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Training Needs Assessment of IT Professionals

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This abstract is on an organization-focused topic.

Increasing competition and an information technology (IT) labor shortage have required management to consider human resources as a strategic necessity for IT departments. In an attempt to hire and retain IT professionals, managers will need to provide training that allows professionals to maintain a current skill mix as the industry continues to rapidly change. Because IT professionals are required to maintain a constantly changing mix of technology skills and “soft” skills (Cheney, Hale and Kaspar, 1990; Dwight, 1993; Lee, Trauth and Farwell, 1995; Leitheiser, 1992; Mistic, 1996; Prabhaker, Litecky and Arnett, 1996), they require ongoing training efforts.

Assessing IT professionals’ need for training can be a difficult undertaking. Nelson, Whitener and Philcox (1995) demonstrated that a training needs assessment framework developed by Ostroff and Ford (1989) could be used effectively within an end-user training program. I would like to apply this framework to the training of IT professionals and examine how to practically implement one portion of the framework. This led me to the following research question: *Is training with customized content (based on any deficiency in the desired KSA’s in IT professionals) just as effective and more efficient than training with general content?*

Importance of Research

Sein, Bostrom and Olfman (1998) identified two research questions that still need to be addressed in IT training research. Their first research question: “What specific methods exist for assessing the training needs of different categories of trainees of IT-based tools?” Their second research question: “What are the most appropriate training methods for specific types of trainees and specific IT-tools?” Although considerable research exists that has examined the second question (Ahrens and Sankar, 1993; Bostrom, Davis and Bostrom, 1993; Davis and Davis, 1990; MacKay and Lamb, 1991; Olfman and Mandviwalla, 1994; Olfman and Sein, 1990; Santhanam and Sein, 1994; Simon, et al., 1996), I have found very

little research based on the first question (Nelson, 1991; Nelson, Whitener and Philcox, 1995).

This research study will examine the first of these two questions using IT professionals as trainees. It will apply current theory on job performance evaluation to assessing the need for training among IT professionals.

Theory Base for Research

Ostroff and Ford (1989) proposed a training needs assessment framework (see

Table 1) that examines training issues at three levels within an organization: individual, subunit and organizational. At each of these levels of analysis, there are three content areas for training. The authors propose that training needs assessment should consider issues within each of the cells in their framework.

Nelson, Whitener and Philcox (1995) performed a case study on an organization (the IRS) which utilized the Ostroff and Ford framework for setting up an end-user training program for a new IS. The case study indicated that the framework was effective for the training program; however, the authors did not explore individual portions of the framework, nor did they indicate how to implement the various sections. My dissertation would explore one portion of the framework (the *Individual* level of analysis) and provide empirical and theoretical justification for using it. The cells in the framework at the *Individual* level of analysis suggest that organizations should examine any knowledge and skill deficiencies in employees based on knowledge and skill requirements for tasks. Also, it is important for the organization to examine the contribution of individual goals, objectives and values to the overall organization.

Motowidlo, Borman and Schmit (1997) have proposed a model of job experience that fits the *Individual* level of analysis of the Ostroff and Ford framework (see Figure 1). Job experience is composed of two dimensions: task performance (activities that contribute to the organization’s core technical processes) and contextual performance (activities that maintain the “... broader organizational, social, and psychological environment in which the technical core must function”). Task performance appears to relate to the Task content area of the Ostroff and Ford framework, and contextual performance appears to relate to the Organizational

content area. The Person content area of the framework relates to both task and contextual performance.

Cognitive ability in combination with learning experiences is proposed to impact primarily task performance through several mediating variables (task habits, skill and knowledge), while personality, again in combination with learning experiences, primarily impacts contextual performance through several mediating variables (contextual habits, skill and knowledge). There is also a secondary cross-over effect, with cognitive ability impacting contextual performance to some degree and personality impacting task performance to some degree.

Training tends to be delivered in standard packages. If the IT professional already possesses some of the KSA's taught in the training sessions, the efficiency of standard training is lowered. On the other hand, the effectiveness of the training may depend on the entire training package being delivered to the trainee. This study will examine the impact of customized training on the effectiveness and efficiency of the training. In an era of customizing products for the consumer (Hibbard, 1998; Davey, 1998), it will become increasingly important for IT departments to target and customize training for their employees. As this occurs, our understanding of the

process of customizing training will also become increasingly important.

Based on this model, I have proposed the following two hypotheses (stated in null form):

- H₁: Customized training requires fewer resources (higher efficiency) than standard training.
- H₂: Customized training has at least the same level of effectiveness as standard training.

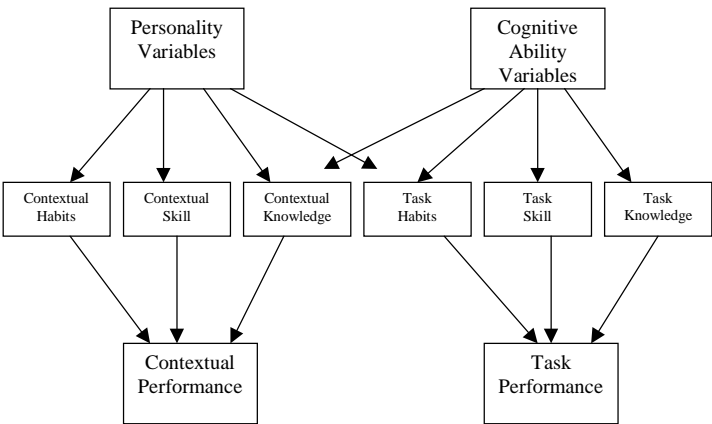
Possible Research Approach or Methodology

This research study would conduct a laboratory experiment with two training groups: a control group and a treatment group. Both groups would have their task and contextual KSA's measured before and after training. The control group would receive a standard training package. For the treatment group, training would be assigned to employees based on any KSA deficiencies. The effectiveness and efficiency of the training would be measured (both objective and subjective measures) and then compared.

Table 1. Training needs assessment framework.

Level	Content		
	Person	Task	Organizational
Individual	Individual KSA's, motivations and attitudes	Basic tasks performed or technology used by each individual in the organization	Individual goals, objectives and values
Subunit	Subunit skills and climate	Basic tasks performed or technology used by each subunit in the organization	Subunit goals, objectives and values
Organizational	Organizational skills and climate	Basic tasks performed or technology used by all the people in the organization	Organizational goals, objectives and values

Figure 1. Model of job performance.



Bibliography

- Ahrens, J.D. & Sankar, C.S. "Tailoring database training for end users," *MIS Quarterly* (17:4), December 1993, pp. 419-439.
- Bostrom, R.P., Olfman, L. & Sein, M.K. "The importance of learning style in end-user training," *MIS Quarterly* (17:1), March 1990, pp. 101-119.
- Cheney, P., Hale, D. & Kasper, G. "Knowledge, skills and abilities of information systems professionals: Past, present and future," *Information & Management* (19:4), 1990, pp. 237-247.
- Davey, T. "Personalized service at lower cost," *Informationweek*, September 14 1998, pp. 173-177.
- Davis, S.A. & Bostrom, R.P. "Training end users: An experimental investigation of the roles of the computer interface and training methods," *MIS Quarterly* (17:1), March 1990, pp. 61-85.
- Davis, L.D. & Davis, D.F. "The effect of training techniques and personal characteristics on training end users of information systems," *Journal of Management Information Systems*, (7:2), Fall 1990, pp. 93-110.
- Dwight, D. "Hard demand for soft skills," *Datamation*, (39:2), January 15 1993, pp. 28-32.
- Hibbard, J. "Maximum value from customer data," *Informationweek*, September 14 1998, pp. 10ER-12E.
- Lee, D., Trauth, E. and Farwell, D. "Critical skills and knowledge requirements of IS professionals: A joint academic/industry investigation," *MIS Quarterly*, (19:3), September 1995, pp. 313-340.
- Leitheiser, R. "MIS skills for the 1990's: A survey of MIS managers' perceptions," *Journal of Management Information Systems*, (9:1), Summer 1992, pp. 69-91.
- MacKay, J.M. & Lamb, C.W., Jr. "Training needs of novices and experts with referent experience and task domain knowledge," *Information & Management*, (20:3), 1991, pp. 183-189.
- Misic, M. "The skills needed by today's system analysts," *Journal of Systems Management*, (47:3), March 1996, pp. 34-40.
- Motowidlo, S.J., Borman, W.C. & Schmit, M.J. "A theory of individual differences in task and contextual performance," *Human Performance*, (10:2), 1997, pp. 71-83.
- Nelson, R.R. "Educational needs as perceived by IS and end-user personnel: A survey of knowledge and skill requirements," *MIS Quarterly*, (15:4), December 1991, pp. 502-525.
- Nelson, R.R., Whitener, E.M. & Philcox, H.H. "The assessment of end-user training needs," *Communications of the ACM*, (38:7), July 1995, pp. 27-39.
- Olfman, L. & Mandviwalla, M. "Conceptual versus procedural software training for graphical user interfaces: A longitudinal field experiment," *MIS Quarterly*, (18:4), December 1994, pp. 405-426.
- Ostroff, C. & Ford, J.K. "Assessing training needs: Critical levels of analysis," in *Training and Development in Organizations*, Raymond Katzell (ed.), Jossey-Bass, Inc., San Francisco, CA, 1989, pp. 25-62.
- Prabhakar, B., Litecky, C. & Arnett, K. "A longitudinal analysis of job skill trends in the MIS job market," *Proceedings of the Americas Conference on Information Systems*, Phoenix, AZ, August 1996, pp. 338-340.
- Santhanam, R. & Sein, M.K. "Improving end-user proficiency: Effects of conceptual training and nature of interaction," *Information Systems Research*, (5:4), December 1994, pp. 378-399.
- Sein, M.K., Bostrom, R.P. & Olfman, L. "Reconceptualizing IT training for the workforce of the future," *Proceedings of the 1998 ACM SIGCPR Conference*, Boston, MA, March 1998, pp. 233-241.
- Simon, S.J., Grover, V., Teng, J.T.C. & Whitcomb, K. "The relationship of information system training methods and cognitive ability to end-user satisfaction, comprehension, and skill transfer: A longitudinal field study," *Information Systems Research*, (7:4), 1996, pp. 466-490.