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ABSTRACT

This symposium on transfer of learning consists of four presentations. "The Influence of the Implementation of a Transfer Management Intervention on Transfer of Training" (Patricia R. Saylor, Marijke T. Kehrhahn) reports a study that evaluated effectiveness of transfer management interventions provided by a change facilitator in establishing a positive transfer climate and promoting achievement of transfer goals set by middle school teachers. "Learning Strategies: A Key to Training Effectiveness" (Paula Willyard, Gary J. Conti) describes a study of learning strategies of 456 adults that found a connection between the image of the organization and the type of learners attracted to it and identified learning characteristics that trainers can use to improve learning. "An Examination of Learning Transfer System Characteristics Across Organizational Settings" (Elwood F. Holton III et al.) discusses a study that compared transfer systems across three organization types, eight different organizations, and nine different types of training and found they are significantly different across organizational types, organizations, and training types. "Adult Learning and the Internet" (Gary J. Conti, Anne A. Ghost Bear) focuses on a study that describes learning strategies used by eBay users and finds that learners using critical thinking skills are attracted to the Internet, Internet use leads to differing attitudes about skill and self concept changes, and learning strategy groups approach learning on the Internet very differently. All four papers include substantial bibliographies. (YLB)

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Transfer of Learning

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Tulsa, Oklahoma

February 28 - March 4, 2001

The Influence of the Implementation of a Transfer Management Intervention on Transfer of Training

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Research and theory on transfer of training has indicated that transfer management interventions may improve transfer outcomes and influence employee perceptions of transfer climate. This study evaluated the effectiveness of transfer management interventions provided by a change facilitator in establishing a positive transfer climate and promoting achievement of transfer goals set by middle school teachers.

Keywords: Transfer of Training, Transfer Management, Transfer Design

Employees of today's organizations are faced with the challenge of continually updating their skills and applying new technologies to enhance their work performance. Employee training programs are still the most popular method for transmitting knowledge and introducing technology skills in the effort to improve employee performance (Broad, 1997). Yet transfer of training, or the application of knowledge and skills that have been newly acquired during training, continues to be a major concern of human resource development specialists and managers. Are employees applying what they've learned in technology training? In what ways can HRD practitioners support and enhance the transfer of training?

Public school personnel, like employees of many other enterprises, are faced with the challenge of learning new technology skills and integrating them into their daily practice. Our study evaluated the effectiveness of transfer management interventions provided by a change facilitator in establishing a positive transfer climate and promoting achievement of transfer goals set by middle school teachers.

Problem Statement

The problem of transfer of training continues to be a concern for HRD practitioners and managers. Broad (1997) noted that while training is the most frequently used method for improving workplace performance, "research, observations of training professionals, and testimony from many managers show that most current training efforts do not result in significant transfer of new skills and knowledge to the job." (p. 8). The rate of transfer has been reported across the literature to be from 10% (Georgensen, 1982) to 40% (Broad & Newstrom, 1992).

Over thirty years of research on the transfer of training phenomenon has illuminated transfer as a complex process that is influenced by learner, instructional, and environmental variables (Baldwin & Ford, 1988; Ford & Weissbein, 1997). HRD researchers of training transfer have offered discussions concerning barriers to transfer (e.g., Newstrom, 1985), factors for performance improvement (e.g. Rummel & Brache, 1995), and comprehensive models of transfer (e.g. Noe, 1986) to shed light on the transfer process. Holton (1996), stating that "evaluation of interventions is among the most critical issues faced by the field of HRD today" (p. 5), proposed a model for the evaluation of employee training programs that designates transfer of training, the change in individual performance as a result of applied learning, as an important outcome variable to examine.

Theoretical Rationale

Holton (1996) proposed, based on past research, that individual performance outcomes are influenced by motivation to transfer newly acquired knowledge and skills, individual job attitudes, transfer conditions within the work environment, and the implementation of transfer designs. This segment of Holton's model was the foundation for the reported research. In this study, motivation to transfer was defined as the measure of the employee's

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perceived applicability and usefulness of technology skills (Noe, 1986) and the level of challenge, anticipated support, and intention to use new skills (Kehrhahn, 1995).

Proposed individual characteristics that influenced transfer of technology training were teacher efficacy and age. Teacher efficacy (Ashton & Webb, 1986), the perception of one's own abilities to perform a new task coupled with one's belief that teaching efforts will overcome other obstacles to successfully bring about student learning, was studied as the participants' beliefs that their successful integration of technology into the curriculum would enhance student learning. Age was selected as an individual variable because of its relationship in other studies to apprehension to learn about and use technology (Hastings, Sheckley, & Nichols, 1995) and slower acquisition of new skills (Pascual-Leone & Irwin, 1994). Transfer conditions within the work environment called environmental favorability (Noe, 1986), included informal social support from peers, administrators, and a technology change facilitator, and task support, in the form of resources such as time and equipment (Peters & O'Connor, 1980). In addition, teachers' perceptions of the school climate to support change (Sagor & Barnett, 1994) were expected to influence their transfer behavior.

Transfer design was a critical component of our study. Transfer designs are interventions connected with the training program that will have a direct influence on transfer. Holton (1996) stated that transfer designs "vary considerably depending on content, cultures, and other situational factors" (p. 15). Broad (1997) advocated for the development of transfer management interventions to dramatically improve transfer rates. Broad suggested specific strategies which included: Addressing trainees' personal concerns to reduce anxiety; providing coaching and information to trainees as needed; building a sense of community among learners, offering a variety of program options; and, creating opportunities for practice and time to meet with instructors. The Concerns-based Adoption Model (CBAM; Hord, et al., 1987) is a systematic approach to transfer and change management. According to this model, individual change is a developmental process whereby individuals must address personal concerns before they can approach the task; similarly they must address task management concerns before considering impact on student outcomes. Using Hord et al.'s model as a guide, we designed and implemented a transfer management program to increase transfer goal attainment. A Technology Change Facilitator (TCF) facilitated the planning, instruction, and support for the transfer effort.

Ford and Weissbein (1997), in their update of Baldwin and Ford's (1988) classic review of transfer of training research, emphasized the need to study training designs that enhance transfer, and continued examination of individual and environmental factors that seem to promote or inhibit transfer. Holton (1996) noted that future research should identify specific variables that should be measured with regard to changes in individual performance as a result of training. The reported study set out to examine transfer of technology training across an entire organization, a middle school, to determine the contributions of transfer design as well as individual and environmental variables.

Research Questions

- RQ1 To what extent can the implementation of a transfer management intervention improve transfer of training outcomes?
- RQ2 To what extent can the following variables: teacher efficacy, environmental favorability (social support, task support, school climate), motivation to transfer, and age, account for differences between employees who transfer training (Users) and those who do not (Non-Users)?

Methods

Quantitative and qualitative data were collected over the course of one school year. The yearlong focus allowed time for the transfer management intervention to be fully implemented and to carefully examine its influence on the growth and implementation of technology-related skills. Data collection was targeted at gathering information to illuminate the factors that contributed to the transfer of technology training as faculty worked to meet their technology transfer goals for the year.

Participants. The research was conducted in a typical suburban middle school located in New England. Administrators included a principal and two associate principals, as well as a district-wide curriculum specialist for each academic discipline. The entire middle school staff of 75 certified teachers participated in the mandatory professional development program. The 68 teachers who participated in the study consisted of 25 men and 43 women, ages 25 to 59, who had been employed at the school for 1 to 35 years. They were classroom teachers from

grades 6, 7, and 8, as well as cross-grade specialists, such as unified arts, guidance, and music teachers. Sixty-three participants had attained a Master's Degree or higher.

Transfer Management Intervention. The transfer management intervention was planned to address the ongoing needs of individual learners and to provide an environment conducive to learning, practicing, and implementing new technology skills. The professional development program included an initial training session, presence of a change facilitator (TCF) who focused her work on the implementation of technology-related changes by promoting individual use and addressing concerns, and a year-long program of formal and informal activities and supports that promoted learning and application. The transfer management intervention was designed by the researchers, the TCF, and the building staff development team and was implemented by the TCF. Specific features of the transfer management intervention are listed in Table 1.

Table 1. Features of Transfer Management Intervention

Component	Specific features
Planning (Fullan, 1991; Hall et al., 1986)	<ul style="list-style-type: none"> • Ground efforts in district-wide goal for technology literacy for all staff by 2000 • Assess needs and concerns of teachers prior to planning the effort • Plan interventions to legitimize and address individual concerns • Develop resources to address individual questions in a timely manner
Initial training session (Locke & Latham, 1990)	<ul style="list-style-type: none"> • Familiarize staff with range of technology uses and resources • Assess current technology skills • Determine personal transfer goal by establishing a technology implementation goal • Develop specific approaches to achieving the goal and assessing goal achievement
Technology change facilitator (Hord, et al., 1987)	<p>Role:</p> <ul style="list-style-type: none"> • Mediate between the individual learners and the workplace context • Listen to staff concerns and address these concerns as part of the professional development effort • Adjust the effort to meet the needs of individual learners and work demands <p>Personal qualities:</p> <ul style="list-style-type: none"> • Strong teacher efficacy • Knowledge of adult learning principles and outstanding training and leadership skills • Willingness to be available to teachers
Formal learning opportunities (Olivero, Bane, & Kopelman, 1997)	<ul style="list-style-type: none"> • 26 one-hour classes that addressed faculty's common learning needs on a sign-up basis • Deliberate practice sessions focused on adaptation of skills for classroom use • Specific instruction in use of software and technology
Informal learning Guided and independent practice (Broad, 1997)	<ul style="list-style-type: none"> • Hands-on practice sessions • Feedback readily available from TCF and peers
Goal management (Cheek & Campbell, 1994; Locke & Latham, 1990; Wexley & Baldwin, 1986)	<ul style="list-style-type: none"> • Participants chose and defined their own goals • Supervisory goal discussions at three evaluation conferences during the year • Coordination and synchronization of department level goals • TCF followed up on goals and offered assistance • Continual reminders from peers and the learning community to focus on and achieve goals
Learning teams (Broad, 1997; Killion & Kaylor,	<ul style="list-style-type: none"> • Learners organized their own collaborative sessions (informal breakfast meetings, team meetings, after school meetings) around common goals • Meetings used for planning, reflective dialogue, problem solving, and adaptation of skills to

<p>1991; Kiener, 1994)</p> <p>Coaching and technical assistance (Broad, 1997)</p>	<p>specific situations</p> <ul style="list-style-type: none"> • TCF provided facilitation, problem solving, and mentor support for teams <p>TCF orchestrated:</p> <ul style="list-style-type: none"> • Observation sessions for reluctant learners in classes in which technology was being used • Dissemination of journal articles • Teaming of faculty who were not working on goals with mentors who had successfully accomplished goals • Individual tutoring from TCF and other experts upon request • Establishment of growing list of technology experts who could answer questions and solve problems in a hurry • Publication of monthly newsletters that highlighted tips, resources, networking opportunities, and help sessions • Publication of a help manual that included simple steps for independent practice
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The wide variety transfer management activities addressed the concerns of most participants and the results showed that addressing a variety of levels of concern facilitated transfer for many individuals. Following Pranger's (1998) research, the model-in-action demonstrated an intensive coordination of informal and formal learning opportunities using the resources of a skilled facilitator and knowledgeable peers.

Data gathering. Quantitative and qualitative data were collected throughout the school year. Prior to the start of the professional development effort, each faculty member completed a Demographic Information Sheet to provide information about age, gender, subject area taught, highest degree attained, years of teaching experience, various indicators of technological expertise, and involvement in other professional development initiatives. The Gibson Teacher Efficacy Scale (1984) was administered to determine participants' general teaching efficacy ($r = .70$)¹, their belief that teachers in general make a difference with students, and personal teaching efficacy ($r = .78$), their belief in their own ability to make a difference by learning new skills. In addition, the School Climate Inventory (Sagor & Barnett, 1994; $r = .82$) was administered to determine the degree to which participants felt that the school climate was conducive to change. Immediately following the initial training session, teachers set and recorded their personal technology literacy goal (transfer goal) for the year, assessed the quality of the training using an evaluation form, and reported on their intention to implement what they had learned in the session using a Motivation to Transfer scale ($r = .73$).

During the ensuing months, one researcher conducted regular visits to the school. She contacted the TCF frequently to monitor and record information about interventions, observed activity in the computer lab, and informally interviewed teachers and administrators to monitor the general progress of the implementation plan. Anecdotal data was carefully documented for later analysis. One month before the end of the school year, an Environmental Favorability survey ($r = .78$) was administered to measure participants' perceptions of resources and support that helped them reach their technology goals. The survey included items about perceived frequency of social support from peers ($r = .79$), administrators ($r = .72$), and TCF ($r = .80$), and the perceived usefulness of this social support from peers ($r = .60$), administrators ($r = .47$), and the TCF ($r = .69$). At the last staff meeting of the year, teachers revisited their transfer goals and assessed their goal attainment. Each teacher was given a Levels of Use open-ended questionnaire, adapted from the Levels of Use interview format (Lyness, 1985), to assess implementation of their technology-based learning and the degree of success in reaching their transfer goal. In addition, each teacher was assessed and assigned a level of technology expertise (nonuser, low-end user, moderate user, high-end user) by the district technology supervisor. These data were used to triangulate individual reports of goal attainment.

Data analysis. Quantitative data from the five instruments (Levels of Use assessment, Gibson Teacher Efficacy Scale, Motivation to Transfer scale, Environmental Favorability scale, School Climate Inventory) were analyzed to develop a composite profile of teachers who successfully reached their transfer goals. Qualitative data were evaluated to add depth and detail to the emerging profile of those who transferred training.

First, the researcher scored each teacher's response to the Levels of Use questionnaire. Participants were assigned one of seven Levels of Use (0 = no interest; I = seeking orientation; II = preparing to implement; III = mechanical implementation; IVA = routine implementation; IVB = refining implementation; V = collaborating with colleagues to achieve collective implementation; and VI = seeking new goals and making major modifications in use

¹ Cronbach's alphas reported in the text are those calculated for the sample.

of technology skills) by matching key words found in their responses to those indicated in the Level of Use scoring manual (Loucks, Newlove, & Hall, 1975). To assure the accuracy of the assignment into User/NonUser categories, two experts reviewed the written interviews to confirm assignment to appropriate categories. Self-reports on accomplishments described in the interviews were cross-checked with documentation of individual participation and goal attainment kept by the TCF and district technology skills assessment reports to confirm the accuracy of self-reports. Users were defined as those subjects whose use of their self-determined technology goal reached at least a mechanical level. Nonusers were those who had not yet begun to use the innovation.

Once individuals were assigned to either *User* or *Non User* groups, the groups were examined for distinguishing differences using discriminant function analysis. We then sought to further explain differences between the groups by using qualitative data to support or illuminate distinctions found in the quantitative analysis.

Results

RQ 1 To what extent can the implementation of a transfer management intervention improve transfer of training outcomes?

The overall purpose of the study was to determine whether the implementation of a transfer management intervention carefully designed to support learning, application, and goal accomplishment would result in higher participation and better results than standard staff development and in-service efforts. Overall, 79% of the teachers (54 teachers) involved in the study engaged with and reached their transfer goals. Using the Levels of Use framework as a guideline to determine transfer, eleven teachers were using technology mechanically, indicating that they had initiated use on a short-term basis. Fifteen teachers were routinely using technology as part of their day-to-day work. Seventeen teachers had reached a level of refinement, varying use of the technology to increase the impact on students. Eight teachers were collaborating with colleagues to achieve a collective impact on students, and three were seeking major modifications or adapting their goals to expand use of technology.

In this study, 21% of the participants (14 teachers) did not engage with or reach the transfer goals they had set. At the end of the year, seven teachers remained at the lowest level of non-use, indicating no interest in technology implementation. Two teachers reported that they were seeking orientation in order to begin work on their transfer goals and five participants were preparing to implement their goals. Years of research on the relationship between attendance at a professional development workshop or seminar and change in individual performance have consistently found that very few traditional programs result in more than low levels of transfer of training (Baldwin & Ford, 1988; Broad, 1997). Even the most generous estimates of transfer set the rate at about 40% (Newstrom, 1990). Against the background of the reported ineffectiveness of traditional professional development programs, a transfer rate of 79% is exceptional.

Qualitative data collected through open-ended questionnaires pointed to what learners felt were the most effective features of the transfer management intervention. Responses to the question: "What factors contributed to your success with your technology goal?" were thematically coded for content. Teachers acknowledged: 1) the Technology Change Facilitator, specifically support, coaching, availability, and responses to questions on a timely basis; 2) peers, specifically access to peer expertise, coaching, and availability; 3) anticipation of follow-up and knowing there was a plan to provide technical assistance and support in place; 4) the availability of a range of activities at various times that met individual needs and allowed learners to work at their own pace; 5) availability of feedback from TCF and peers; and, 6) expansion of the network of experts from whom learners could seek advice. Clearly, the responsiveness and availability of social support resources focused on the application of new technology skills influenced the high rate of transfer.

RQ2 To what extent can the following variables: teacher efficacy, environmental favorability (social support, task support, school climate), motivation to transfer, and age, account for differences between employees who transfer training (Users) and those who do not (Non-Users)?

Discriminant Function Analysis (DFA) was used to test RQ2. The rationale behind discriminant analysis is to make use of existing data dealing with group membership and relevant predictor variables to create a formula that will accurately predict group membership, using the same variables with a new set of participants. Univariate analysis of the independent variables by group was conducted to select the most parsimonious equation for the DFA. The analysis revealed the highest effect sizes for differences between groups were perceived social support ($d =$

.96)², teacher efficacy ($d = 1.02$), motivation to transfer ($d = .70$), and age ($d = .80$). Perceived task support ($d = .24$), quality of training scale ($d = .05$) and school climate ($d = .09$) were not included in the final DFA because there were no significant differences between Users and Non-users with regard to these variables. Independent variables that demonstrated the highest effect sizes in univariate analyses were entered using the direct method.

The results of the final discriminant analysis for independent variables associated with transfer of training of technology skills are presented in Table 2. The table includes classification results, as well as a simple summary of number and percent of participants classified correctly and incorrectly for each group. As shown in Table 2, 86.76% of the cases were correctly classified. The analysis predicted Users, those who successfully transferred training, with 94.4% accuracy. Only 3 Non-users (5.6%) were incorrectly classified as Users. The analysis predicted 57.1% of Non-users as such, and 42.9% of Users incorrectly as Non-users. This analysis indicates that Users can be differentiated from Non-users on the basis of the variables teacher efficacy, perceived social support, motivation to transfer, and age.

Table 2. Classification Results of Discriminant Function Analysis

Actual Group	Number of Cases	Predicted Group Membership	
		Users	Non-users
Users	54	51 (94.4%)	3 (5.6%)
Non-users	14	6 (42.9%)	8 (57.1%)

Percent of "grouped" cases correctly classified: 86.76 %

The analysis of RQ2 reported a Wilks' Lambda of .71 ($p < .0002$). According to this statistic, 29% of the variance associated with group membership is explained by the independent variables ($1-\Delta = .29$), leaving 71% still unexplained. In addition, Wilks Lambda (U-Statistic) can be determined using the step-wise method. In the present study, the approximate contribution of particular variables using this method ($1-\Delta = \%$) were as follows: Perceived social support contributed 15% of the variance in transfer of training ($\Delta = .85$); teacher efficacy contributed 14% of the variance ($\Delta = .86$); motivation to transfer contributed 9% ($\Delta = .91$); and age contributed 8% ($\Delta = .92$). The total is greater than 29% because of overlapping variance.

Additional Analyses. Two additional analyses were conducted as follow-up to the DFA. The researchers examined the composition of the group of Non-users predicted to be Users, and the composition of the group of Users predicted to be Non-users. Individual scores on instruments and qualitative data were examined to determine why individuals were mis-classified.

Why had the six teachers not met their transfer goals when their profiles indicated that they would be Users? While all six participants had high teacher efficacy, three did not perceive social support to the same degree as users, two were not as motivated to transfer, and three were older than the 95% confidence interval for age. The further examination of the data implied that all four independent measures must be at optimal levels in order for transfer to occur. Anecdotal data from Levels of Use questionnaires and person interviews indicated that these teachers had individual reasons for lack of transfer: availability of equipment, timing of training, lack of job applicability, involvement in other initiatives, fear of computers, and lack of personal ability. In other words, these individuals fit the profile to be Users, but individualized concerns interfered.

Based on the first follow-up analysis concerning these teachers, the researcher examined two additional areas. First, specific questions posed in the Motivation to Transfer instrument provided insight. In particular, when asked, "How applicable are the new knowledge and skills you've learned to your job?" all of these participants responded "Not at all applicable." Second, examination of the technology goals set by these participants revealed that all had committed to a non-specific goal at the beginning of the study, such as "improvement in computer use," and "becoming familiar with programs." As suggested in prior research, the perceived applicability of the new knowledge and skills and the specificity of set goals influence the effort to transfer training.

Also of interest to the researchers was the question: Why did three teachers implement their transfer goals when variables used in the discriminant function analysis predicted that they would not? While these participants fit

² Effect sizes were calculated using the Cohen's d convention (1992).

the Non-user profile on every independent variable they all appeared to have been influenced to reach their transfer goals. One individual worked in a department in which use of technology was high and was encouraged by peers to persist in integrating technology. Another teacher worked to become much more computer literate on his home computer and transferred those skills to his work environment. The third individual was strongly encouraged by his administrator to use technology on the job. The follow-up analysis indicated that even those teachers whose profiles indicated that they would not transfer training could be influenced to transfer in various ways.

Conclusions and Recommendations

The results of the study support the segment of Holton's (1996) model of HRD Evaluation and Research (p. 17) that proposed that motivation to transfer, perceptions of transfer climate, and the implementation of a transfer design have a direct influence on transfer of training. In addition, the job attitude teacher efficacy, or the belief that learning and applying new technology skills would produce positive outcomes for students, positively influenced transfer of training efforts. The results of the study shed light on specific aspects of the transfer of training phenomenon that will help HRD practitioners become more proficient at orchestrating and influencing the transfer process.

Motivation to Transfer. Motivation to transfer explained 9% of the variance in transfer of training in this study. Motivation to transfer was framed as a combination of perceived applicability and usefulness of new technology skills, as well as the level of challenge associated with application, the anticipated support for applying new skills, and the intention to achieve the transfer goal. The applicability and usefulness of technology knowledge and skills appeared to be a deciding factor in the study as those who did not meet their transfer goals clearly stated that there was no applicability of technology skills to their specific jobs. For HRD professionals, the implication of these results highlight the importance of working with learners to develop a level of understanding of new technologies that can lead to the perception of applicability to their specific job. Assuming applicability, even for the most obvious skills, may not be enough; HRD professionals must assess learner perceptions of applicability and may need to develop interventions for those learners who have not made the connection.

Transfer Climate. In this study, perceptions of the availability and usefulness of social support explained 15% of the variance in transfer of training. Interestingly, there was no difference between the group of teachers who reached their transfer goals and those who did not in terms of the perceptions of the school climate for supporting change. All the teachers saw the school climate as ready for and supportive of change. The resources and supports that were offered through the transfer management program were equally available to all teachers and all were encouraged to participate in the formal and informal activities; however, teachers who met their transfer goals *perceived* social support to be more available and more useful. The results of this study mirror the results of Shore and Wayne (1993) that demonstrated that perceived organizational support predicted organizational citizenship behavior. Many employees consider transfer of training to be organizational citizenship behavior (i.e., 'extrarole behavior that is generally not considered a required duty of the job, p. 775). Further research may confirm the relationship between the propensity to perceive supportiveness and the willingness to engage in activities that are seen as voluntary yet beneficial to job performance.

Job Attitudes. While teacher efficacy, which explained 14% of the variance in transfer of training outcomes, is a construct specific to school settings, it is grounded in the concept that individuals have beliefs that learning and applying new skills will result in positive outcomes at a strategic level. Further, positive teacher efficacy implies that the individual feels that their efforts will not be thwarted or minimized by environmental barriers. Based on the results of this study, we propose that individuals are more likely to sustain an effort to transfer training if they feel their efforts will result in valued outcomes.

Transfer Design. The value of transfer design for facilitating a high rate of transfer is quite clear from the results of the study. Much like the findings of Olivero, Bane, and Kopelman (1997), we found that an extensive effort to provide opportunities for practice and feedback following participation in the initial training program was successful in producing changes in individual teacher performance among a large percentage of the participants. While the effort was extensive, the payoff was high. HRD specialists who seek to increase training effectiveness may find, based on these results, that there is no easy road to transfer. Design and implementation of transfer management interventions that are customized to the culture, the content, and the learners may be one of the most critical skills sets for HRD practitioners who are challenged to improve employee performance through learning.

How This Research Contributes to New Knowledge in HRD

This research contributes to a growing body of research that emphasizes the importance of the context within which application of new knowledge, skills, and attitudes take place, the workplace environment. Not only does this research confirm a segment of Holton's (1996) model for evaluating HRD efforts, it offers an example of a comprehensive transfer management intervention

that worked to promote a high rate of transfer of technology training among the staff of an entire organization, a middle school. HRD practitioners who struggle with the transfer problem can glean ideas from the features of the transfer management intervention that they can test in their own arenas. Further, HRD practitioners may be inspired to develop and customize comprehensive transfer designs to improve the outcomes of their practice.

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Learning Strategies: A Key to Training Effectiveness

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Learning strategies allow trainers to quickly identify the individual differences of learners. This study measured the learning strategies of 456 adults; 45 were interviewed concerning how they apply their learning strategies and how instructor actions are either conducive or detrimental to their learning. The findings revealed a connection between the image of the organization and the type of learners attracted to it and described learning characteristics that can be utilized by trainers to improve learning.

Keywords: Adult Learning, Learning Strategies, Individual Differences

Adult Learning

Because of the demands of the Information Age, many organizations are becoming learning organizations. The useful and immediate application of new knowledge demands well-trained employees and necessitates an effective training program. Training is so important and vital to an organization's development that it must be effective and resources must be maximized. However, the teaching-learning process for this is complicated. More is involved in training than the transfer of knowledge at the cognitive level. Because of the diversity of individual learners, the needs of each learner should be incorporated into the training activities.

Malcolm Knowles revolutionized both the study of adult learning and the process of teaching adults with the advancement of the concept of andragogy. Andragogy was originally defined as the "art and science of helping adults learn" but can be better envisioned as a set of assumptions about learners" (Knowles, 1980, p. 43). These assumptions are the bases of a learner-centered approach to the teaching-learning transaction. This contrasts to the teacher-centered approach that assumes the learner to be dependent, to bring limited experience to the teaching-learning transaction, and to seek primarily subject-centered educational experiences. In the teacher-centered approach, learning readiness is based on chronological maturation and not on either the social roles or the developmental tasks the learner is experiencing (pp. 43-44).

Andragogy provides a learner-centered approach for the instruction of adult learners. Andragogy is based on the following set of assumptions about the learner: (a) the adult learner's experience is acknowledged and utilized as a rich valuable resource for learning, (b) the adult learner moves from dependency toward self-direction, (c) the adult's readiness to learn relates to both developmental tasks and to an individual's social roles, (d) the adult learner is motivated by internal factors such as self-esteem and achievement, and (e) adults maintain a problem-centered focus which lends itself toward a need for immediacy of application of new learning (Knowles, 1980, pp. 43-45).

Meaningful adult learning experiences have the potential to transform the lives of the learners. Transformation theory attempts to analyze and explain the process through which adults make meaning of their experience. Adults delineate or understand their experience by interpreting information through several filters including the educational, religious, and socialization processes. Prior learning from each of these avenues tends to constrict, distort, and limit the adult learner's acting, believing, learning, perceiving, and thinking. "It is not so much what happens to people but how they interpret and explain what happens to them that determines their actions, their hopes, their contentment, and emotional well-being and their performance" (Mezirow, 1991, p. xiii).

Adult learning can be viewed as an interpretation of information utilizing one's existing set of expectations through which meaning and ultimately one's life are constructed. "In transformative learning, however, we reinterpret an old experience (or a new one) from a new set of expectations, thus giving a new meaning and perspective to the old experience" (Mezirow, 1991, p. 11). Through this process, an individual can release oneself from flawed and inadequate

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reasoning to embrace a more comprehensive and flexible understanding of oneself and the world.

Adults choose to learn for a variety of emotional, personal, professional, and social reasons. "It may be that the circumstances prompting this learning are external to the learner (job loss, divorce, bereavement), but the decision to learn is the learner's" (Brookfield, 1986, pp. 9-10). This position provides the adult learner with the power to either remain in a learning environment that enriches or to withdraw if the learning proves inadequate or unsatisfactory.

Learning Strategies

One way to implement adult learning principles is by addressing individual differences. Consequently, learning styles and strategies have been the subject of numerous research initiatives and much discourse in adult learning (Fellenz & Conti, 1993; Conti, Kolody, & Schneider, 1997; Kolb, 1984). There are few psychological processes that have been examined with as much vigor. Early investigation centered upon teaching and teaching style as well as learning style assessment and individual differences in learning. A major shift in focus was ushered in when Kidd (1973) announced that the field of Adult Education was moving from a teacher-centered focus to a learner-centered focus. Others began to adopt a similar stance in their research of this area (Brookfield, 1986; Conti & Fellenz, 1991a; Conti, Kolody, & Schneider, 1997) as researchers recognized that "one can learn how to learn more effectively and efficiently at any age" (Smith, 1982, p. 15). Kidd (1973) skillfully summarized this emerging trend which placed utmost importance upon the learner.

In all ages, of course wise men have recognized that learning is the active, not the passive, part of the process: the learner opens himself, he stretches himself, he reaches out, he incorporates new experience, he relates it to his previous experience, he reorganizes this experience, he expresses or unfolds what is latent within him. (p. 14)

A learner-centered approach emphasizes the learner as a critical, dynamic component of the learning process. Along with greater freedom, this role entails increased responsibility for one's own learning (Knowles, 1980, p. 48). Current exploration and inquiry have shifted to the realm of learning strategies and their relationship to the learner in a variety of settings (Conti, Kolody, & Schneider, 1997; Gallagher, 1998; Gehring, 1997; Kolody, 1997). "Today, educators and cognitive researchers are focusing on how information is learned as opposed to what is learned" (Lefton, 1994, p. 192).

Learning strategies are the methods and techniques an individual utilizes to learn or acquire knowledge. Learning strategies differ from learning style in that they are techniques rather than stable traits and they are selected for a specific task. Such strategies vary by individual and by learning objective. (Conti & Fellenz, 1991a, p. 64)

Utilization of learning strategies is contingent upon both the circumstances and the current learning situation. "Learning strategies are the techniques or skills that an individual elects to use in order to accomplish a learning task" (Fellenz & Conti, 1993, p. 3).

Adult learning tends to be pragmatic and problem-centered. Learning of this type is often referred to as "real-life learning". One of the major characteristics of adult learning is that it is often undertaken for immediate application in real-life situations. Such learning usually involves problem solving, reflection on experience, or planning for one of the numerous tasks or challenges of adult life. Thus the phrase "real-life learning" has been used to distinguish typical adult learning from the academic learning of formal situations that is usually spoken of as studying or educating. (Fellenz & Conti, 1993, p. 4)

Real-life learning in the field of Adult Education has been conceptualized as consisting of the five areas of metacognition, metamotivation, memory, critical thinking, and resource management (Fellenz & Conti, 1993).

Studies based on this conceptualization of learning strategies have delineated three groups of learners with distinct learning strategy preferences (Conti & Kolody, 1999). Through cluster analysis, three categories of learners have been discovered and labeled as Navigators, Problem Solvers, and Engagers. "Navigators are focused learners who chart a course for learning and follow it" (p. 9). Planning and a strong sense of purpose personify both this group of learners and their utilization of learning strategies. Problem Solvers utilize critical thinking skills. Problem Solvers tend to both generate alternatives and test assumptions as a part of their primary learning strategy (p. 12). "The Engagers are passionate learners who love to learn, learn with feeling, and learn best when they are actively engaged in a meaningful manner with the learning task" (p. 13). Engagers enjoy the learning process and derive personal satisfaction from interaction with others.

Methodology

The purpose of this study was to describe the learning strategies of adults at a community college. Although community colleges have a different mission than organizations in business and industry, adult learners at community colleges in many ways are representative of those found in the world of work. Because community colleges are the primary access points for a multitude of diverse students

into post-secondary learning situations, those in the business community can gain insights about adult learners by examining those at community colleges. This study, which was conducted in the community college setting, sought to answer the following research questions: (a) what are the identified learning strategy preferences for adult learners at the community college, (b) how do learners in each of the learning strategy groups describe their learning process, and (c) what instructor actions are conducive to learning and what actions by the instructor are detrimental to learning.

This was a descriptive study that involved 456 students at Tulsa Community College's Southeast Campus. A stratified, cluster sample of students was used in which at least 100 students were selected from introductory courses in the four academic divisions of Business Services, Communications, Liberal Arts, and Science and Mathematics. All 456 participants completed the Assessing The Learning Strategies of AdultS (ATLAS) and a demographic survey. ATLAS is a valid and reliable instrument that identifies learning strategy preferences and places a person in the category of either a Navigator, Problem Solver, or Engager (Conti & Kolody, 1999). A total of 45 students were interviewed for a more in-depth exploration of issues related to learning strategy usage and to how instructors contribute to learning for each group of learners.

Both quantitative and qualitative data were collected. Quantitative data were collected using the ATLAS learning strategies instrument, a survey form, and college records. ATLAS can be completed in approximately 2 minutes and produced the categorical data of each person's learning strategy preference group. The demographic survey elicited information about each person's background and gathered each participant's Social Security Number. This number was used at the end of the semester to solicit the person's exact grade point average from the official school records. Nearly two-thirds (63%) of the 456 participants on whom qualitative data were collected were females, and slightly over one-third (37%) were males. The group ranged in age from 17 to 57 with an average age of 23.3. Chi square was used to compare the observed frequency of the learning strategy responses for this group to the expected learning strategy norms on ATLAS.

Qualitative data were gathered from 45 interviews with 15 adults in each of the three learning strategy groups of Navigators, Problem Solvers, and Engagers. The interviews were between 25 and 45 minutes in length and explored factors related to the student's learning process, barriers in this process, and the instructor's influence in this process. The gender and age distribution of those interviewed mirrored that of the general sample. The interviews were recorded and then analyzed to discern emerging themes.

Findings

One of the most striking findings of this study is in the area of learning strategy preferences. In contrast to the expected distribution in the general population, Engagers were over-represented with 54.2% of the population ($\chi^2=105$, $df=2$, $p=.001$). Both the Navigators with 23.9% and Problem Solvers with 21.9% were underrepresented. The anticipated distribution based on the norms for ATLAS was 31.8% for Engagers, 36.5% for Navigators, and 31.7% for Problem Solvers (Conti & Kolody, 1999, p. 18).

Each learning strategy group described their approach to learning. Navigators revealed that they rely upon (a) planning and organization, (b) internal and external organizers, (c) grades and feedback, (d) working alone rather than in groups, and (e) monitoring. Navigators can become so preoccupied with academic success and achievement that they become hypercritical of themselves.

I like to compile information and set it up and work from that to see whatever goal I need to reach. I try to follow the plan as much as possible. (48-year-old African American female)

I am concerned with material that fits into meaningful patterns. I section it out and make outlines and do lists. All of the description [of a Navigator in the ATLAS booklet] matches me to a "T". (21-year-old Caucasian female)

I am very hard on myself. I am never happy with myself or within myself. I am a perfectionist at times. (27-year-old African American female)

I try to be and do what I can do to the best my abilities. Sometimes I go beyond that and do more than I should have to especially in school. My husband says you're only one person. (28-year-old Caucasian female)

Problem Solvers employ (a) a trial and error process, (b) visualization, (c) practical experimentation, and (d) questioning as their primary approach to learning. Problem Solvers utilize questioning not only for their own benefit but also to promote greater understanding for others in the class as well.

It is easier to understand if I can visualize it. If I can see myself doing it then I can pretty much obtain it. If I cannot remotely imagine it or trying it, then I have no success being there. (24-year-old American Indian female)

I like finding ways around to get what you are trying to get to—finding other routes to get to it. (25-year-old Caucasian male)

When I try to solve a problem, there is an easier way. There are many tactics to use in solving a problem besides one way. Then I come up with how I will do it. Don't set your mind on one spot—use thinking abilities in other areas. Go beyond that and beyond what I'm in now. (54-year-old African American female)

I question a lot, on everything. I feel like I'm the over-questioner to other people afraid to raise their hand and ask a question. If you're thinking it, other people are too, but maybe they are afraid or shy and won't ask. (31-year-old American Indian female)

Engagers tend to take on the attitude the instructor possesses toward learning. If the instructor is passionate about learning, then Engagers will be also. Conversely, if the instructor is disinterested and impersonal, then Engagers will disengage from the learning as well.

I won't engage if I'm not interested. If I have to do it, I will go through the motions. But once I get started getting into it, it becomes interesting because it is something I don't know. (39-year-old Caucasian female)

I focus on learning not evaluation. Everything I do I give it my all and expect to come out on top. If I'm not learning and I'm not interested, I'm not going to learn. I have to be interested. It has to appeal to me. (41-year-old Hispanic female)

Instructors' actions greatly influence the learning process for the groups of learners (Knowles, 1980). Therefore, each learning strategy group also described the instructor's actions that were perceived to facilitate learning. Navigators indicated that they preferred instructors who (a) were approachable and willing to provide feedback, (b) maintained standards that were challenging but not rigid, and (c) provided clear expectations.

The perfect teacher is one who shows interest in students and cares if students make it through the class. One who is willing to give one-on-one attention and shows he cares and is there if you have questions. They explain things in detail so you can understand. (27-year-old African American female)

I want to know what is expected of me. It bothers me if the instructor is not real specific. If nobody tells me what is required, then I don't know. (38-year-old Caucasian female)

Problem Solvers desired instructors who (a) allowed them to question and discuss learning in an open forum, (b) utilized a step-by-step process in teaching (c) were thorough, (d) provided a hands-on environment, and (e) promoted the learning of all students in the classroom.

Class is best if it is an open forum to really interact with instructors and classmates and debate the topic or subject. I like open-ended questions that give you leeway to answer the way you want and instructors who give personal examples. (23-year-old Caucasian male)

I like instructors who had an open forum for talking so everybody understands. They make sure everybody is on the same page. (18-year-old African American male)

Engagers wanted instructors who (a) place learning above evaluation, (b) develop a personal relationship with them, (c) make learning fun, and (d) are passionate about learning themselves.

It matters a lot. If they don't care and don't have a passion, I don't learn or do as well. If it is not important to him then it's not going to be important to me. (43-year-old Caucasian male)

If I'm not learning anything, it is a waste of time. They make it interesting and make the learning fun. We played jeopardy-like games in anatomy class. We knew the answers to the questions, but we had fun. (39-year-old Caucasian female)

Instructor's actions can also hinder the learning process for the groups of learners. Certain instructor actions can be viewed as detracting from the learning process. Each group described instructor actions that they perceived as distracting from the learning process. Navigators dislike it when instructors (a) do not answer questions, (b) do not provide feedback, and (c) do not explain assignments. Problem Solvers dislike it when instructors (a) do not allow or promote questioning and (b) do not respect students. Engagers dislike it when instructors were (a) dispassionate about teaching their subject area and (b) unwilling to develop a personal relationship with students.

Each learning strategy group utilized different initial actions for learning projects not related to academic endeavors. Navigators referred to (a) deadlines, (b) examples, and (c) the opinions of experts. Problem Solvers referred to (a) having an idea of the broad objectives before they begin, (b) considering the alternative methods of reaching the final goal before making a decision on how to proceed, and (c) visualizing the end results before beginning. Engagers stated that they desire (a) a belief that the learning will be valuable, (b) a need for the learning they are going to undertake, (c) confidence in their ability to accomplish the project, and (d) the possibility for enjoyment in the process before initiating a learning project.

The concept of learning strategies is a developing area that offers those working with adults such as those in training roles in business and industry with ways to address individual differences. This study contributes to the development of descriptions of each of the learning strategy groups and further expands them. For example, Engagers and Problem Solvers see learning as a community activity where cooperation is promoted instead of competition. Engagers exemplify this characteristic primarily through their strong desire to collaborate and work in groups (Conti & Kolody, 1999, p. 14). Problem Solvers in this study were individuals who envision learning as a group endeavor where everyone is responsible for assisting classmates that may not understand the material. Problem Solvers clarify concepts through the utilization of questioning as a technique to allow fellow students to benefit from this process. The notion of teamwork is central to both Problem Solvers and Engagers.

Navigators do not like group work and instead see learning as a collaborative effort between themselves and their instructor. Navigators need external verification or recognition such as grades or a test to validate their learning. They want standards and then want to compete against those standards.

I don't settle for second best. If I'm going to do something, I do it all the way. If I do it, I do it right. If not, it is a waste of my time. (21-year-old Caucasian female)

Navigators are engrossed by the desire for achievement, and as a result they are always aiming higher and adopting increasingly rigorous standards of performance for themselves. This strong need for perfection may reduce their satisfaction with accomplishments.

The instructor's attitude is critical to the teaching-learning transaction for all three groups of learners. Instructors need to attend to both the affective and cognitive domains to address the needs of all learners. For example, Engagers' performance in teaching-learning situations is contingent upon the establishment of a personal relationship with the trainer. This relationship is the foundation of the learning process for Engagers. They are actively "engaged" in the learning as long as the instructor remains involved and is interested in the subject area. However, Engagers will disengage from learning if the instructor appears to be disinterested in the subject matter or is perceived to be teaching just to earn a living. Instructors that are willing to inspire students may help provide a key component in retaining them in learning situations (Boyer, 1990). One Engager stated his feelings concerning instructors' attitudes as follows:

If the teacher doesn't care, then I'm not getting my money's worth. I'm not getting their full potential if they don't care. If they care, you can tell you are getting their all and everything they know. You are getting the same knowledge. If they don't care, it is pretty much a waste of time. (30-year-old African American male)

The importance of the instructor's attitude is not only essential to Engagers but is also important to both Navigators and Problem Solvers. Navigators desire attention and respect from the instructor. Navigators want the instructor to be available to them in order to obtain feedback concerning their performance. Problem Solvers want both a more collaborative learning process and respect from the instructor. Problem Solvers also seek a learning environment where their questions and input are both heard and regarded as significant. Additionally, Problem Solvers prefer relationships with the instructor in which they are considered as true partners in the educational process. Clearly, instructor attitudes are essential to all three groups of learners although each is exemplified in distinct ways.

Discussion

The axiom "knowledge is power" has been stated numerous times related to a multitude of situations. Utilizing this statement in reference to gaining information pertaining to one's learning strategy preference is no exception. This is especially applicable in a society where "there is no one education, no one skill, that lasts a lifetime now" (Naisbitt & Aburdene, 1985, p. 141). There is little question that:

It pays to develop awareness and understanding of self as a learner. One can gain valuable insight into personal blocks to learning, to personal strengths and weaknesses, as well as personal preferences for the methods of learning and for learning environments. (Smith, 1982, pp. 21-22)

Awareness is a central component of learning how to learn. This characteristic is vital because "if you know how to learn, you can adapt and change no matter what technological, social, or economic permutations occur" (Naisbitt & Aburdene, 1985, p. 133).

Providing employees with an awareness of their own learning strategy preference may encourage them to further consider their current strategy utilization. This new awareness could also provide an impetus to further investigate additional methods that could be more effective in improving performance. "Learning strategies provide each student with the potential to adjust in an appropriate way for each learning situation" (Conti & Fellenz, 1991b, p. 20). The ability to expand one's repertoire of available strategies can lead to improvements in both learning and performance.

Learning occurs both in the affective and cognitive domains. Bloom and his associates identified three domains of learning as the (a) cognitive domain which deals with the recall or recognition of knowledge and the development of intellectual abilities and skills, (b) the affective domains which describes values and attitudes and the development of appreciations, and (c) the psychomotor domain which deals with physical activities (Bloom et al., 1956, p. 7). For Engagers, "the affective domain is the dominant factor in learning" (Conti & Kolody, 1999, p. 14). They "consider work as an extension of themselves and are motivated by feelings of satisfaction or pride" (p. 15). However, oftentimes instructors focus only on the content of the learning situation. Such an approach can cause Engagers to feel alienated. By addressing both the affective and cognitive domain learning needs in a training situation, trainers can help provide Engagers with increased self-awareness concerning their feelings and thoughts in certain learning situations. Engagers may feel guilty about not being interested in a specific learning situation and may not realize that their learning strategy preference is making them uncomfortable in particular learning environments. Trainer recognition of both the affective and cognitive learning needs could not only help Engagers realize that there is nothing wrong with them, but it may also provide answers as to why they are uncomfortable in certain situations. By recognizing this aspect of their learning, Engagers can begin to better understand their own behaviors in learning situations. However, Engagers need trainers to attend to both the affective and cognitive components of learning in order to maximize the process.

Knowledge of the principles of adult learning can be effective in establishing a supportive environment that will enhance student learning for all students (Knowles, 1980), and this is particularly so for Engagers. Training in the administration, utilization, and intent of learning strategies could allow trainers the opportunity to incorporate instructional techniques that foster individual differences. It could also provide them with an array of alternative teaching techniques that are specifically designed to meet the needs of each learning strategy group. ATLAS is an easy to administer instrument that trainers could use for this purpose.

Adult learning principles encourage cooperative learning environments, and teamwork is becoming a fundamental requirement in the world of work. A knowledge of the learning strategy preferences of each of the three groups of learners can facilitate this group effort. This is especially important for Navigators because cooperative learning procedures do not support their natural learning strategy preference. In order for this learning to occur, Navigators will need to embrace strategies that incorporate these aspects into their learning process. Knowledge and awareness of alternative learning strategies can provide Navigators as well as all learners with the ability to interact more effectively with others in learning situations. In addition to preferring personally competitive learning situations, Navigators have such a strong desire to seek perfection on learning tasks that in order to help them become more balanced as learners they may need to incorporate the learning strategy of conditional acceptance. Conditional acceptance is the ability of critical thinkers to work at a problem long enough that they become satisfied with the product and move on to new learning (Conti & Kolody, 1999, p. 8). Likewise, a knowledge of such factors as how Problem Solvers use questioning and how important the attitude of the leader is to Engagers can affect how the group works together on learning projects.

The cooperative learning needed in a learning organization can be facilitated by Problem Solvers. Previous studies have shown that Problem Solvers have a tendency to generate a wide range of alternatives related to the learning task and to seek further exploration of topics. This study discovered that one way that they do this in a group setting is through asking questions of the trainer. They ask not only about that in which they are interested but also about that in which they think others in the group are interested. If the trainer and the other learners in the group are aware of this trait, these questions can serve as a continuous formative evaluation of the group's understanding of the content. However, for this to be effective for the group and especially for the Problem Solvers, trainers must reassess the tendency in many training sessions to rigorously lay out a training schedule and to consider only those things explicitly defined in the specified learning objectives as valid learning.

Recent studies have indicated that learners tend to be attracted to learning environments that project an image that is compatible with their learning strategy preference. This study (Willyard, 2000) and a study by James (2000) found that Engagers are overrepresented at the community college and in Adult Basic Education classes. Spencer (2000) and Conti and Ghost Bear (2001) have discovered that Problem Solvers are overrepresented in studies related to learning on the Internet. Even though the learners are not consciously aware of the label or exact description of their learning strategy preferences, Engagers are attracted to the inclusive, learner-centered atmosphere that the community college provides and that matches their learning strategy preference. This could be because community colleges both offer personal environments that are responsive to learners' needs and place the teaching mission above all else (O'Banion, 1999). If this is true for other organizations as it appears to be emerging from the research, then organizations should be keenly aware of the image that they project because this image is sending subtle messages to learners who may potentially be entering the organization. This is especially so for organizations that seek to be learning organizations.

Clearly, learners can no longer be treated as a monolithic group in learning situations. The concept of learning strategies presents a way to quickly identify individual differences among the learners. The typology of Navigators, Problem Solvers, and Engagers identified by ATLAS can be useful for initially identifying groups of learners in the training setting. "Such labels can be beneficial to the selection of appropriate methods and techniques when they are used to focus understanding, discussion, and reflective thought about the learner; however, they can be detrimental if they are used to avoid critical thinking about the learners" (Conti & Kolody, 1998, p. 137). Thus, a knowledge of learning strategy preferences offers the trainer a tool for quickly addressing the needs of each learner and for understanding ways to make learning more efficient for each learner. Equipped with such a tool and such knowledge, the trainer can be in a position to increase the effectiveness of everyone in the organization.

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An Examination of Learning Transfer System Characteristics Across Organizational Settings

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No previous research has compared and contrasted learning transfer systems across organizations and training types, primarily because no standard instruments were used in previous research. This study, based on a subset of responses in the LTSI response database, is the first to conduct such a comparison. Using a sub-set of 1099 respondents, transfer systems are compared across three organization types, eight different organizations, and nine different types of training. MANOVA and univariate ANOVA were used to compare transfer systems. Implications for HRD practice and research are discussed.

Keywords: Transfer of Learning, Transfer Climate, Measuring Transfer of Learning

Transfer of learning has long been an important HRD research issue. Since Baldwin and Ford's (1988) review of the literature over a decade ago, considerable progress has been made in understanding factors affecting transfer. Much of the research has focused on *training design factors* that influence transfer (cf. Kraiger, Salas & Cannon-Bowers, 1995; Paas, 1992; Warr & Bunce, 1995). Another stream of research has focused on factors in the *organizational environment* that influence individuals' ability and opportunity to transfer (Rouillier & Goldstein, 1993; Tracey, Tannenbaum & Kavanaugh, 1995). Other researchers have focused on *individual differences* that affect the nature and level of transfer (Gist, Bavetta, Stevens, 1990; Gist, Stevens, Bavetta, 1991). Finally, recent work has focused on developing instruments to *measure transfer and its antecedent factors* in the workplace (Holton, Bates, Ruona, in press; Holton, Bates, Seyler, & Carvalho, 1997).

Unfortunately, the existing research is, for the most part, *not* action-oriented (Holton & Baldwin, in press). That is, most existing authors have stopped at the point of identifying, describing or measuring factors that may influence transfer without investigating how those factors might be effectively *changed or managed*. For example, of the 58 total studies included in the two most comprehensive reviews of the transfer literature (Baldwin and Ford, 1988; Ford & Weisbein, 1997), only those concerning training design dealt much with change or intervention. One notable exception have been studies examining the effectiveness of two post-training interventions (goal setting and relapse prevention training) with all of them finding enhanced transfer (Burke & Baldwin, 1999; Gist, Bavetta, Stevens, 1990; Gist, Stevens, Bavetta, 1991; Tziner, Haccoun, Kadish, 1991; Werner, O'Leary-Kelly, Baldwin & Wexley, 1994; Wexley & Baldwin, 1986).

Furthermore, as Holton (2000) noted, research has not established whether there is an optimal norm level for components of an organization's learning transfer system. Theory often seems to suggest that the most potent learning transfer systems are those with high levels on all factors. However, cultural variations across organizations suggest that not all organizations will or should build the same types of transfer systems. Case evidence supports this. For example, one organization in which the authors have worked had a very strong team culture that made peer support a more powerful predictor of learning transfer than supervisor support. In a state government agency, the exact opposite was true.

Such case evidence suggests that a different conception is needed. First, it is possible that a total overall level of transfer system factors is needed--not an absolute level on any one of them. That is, transfer system factors may operate together as a constellation to influence transfer. Some elements might be interchangeable or compensate for missing elements. For example, strong reward systems might compensate for poor peer support or transfer design. Alternatively, a fit perspective might be more appropriate whereby certain cultures will require certain elements of a transfer system to be stronger than in other cultures. This perspective would explain why supervisor support is essential in a bureaucratic structure (i.e., government agency), but peer support is less salient. Thus, there would be an optimal level for a given organization with a specific culture.

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Holton (2000) goes on to suggest that it is best to search for *leverage points* for change. It seems likely that the particular factors in an organization's transfer system that are optimal for intervention will vary widely. The leverage point is likely to be a function of the absolute level of a particular factor and its salience in a particular organization's culture. Most organizations would like to see a simple decision rule such as "if supervisor support is less than 3.0, an intervention is needed." This is too simplistic. A value of 2.5 on the supervisor support scale in the government agency might be a critical leverage point, but the same 2.5 found in a team-based organization might not be a leverage point because the supervisor is less important.

Unfortunately, there has been no research investigating the most basic question of how learning transfer systems differ across organizational settings. Previous research has focused mostly on explanation of transfer processes within a specific organization. Before the question of optimal norm levels of transfer factors can be considered, basic questions about differences across organizational settings have to be explored. Identifying differences in transfer systems provides a better understanding of 1) what current transfer systems are like, 2) if current transfer systems are robust in organizations, and 3) what potential transfer factors jeopardize transfer of learning. Understanding transfer system differences across different situations would help organizations become aware of what parts of a transfer system need improvement to enhance transfer of learning. This study empirically examines the differences in transfer systems across eight organizations, three organizational types, and nine training types. It addresses the following research questions:

- 1 - Are there significant differences in transfer system characteristics between organizational types (profit, non-profit and public sector)?
- 2 - Are there significant differences in transfer system characteristics between specific organizations?
- 3 - Are there significant differences in transfer system characteristics between different training types?

Method

Measures. The Learning Transfer System Inventory (LTSI) was developed by Holton and Bates (Holton, Bates & Ruona, in press). The constructs of the LTSI were established based on a conceptual model (Holton, 1996) and previous research (Holton, Bates, Seyler & Carvalho, 1997a, 1997b) validated by factor analysis. It is one of the most robust transfer system assessment instruments developed. A convergent and divergent validity study showed that most of the constructs had only low correlations with other related variables (Bookter, 1999) further reinforcing the uniqueness of the transfer system constructs. Some scales have also shown initial evidence of criterion validity in predicting motivation to transfer, learner perceptions of the training utility, and operating procedure use on the job (Bates, Holton, & Seyler, 2000; Ruona, Holton, Bates, & Leimbach, 1999; Seyler, et al. 1998)

The 16 LTSI constructs provide a comprehensive assessment of factors that influence transfer including program-specific transfer factors and general transfer factors. It is comprised of 68 items grouped into 16 constructs (see Table 1). The 16 constructs were categorized into four major groups: trainee characteristics, motivation, work environment, and ability (Noe & Schmitt, 1986). Trainee characteristics include learner readiness and performance self-efficacy constructs, while the motivation scales include motivation to transfer learning, transfer effort-performance expectations, and performance-outcome expectations. The work environment scales include feedback/performance coaching, supervisor/manager support, supervisor/manager sanctions, peer support, resistance/openness to change, positive personal outcomes, and negative personal outcomes. Opportunity to use learning, personal capacity for transfer, perceived content validity, and transfer design comprise the factors of the ability scales. All of the items use a 5-point Likert type scales from (1) strongly disagree to (5) strongly agree.

Table 1. LTSI Scale Definitions and Sample Items

FACTOR	DEFINITION	SAMPLE ITEM	NUM ITEMS	α
TRAINING SPECIFIC SCALES				
Learner Readiness	Extent to which individuals are prepared to enter and participate in training	Before the training I had a good understanding of how it would fit my job-related development.	4	.73
Motivation to Transfer	Direction, intensity, and persistence of effort toward utilizing in a work setting skills and knowledge learned.	I get excited when I think about trying to use my new learning on my job.	4	.83
Positive Personal Outcomes	Degree to which applying training on the job leads to outcomes that are positive for the individual.	Employees in this organization receive various 'perks' when they utilize newly learned skills on the job.	3	.69
Negative Personal Outcomes	Extent to which individuals believe that <u>not</u> applying skills and knowledge learned in training will lead to negative personal outcomes.	If I do not utilize my training I will be cautioned about it.	4	.76

Personal Capacity for 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.	My workload allows me time to try the new things I have learned.	4	.68
Peer Support	Extent to which peers reinforce and support use of learning on the job.	My colleagues encourage me to use the skills I have learned in training.	4	.83
Supervisor Support	Extent to which supervisors/managers support and reinforce use of training on the job.	My supervisor sets goals for me which encourage me to apply my training on the job.	6	.91
Supervisor Sanctions	Extent to which individuals perceive negative responses from supervisors/managers when applying skills learned in training.	My supervisor opposes the use of the techniques I learned in training.	3	.63
Perceived Content Validity	Extent to which trainees judge training content to accurately reflect job requirements.	What is taught in training closely matches my job requirements.	5	.84
Transfer Design	Degree to which 1) training has been designed and delivered to give trainees the ability to transfer learning to the job, and 2) training instructions match job requirements.	The activities and exercises the trainers used helped me know how to apply my learning on the job.	4	.85
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.	The resources I need to use what I learned will be available to me after training.	4	.70
GENERAL SCALES				
Transfer Effort-Performance Expectations	Expectation that effort devoted to transferring learning will lead to changes in job performance.	My job performance improves when I use new things that I have learned.	4	.81
Performance-Outcomes Expectations	Expectation that changes in job performance will lead to valued outcomes.	When I do things to improve my performance, good things happen to me.	5	.83
Resistance/Openness to Change	Extent to which prevailing group norms are perceived by individuals to resist or discourage the use of skills and knowledge acquired in training.	People in my group are open to changing the way they do things.	6	.85
Performance Self-Efficacy	An individual's general belief that they are able to change their performance when they want to.	I am confident in my ability to use newly learned skills on the job.	4	.76
Performance Coaching	Formal and informal indicators from an organization about an individual's job performance.	After training, I get feedback from people about how well I am applying what I learned.	4	.70

Sample. This study is part of an ongoing data collection effort to validate and improve the LTSI (Holton, Bates, & Ruona, in press). The sample for this analysis was selected from the LTSI response database which currently includes 4562 responses from 15 different organizations in three different countries. When using analysis of variance to examine between group differences, it is important that cell sizes be approximately equal or at least of similar magnitude (Tabachnick & Fidell, 1996). Therefore, only a subset of available responses was used in this exploratory study. Organizations were not selected from the available data if the sample size of these organizations was more than 300 or less than 40. Only U.S. organizations were selected because cross cultural validation on the LTSI has not been completed.

The final selected sample consisted of 1099 individuals employed by eight different U. S. organizations comprised of four private sector (three manufacturing and one services firm), three public sector agencies (one federal and two state government), and one non-profit organization (only one was available in the dataset). For research question three, the training was categorized into nine different types of training including supervisory, public management, technical/computer, soft skills (e.g interpersonal, coaching, and conflict management training), new employee academy, business professional, competency, leadership, and sales training programs. Training type information was only available for 617 of the 1099 respondents in this sample. The decision to select this sample for research question three resulted from the consideration of equal groups and various training types. Training types with more than 200 or less than 35 respondents were not selected in the sample of research question three.

Data Analysis. Multivariate analysis of variance (MANOVA) was used to answer all three research questions because the research questions involved multiple dependent variables (Tabachnick & Fidell 1996; Hair et al. 1998). The sixteen constructs of the LTSI were used as the dependent variables. According to Tabachnick & Fidell (1996), when research questions involve multiple dependent variables, if each dependent variable is tested individually severe inflation of Type I error. In MANOVA, correlated dependent variables are considered simultaneously, eliminating the experimentwise error rate problem.

Post hoc comparisons with univariate analysis of variance was then used to explore the findings in more detail. A Bonferroni adjustment was used because it is most appropriate for multiple analyses when overall Type I error is taken into account (Keselman, et al., 1998). Prior to these analyses, the data were examined for adherence to MANOVA assumptions and outliers were also investigated. No significant violations of assumptions or influential outliers were discovered.

Results

Research Question 1. Research question 1 asked if significant differences existed in transfer systems across organizational types. Organizations were categorized into three types: public, private, and non-profit organizations (see Table 2). Public, private, and non-profit organizations included 475 (43.2%), 432 (39.3%), and 192 (17.5%) respondents, respectively. The ratio of the largest group to smallest group was 2.52.

MANOVA analysis showed statistically significant differences (Wilks' lambda = .718, $F = 11.632$) on all criteria indicating that transfer system characteristics differed across organizational types. Univariate ANOVA tests showed that all of the scales were significantly different across organizational types, with the exception of two scales, learner readiness and performance self-efficacy (see Table 2 below).

Post hoc comparisons were then examined for differences among pairs of organizational types. When comparing public and private organizations, only six out of twenty-six paired comparisons showed significant differences. The results showed that performance-outcomes expectations ($M=3.40$ vs. 3.15), opportunity to use

Table 2 - Univariate Comparisons By Organizational Types

Training Specific	Organizational Type Means				F	P
	Overall	Public	Private	Non-profit		
Learner Readiness	3.17	3.13	3.16	3.28	2.39	0.092
Motivation to Transfer Learning	3.9	3.9	3.9	4.1	11.4	<.00
Personal Outcomes-Positive	2.4	2.3	2.3	2.9	44.5	<.00
Personal Outcomes-Negative	2.4	2.6	2.2	2.7	49.6	<.00
Personal Capacity for Transfer	3.2	3.1	3.2	3.1	4.3	0.01
Peer Support	3.4	3.4	3.3	3.5	8.4	<.00
Supervisor Support	3.0	2.9	2.8	3.4	25.0	<.00
Supervisory Sanctions	2.5	2.7	2.3	2.3	41.1	<.00
Perceived Content Validity	3.4	3.5	3.4	3.6	5.8	0.00
Transfer Design	3.9	3.9	3.9	4.1	10.8	<.00
Opportunity to Use Learning	3.5	3.4	3.6	3.5	9.3	<.00
Training in General						
Transfer Effort-Performance Expectations	3.96	3.93	3.95	4.08	5.49	0.004
Performance-Outcomes Expectations	3.3	3.1	3.4	3.5	21.4	<.00
Resistance/Openness to Change	2.6	2.8	2.5	2.5	14.9	<.00
Performance Self-Efficacy	3.7	3.7	3.7	3.8	1.6	0.20
Feedback/Performance Coaching	3.0	3.0	3.0	3.2	6.0	0.00

learning ($M=3.68$ vs. 3.49), and personal capacity for transfer ($M=3.28$ vs. 3.15) scales in private organizations were significantly higher than those in public organizations. However, the supervisor sanctions ($M=2.75$ vs. 2.31), resistance to change ($M=2.83$ vs. 2.59), and personal outcomes negative ($M=2.62$ vs. 2.21) scales in public organizations were significantly higher than those in private organizations.

Using the four major categories of transfer systems discussed earlier, no significant differences were found on trainee characteristics scales in any paired comparisons. On the motivation scales, two out of three scales, the motivation to transfer learning and transfer effort, revealed that the non-profit organization was significantly different from public and private organizations. For the motivation to transfer scale, the non-profit organization was significantly higher than public and private organizations ($M=4.18$ vs. 3.94 and 3.92 , respectively) while on the transfer effort-performance scale, the non-profit organization was significantly greater than the public and private organizations ($M=4.08$ vs. 3.93 and 3.95 , respectively). This may imply that employees in non-profit organizations are more motivated to transfer their learned skills to the job as well as expect that their transfer effort will lead to changes in job performance than employees in public and private organizations.

Within the seven environment scales, the results showed that the non-profit organization was significantly higher than public and private organizations on four environment-associated scales including performance coaching ($M=3.25$ vs. 3.04 and 3.05 , respectively), supervisor support ($M=3.40$ vs. 2.98 and 2.84 , respectively), peer support ($M=3.59$ vs. 3.40 and 3.34 , respectively), and personal positive outcomes ($M=2.95$ vs. 2.34 and 2.39 , respectively). The results also revealed that the supervisor sanctions ($M=2.75$ vs. 2.31 and 2.32 , respectively) and resistance to change ($M=2.83$ vs. 2.59 and 2.56 , respectively) scales in public organizations were significantly higher than private and non-profit organizations. On the ability scales, the results showed that employees in private organizations had significantly higher opportunity to use learning than employees in public and non-profit organizations ($M=3.68$ vs. 3.49 and 3.51 , respectively).

Overall, the results revealed that the employees in the non-profit organization had higher motivation to transfer learning than public and private organizations. Public organizations had significantly higher resistance to new learning, while private organizations had significantly greater opportunity to apply learning.

Research Question 2. Research question 2 sought to determine if significant differences existed in transfer systems across the specific organizations in the sample. Eight organizations were included in the analysis (Table 3).

Table 3. Sample Description for Research Question 2

	Organizations	
	Frequency	Percent
Organization 1 – state agency	175	15.9
Organization 2 – state agency	89	8.1
Organization 3 – federal agency	211	19.2
Organization 4 – manufacturer	118	10.7
Organization 5 – manufacturer	66	6.0
Organization 6 – insurance company	106	9.6
Organization 7 – manufacturer	142	12.9
Organization 8 – non-profit	192	17.5
Total	1099	100.00

The largest group contained 211 respondents and the smallest group included 66 respondents for a ratio of 3.20. MANOVA analysis revealed significant differences (Wilks' lambda = .341, $F = 10.787$) across organizations indicating that the transfer systems were significantly different across the selected organizations. In the between subject ANOVA, all of the transfer scales were significantly different across the selected organizations (see Table 4).

Table 4. Univariate Comparisons By Organizations

Training Specific	Organizations										F	P
	Overall	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8			
Learner Readiness	3.17	2.90	3.1	3.33	2.99	2.90	3.33	3.31	3.2	8.37	<.001	
Motivation to Transfer Learning	3.9	3.9	3.7	3.9	4.0	4.1	3.9	3.6	4.1	8.9	<.00	
Personal Outcomes-Positive	2.4	2.1	2.6	2.3	2.3	2.4	2.4	2.3	2.9	17.4	<.00	
Personal Outcomes-Negative	2.4	2.0	2.9	2.9	2.1	2.3	2.0	2.2	2.7	40.9	<.00	
Personal Capacity for Transfer	3.2	3.3	3.0	2.9	3.2	3.5	3.2	3.2	3.1	7.0	<.00	
Peer Support	3.4	3.4	3.2	3.4	3.3	3.4	3.3	3.3	3.5	3.9	<.00	
Supervisor Support	3.0	2.9	3.3	2.8	2.7	3.0	2.8	2.7	3.4	11.3	<.00	
Supervisory Sanctions	2.5	2.4	3.8	2.5	2.2	2.5	2.1	2.3	2.3	56.2	<.00	
Perceived Content Validity	3.4	3.4	3.4	3.6	3.3	3.5	3.3	3.3	3.6	4.0	<.00	
Transfer Design	3.9	3.9	3.5	4.0	4.0	4.0	4.0	3.8	4.1	10.4	<.00	
Opportunity to Use Learning	3.5	3.6	3.0	3.5	3.6	3.8	3.7	3.5	3.5	13.3	<.00	
Training in General												
Transfer Effort-Performance Expectations	3.96	4.09	3.7	3.88	3.97	4.12	3.94	3.85	4.0	7.17	<.001	
Performance-Outcomes Expectations	3.3	3.3	2.8	3.1	3.4	3.6	3.4	3.2	3.5	10.0	<.00	
Resistance/Openness to Change	2.6	2.7	3.0	2.7	2.6	2.6	2.4	2.6	2.5	7.2	<.00	
Performance Self-Efficacy	3.7	3.8	3.5	3.7	3.6	3.7	3.9	3.6	3.8	3.8	<.00	
Feedback/Performance Coaching	3.0	3.1	3.0	2.9	2.9	3.2	3.0	3.0	3.2	3.1	0.00	

The post hoc comparisons for research question 2 revealed that respondents in organization 2 rated supervisor sanctions significantly higher than any other organization in this study ($M=2.83$ vs. 2.43, 2.54, 2.28, 2.52, 2.16, 2.37, and 2.32, respectively). This implies that the supervisor sanction issue in that particular organization probably needed to be improved in order to enhance transfer of learning.

Organization 8 appeared to have a substantially different transfer system than other organizations. In organization 8, the performance coaching scale was significantly higher than organization 3 and 4 ($M=3.25$ vs. 2.96 and 2.96, respectively). The supervisor support scale was significantly higher than organizations 1, 3, 4, 6, and 7 ($M=3.40$ vs. 2.96, 2.84, 2.79, 2.88, and 2.74, respectively). The peer support scale of organization 8 was significantly higher than organizations 2, 6, and 7 ($M=3.59$, vs. 3.22, 3.30, and 3.30, respectively). The personal positive outcomes scale of this organization was significantly higher than organizations 1, 3, 4, 5, 6, and 7 ($M=2.95$ vs. 2.13, 2.39, 2.34, 2.46, 2.40, and 2.38, respectively), and the personal negative outcomes scale was significantly higher than organization 1, 4, 5, 6, and 7 ($M=2.75$ vs. 2.09, 2.15, 2.38, 2.05, and 2.29, respectively). In summary, five out of seven work environment associated scales in organization 8 were significantly higher than at least two other organizations. This may imply that the work environment in this organization was generally better than other organizations in this study. This result is also consistent with other researchers' suggestions that each organization has its own positive and negative transfer factors that may either promote or prohibit learning and transfer (Mathieu, Tannenbaum, and Salas, 1992; Holton, Bates, and Ruona, 2000).

Research Question 3. Research question 3 sought to determine if significant differences existed in transfer systems across training types. Nine different training types were included in this analysis as shown in Table 5.

Table 5. Sample Description for Research Question 3

	Training type	
	Frequency	Percent
Training 1: Supervisory	67	10.9
Training 2: Public management	110	17.8
Training 3: Technical/computer	38	6.2
Training 4: Soft skill*	44	7.1
Training 5: New Employee Academy	89	14.4
Training 6: Business professional	50	8.1
Training 7: Competency	59	9.6
Training 8: Leadership	42	6.8
Training 9: Sales	118	19.1
Total	617	100.00

* Soft skill training: interpersonal, coaching, and conflict management training

The largest group was 118 (19.1%) respondents; the smallest group was 38 (6.2%) respondents; and the ratio of these two extreme groups was 3.11. MANOVA analysis indicated that the transfer systems are significantly different (Wilks' lambda = .296, $F = 5.909$) across training types. In the between subject ANOVA, all of the scales were significantly different across training types, except for two scales, perceived content validity and performance coaching (see Table 6).

Table 6. Univariate Comparisons By Training Types

Training Specific	Overall	Training Types										F	P
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9			
Learner Readiness	3.0	2.9	2.8	3.4	3.3	3.1	3.2	3.3	3.0	2.9	3.8	<.00	
Motivation to Transfer Learning	3.9	4.0	3.9	3.9	3.9	3.7	3.8	3.5	4.0	4.0	4.1	<.00	
Personal Outcomes-Positive	2.3	2.5	2.0	2.0	2.1	2.6	2.5	2.3	2.2	2.3	4.9	<.00	
Personal Outcomes-Negative	2.2	2.3	2.0	2.0	1.8	2.9	2.1	2.5	2.2	2.1	17.9	<.00	
Personal Capacity for Transfer	3.2	3.5	3.4	3.2	3.1	3.0	3.1	3.3	3.4	3.2	4.0	<.00	
Peer Support	3.3	3.5	3.4	3.6	3.2	3.2	3.3	3.2	3.2	3.3	2.4	0.01	
Supervisor Support	2.9	3.2	2.9	3.0	2.6	3.3	2.8	2.5	2.9	2.7	5.6	<.00	
Supervisory Sanctions	2.5	2.3	2.4	2.2	2.3	3.8	2.4	2.4	2.5	2.2	42.7	<.00	
Perceived Content Validity	3.4	3.5	3.3	3.4	3.3	3.4	3.3	3.4	3.4	3.3	0.4	0.88	
Transfer Design	3.8	4.1	3.9	3.7	3.8	3.5	3.8	3.9	4.0	4.0	4.6	<.00	
Opportunity to Use Learning	3.5	3.8	3.6	3.6	3.6	3.0	3.4	3.4	3.8	3.6	12.2	<.00	
Training in General													
Transfer Effort-Performance Expectations	3.9	4.0	4.0	3.9	3.8	3.7	3.8	3.8	4.0	3.9	3.8	<.00	
Performance-Outcomes Expectations	3.2	3.6	3.2	3.0	3.1	2.8	3.4	3.1	3.3	3.4	6.8	<.00	
Resistance/Openness to Change	2.7	2.5	2.7	2.4	2.4	3.0	2.7	2.7	2.7	2.6	4.4	<.00	
Performance Self-Efficacy	3.7	3.8	3.8	3.6	3.8	3.5	3.7	3.6	3.7	3.6	2.2	0.02	
Feedback/Performance Coaching	3.0	3.2	3.0	3.1	2.9	3.0	3.0	3.0	3.0	2.9	1.1	0.33	

Post-hoc tests showed that no significant differences were found on performance coaching, peer support, and perceived content validity scales in the paired comparisons. Respondents who received new employee academy training rated personal negative outcomes ($M=2.94$ vs. 2.34, 2.05, 2.04, 1.88, 2.11, 2.50, 2.21, and 2.15, respectively) and supervisor sanctions scales ($M=3.83$ vs. 2.30, 2.46, 2.24, 2.37, 2.43, 2.46, 2.56, and 2.28, respectively) significantly higher than those who received any other training types. However, the opportunity to use scale was rated significantly lower than any other training types ($M=3.01$ vs. 3.85, 3.64, 3.60, 3.62, 3.47, 3.48, 3.87, and 3.66, respectively). In addition, respondents in the same training program rated personal outcomes positive significantly higher than public management, technical/computer, and soft skill training ($M=2.66$ vs. 2.08, 2.09, and 2.14, respectively).

Respondents who received competency training rated the motivation to transfer learning scale significantly lower than supervisory, public management, leadership, and sales training programs ($M=3.54$ vs. 4.06, 3.91, 4.03, and 4.06, respectively). Performance-outcomes expectations for supervisory training was significantly higher than public management, technical/computer, soft skill, new employee academy, and competency training programs ($M=3.69$ vs. 3.25, 3.03, 3.16, 2.89, and 3.18, respectively). Respondents who received leadership training rated the performance-outcomes expectations ($M=3.39$ vs. 2.89), opportunity to use learning ($m=3.87$ vs. 3.01), and transfer design ($M=4.01$ vs. 3.55) significantly higher than those who received the new employee academy training, while the leadership training respondents perceived supervisor sanctions ($M=2.56$ vs. 3.83) and personal negative outcomes ($M=2.21$ vs. 2.94) significantly lower than those who received the new employee academy training.

Respondents who received sales training rated motivation to transfer learning ($M=4.06$ vs. 3.74), performance-outcomes expectations ($M=3.42$ vs. 2.89), opportunity to use learning ($M=3.66$ vs. 3.01), and transfer design scales ($M=4.00$ vs. 3.55) significantly higher than those who received new employee academy training. Sales training respondents rated supervisor sanctions ($M=2.28$ vs. 3.83), resistance/openness to change ($M=2.64$ vs. 3.04),

and personal negative outcomes ($M=2.15$ vs. 2.94) significantly lower than those who received new employee academy training.

Implications and Future Research

This study documents for the first time that transfer systems are significantly different across organizational types, organizations, and training types. While this might be intuitively obvious to those who work in organizations, no previous research had documented and compared transfer system factors as was done here. The results from research question 2 confirm the highly variable nature of transfer system factors across different organizations. It is also distressing to note the overall low levels reported on most transfer system factors. For the most part, employees reported severe weaknesses in their organization's transfer system as evidenced by the number of mean responses hovering around 3.0.

Research question 1, which examined differences by organizational type, showed that all but two scales (learner readiness and performance self-efficacy) were significantly different across types of organizations. Results from private sector organizations showed that employees perceive that changing their performance is more likely lead to valued outcomes, that they have more opportunity to use their learning, can have more capacity for trying new learning. Employees in public sector organizations, on the other hand, perceive that their supervisor is more likely to oppose their use of new methods learned in training, that they are more likely to encounter resistance to change, and are more likely to have negative personal outcomes if they do not apply their training. The nonprofit organization included in this study, appeared to have a particularly strong transfer system with higher motivation to transfer and but if more supervisor support.

Results from research question three were also quite interesting. First, there were no differences in perceptions of perceived content validity across the training types. However, all training was rated with only moderate content validity as the mean score was approximately 3.4. Supervisor support was also rated to low across all training types, confirming the widely held belief that supervisors do not generally support training like they should. The two personal outcomes scales were also low, confirming that organizations generally have not adequately linked training to performance outcomes. The results also indicate at perceptions of transfer system factors vary depending on the type training. This supports the notion that organizational systems' support for transfer varies depending on the type training.

These results also point to the importance of using a diagnostic instrument such as the LTSI. Transfer systems are not uniform and stable but rather vary depending on the type of organization, culture of the organization, and the type training. Human resource professionals in organizations need to diagnose their transfer systems and identify the key factor or factors that will have an influential effect on trainees' transfer of learning. A transfer system survey, such as the LTSI, can be used as a diagnosis tool prior to training and as an evaluation tool after training to examine transfer systems within organizations.

Earlier we introduced Holton's (in press) notion of leverage points for change in learning transfer systems. This study suggests that the leverage point conception may have some merit. The LTSI results suggest that different interventions might emerge for each of the organizations included in this study. Furthermore, these results suggest that different interventions might be needed for different training types within a single organization. Of course actual transfer outcomes data would be necessary to confirm this hypothesis, but it appears to have promise.

It should also be noted that many of the differences between groups were somewhat small. They were statistically significant because of high power due to large cell sizes. Because this instrument has not been heavily utilized in predictive studies, the effect of these differences on performance outcomes is unknown.

Overall, this study is the first to provide descriptive and comparative data about organizational transfer systems. If learning transfer research and practice is to become more action oriented as was advocated the beginning of this paper, it is important that additional research of this type be conducted to better understand the state of the practice and gaps that need to be closed. One of the key benefits of using a standard validated instrument like the LTSI is that we can begin to make comparisons across organizations as was done here. Prior to development of this instrument, such comparisons were not possible because each study tended to use its own unique measures. As work continues with the instrument, new insights on the dynamics of organizational transfer systems are expected to emerge.

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Adult Learning and the Internet

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Adults voluntarily learning to use the Internet through the eBay auction process are demonstrating adult learning related to technology in the real-world. This study describes the learning strategies used by 380 eBay users. The findings reveal that learners using critical thinking skills are attracted to the Internet, that Internet use leads to differing attitudes about skill and self-concept changes, and that learning strategy groups approach learning on the Internet very differently.

Keywords: Adult Learning, Internet, Learning Strategies

Periods of change offer tremendous opportunities for learning. This is especially so for computers and the Internet. Recently in an interview on CNBC, an executive for an investment advising firm made the analogy that the world is currently in the third inning of the new ball game brought about by the Internet. If this analogy is correct, then one player in the game that has strong pitching and large crowds is eBay. eBay is the world's largest personal online trading community as a result of creating a new market of efficient one-to-one trading in an auction format on the World Wide Web. Individuals use eBay to buy and sell items in more than 1,600 categories including such areas as collectibles, antiques, sports memorabilia, computers, toys, and jewelry. eBay provides over two million new auctions and 250,000 new items every day from which users may choose. The mission of eBay is to trade practically anything on earth while treating each of its customers with respect. To facilitate this, eBay encourages its members to interact via e-mail and has a feedback system in which both buyers and sellers can post comments about their dealings with each other.

eBay was launched on Labor Day of 1995. Immediately, it began to attract a volume of customers, and today it has over 12 million registered users. While many formal learning organizations are still talking about the need to teach computer literacy courses or about the need for teaching people about the Internet, it is clear that a large number of adults around the world have initiated self-directed activities to learn how to not only get on eBay but also how to participate in its interactive features. A review of the posted auctions and the feedback comments reveals a wide range of literacy levels, keyboard skills, and creativity by eBay users. Because this is a new area of learning and because it is informal in nature, adult educators have not yet investigated the learning strategies that participants are using for this type of adult learning. However, the knowledge of the learning that is taking place in this informal setting is crucial to educators that hope to train adults on similar types of technology for use in formal settings. Computers and access to the Internet have become pervasive. Learning how to use this technology is no longer an option for those in the modern workforce, and those responsible for carrying out this training need to know how adults learn to use this technology. In order to investigate how adults voluntarily go about this learning process in a real-world setting, the purpose of this study was to describe the learning strategies that adults use in learning to engage in the eBay auction process. The study utilized the following research questions: (a) what are the identified learning strategy preferences of adult learners using eBay, (b) how do adult learners describe their learning experiences related to the eBay auction process, and (c) how they feel about their computer skills and self-confidence as a result of participating in the eBay auction process.

The Internet

"The Times, They are A-Changin'": These prophetic words from Bob Dylan's 1964 song are truer now than any time in recent history. Not since the Agricultural and Industrial Revolutions have so many changes affected so many people in such a short period of time. This accelerated eruption and transmission of data is dramatically remolding, recasting, and shrinking the global community. Frequently called the Information Revolution, Information Age, or the Age of Technology, this metamorphosis of data gathering and exchange is rapidly creating a new single-market world. This new world is a world of computer-based knowledge which stretches from living rooms to corporate headquarters. It is changing the way people communicate among themselves personally and the way they conduct business.

Just as previous revolutions inalterably changed people's ways of life over time, the current revolution is transforming the daily source, volume, and quantity of information that is available at a lightning-quick pace. This

massive change has come in an incredibly short time. For the last quarter of this century, these rapid and revolutionary changes have created anxiety in society as "new trends and technologies flash before us with each click of the mouse" (Cahoon, 1998, p. 71).

The core component of the Information Revolution is the Internet. Commonly known as the World Wide Web or the Information Superhighway, the Internet is a mass conglomeration of multidirectional communication networks. Although the Internet began in the U. S. as a federally-funded research project, the 1980s and 1990s have seen a dramatic increase in commercial network providers. The majority of today's Internet is composed of private networking agencies located in educational institutions and government organizations (Cerf, 2000).

Use of this network is expanding so quickly that calculating global Internet participation is nearly impossible and is out of date as soon as it is published. In such a fast growing market, reporting precise numbers of online participants worldwide is not an exact science. It is subject to change daily. The Internet is "the fastest growing technology in history" (Taylor, 1999, p. 1). Over one-half the homes in the United States are online with 90% of those utilizing the Internet regularly (p. 1). There are currently 362.97 million users of the Internet worldwide.

The dynamics of this new technology have not only changed the way information is disseminated, but it also is changing how people communicate with each other. Internet use is exploding and people are constantly being exposed to a whole new era of new terminology. Global economy, telecommuting, e-commerce, e-mailing, networking, http, and html are but a few of the words and phrases which have taken on new or expanded meanings today. Many sentences seem to end with the words ".dot com". Information is e-mailed, downloaded, attached, data synched, faxed, and linked. Internet users browse, surf, online conference, and chat. They meet, discuss, conference, and inform call online. They exchange e-mail addresses, web sites, business news, and personal information. Instead of the "tune out and turn on" of the 1960s, today's trendy people "logon" or "logoff". Internet users travel through cyberspace to cybercafes, home pages, and websites to visit with one another.

This new technological revolution has given rise to a new form of literacy known as computer literacy. Just as literacy may be defined as the ability to read and comprehend written language, computer literacy is defined as "the knowledge and an understanding of computers, combined with the ability to use them effectively" (<http://www.duboismarketing.com/computer.html>, p. 1). Computer literacy may also be described as "digital literacy", which is "the ability to access networked computer resources and use them" (Gilster, 1997, p. 1). Literacy in the Information Age simply requires developing new skills to merge onto the Information Superhighway.

The Internet has changed the way people interact with technology. In the United States, people have grown accustomed to television which calls for passive behavior by the observer. However, Internet users have become interactive participants with much more responsibility in the hands of each individual. "We have never had the means of connecting so many people with so powerful a set of tools" (Gilster, 1997, p. ix). A world of information is available to Internet users with the click of a computer mouse. Often separated by great distances, people may now access each other with the ease and affordability of global e-mail.

As a result of growing computer accessibility, developing technology, and increasing global Internet participation, a new subgroup of World Wide Web users has emerged. This group consists of Internet users known as online auction traders. These buyers and sellers of items on Internet auction sites make up a major segment of the growth of the Internet (<http://www.ebay.com>). They engage in commerce using state-of-the-art technology as they buy and sell goods through an Internet auction house. The largest group of high-tech traders is found on eBay, the world's largest Internet auction site (<http://www.ebay.com>).

Since its creation in 1995, over 60 million auctions have been completed on eBay. In January of 2000, the average daily number of visitors to the eBay site set a new Internet record of 1.782 million (<http://www.ebay.com>). Each day, 6.5% of all Internet users across the world visit eBay's site to buy, sell, browse, or chat with other operators (<http://www.ebay.com>). The learning that is taking place on eBay by these 12 million subscribers demonstrates the basic principles of adult learning.

Adult Learning

Adult learning is the process by which adults interpret and give meaning to significant experiences in their lives. Knowles (1970) laid the foundation for the understanding of adult learning when he pointed out that adult learning is based upon the four assumptions that (a) adults have a self-concept of being responsible for their own decisions, (b) adults have a vast reservoir of experiences to use and build upon in a learning activity, (c) adults learn to satisfy needs in their evolving social roles, and (d) adults are problem-centered in their learning (p. 39). Later he added that adults need to know why they need to learn something before undertaking the learning and that the most potent motivation is internal (Knowles, et al., 1998, pp. 64-68).

Thus, adults apply their learning in real-world situations (Fellenz & Conti, 1989, pp.3-4). At the heart of this learning process is the development of each learner's awareness and capacity for effective self-monitoring and active reflection (Smith, 1991, p. 11). Involving the learner in this process includes participation in planning, conducting, and evaluating learning activities (Smith, 1976, p. 6). This learning-how-to-learn process allows adults to "learn on an ongoing basis in everyday, real world situations" (Kitazawa, 1991, p. 31) so that they can control and make sense out of their life experiences. This real-life learning is "relevant to the living tasks of the individual in contrast to those tasks considered more appropriate to a formal education" (Fellenz & Conti, 1989, p. 3). Real-life learning is the ability to learn on a recurring basis in every day, real-world circumstances. This learning occurs from the learner's real-life conditions and requires a comprehension of such "personal factors as the learner's background, language, and culture as well as social forces such as poverty and discrimination" (p. 25). Significant differences exist between learning for real-life problems and for those found in formal education (Sternberg, 1990).

Adult educators have focused on the concept of learning strategies as a means of understanding individual differences related to real-life learning. Learning strategies address solving real problems involving metacognitive, motivation, memory, critical thinking, and resource management. Learning strategies are those techniques or specialized skills that the learner has developed to use in both formal and informal learning situations (McKeachie, 1988). They are "the techniques and skills that an individual elects to use in order to accomplish a specific learning task....Such strategies vary by individual and by learning objective" (Fellenz & Conti, 1989, pp. 7-8).

Learning strategy research with adult learners has led to the identification of three distinct groups of learners. These have been labeled Navigators, Problem Solvers, and Engagers. Navigators are focused learners who prefer a well-planned, structured learning environment complete with feedback that allows them to monitor their progress and remain on course (Conti & Kolody, 1999, pp. 9-11). Problem Solvers are learners who rely heavily on the critical thinking strategies of generating alternatives, testing assumptions, and practicing conditional acceptance. Problem Solvers prefer a learning environment that promotes creativity, trial-and-error, and hands-on experimentation (pp. 11-13). Engagers are passionate learners who operate from the affective domain with a love for learning and who learn best when actively engaged in the learning in a meaningful manner. Personal growth, increase in self-esteem, helping others, and working as part of a team for a worthwhile project are emotionally rewarding to Engagers and will motivate them to embark upon and to sustain a learning experience (pp. 13-15). The Navigators and Problem Solvers initiate a learning task by looking externally to themselves at the utilization of resources that will help them accomplish the learning. Engagers, on the other hand, involve themselves in the reflective process of determining internally that they will enjoy the learning task enough to finish it (pp. 18-19).

Methodology

Using the long-established principle in architecture of Frank Lloyd Wright that form and function should be compatible, this study used the information and data collection advantages of the Internet to collect data about how adults learn using the Internet. eBay posts the results of each auction after the auction is completed. This includes a list of all people who bid on an item along with the person's eBay user identification name. These names are linked to the person's e-mail address and history with eBay. A representative sample of 380 eBay users was identified by electronically downloading the e-mail addresses of auction participants of completed sales between August 15, 1999, and January 30, 2000. The auctions were stratified by the 12 categories of eBay. During the sample identification process, eBay added a new category, and that category was also included in the study. Several subgroupings exist within each category. Therefore, one subgroup with a high volume of auctions was selected within each category. Within that subgroup, high volume auctions were selected in which the final sale price of the item was under \$10, between \$11 and \$100, and over \$100. This provided a sample in which various levels of financial commitment were involved.

Data were gathered electronically. Each participant's address was captured electronically from the public domain areas of the eBay website and downloaded into an Excel structure. A questionnaire was developed using Front Page and uploaded to an America On-Line account. Those identified in the sample were e-mailed a request to participate in the study. The participants clicked on the Internet address in the e-mail message that took them directly to the questionnaire. Participant responses were recorded electronically in files linked to the questionnaire. These files were automatically e-mailed to the researcher's account and then downloaded directly into the researcher's personal computer for analysis.

The sample of 380 participants approximated the 384 statistically suggested for a 95% confidence level for a study with a population the size of eBay (Mitchell & Jolley, 1988, p. 302). The gender distribution of the sample was nearly equal with 188 males (50.1%) and 187 females (49.9%); only 5 participants did not report their gender. The group was fairly well educated; the highest educational level of nearly one-fourth (23%) was a high school diploma, of one-fifth (20%) was a post-secondary degree or certificate, of nearly one-third (30.5%) was a bachelor's degree, an of one-fourth

(25.1%) was a graduate degree. Only five (1.4%) had less than a high school diploma, and these respondents were young enough to still be in school. The respondents ranged in age from 13 to 70 with a mean of 41.08 and a median of 43. Responses were received from 8 countries in addition to the United States; these 15 responses came from Australia (2), Canada (6), Germany (2), Denmark (1), Finland (1), Mexico (1), Russia (1), and United Kingdom (1). Although eBay has an international membership, the respondents were overwhelmingly White (93.3%); non-White ethnic origins were as follows: African--3%, Asian--1.0%, Hispanic--1.7%, Native American--1.0%, and Other--2.7%. Also, the responses were mostly from sites that indicated that private individuals participated in the study. Over nine-tenths (93.1%) were from e-mail addresses that ended with .com (58.7%) and .net (34.35); the remaining responds were sent from .edu (3.6%), .org (1.5%), .us (1.5%), and .gov (.3%).

Findings

Both quantitative and qualitative data were collected using the questionnaire. Most questions were open-ended while a few were responses to identified choices. Imbedded within the questionnaire was *Assessing The Learning Strategies of Adults* (ATLAS). This instrument is a valid means of identifying a person's learning strategy preferences and places learners in the categories of Navigators, Problem Solvers, or Engagers (Conti & Kolody, 1999). The respondents were asked to describe their learning activities on eBay and to rate their skills and attitudes related to computers and the Internet as a result of participating in the eBay auction process. Descriptive statistics were used to summarize the ratings, and chi square was used to compare the observed frequency of the learning strategy responses for the eBay users to the expected learning strategy norms on ATLAS. The qualitative responses were analyzed to discover emerging themes related to the questions. In addition, the responses were analyzed using the constant comparative method (Merriam, 1998) to identify patterns in the responses for each of the three learning strategy groups.

The participants in the study use the Internet extensively. The average number of hours that they spend per week on the Internet had a mean of 20.08 hours and a median of 15 hours. Approximately half of this time is spent on eBay with a mean of 10.04 hours and a median of 6 hours.

Learning Strategy Groups

The findings revealed that there is a connection between the Internet and the type of learners attracted to it, and they described how learners apply their general learning strategy preferences in specific learning projects on the Internet. Although the three learning preference groups identified by ATLAS exist in nearly equal portions in the general adult population, a disproportionately large number of the group that relies on critical thinking skills use eBay ($X^2=30.3$, $df=2$, $p=.001$). The distribution on ATLAS in the general population, which was the expected distribution for this study, is as follows: Navigators--36.5%, Problem Solvers--31.7%, and Engagers--31.8% (Conti & Kolody, 1999, p. 18). However, the observed distribution in this study was as follows: Problem Solvers--45.2%, Navigators--28.5%, and Engagers--26.3%. Thus, there are a greater number of Problem Solvers using eBay than the other learning strategy preference groups. Problem Solvers rely on the critical thinking skills of testing assumptions to evaluate the specifics and generalizability within a learning situation, of generating alternatives to create additional learning options, and of embracing conditional acceptance of learning outcomes while keeping an open mind to other learning possibilities.

ATLAS is a relatively new instrument, and its authors are collecting data to further confirm its validity (Conti & Kolody, 1999). Data were collected for this purpose and also to confirm that ATLAS was appropriate for those in the eBay sample. After having their learning strategy preference identified by ATLAS and reading a description of this definition, the participants were asked if this description was fairly accurate in describing them as learners. Overwhelmingly, 90.6% confirmed that the description by ATLAS accurately described them. This finding of an accurate description for 9-out-of-10 respondents is consistent with other findings for ATLAS.

Attitudes

Participants were asked a series of questions to uncover their attitudes concerning communications on eBay, their computer skills, and their confidence using computers and the Internet. In order to increase the personal nature of its website and business process, eBay encourages bidders, buyers, and sellers to interact via e-mail. eBay has instituted a feedback system in which buyers can post ratings and comments about the seller, the quality of the item purchased, and the quality of the communication and interaction with the seller. Likewise, the seller can post comments and evaluations about the buyer. These comments are important to sellers if they are to continue to sell products on eBay. A review of the messages posted on eBay reveals that a large volume of civil and courteous communication takes place through these

messages that facilitates the auction process. Messages from respondents and the personal experiences of the researchers support this overall view of the importance of the e-mail communication process in making the use of eBay more personal. Therefore, participants were asked questions concerning their use of e-mail in connection with eBay.

Quantitative questions concerning the use of e-mail on eBay used a 5-point Likert scale. More than half used e-mail Very Much (33.6%) or Much (20.8%) to communicate with other eBay users; slightly over one-fourth used it Some (26.7%), and about one-fifth used it Seldom (14.4%) or Never (4.5%). Over four-fifths found this communication Extremely Positive (33.7%) or Positive (50.1%). Most of the others viewed it as Neutral (14.8%) with only an extremely small number finding it either Negative (.5%) or Extremely Negative (.8%). Thus, most used and were very satisfied with e-mail as a means of improving the use of eBay.

Participants were also asked to rate their computer skills and to rate how they have changes as a result of using eBay. Almost all of the participants had average or better computer skills; nearly three-fourth had Very Good (38.4%) or Good (33.1%) skills; almost one-fourth had About Average (24.2%) skills. Very few of the eBay users considered their computer skills Poor (3.8%) or Very Poor (.5%). Perhaps because they had good computer skills before using eBay, many did not feel that their computer skills had increased greatly as a result of using eBay. While nearly one-third saw Some (32%) improvement and one-fourth saw Much (14.2%) or Very Much (11.35), a little less than half saw Little (19.4%) or Very Little (23.1%) improvement. However, nearly three-fourths felt that using eBay has increased their research skills in finding out about things Very Much (15.8%), Much (19.5%), or Some (35.8%) while about one-fifth felt that it has helped only Little (16.3%) or Very Little (12.6%).

Since experience with the use of a technology has the potential to increase one's confidence in the use of that technology, participants were asked about changes in their confidence levels related to themselves and to their ability to deal with others, with the use of computers, and with the use of the Internet. Although educators hypothesize that positive experiences such as the application of technology in successful situations such as eBay will lead to increased self-confidence in most people, the participants' responses did not reflect this enthusiasm. Their responses for all these items shared a similar pattern: approximately half expressed little change, slightly over one-fourth saw some change, and less than one-fourth experienced much change. Their responses for increased self-confidence were as follows: Very Little (31.7%), Little (21.8%), Some (31.1%), and Much (15.4%). Their responses for increased ability to deal with others were as follows: Very Little (23.9%), Little (21%), Some (32.5%), Much (14.8%), and Very Much (7.8%). Their responses for increased ability to use computers were as follows: Very Little (28.6%), Little (20.8%), Some (27.8%), Much (15.1%), and Very Much (7.8%). Their responses for increased ability to use the Internet were as follows: Very Little (25.2%), Little (22.5%), Some (26.3%), Much (16.9%), and Very Much (9.1%).

Learning on the Internet

Participants were asked a series of open-ended questions related to their learning on the Internet using eBay. They typed their responses into scroll boxes on the Internet that allowed them to enter as much information as they desired. When the participants submitted their form, their responses were sent to the researchers in an e-mail message. These responses were copied to the Microsoft Windows clipboard, transferred to a word processor, and then read into a Microsoft Assess program. The responses for each item were copied to a word processor file. Each response was tagged with the respondent's ATLAS score and the demographic information of age, gender, education, and race.

The following questions were used to generate the qualitative data.

1. How did you learn about eBay?
2. Describe the learning process you used to get started on eBay.
 - a. How did you learn about getting your account started?
 - b. Once you had your account started, how did you go about learning what was on eBay and about the different parts of the eBay web page?
3. Describe a typical session that you have on eBay.
4. Think about an auction on eBay in the past 6 months that interested you and that you took action to learn more about it.
 - a. Describe how you went about learning more about the item.
 - b. Describe how you went about learning more about the people involved in the auction
 - c. Describe how you went about learning more about the any other things related to the auction.

Participants learned about eBay in a variety of ways. The respondents described that their beginning of knowledge about eBay came from such sources as different forms of media, advertisements, Internet activities, and other people. While their method of learning may have varied, it was clear that eBay was pervasive and its use was widespread.

Participants in the three ATLAS groups differed in the ways they learned about eBay. Navigators relied on

advertisements, other collectors, and television personality Rosie O'Donnell to learn about eBay. Problem Solvers regarded co-workers and listed Internet activities as their sources of knowledge about eBay. In addition, Problem Solvers were much more likely to detail specific examples of how they learned of eBay than their Navigator or Engager counterparts. Engagers tended to report that their friends were the source of their acquaintance with eBay while Navigators and Problem Solvers were more likely to list relatives as their source of learning about the auction site.

Of the people participating in the eBay study, most listed following eBay's directions as the way they learned about getting their accounts started. While some read the eBay information and others went directly to attempted bidding, 56% of all respondents said they learned about becoming an eBay user by direction-following.

Navigators were more likely than Problem Solvers or Engagers to surf eBay's website or use the search options. Problem Solvers chose to give explicate combinations of sources when describing how they learned about registration. Aside from following eBay's registration directions, Engagers chose to go directly to the bidding process or read eBay's instructions to become users.

People participating in the eBay study reported that they went about learning what was on eBay web page by using an assortment of methods. While some browsed or searched the website, others relied on trial-and-error or a combination of resources available. Almost three-fourths (74.3%) of the participants browsed, searched, used trial-and-error, or used the website features to discover the different eBay parts.

Distinct differences between the ATLAS groupings were discovered. Navigators were more than seven times more likely to use their own logic to learn about the eBay website than their Problem Solver or Engager counterparts. Problem Solvers relied on a combination of sources, trial-and-error, and specific examples when answering the question. Engagers were more than twice as likely to go directly to eBay's search engine than were Navigators or Problem Solvers.

To describe a typical session on eBay, the participants used methods that were grouped into the eight basic categories of checking current auctions, browsing, giving detailed examples, executing predetermined plans, searching keywords or items, using a combination of strategies, or varying their sessions to meet their needs. Navigators were more likely than Problem Solvers or Engagers to browse eBay and use calculated plans during a typical session while Problem Solvers more often chose to vary their sessions and give detailed examples than people in the other two groups. Engagers tended to go straight to their current auction sites or search for specific items of interest.

In order to learn more about eBay auction items, the participants used an array of methods. While some briefly mentioned reading the item description or viewing the item picture, others progressed into intimate details and elaborate examples. Some relied on outside resources such as the auction item seller, the Internet, or reference books while others depended on their own knowledge.

Navigators were much more likely to use the Internet while researching information about items and were more apt to make use of outside sources such as reference books, catalogs, and trade journals than were Problem Solvers or Engagers. Problem Solvers tended to offer more detailed examples of their learning experiences than the Navigators and Engagers, and they were much more likely to depend on their own current knowledge to come to their aid. Engagers chose to merely look at the item descriptions or pictures or to use a brief listing of a combination of techniques which usually included other people.

Responding eBay users described the methods they used to learn more about the other people in the auctions in several ways. The most common response to how the study participants learned more about other eBay users was the Feedback Forum (35.1%). This was followed by a combination of techniques (25.7%) and detailed remarks about their experiences (13.8%). Others used auction histories (4.4%), e-mail (3.6%), eBay's About Me pages (1.7%), and outside sources (1.1%). Some (6.6%) reported that they either did not learn more about other people or that others were insignificant in the eBay process.

Learning strategy groups showed some differences and a few similarities in the way they went about learning more about other eBay people. While all three ATLAS groups used eBay's Feedback Forum, almost one-half of the Navigators used the feedback evaluations as compared to 29.4% of Problem Solvers and 29.5% of Engagers. The Problem Solver participants continued to give more detail and information than was expected. They were three times more likely than Navigators or Engagers to give detailed remarks in their answers to this request. Although Engagers made up only 26% of the respondents, close to half of the people who used their instincts while learning more about other eBay people were Engagers.

When asked to describe how they went about learning more about things other than auction items or people, the participants chose several categories of responses. While some chose not to respond or could not comment (28.5%), others responded from eBay's website (16.6%), by conducting research (10.2%), by reporting that they learned about other aspects of the auctions from other people (9.7%), by offering detailed examples or comments (8.8%), by trial-and-error (5.5%), and by a combination of sources (5.0%).

Differences existed between people identified in the three ATLAS groups. Although most (22.3%) relied on the

eBay site itself for information, Navigators were more than three times as likely as Problem Solvers and were twice as likely as Engagers to read the item description or view the item picture when learning additional information about eBay. Problem Solvers tended to use a combination of sources to learn more than their Navigator or Engager comrades but were almost twice more apt to give detailed comments or advise to the researchers or other eBay users than either the Navigators or the Problem Solvers were. Although Engagers made up only 26% of the people responding, 38.9% either chose not to answer the question or found it difficult to answer. The most popular source for additional eBay information for Engagers was other people.

Conclusions

Several conclusions can be drawn from the findings. The learning strategy findings are congruent with and complement other on-going studies in the area. In another study using the Internet, Spencer (2000) found a disproportionately large number of Problem Solvers. Engagers have been found in a disproportionately large number in adult basic education programs (James, 2000) and in community colleges (Willyard, 2000); both of these educational entities have an image of focusing on the learner's self-concept and individual needs. In contrast to these, the Internet has an image of fostering individual exploration and self-directed activities. Resources seem endless of the "web" and "surfing" produces limitless learning opportunities. This image is ideal for the learning strategy preferences of Problem Solvers. Thus, even though learners are equally distributed throughout the society, they tend to gravitate toward learning situations that are compatible with their approach to learning. This occurs even though most learners have not consciously thought about or tried to label their approach to learning. Each training organization needs to be aware of the image that it projects. It may be subtly projecting messages that are posing barriers to some learners.

The findings confirm that ATLAS is useful and accurate for identifying the learning strategy preferences of adult learners from diverse settings. Learners can benefit by being aware of how they learn and of how this learning relates to the other general categories. Classroom experiences in the adult basic education, community college, and university settings shows that increasing learners' metacognitive levels concerning their approach to learning helps them in their own learning and in interacting with both the instructor and others in the learning situation. This awareness can help them better understand new and different learning situations and learning organizations.

Learning strategies can be learned. Once those in charge of facilitating the teaching-learning transaction are aware of the various elements in the curriculum and the organization, they can incorporate training related to the needed strategies so that all learners can be successful. The adult education situation should be a place where learners can either apply the lifelong learning skills that they have already learned or learn new ones that they need (Smith, 1982). Equipped with a knowledge of the learning strategies of the participants and image of the organization, more efficient learning experiences can be planned.

In their qualitative responses, all groups were able to clearly describe elements of their learning on eBay that exemplified and gave meaning to their learning strategy group as identified by ATLAS. Although some used eBay as a way to improve their technical computer skills and self-concept related to computers and the Internet, most viewed engaging in eBay as simply an application of existing skills. The human interaction fostered by the e-mail function associated with eBay was an important element for many in maintaining their use of eBay.

This study has implications for researchers in terms both of its findings and methodology. Much of the research on adult learning investigates learning in formal settings. Yet, the work of Tough (1976) and others shows that a major portion of what adults learn takes place in self-directed learning projects outside of formal educational settings such as with eBay. Moreover, Knowles' (1970) concept of andragogy stresses that adults learn for immediate application. The type of learning that is taking place on eBay fits these criteria. Learning more about how adults learn related to this modern technology can provide insights into the overall learning process. Also, electronic communications offer new ways for researchers to conduct their projects. Since this project is rooted in learning on the Internet, the characteristics of the Internet were incorporated into the research design. The techniques used for identifying a sample, posting a website questionnaire, contacting respondents, and analyzing data can be helpful to other researchers as they venture into this area.

Effective training of the workforce necessitates training related to computers and the support system which makes them such a powerful information tool. Trainers are presently designing and will continue to include programs that both teach people how to use this technology and how to integrate this technology into their jobs. Learners clearly approach this learning differently based upon their preferred learning strategies. They differ in the types of resources they prefer to use for this learning, in how they utilize these resources, and in how they feel, talk, and think about these resources. Likewise, they view the benefits, power, and tools of the Internet differently and therefore incorporate them in diverse ways in their learning. Trainers can utilize this understanding of how adult learners naturally incorporate these learning

strategy differences into their real-life learning on the Internet to improve the efficiency of technology training in formal settings.

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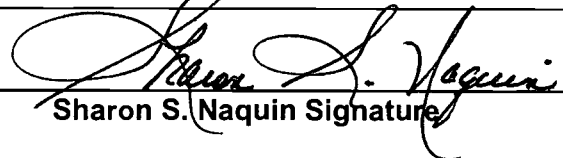
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