determining the number and nature of the underlying variables among larger numbers of measures in this study (Kerlinger 1973). According to Holton *et al.* (2000), exploratory factor analysis is the best method at this stage where there is no strong theory or conceptual framework exist in transfer of training literature. Although a conceptual framework is used in this study to guide the development of instruments, the conceptual framework has not been tested yet. Therefore, exploratory factor analysis is more suitable to apply at this stage.

*Research Question 3: If 'Yes' to Q.2, then how does knowledge sharing influence transfer of training in the government agencies in Malaysia?*

This question will be answered through the combination of SPSS analysis of the questionnaires and semi-structured interviews. Information gathered from the interviews will then be coded into the SPSS system so that they can be analysed to provide illustrations and examples in order to explain the findings.

*Research Question 4: What are trainees' perceptions toward knowledge sharing in the context of transfer of training in the government agencies in Malaysia?*

SPSS analysis of the semi-structured questionnaires will be utilised to gain insight into trainee's own perceptions towards knowledge sharing as a positive indicator of transfer of training. Information gathered from the interview will then be coded into the SPSS system so that they can be analysed and explain the findings.

*Research Question 5: What are trainers' perceptions toward knowledge sharing in the context of transfer of training in the government agencies in Malaysia?*

A total of five training managers in the government agencies will be targeted. They will be provided with the results of this study. Through an online interview (web-based) we will seek the opinions of the training managers on knowledge sharing results of the surveys and semi-structured interviews in order to gauge their intention to incorporate knowledge sharing as part of course evaluation.

## Conclusions

Whilst both the LTSI and TPB models have been investigated empirically, the link between knowledge sharing and transfer of training has not been specifically tested. This paper has proposed the development of a research design to test whether knowledge sharing can be considered a factor in the transfer of training through the combination of the LTSI and TPB models. The proposed study may have important implications to HRD professionals, as any effort taken to re-organising, restructuring and re-regulating rewards for labour must take into account the employees' job performance. In terms of understanding the factors affecting transfer of training this research strategy will contribute to the development of new training evaluation models by adding a new dimension, knowledge sharing.

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