Pepperdine University
Graduate School of Education and Psychology

TRANSFER OF TRAINING: 1988–2011 WITH THE PRACTITIONER IN MIND

A dissertation submitted in partial satisfaction
of the requirements for the degree of
Doctor of Education in Organizational Leadership

by
Patsy Lionetti

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This dissertation, written by

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DOCTOR OF EDUCATION

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DEDICATION

This dissertation is dedicated to my husband and best friend, Tom, for all the love, support and encouragement he has given me throughout this process and continues to give on a day by day basis. Thank you for your belief in me and for encouraging me when I was frustrated, tired and cranky and for helping me see the laughter and joy in life regardless of the difficulty of the moment!

You are the best decision I ever made.
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My sincere thanks go to Dr. Doug Burke who is a renowned inventor and professor at USC who stretched my thinking. Dr. Burke’s inventive mind and strong business focus served to stretch my thinking and focus my thoughts at the same time. I had a great committee.

Finally, I thank Dr. Margaret Webber, my Pepperdine instructors, and my Pepperdine classmates who educated me in more ways than I can say.
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ABSTRACT

The purpose of this study was to provide a comprehensive, integrated review of transfer of training literature from 1988 to 2011 and to consolidate the findings to provide action oriented suggestions for practitioners. Research questions for this study were: (a) What characteristics in the transfer of training literature influence transfer of training? and, (b) Where can organizations focus their investments to leverage results for training transfer?

Baldwin and Ford conducted the seminal literature review on training transfer in 1988, reviewing research from 1907 to 1987 (Blume, Ford, Baldwin, & Huang, 2010). Training has been proven to be effective in improving work performance (Grossman & Salas, 2011), but training improves work performance only if employees use or apply the newly acquired knowledge and skills (Mooney & Brinkerhoff, 2008). Therefore, training transfer is best defined as “the degree to which trainees effectively apply the knowledge, skills, and attitudes gained in a training context to the job” (Baldwin & Ford, 1988).

Baldwin and Ford’s (1988) model posited that the 3 training inputs of trainee characteristics, training design, and work environment all directly impact learning and retention, as well as training transfer. Since Baldwin and Ford’s work, there has been a plethora of research on the characteristics comprising these 3 inputs, leaving the extant literature overwhelming and confusing. This study builds on Baldwin and Ford’s work.

This study analyzed frequency of findings from 9 respected meta-studies completed since 1988, and the study’s findings allow practitioners to prioritize their efforts for best value delivery, taking into account each organization’s sphere of control to assure that efforts are less likely to be wasted.
This study recognizes that there will not be a single set of best practices, but that practices will depend on the individual organization, its culture, and its structure. The key transfer of training variables for a typical organization were determined to be opportunity to perform, supervisor support, content relevance, training design strategies, and instructor training.
Chapter 1: The Problem

The 2010 British Petroleum (BP) Horizon’s oil spill in the Gulf of Mexico dramatically and tragically demonstrated the importance of effective training and the need to effectively transfer skill sets from the classroom to on-the-job performance. On April 20, 2010, BP’s Deepwater Horizon platform exploded and caused the largest marine oil spill in the history of the petroleum industry. Eleven men were killed and 17 more were injured. Almost five million barrels of crude oil poured into the fishing waters of the Gulf of Mexico and severely damaged the Gulf Coast environment and economy. The U.S. National Commission investigating the disaster concluded that the disaster was caused by inconsistent BP leadership and the “…failure to provide individuals with the information, tools and training necessary to be effective” (National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, 2011, p. 225).

Training is a planned learning event designed to result in a change of knowledge, skills or attitudes (KSAs) or a change in behavior (Campbell, Dunnette, Lawler, & Weick, 1970). Training has been proven to be effective in improving work performance (Grossman & Salas, 2011) but training improves work performance only if employees use or apply the newly acquired knowledge and skills (Mooney & Brinkerhoff, 2008). Training transfer is ”the degree to which trainees effectively apply the knowledge, skills and attitudes gained in a training context to the job” (Baldwin & Ford, 1988, p. 63). Stolovitch and Keeps (2006) agree that transfer of training is “the application by the learner of the skills or knowledge acquired in learning to the work context” (p. 234). Extensive training is required before employees are permitted on offshore rigs but for some reason it seems the training did not transfer to performance on this BP platform.
Nothing is more important than protecting human life and the BP incident shows that mistakes caused by lack of training transfer can also result in other severe consequences. The BP Oil Spill had a devastating impact on the Gulf of Mexico environment as well as its economy. The Spill made the world news for months as BP worked hard to staunch the flow of oil bleeding into the Gulf. The images of a flaming platform, pelicans drenched in oil and unemployed fishermen sitting in docked fishing vessels made the importance of transfer of training to the on-the-job performance perfectly clear.

It is easy to see the importance of training transfer for on-the-job performance in high risk industries (Treat, 1994) such as energy companies searching for oil in increasing by difficult locations, and in other disciplines where lives are on the line such as health care, the military, and air and space; however the importance of effective transfer of training does not end with dangerous industries. Transfer of training is important to the economic viability of any organization that depends upon employee effectiveness to remain competitive in the world market.

**Background**

The arrival of the internet and the World Wide Web (WWW) in the 1990s moved the world to a fiercely competitive global economy and business to cyberspace. Access to information and products dramatically increased and essentially removed geographical, physical, societal and national borders that limited competition. This was the move to the *Information Age* which caused world’s economies and societies to change dramatically. Toffler (1990) noted in *PowerShift* that society moved from the Agricultural Age, zoomed through the Industrial Age and launched into the Information Age in less than
200 years. The fact that man went from horse and buggy to the moon so quickly really emphasizes the dramatic changes that have occurred within this short time span. Such change has obviously had a huge impact on businesses, the nature of work and the knowledge, skills and attitudes (KSAs) a workforce needs to be competitive (Salas, Priest, Wilson, & Burke, 2006).

In today’s Information Age, people are the key resource and keeping those people trained and current as technology and events rapidly change is an important key to being competitive (Arguinis & Kriager, 2009). According to Grossman and Salas (2011), “Employees are increasingly required to develop a wide, mutable set of skills that are essential to the success of their organizations” (p. 103). Employees are sent to training to improve their KSAs and are expected to transfer what they have learned by applying it to the job thus improving business performance. There is no question that training works. Effective training that is applied on-the-job has proven to improve productivity, employee morale, and safety as well as reduce errors and decrease lawsuits making an organization more competitive (Salas et al., 2006).

Organizations recognize that training works (Skerlavaj, Dimovski, Mrvar, & Pahor, 2010) and spend billions of dollars every year (O’Leonard, 2012; Paradise, 2007) to train their employees. The problem is that training works only if the trainee transfers the training (applies the training) to improve performance on the job. It is estimated that only 10% to 30% of training transfers to on-the-job performance (Broad, 2005, p. 1). Training transfer is “the extent to which the learning that results from a training experience transfers to the job and leads to meaningful changes in work performance” (Baldwin, Ford, & Blume, 2009, p. 41).
Investment dollars spent on training that does not transfer to on-the-job performance are a wasted use of an organization’s limited resources. And, as the 2010 BP Oil Spill showed, wasted resources can be only the tip of the iceberg when training does not transfer. In some instances lack of training transfer can have devastating emotional, economic and environmental results greater than just wasted investment dollars or poor organizational performance. Clearly, lack of training transfer to on-the-job performance is an important issue and it has been an issue for some time (Michalak, 1981).

**Baldwin and Ford**

Baldwin and Ford (1988) recognized that training transfer was “of paramount concern for training researchers and practitioners” (p. 63) because American businesses were spending an estimated $100 billion on training and development with “not more than 10% of these expenditures actually result[ing] in transfer to the job” (p. 63). Baldwin and Ford noted that while researchers and practitioners in organizations had concluded that training transfer was a problem, there had been no comprehensive review of the training transfer literature and there was not a comprehensive framework to critique the available literature. Baldwin and Ford closed this gap by conducting a comprehensive literature review on training transfer in 1988 that reviewed training transfer research from 1907–1987 (Blume et al., 2010) and provided a Model of the Transfer Process (see Figure 1) to use as an organizing framework for understanding training transfer. Baldwin and Ford identified three key inputs that impact training transfer, (a) trainee characteristics, (b) training design, and (c) work environment, with specific characteristics beneath each input that impact training transfer. Baldwin and Ford’s study in training transfer research and their Model of the Transfer Process has been the most
frequently used model for researchers in the field since its publication (Blume et al., 2010).

![Diagram](image-url)

**Figure 1.** Baldwin and Ford’s model of transfer process. Adapted from “Transfer of Training: A Review and Directions for Future Research” by T. T. Baldwin and J. Ford, 1988, *Personnel Psychology, 41*(1), 63–105. Copyright 1988 by Wiley. Reprinted with permission

In their 1988 review, Baldwin and Ford identified two viewpoints that tried to explain why practitioners and organizations were not using research findings to improve on-the-job performance in organizations. The first viewpoint posited that “existing literature on transfer offers little of value to trainers concerned with maximizing positive transfer” (p. 64). They noted that Gagne (1962) and Wexley (1984) were researchers who
supported this view. The second viewpoint theorized that “trainers often fail to apply the scientific knowledge that does exist” (p. 64). Baldwin and Ford identified Hinrichs (1976) as an example of a researcher who supported that view. The two viewpoints seem to suggest there was nothing of value for practitioners to use, or that the practitioners either did not know about or refused to use the research that was available.

Baldwin and Ford (1988) chose to avoid taking side with either viewpoint. They chose to remain neutral and present a review of the research that was currently available and let the data speak for itself. They stated that the goal of their study was to “investigate systematically” (p. 64) what was known about training transfer at that time and “to consider how [to] proceed to learn more” (p. 64).

Baldwin and Ford’s (1988) literature review covered training transfer findings from 1907-1987 (Blume et al., 2010). After Baldwin and Ford’s publication, there was a flood of research findings (Grossman & Salas, 2011) and there is now a wealth of information and evidence available to organizations. And while Baldwin and Ford identified two viewpoints on why training does not transfer, later researchers such as Burke and Hutchins (2007), Grossman and Salas (2011), zu Knyphausen-AufseB, Smukalla, and Abt (2009) suggested a third reason that training transfer findings are not used by practitioners. They noted that there is such a wealth of information with inconsistent and sometimes contradictory findings that it is difficult for practitioners to pinpoint where to focus their organization’s resources. Michael Fullan, a noted change theory expert, noted that one of the problems facing organizations who want to improve learning is “the fragmentation, overload and incoherence resulting from the uncritical and uncoordinated acceptance,” of too many different findings (Hattie, 2009, p. 2).
Added to the abundance of training transfer research is the fact that researchers and experts in the fields of learning, education, and psychology frequently use terminology that is familiar to them but unfamiliar to business practitioners. And, practitioners in the business world often are overwhelmed with time constraints and the need to produce results. Practitioners do not have the time to pour over hundreds and hundreds of studies to identify the key training inputs or characteristics that might work for their organization – especially when the studies are often inconsistent or do not have sample populations that match the organization’s employee base.

Practitioners may find it difficult, if not impossible, to pinpoint which factors in which studies are most important to implement (Grossman & Salas, 2011). Furthermore, organizations cannot implement everything. There is neither the time nor the money. Businesses and practitioners must make educated decisions and select solutions where they can get the best value for their investment. Business and practitioners must also choose to implement findings that are within their sphere of control. For example, Baumgartel, Reynolds, and Pathan (1984) found that individuals with a strong need for achievement transfer training better than individuals who do not have a strong need for achievement. That is interesting information in understanding why an individual might or might not transfer training, but once the individual has been hired by an organization, changing the individual’s need for achievement is not likely to be within the organization’s sphere of control.

Researchers such as Burke and Hutchins (2007), zu Knyphausen-AufseB et al. (2009), Grossman and Salas (2011), and others followed Baldwin and Ford (1988) years later with literature reviews of their own and identified variables that they believe
organizations should implement. In 2009 zu Knyphausen-AufseB et al. went a step further by using a business lens to review training transfer research. These researchers recognized that cost, value and sphere of control impact business decisions. Their work recognized the impact of business constraints and helped to move the discussion of the transfer of training out of the theoretical into a real-world, business environment. Zu Knyphausen-AufseB noted that the purpose of their study was to “facilitate the company’s investment decision into transfer variables which (1) can be influenced by the company itself (sphere of control) and (2) which are worth the organizational and financial effort (cost-value ratio)” (p. 288).

Zu Knyphausen-AufseB et al.’s (2009) findings showed that social support from managers and peers and training content factors were the most cost effective for organizations to implement and were elements where the organization had the most control. Organizations could inexpensively implement these elements by directing managers and peers to encourage learning and ensuring that the organization’s courses had content that was useful to the employees. They determined that the second highest ranking elements in the successful transfer of training were the opportunity to actually apply the training to on-the-job work and posttraining factors, such as goal-setting or relapse prevention. These two elements were also well within the control of the organization. Zu Knyphausen-AufseB et al.’s (2009) identified job and career variables, perceived content validity of courses and the valence or expectancy of value from courses as well as organizational culture and situational variables as other elements that had impact on transfer of training but were elements where the organization had less control.
This dissertation conducts a comprehensive review of the training transfer literature by summarizing Baldwin and Ford’s (1988) review and then building on it by reviewing the training transfer literature after Baldwin and Ford (1988). It integrates the findings and plots the most consistent findings of research on a 3X3 matrix to help practitioners pinpoint \textit{low hanging fruit} where they can invest and get results from transfer of training to on-the-job quickly. It also recommends where businesses should make longer term business investments so that training results in transfer to on-the-job performance. This dissertation uses a business lens in the shape of a 3X3 matrix called Recommendations for Practitioners (see Figure 2) adapted from zu Knyphausen-Aufseß et al. (2009) to rank its recommendations.

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{figure2.png}
\caption{Recommendations for practitioners’ matrix.}
\end{figure}

Because this study also looks at transfer of training through a business lens, it is important to understand the differences between this dissertation and the work done by zu
Knyphausen-AufseB et al. (2009). There are several significant differences between the zu Knyphausen-AufseB et al. (2009) lens and the Action Recommendations for Practitioners lens used in this study. The zu Knyphausen-AufseB et al. (2009) lens compares Cost-value to organizational control. Their preeminent factor is cost over value. All organizations are different and for some cost may be the deciding factor. For other organizations the concern is to get the best value for the cost. Since I am a practitioner in a decentralized global organization, this dissertation explored value to cost, with value as the preeminent factor. The Y axis on the adapted model, Recommendations for Practitioners, shows a Value-Cost ratio criterion on the Y axis.

Next, zu Knyphausen-AufseB et al. (2009) used a plus and a minus sign on the Y axis and the X axis to indicate range. The use of a plus and minus sign could be interpreted as a judgment of positive or negative to a reader so the Recommendations for Practitioners matrix uses low and high to indicate range on both the Y axis and the X axis. The Recommendations for Practitioners model also numbers the squares 1 – 9 with the squares 2, 3, and 6 showing as the most desired recommendations. This is done to add further clarity and to emphasize which factors are the favored recommendations. Segments 2, 3, and 6 are the most attractive for an organization to implement and are called the sweet spots. Any finding ranked in segment 2, 3, or 6 is well within the organization’s sphere of control. It is clearly something that the organization can influence to make a difference. Any finding ranked in segment 2, 3, or 6 also provides the organization the best value for the cost of operationalizing or implementing that finding.

This dissertation builds on zu Knyphausen-AufseB’s concept of using a business lens to view transfer of training research but for simplicity, clarity and ease of
comparison, this dissertation uses the original wording for specific research findings when comparing factors or making recommendations. For example, research on motivation will list motivation individually and not group it with other characteristics. That way, the research on motivation can be compared with new research motivation.

Zu Knyphausen-AufseB et al. (2009) consolidated and grouped characteristics under new headings such as personality variables, which included characteristics such as introversion, emotional stability, fear, agreeableness, conscientiousness, motivation, and other characteristics. Zu Knyphausen-AufseB grouped their findings into thirteen categories which were unique to their study with 36 sub-categories. While that worked for their study, it was impossible to compare other researchers’ findings using their categorization system because those categories did not exist in other literature.

It is clear that there is a wealth of information available on training transfer. It is also clear that practitioners need a way to facilitate their decisions for investment. There was a wealth of research before Baldwin and Ford’s (1988) literature review and the extant literature continued to grow from 1988–2011.

This dissertation presumes that Baldwin and Ford (1988) research is still applicable. The dissertation builds on Baldwin and Ford by summarizing their findings and then providing an exhaustive literature review since their work. The goal is to present what business would call one stop shopping so there is no need to go find and review Baldwin and Ford (1988) and try to paste this study on top of Baldwin and Ford (1988).

This dissertation examines the findings in 10 major training transfer literature review studies in organizational training literature done after Baldwin and Ford (1988). The major literature review studies are Alvarez, Salas, and Garofano (2004), Baldwin,
Ford, and Blume (2009), Blume, Ford, Baldwin, and Huang (2010), Burke and Hutchins (2007), Cheng and Hampson (2008), Cheng and Ho (2001), Ford and Weissbein (1997), Grossman and Salas (2011), and zu Knyphausen-Aufseß, Smukalla, and Abt (2009). The dissertation examined the studies referenced in these meta-studies plus studies conducted since Baldwin and Ford that were not included in any of these meta-studies.

**Framework for Dissertation**

The size of research data available requires a meaningful way to categorize findings for comparison and understanding. Baldwin and Ford (1988) categorized the characteristics that impacted training transfer under three training inputs which were (a) trainee characteristics, (b) training design, and (c) work environment. This study categorizes the characteristics that impact training transfer under the same three major training inputs as shown in Figure 3.

![Figure 3. Key training inputs.](image-url)
The dissertation focuses on only the training inputs and compares research findings that identify which characteristics impact training transfer. The dissertation divides the training transfer findings into two time frames (see Figure 4) with the first a summary of findings included in Baldwin and Ford (1988). The study then builds upon the Baldwin and Ford data with a comprehensive review of training transfer literature that has occurred since their seminal 1988 study. The purpose of the dissertation is to provide a comprehensive one-stop shopping review of recommendations for business practitioners.

<table>
<thead>
<tr>
<th>Time Frame</th>
<th>1 Trainee Characteristics</th>
<th>2 Training Design</th>
<th>3 Work Environment</th>
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<tr>
<td>Baldwin and Ford (1988)</td>
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<td>After Baldwin and Ford (1988-2011)</td>
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*Figure 4. Literature review framework.*

The dissertation explains all the components in Baldwin and Ford’s (1988) Model of the Transfer Process in the literature review in order to lay the foundation for understanding both the original Baldwin and Ford findings and also the findings for the literature review of studies that occurred after Baldwin and Ford. Next the literature review first summarizes the Baldwin and Ford findings under each training input and
then follows with a comprehensive literature review of the research findings for the same
category found in reviewing the literature after Baldwin and Ford (1988–2011).

After the literature review for each time frame the dissertation ranks the most
frequent findings on the Recommendations for Practitioners (see Figure 2) with the
yellow showing the most favorable recommendations from the organization’s point of
view.

**Purpose of Study**

The purpose of this study is to provide a comprehensive, integrated review of the
transfer of training literature from 1988 to 2011, consolidate the findings and rank them
in a business-like framework to provide action oriented recommendations for
practitioners. The study follows Torraco’s (2005) guide, *Writing Integrative Literature
Reviews: Guidelines and Examples* to answer the following research questions:

**Research Questions**

1. What characteristics in the transfer of training literature influence transfer of
   training?

2. Where can organizations focus their investments to leverage results for
   training transfer?

**Significance of Study**

Research shows that training can make a difference in performance and
organizations recognize that training works (Skerlavaj, Dimovski, Mrvar, & Pahor,
2010). Organizations are convinced that training can help improve company
performance. U.S corporations alone spent approximately $67 billion on training in 2011
and this spending is projected to increase by almost 10% in 2012 (O’Leonard, 2012).
However, along with the increase in spending, organizations are demanding results. Organizations recognize that “[k]nowledge and skills that are not applied on the job reflect training dollars wasted,” (O’Leonard, 2012, p. 11).

Almost 3 decades ago, Baldwin and Ford’s (1988) study showed that organizations were not getting a good return on their training investments. They showed that while organizations were spending millions of dollars on training, the organizations were getting only an estimated 10% of training transferred to on-the-job performance. Recent studies show that training transfer has not much improved.

Sak and Ashforth’s (2002) survey suggested that immediately after training some 40% of trainees did not transfer training to on-the-job performance; 70% did not after a year and in the end perhaps only 50% of training investments actually transferred to on-the-job performance that benefitted the organization. In 2005, training transfer to on-the-job performance was estimated to be between 10% and 30% (Broad, 2005). In 2007, the American Society for Training and Development estimated that only 5% to 20% of training expenditures transferred to on-the-job performance (Paradise, 2007). The Corporate Executive Board (as cited in Jennings, 2008) agreed that “L&D [Learning and development] programs commonly fail to bridge the gap between learning and performance” (p. 3) and note that “while most L&D programs receive high satisfaction scores, learner satisfaction and program attributes [such as course topic, delivery channel, program length, etc.] have no impact on learner performance” (p. 6). While there is disagreement on the precise size of the problem regarding lack of training transfer, there is no doubt that there is a problem. While the exact percentage of training transfer is
debateable, there is clearly a need to improve training transfer and organizations are demanding better results from training.

Having effective training and training transfer is significant to organizations because of the huge financial investment and because of demographic trends impacting the 21st century workforce. O’Leonard (2012) notes that, “Most companies have significant skill gaps in their workforces and business leaders realize they must commit to developing those skills internally” (p. 8). Organizations cannot just hire their way out of the skills gaps because there is a shortage of skilled employees in many industries as the baby boomers retire and a smaller generation replaces them. Organizations are being forced to develop their internal staff to fill the gaps. Training and training transfer are more important than ever.

In their 2011 study, Grossman and Salas issued a call to action to help organizations better understand where to focus efforts to get results from training. They suggested it was time to move from the question of whether or not training can transfer, because research has shown that it can, and move the “focus of research … to a deeper investigation of the factors that have already yielded solid evidence” (p. 105). Blume et al. (2010) agreed and called for action-oriented, focused research that organizations could put to use. Blume and his colleagues noted that “The challenge is not how to build a bigger and more influential transfer support system; it is how to make transfer a more integral part of the existing organizational climate” (p. 1096).

Yet, while recent reviews of transfer of training (Blume et al., 2010; Burke & Hutchins, 2007; Ford & Weissbein, 1997; Grossman & Salas, 2010) show that training transfer has not much improved in the time since Baldwin and Ford’s (1988) literature
review, several researchers note that what makes training transfer effective is still largely a mystery (Blume et al. 2010; Grossman & Salas, 2011) in spite of a huge database of research that has proven that training is effective and can be transferred. Grossman and Salas (2011) and Blume et al. (2010) suggest that there has been enough research to determine if training will transfer—it will. They call for more focused, targeted research so that the characteristics that make up the three key training inputs (trainee characteristics, training design, and work environment) that impact training transfer can be clarified and best practices identified giving organizations a clearer direction of where to focus their investments.

This study is significant because while there is an overwhelming database of information regarding transfer-of-training, much of it is general and not actionable by organizations (Blume et al., 2010). There is a need for more focused research to help organizations and researchers understand how transfer of training can be accomplished using processes and procedures already in place (Blume et al., 2010; O’Leonard, 2012). The goal of this study is to provide focus that organizations can put into action quickly and get the best value for cost to help improve performance by integrating findings about transfer of training. Findings will help organizations target their resources to give them better leverage and return on investment decisions.

This dissertation provides a review of the training transfer literature that includes a summary of Baldwin and Ford’s (1988) seminal literature meta-study and builds upon it with a comprehensive literature review of research for the years 1988 – 2011. This will save time-strapped and resource-limited organizations a one-stop shopping study with
recommendations to help practitioners facilitate their investment decisions for training transfer effectiveness.

Training transfer research has created an extensive vocabulary along with its findings. An understanding of the vocabulary is needed to support comparison of the research.

**Definitions**

*Closed skills* are defined as having more specific, prescribed behaviors with less choice involved.

*Cognitive ability* refers to an individual’s intelligence and his/her capacity to understand, to learn and to solve problems. Tests for cognitive ability may include math, verbal and questions about specific areas of knowledge such as science or mechanics.

*Cost-value ratio* is the “quotient of organizational and financial effort (input) and the final training transfer (output)” (zu Knyphausen-Aufseß et al., 2009, p. 298).

*Effectiveness* is the ability of an organization to maximize the environment in acquiring and using scarce and valued resources to their best advantage. All organizations must make the best use of their resources in order to be competitive. De Geus (2002) offers the additional criteria of longevity in an organization as a way to prove effectiveness.

*Extraversion* is defined as being outgoing and seeking the company of others and being very sociable.

*Extrinsic motivation* is defined as a reward given from an external source for certain actions or behaviors that cause an individual to behave in that manner such as an increase in pay or a job promotion.
Far transfer refers to skills and knowledge that are taught in a learning event that requires the learner to adapt what he/she has learned in the learning event to different situations on the job. This type of learning is more difficult to teach, more difficult to learn and harder to transfer to on the job performance.

Intrinsic motivation is defined as doing or behaving in a certain manner because of internal feelings of satisfaction such as having a feeling of self-worth or meaningfulness.

Introverts are described as quieter, less assertive and less outgoing and more introspective than extroverts.

A learning organization, according to Senge (2006), is an organization “where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free and where people are continually learning how to learn together” (p. 3).

Low hanging fruit refers to activities or actions that can be implemented quickly and for low cost.

Motivation refers to how much persistence and intensity that trainees are willing to apply to their learning before, during and after the learning event.

Motivation to learn is defined as the amount of effort an individual is willing to exert to gain new knowledge and skills during a learning event.

Motivation to transfer is defined as the intention of the participant to actually apply the knowledge and skills learned to the on-the-job situation.

Near transfer is easier to teach, easier to learn and easier to apply as this is training that is the same on the job as it is learned in the learning event. This type of
training is usually procedural, repeated in the same order and easier to transfer. It is applied the same way on the job as was taught in the learning event and the learner does not have to adapt any skills or knowledge.

*On-the job performance* refers to individual performance. Rummler and Brache (1990) equate job performance with the individual’s effectiveness in meeting job goals.

*Open skills* are defined as skills where learners have more choice regarding how and what concepts and principles to transfer to the job and involve more opportunity for using skills in different situations.

*Organization* refers to both not-for-profits as well as for-profit with the construct that the organization’s goal is performance results. For example, a global energy company’s goal is performance results so that it can increase profits, increase shareholder return or increase growth. A not-for-profit organization might not seek to make a profit but want to increase in performance for other reasons. The Houston Food Bank, for example, wants to increase the number of clients it can serve by providing food. It wants to improve its performance just as much as a for-profit organization but has a different goal in mind.

*Organizational performance* refers to the effectiveness of an organization in achieving its goal (Kotter & Heskett, 1992).

*Peer* refers to an individual or colleague who is “equal to another in abilities, qualifications, age, background, and social status” (Webster’s New World Dictionary, p. 996). Colleagues work toward a common purpose, recognize each other's abilities and learn from each other. Colleagues work together to improve the performance of the organization.
Perceived content validity is defined as the extent to which a trainee thinks the content of a course/training aligns with job requirements.

Performance is defined as behavior that results in achievement and accomplishment. Performance is what happens when training is successfully applied to the job with positive results. Burke and Hutchins (2007) emphasize that performance is not the same thing as learning because an individual can learn but return to the job and not translate their learnings into performance. Burke and Hutchins say “performance—rather than learning—is the major outcome of training” (p. 122).

Practitioner is defined as a workplace learning professional whose job responsibilities include providing learning and development opportunities to employees to assist in improving individual and organizational performance.

Self-efficacy is “the belief in one’s capabilities to organize and execute the courses of action required to manage prospective situations” (Bandura, 1995, p. 2).

Social learning as discussed by Bandura notes that people observing each other and learn from the behavior and actions of others. Vygotsky and Cole’s (1978) theory of social interaction supports Bandura by noting that social interaction is basic to cognition development. Trainers often think of social learning as informal learning. Social learning is defined as learning from and along with others. This type of learning has been around since the caveman and continues easily in the Information Age. It has occurred in groups, at conferences, with old friends, in taverns and cafes as easily as in a classroom or with colleagues down the hall. Individuals receive a combination of five benefits in seeking information from other people: solutions, meta-knowledge (pointing to people or
databases), validation of plans or solutions, reformulation of problems, and legitimization from interaction with a highly respected person (Cross, Rice, & Parker, 2001).

*Sphere of control* is the extent that an organization can influence a training transfer characteristic.

*Trainee* (participant, learner) is the recipient of training. These terms are used interchangeably throughout the dissertation.

*Trainer* (facilitator, instructor) refers to the individual who leads the training event. While these terms may have different meanings in some instances, they will be used interchangeably in this dissertation.

*Training* is the “systematic acquisition of knowledge, skills and attitudes (KSAs) that together lead to improved performance in a specific environment” (Salas et al., 2006, as cited in Grossman & Salas, 2011, p. 103).

*Training transfer* is “the degree to which trainees effectively apply the knowledge, skills and attitudes gained in a training context to the job” (Baldwin & Ford, 1988, p. 63). For this dissertation transfer of training will be tied to performance and transfer of training will be defined as applying training to the job with positive results.
Chapter 2: Review of Relevant Literature

Organizations spend billions on training because they know that training works if the employee transfers training to on-the-job performance (Grossman & Salas, 2011; O’Leonard, 2012). Indeed, research has shown that successful transfer of training to on-the-job performance can improve productivity, improve morale, improve safety, and reduce costs (Grossman & Salas, 2011). Sadly, it is estimated that only 5% to 20% of training transfers to on-the-job performance (Brinkerhoff, 2006; Broad, 2000; Fitzpatrick, 2001; Mooney & Brinkerhoff, 2008; Tannenbaum & Yukl, 1992). Money spent on training that does not transfer to on-the-job performance is money wasted.

In a time of brutal global competition, exponential knowledge growth, instant social messaging, rapidly changing technology and increasing competition for skilled employees, organizations cannot afford to waste their limited resources. Organizations recognize this and are putting more and more pressure on learning and development leaders to prove that “employees are applying the skills they have learned…” (O’Leonard, 2012, p. 11) to ensure they are getting a return on their investment.

The purpose of this study is to provide a comprehensive, integrated review of the transfer of training literature from 1988 to 2011. The study used Baldwin and Ford’s (1988) Model of the Transfer Process to categorize findings since their work has been recognized as the most frequently used framework in the field (Blume et al., 2009). The study includes their findings and builds on them with current findings to identify the most frequently confirmed characteristics shown to impact training transfer.

The study also follows Baldwin and Ford’s (1988) recommendation to take “a more eclectic orientation toward transfer by focusing on a number of other literatures
neglected by industrial-training researchers” (p. 98). Research from industrial training literature in this study is supplemented by research from literature from other sources such as government; business, education, organizational development, the learning sciences, change management and industrial training (see Figure 5).

**Figure 5. Sources to provide eclectic approach to research.**

For example, John Hattie’s *Visible Learning* (2009) research was included from educational literature. Hattie’s research took 15 years and synthesized 800 meta-analyses (50,000+ studies) and included data from millions of participants from birth through university. Research from government literature included data from the U.S. National Research Council’s *How People Learn: Brain, Mind, Experience, and School* (2000). Literature from the learning sciences included *The Cambridge Handbook of The*
Learning Sciences (Sawyer, 2006). Sawyer noted that 2000 National Research Council Report (NRC) was “the first overview of the new sciences of learning” (p. xii) and that his own work “pick[ed] up where the NRC report left off” (p. xii). Business literature included research from Bersein and the American Society of Training and Development and others to bring a more eclectic and comprehensive approach to the research.

With so much research and such an extensive data base, it would seem that identifying characteristics that cause successful transfer of training to on-the-job performance should be easy. However the very extent of the data along with conflicting results from different researchers leaves business stymied. With estimates that only 5 to 20% of training transfers back to on-the-job performance, it is clear that what causes effective training transfer is confusing (Brinkerhoff, 2006; Broad, 2000; Fitzpatrick, 2001; Mooney & Brinkerhoff, 2008) and there is a need to consolidate the research into a meaningful tool for business.

Baldwin and Ford’s Model for the Transfer Process (see Figure 1) is the most frequently used model to categorize training transfer findings (Blume et al., 2010). Findings are called characteristics and are categorized under three training inputs which impact training transfer. These three training inputs are (a) trainee characteristics, (b) training design, and (c) work environment.

This literature review first explains Baldwin and Ford’s (1988) Model for the Transfer Process because understanding the model is foundational to understanding the three training inputs that impact training transfer. After discussing Baldwin and Ford’s model, the literature’s review is divided into three sections. Section 1 focuses on the training input Baldwin and Ford called trainee characteristics and first provides a
summary of the literature captured in their study and second provides the findings from a comprehensive review of the training transfer literature on trainee characteristics since Baldwin and Ford.

Section 2 focuses on the input Baldwin and Ford (1988) called training design and first provides a summary of the literature captured in the Baldwin and Ford study and secondly provides the findings from a comprehensive review of the training transfer literature on training design since Baldwin and Ford’s study.

Section 3 focuses on the training input Baldwin and Ford (1988) called work environment and first provides a summary of the literature captured in the Baldwin and Ford study and second provides the findings from a comprehensive review of the training transfer literature on work environment since the Baldwin and Ford study. For ease of reading, the dissertation framework with Section Numbers (see Figure 6) is shown below.

<table>
<thead>
<tr>
<th>Section 1 Trainee Characteristics</th>
<th>Section 2 Training Design</th>
<th>Section 3 Work Environment</th>
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<tr>
<td>Baldwin and Ford (1988)</td>
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<td>After Baldwin and Ford (1988-2011)</td>
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*Figure 6. Literature review framework with section numbers.*

**Understanding Baldwin and Ford’s (1988) Model of Transfer Process**

Understanding the Baldwin and Ford (1988) model is foundational to understanding how they demonstrated the three training inputs impacted training transfer. Baldwin and Ford explained their Model of the Transfer Process (see Figure 1) in terms of three factors and the six linkages among these factors. These factors were (a) training
inputs, (b) training outputs, and (c) conditions of transfer and the six linkages among these factors were designated by numbers 1-6. The linkages show that the training inputs and the training outputs have both direct and indirect impacts on the conditions of transfer.

Generalization and maintenance are the conditions of transfer and are the end result of positive training transfer. According to Baldwin and Ford (1988), training transfer is more than just remembering the knowledge, skills and attitudes (KSAs) taught in a training experience. A participant must learn and retain the KSAs, apply (generalize) the learnings to the job site, and maintain these learnings over a period of time for training transfer to occur. Learning and Retention (training output) have a direct impact on Generalization and Maintenance since a participant must learn the material in a training situation and retain that knowledge and skill (Kirkpatrick, 1967, as cited in Baldwin & Ford, 1988) in order to apply them. The direct impact of Learning and Retention on Generalization and Maintenance is shown by linkage 6.

Trainee Characteristics (Training Input) also have a direct impact on Generalization and Maintenance. A trainee might learn the KSAs and retain them but then make a conscious or unconscious decision to not transfer the learnings because of lack of motivation (Frazis, Gittleman, & Joyce, 2000) or concern of being different from his peers and, or lack of peer support (Chiaburu & Marinova, 2005; Colquitt, LePine, & Noe, 2000). The direct impact of trainee characteristics on the end results of Generalization and Maintenance is shown by linkage 4.

Work Environment (Training Input) also has a direct impact on Generalization and Maintenance. A trainee might learn and retain the KSAs from a training activity but
not have the opportunity to use the learnings back on the job (Burke & Hutchins, 2007). Not having the opportunity to apply the learnings keeps training from transferring back to the job performance. Having a positive work climate that encourages the transfer of training also supports training transfer. Cromwell and Kolb (2004) showed that having supervisor support improved training transfer. Lack of supervisor support would make training transfer more difficult. The work environment’s direct impact on Generalization and Maintenance is shown by linkage 5.

Finally, the three Training Inputs of (a) trainee characteristics, (b) training design, and (c) work environment all directly impact learning and retention. The direct impacts of trainee characteristics, training design and work environment on learning and retention are shown by linkages 2, 1 and 3 respectively in Figure 1.

Some examples of trainee characteristics that impact learning and retention are: cognitive ability (Colquitt et al., 2000), learner readiness (Devos et al. 2007) and self-efficacy (Bell & Kozlowski, 2002). A trainee has to have the innate ability to learn the KSAs presented in training and has to be ready to learn. Self-efficacy, the confidence in one’s self to achieve the learning, has also been shown to be effective in mastering and retaining new KSAs. The direct impact of trainee characteristics on learning and retention is shown in linkage 2.

Training Design also has a direct impact on learning and retention. Some examples of effective training design include error management (Burke & Hutchins, 2007), a realistic training environment (Salas et al., 2006) and behavior modeling (Taylor, Russ-Eft, & Taylor, 2009). The direct impact of training design on learning and retention is shown by linkage 1 in Figure 1. However, Blume et al. (2010) note that there
is “lack of consistent support for any particular transfer interventions” (p. 32) so Blume posits that there is no one design element that is effective for all training. They caution that the training professional must be aware of the content of the training and design the training with the specific audience and learning objectives in mind.

Finally, the work environment has a direct impact on learning and retention shown by linkage 3 in Figure 1. Saks and Belcourt (2006) note that supervisor support before, during and after training influenced whether or not a trainee would transfer training to on the job performance. Chiaburu and Lindsay (2008) found trainees who had supervisors that reinforced that training was useful and valuable were much more likely to transfer training to the job. The supervisor and work environment influences training transfer before the trainees set foot in the training experience (Grossman & Salas, 2011).

Baldwin and Ford’s (1988) review of the literature on transfer of training jumpstarted interest in transfer of training and their Model of the Transfer Process set the basis for understanding the transfer of training by identifying the three broad training inputs that impact training transfer as (a) trainee characteristics, (b) training design, and (c) work environment. In 1988 these authors reviewed empirical studies from 9 organizational training leaders which included “Bass & Vaughan, 1966; Campbell, 1971; Campbell, Dunnette, Lawler & Weick, 1970; Decker & Nathan, 1983; Ellis, 1965; Goldstein, 1980, 1986; McGehee & Thayer, 1961; Wexley, 1984; and Wexley & Latham, 1981” (p. 66). Baldwin and Ford reviewed thirty-seven other studies along with these to provide a review of transfer of training literature as of 1988.

Baldwin and Ford (1988) critiqued the available studies on transfer of training from 1907–1987 that met their criteria and suggested areas for needed future research.
Their study drew insights from researchers in the field of industrial psychology and peer reviewed articles in such publications as the Journal of Experimental Psychology, Behavior Research and Theory, American Psychologist, the Journal of Applied Behavioral Science, Journal of Consulting and Clinical Psychology, Psychological Reports and the Personnel Psychology. A key recommendation from their report was that future researchers “take a more eclectic orientation toward transfer by focusing on a number of other literatures neglected by industrial-training researchers” (p. 98).

This dissertation followed Baldwin and Ford’s (1988) recommendation and took a more eclectic review of the literature. The dissertation started with the same peer reviewed research sources as Baldwin and Ford and included the research from publications from industrial psychology journals such as Personnel Psychology, Psychological Review, Training and Development Journal and others as its beginning. The dissertation then extended the literature review to include several large studies on learning from educational sources. The dissertation reviewed findings from How People Learn: Brain, Mind, Experience and School (2000) published by the United States National Research Council. This report was compiled by learning scientists and shows their consensus on learning throughout the previous 20 years (1979–1999).

The dissertation also reviewed findings from Sawyer’s (2006) The Cambridge Handbook of The Learning Sciences, as well as findings from John Hattie’s (2009) Visible Learning, a synthesis of more than 800 meta-analyses identifying the best practices in ensuring learner achievement (performance for an adult). It also included books and research by leading learning scientists in the field of adult education such as Malcolm Knowles, Rosemary Caffarella and Craig Schneier and others along with
learnings from the American Society of Training and Development. This was an effort to bring different research areas together to be able to help practitioners pinpoint where to put their investment resources.

Baldwin and Ford created a Model of the Transfer Process (see Figure 1) that continues to be the most frequently used framework by training transfer researchers (Blume et al., 2010). Their simple model provides a framework to categorize and compare studies. This dissertation first provides a summary of Baldwin and Ford’s training transfer literature review using their Model of the Transfer Process as the framework. Baldwin and Ford posit that both training inputs and training outputs impact training transfer. The following explains Baldwin and Ford’s model.

Starting with the end in mind, Baldwin and Ford demonstrate that the training outcomes of learning and retention have a direct impact on training transfer. Obviously, the trainee must learn and retain the knowledge, skills, and attitudes learned in training in order to transfer them to on the job performance (Kirkpatrick, 1967). Baldwin and Ford then note that Trainee Characteristics with the traits of ability, personality, and motivation have a direct influence on training transfer. These authors note that even if the skills are well learned and retained, the trainee may not be motivated to transfer the skills or his/her personality might restrict the desire to transfer. Just because an individual learns and retains the knowledge and skill does not mean he/she will apply them. Baldwin and Ford show that work environment has a direct influence on training transfer. Trainees must have the opportunity to use their newly acquired KSAs in the work environment and support in the environment to try them.
Finally, Baldwin and Ford (1988) posited that trainee characteristics, training design, and the work environment have a direct impact on the trainee’s ability to learn and retain so training can be transferred.

**Section 1: Trainee Characteristics**

Trainees bring who they are to training. Innate personal characteristics impact how much a trainee learns and whether or not he transfers learned knowledge and skills to on-the-job performance. This section discusses literature regarding trainee characteristics first included in Baldwin and Ford (1988) and then literature that occurs after their study for the years 1988–2011.

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*Figure 7. Literature framework—section 1 trainee characteristics.*

**Trainee characteristics: Baldwin and Ford.** Baldwin and Ford (1988) reasoned that an individual’s personal characteristics must impact training transfer. They found scarce research on trainee characteristics felt to affect training transfer and identified only the characteristics of (a) ability, (b) personality and, (c) motivation as impacting the transfer of training (see Table 1). They called for more research on trainee characteristics that might impact training transfer.
Table 1

Trainee Characteristics in Baldwin and Ford

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<tr>
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<tr>
<td>a. Ability</td>
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<tr>
<td>• Ability (intelligence, IQ, aptitude)</td>
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<tr>
<td>• Success in earlier training</td>
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</tr>
<tr>
<td>• Demographics (education, age, income level, rank job level, number of subordinates)</td>
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</tr>
<tr>
<td>b. Personality</td>
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<tr>
<td>• Criterion composite of (a) training performance, (b) probability assessment of promotion potential, and (c) socio-metric measure of Personality (activeness, sociability, responsibility, independence, promptness)</td>
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<tr>
<td>• Need for achievement</td>
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</tr>
<tr>
<td>• Confidence</td>
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<tr>
<td>• Locus of control</td>
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</tr>
<tr>
<td>c. Motivation</td>
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<tr>
<td>• Belief in value of training</td>
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<tr>
<td>• Higher self-expectancies</td>
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<tr>
<td>• Choice to attend/not attend training</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• High job involvement</td>
<td></td>
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<tr>
<td>• Reinforcing feedback</td>
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Baldwin and Ford (1988) noted that ability seemed to impact transfer and cited indications from “Downs, 1970; L. Gordon, 1955; M. Gordon & Cohen, 1973; McGehee, 1948” (p. 68). Other researchers (Gordon & Kleiman, 1976; Neel & Dunn, 1960; Robertson & Downs, 1979; Ryman & Biersner, 1975; Smith & Downs, 1975; Taylor, 1952; Taylor & Tajen, 1948; Tubiana & Ben-Shakhar, 1982) are cited in Baldwin and Ford’s work as finding that some ability and aptitude tests can predict an individual’s
trainability. However, they also included Ghiselli’s (1966) review of literature regarding the successful prediction of trainability via use of aptitude tests, and Ghiselli concluded the predictive power was “far from impressive” (p. 68).

While Ghiselli’s (1966) findings seemed to limit the strength of ability as a key influence on transfer of training at the time, Baldwin and Ford still noted that general intelligence (Neel & Dunn, 1960) seemed to be a factor for learning and for the transference of skills to the workplace. Baldwin and Ford expressed concern for the lack of information about the importance of ability in training transfer and called for more research. They noted that the trainee’s ability had been tested primarily as retention of data and tested immediately after a course. They were concerned that this did not speak to the issue of whether or not training would transfer to the actual on-site job but assumed it set the initial requirement that material must be retained. That is, an individual had to first retain the training and be trainable if s/he were to be expected to be able to transfer the training later to on-the-job performance.

Baldwin and Ford found no studies with clear findings to indicate which of the ability characteristics were the most important to transfer of training. They recommended that more research needed to be done on trainee characteristics and suggested research also needed to be done on how to match training to trainee characteristics.

They also noted limited research on which personality factors were the most important component of trainee characteristics. Initial research in personality factors came from Noe and Schmitt (1986) who indicated internal locus of control seemed to play a role in motivation and Baumgartel, Reynolds, and Pathan (1984) agreed that managers seemed more likely to have an internal locus of control if they were also high
in need for achievement. However, Miles (1965) said that “personality factors had no
direct effect on transfer” (p. 68). Later researchers will consider personality factors in
more detail. Again results are foggy and limited. Baldwin and Ford call for more
research.

Baldwin and Ford’s third component in trainee characteristics was motivation. The
findings for motivation were widely scattered in sub-topics and resulted in a
hodgepodge of findings. They suggested more research was needed on motivation. The
researchers cited Ryman and Biersner (1975) as finding a significant relationship
between trainee confidence and successful class completion. They cited Hicks and
Klimoski (1987) as showing that trainees having the ability to decide to attend or to not
attend a training course impacted their motivation to learn. They cited Tubiana and Ben-
Shakhar (1982) as finding a significant relationship between motivation to perform
successfully in training and “a composite criterion of training performance, a probability
assessment of promotional potential, and a socio-metric measure of the trainee’s
popularity with peers” (p. 69).

Baldwin and Ford cited other researchers who noted that employees with high job
involvement showed more motivation to learn and transfer skills (Noe & Schmitt, 1986)
and managers who believed in the value of training were more apt to be successful in
training and more apt to transfer training to the job (Baumgartel et al., 1984). Finally the
researchers noted that some researchers found higher self-expectancies (though whether
this refers to self-efficacy or holding self to higher standards was unclear) resulted in
higher performance (Eden & Ravid, 1982; Eden & Shani, 1982).
Baldwin and Ford also noted posttraining interventions such as goal setting and feedback as part of trainee characteristics; however, later researchers will move these to training design and discuss them there (which is what this study will do). They cited Wexley and Nemeroff (1975) as finding a significant relationship between management development trainees who were assigned goals and their success in applying their learning vs. a control group of management development trainees who did not get goals and were less successful.

Baldwin and Ford identified a wide assortment of findings about trainee characteristics. They called for a theoretical framework to guide future research so that there can be a systematic review of and comparison of studies and findings to identify what trainee characteristics are needed for successful training and training transfer. They recognize that research to 1988 had examined some individual-difference factors such as job involvement, need for achievement, belief in value of training, aptitude tests, peer popularity, and intelligence level but called for more data. The researchers noted that a number of motivational strategies had been considered in research such as goal setting, choice in attending training, realistic information about training programs and relapse prevention but the researchers clearly pointed out that that there was no coherent, systematic approach to the analysis of training transfer.

Clearly, motivation became a catch-all component in Baldwin and Ford’s first efforts to capture findings from then current data. Baldwin and Ford paid special attention in their recommendations regarding future research on motivation suggesting the perceived value of using the expectancy model (Lawler, 1973; Vroom, 1964). The researchers saw value in the expectancy model because of its interactive aspect between
motivation and perception. They posited that an individual’s perception of self and perception of the work environment impacted the trainee’s general attitude and so impacted motivation. Their opinion was that the expectancy theory would provide a lens to delve into more aspects of trainee characteristics such as locus of control, self-esteem, communication style, and past experience and that understanding these will provide more information on trainee characteristics. They particularly liked the concept of the expectancy framework because it sees motivation as a dynamic element that can change over time.

Baldwin and Ford (1988) concluded that research on trainee characteristics was too limited to identify specific characteristics that could impact training transfer. They called for more research in this area and researchers answered this call with a plethora of research after them.

**Trainee characteristics: After Baldwin and Ford (1988).** Trainees bring who they are to training. That is, they bring their cognitive abilities, their past experiences and their own personalities into the learning environment. These, innate personal characteristics impact how much a trainee learns and whether or not s/he transfers learned knowledge and skills to on-the-job performance. Few personal characteristics (ability, success in earlier training, activeness, sociability, need for achievement, confidence, locus of control, motivation, high job involvement and higher self-expectancies) had been studied when Baldwin and Ford conducted their review.

After Baldwin and Ford, the floodgates opened on trainee characteristics that impact transfer of training. “A learner’s characteristics influence training outcomes…[and] an individual’s ability and motivation affect performance,” (Sackett,
Gruys, & Ellingson, as cited in Burke & Hutchins, 2007, p. 265). Table 2 shows some of the trainee characteristics researched since Baldwin and Ford. The sheer number of characteristics studied makes it clear why an organization would have difficulty deciding where to invest their resources.

Table 2

*Trainee Characteristics in and After Baldwin and Ford*

<table>
<thead>
<tr>
<th>In Baldwin and Ford</th>
<th>After Baldwin and Ford</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>a. Ability</strong></td>
<td><strong>a. Ability</strong></td>
</tr>
<tr>
<td>• Ability (intelligence, IQ, aptitude tests)</td>
<td>• Basic skills</td>
</tr>
<tr>
<td>• Success in early training</td>
<td>• Demographics (gender, age, ethnicity, work experience, military experience, union membership, organization and role level, geographic location, tenure, biodata, etc.)</td>
</tr>
<tr>
<td>• Demographics (education, age, job- income level, rank job level, number of subordinates)</td>
<td>• Cognitive ability</td>
</tr>
<tr>
<td><strong>b. Personality</strong></td>
<td><strong>b. Personality</strong></td>
</tr>
<tr>
<td>• Composite criterion of (1) training performance, (2) probability assessment of promotion potential, and (3) socio-metric measure of trainee’s popularity with peers</td>
<td>• Negative affectivity</td>
</tr>
<tr>
<td>• Personality (activeness, sociability, responsibility, independence, promptness)</td>
<td>• Positive affectivity</td>
</tr>
<tr>
<td>• Need for achievement</td>
<td>• Self-efficacy</td>
</tr>
<tr>
<td>• Confidence</td>
<td>• Conscientiousness</td>
</tr>
<tr>
<td>• Locus of control</td>
<td>• Intrinsic motivation</td>
</tr>
<tr>
<td><strong>(table continues)</strong></td>
<td><strong>Knowledge of self</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Openness to experience</strong></td>
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<tr>
<td></td>
<td><strong>Extroversion</strong></td>
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<tr>
<td></td>
<td><strong>Introversion</strong></td>
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<tr>
<td></td>
<td><strong>Intellectual curiosity</strong></td>
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<td></td>
<td><strong>Emotional stability</strong></td>
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<td></td>
<td><strong>Fear</strong></td>
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<td></td>
<td><strong>Anxiety</strong></td>
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<td></td>
<td><strong>Locus of control</strong></td>
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<tr>
<td></td>
<td><strong>Agreeableness</strong></td>
</tr>
<tr>
<td>In Baldwin and Ford</td>
<td>After Baldwin and Ford</td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>c. Motivation</td>
<td>c. Motivation</td>
</tr>
<tr>
<td>• Belief in value of training</td>
<td>• Confidence</td>
</tr>
<tr>
<td>• Higher self-expectancies</td>
<td>• Experience with other cultures</td>
</tr>
<tr>
<td>• Choice to attend/not attend training</td>
<td>• Cultural influences</td>
</tr>
<tr>
<td>• High job involvement</td>
<td>• Individual cynicism</td>
</tr>
<tr>
<td>• Reinforcing feedback</td>
<td>• Adaptability</td>
</tr>
<tr>
<td></td>
<td>• Capacity for learning how to learn</td>
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</table>

The extensive research into trainee characteristics after Baldwin and Ford added great robustness to the field; however, the resulting literature “remains characterized by inconsistent measurement of transfer and significant variability in findings” (Blume et al., 2010, p. 1065) making it difficult for an organization to determine where to focus resources. While all of the above characteristics make up an individual’s personality and self, the purpose of this dissertation is to research and isolate data that can help the practitioner put research into action.
After extensive research, four trainee characteristics were selected as having the most impact on transfer of training. These four were selected because they were each identified as impacting training transfer from at least three sources that included the reviewed meta-studies, *Visible Learning* (Hattie, 2009), *How People Learn: Brain, Mind, Experience and School* (National Research Council, 2000), *Handbook of Human Factors and Ergonomics* (Salvendy, 2006), *The Modern Practice of Adult Education* (Knowles, 1980), or *The Cambridge Handbook of the Learning Sciences* (Sawyer, 2006). The four trainee characteristics believed to have the most impact on transfer of training are: (a) cognitive ability, (b) self-efficacy, (c) motivation, and (d) perceived value of training.

Hattie (2009) spent 15 years reviewing over 800 meta-analyses relating to achievement. He created a visible tool built on the same concept as a speedometer in order to show the differing influence of various characteristics on learning. Hattie took the average of each influence and placed an arrow through one of the zones on the speedometer to index the influence of that particular characteristic. All influences that average above $d = .40$ are in the Zone of desired effects “as these are the influences that have the greatest impact on student achievement outcomes” (p. 19). A speedometer (see Figure 8) is shown for any characteristic that Hattie identified as influential. The arrow designates the influence.

1. **Cognitive ability.** Burke and Hutchins (2007), Alvarez, Salas, and Garofano (2004), Grossman and Salas (2011), and Hattie (2009) all identified cognitive ability as a trainee characteristic that impacts transfer of training. Cognitive ability was defined as an individual’s intelligence and his capacity to understand, to learn and to solve problems. Tests of cognitive ability often included verbal and math questions along with questions
from specific areas of knowledge such as science, spatial ability, etc. (Tannenbaum et al., 1993). Researchers have long believed that cognitive ability influences training and learning (Bell & Kozlowski, 2002; Burke & Hutchins, 2007; Cannon-Bowers et al., 1995; Ferguson et al, 2000; Gully, 2002). Burke and Hutchins cited Colquitt, Le Pine, and Noe’s (2000) extensive meta-analysis based on 20 years of training research as showing a .43 correlation between cognitive ability and training transfer.

Alvarez, Salas, and Garofano (2004) cited researchers who found cognitive learning related to transfer performance (Alliger, 1997; Kraiger, 1993; Tannenbaum, 1993). Cognitive learning depends upon cognitive ability and is measured through testing (Tannenbaum et al., 1993, as cited in Alvarez et al., 2004). Alvarez et al. noted that cognitive learning was one of the 10 training characteristics that influence training outcomes.

Grossman and Salas (2011) noted that a trainee’s cognitive ability was a strong predictor of transfer. Grossman and Salas cited research from Blume et al. (2010), Colquitt et al. (2000), Kanfer and Ackerman (1989), and Velada et al. (2007) as researchers who found that “trainees higher in cognitive ability have more success in processing, retaining, and generalizing trained skills” (Grossman & Salas, 2011, p. 107).

Clark and Voogel (1985) posited that “one of the most common and supportable findings in educational research is that far transfer is achieved by students with higher general ability scores” (p. 120). This finding also demonstrates where terminology can alienate use of findings. Practitioners need clarity of terms and transparency in how to apply findings. To ensure understanding, near and far transfer is explained below.
Transfer of training is often separated into two categories called *near transfer* and *far transfer*. Far transfer is the application of learning to situations dissimilar to those of the original learning event. Far transfer involves training where the participant must learn knowledge and skills and be able to apply them to situations that can change. This is more difficult to teach because the learner must learn not only the skills and knowledge, but also must determine how to adapt them to changing situations. It also makes the learning more difficult to transfer. Near transfer is the application of learning to situations that are always similar to the learning event. Near transfer generally applies to training that is redundant, applied in the same order, or procedural. This training is easier, but the learner is unlikely to be able to apply it to changing situations (Cree & Macaulay, 2000).

Hattie (2009) looked at cognitive ability via a lens of what the individual had achieved in the previous years. He noted that brighter individuals tended to achieve more and not as bright individuals achieved less. This was a trend that manifested itself year after year. After comparing over 800 meta-studies, Hattie concluded that “prior achievement is a powerful predictor” (p. 41) of the ability to be trained and to transfer that knowledge to application. He also noted that the .67 effect size for prior achievement as an indicator of future success was one of the highest effect sizes in his synthesis of over 800 meta-studies. Prior achievement was clearly a strong indicator of future ability. Cognitive ability was the key factor in achievement, so clearly cognitive ability influences future performance (see Figure 8).
Feinstein (2003) compared achievement for more than 17,000 United Kingdom children looking at their achievement at 22 months, 32 months, 42 months, 5 years, 10 years, and age 26. Feinstein’s study found that ability at 22 months was a good predictor of ability at 26 years old. Feinstein also noted social class effects (based on parent occupation) at 22 months and found this also influenced children’s performance.

Feinstein (2003) posited that the dual influence of early achievement and socioeconomic resources had a strong impact on future performance. This is a characteristic that is set long before an individual enters the workforce. There is little that training practitioners can do about cognitive ability once the individual is hired; however, the training and human resources departments can work together to ensure that recruitment and selection provides the employee most suitable for the work.
2. **Self-efficacy.** Hattie (2009) considered self-efficacy as one strand in the rope of self-confidence. Hattie noted a Hansford and Hattie study that found a low but positive relationship between an individual’s self-concept and achievement (see Figure 9).


Self-efficacy is an individual’s belief in his own competence and ability (Bandura, 1995). Ford and Weissbein (1997), Merriam and Leahy (2005), Hattie (2006), Salvendy (2006), Burke and Hutchins (2007), and Grossman and Salas (2011) noted that self-efficacy influenced transfer of training and performance. Many researchers in the 1990s such as Facteau et al. (1995), Gist, Stevens, and Bavetta (1991), Saks (1995), and Tannenbaum and Yukl (1992) did research on self-efficacy. More recently, Holladay and Quinones (2003), Ku and Chang (2011), and Switzer, Nagy, and Mullins (2005) have added to the database of trainee characteristics with a studies on the role of self-efficacy in the transfer of training.
Several researchers found a positive relationship between pre-training self-efficacy and training mastery (Harrison, Rainer, Hochwarter, & Thompson, 1997; Holladay & Quinones, 2003; Mathieu, Martineau, & Tannenbaum, 1993). Others have found a positive relationship between self-efficacy and transfer generalization and transfer maintenance (Chiaburu & Marinova, 2005; Ford, Smith, Weissbein, Gully, & Salas, 1992; Gaudine & Saks, 2004; Saks, 1995). Some researchers have found that some interventions designed to increase self-efficacy have caused increases in training performance (Gist, 1989; Gist et al., 1991; Morin & Latham, 2000) and concluded that self-efficacy is malleable. The finding that self-efficacy is malleable is of interest to organizations eager to find ways to influence transfer of training because it means that self-efficacy can be taught or supported.

Ford and Weissbein (1997) noted that self-efficacy came from applied social learning concepts and had been shown to impact confidence in executing a task during training transfer. Merriam and Leahy (2005) agreed that individuals who believed they could do more in the workplace were more likely to apply skills and learning in training transfer.

Salvendy (2006) noted that self-efficacy had been studied extensively in the 1990s. Interestingly, Salvendy noted that self-efficacy whether held before training or acquired during training, “was influenced by cognitive ability (Hunter, 1996), influence[d] reactions to training (Mathieu et al., 1992), h[ad] motivational effects Quinones, 1995), l[ead] to better performance (e.g., Martocchio and Webster, 1992; Ford et al., 1997; Stevens and Gist, 1997), and dictate[d]” (p. 479) whether trainees would or would not transfer training.
Burke and Hutchins (2007) support Salvendy’s position that self-efficacy can be acquired and cite studies from Gist (1989), Gist et al. (1991), and Brown and Morrissey (2004), who identified interventions that worked to help increase self-efficacy to enhance training transfer. Gist (1986) noted that supportive feedback and mastery experiences were transfer interventions that improved self-efficacy (as cited in Burke & Hutchins, 2007). Gist (1991) demonstrated that goal-setting and self-management strategies were effective in increasing self-efficacy when used as posttraining interventions (as cited in Burke & Hutchins, 2007). Brown and Morrissey (2004) noted that verbal self-guidance worked to improve self-efficacy and training transfer when used as a transfer intervention (as cited in Burke & Hutchins, 2007). These were good learnings for practitioners wanting to improve self-efficacy of learners in the workplace environment.

Finally, Grossman and Salas (2011) identified self-efficacy as one of the most consistent relationships with training transfer. Grossman and Salas cited Blume et al. (2010), Burke and Hutchins (2007), Chiaburu and Lindsay (2008), Chiaburu and Marinova (2005), and Velada et al. (2007) as studies that confirm the influence of self-efficacy on training transfer. Grossman and Salas concluded that individuals with high self-efficacy had more confidence in their abilities and so were more likely to persist with difficult tasks and so more likely to achieve performance.

3. Motivation. Motivation is a characteristic that has been extensively researched in the literature of training transfer (Cannon-Bowers et al., 1995; Chiaburu & Marinova, 2005; Facteau et al., 1995; Holton, 1996; Noe & Schmitt, 1986; Quinones, 1995; Tannenbaum et al., 1993; Tannenbaum & Yukl, 1992; Tracey et al., 2001; Warr et al., 1999; Warr & Bunce, 1995). Motivation refers to how the persistence and intensity
trainees apply to their learning before, during and after the learning event. Burke and Hutchins (2007), Grossman and Salas (2011), Hattie (2009), Merriam and Leahy (2005), Salvendy (2006), and Yamnill and McLean (2001) posit that motivation influences training transfer.

Motivation influences how much time and effort a trainee is willing to devote to learning or applying training (National Research Council, 2000). Motivation impacts more than just the trainee’s desire to learn. Merriam and Leahy (2005) note that a “… participant’s motivation is one [characteristic] that affects the transfer of learning” as well (p. 5).

Grossman and Salas (2011) agree that motivation influences training transfer and note at the beginning of their study that they have chosen to report only those characteristics that have “the strongest, most consistent relationships with the transfer of training” (p. 103). Grossman and Salas cite studies by Baldwin et al. (2009), Blume et al. (2010), Chiaburu and Lindsay (2008), Chiaburu and Marinova (2005), Naquin and Holton (2002), and Tziner et al. (2007), confirming the influence of motivation on training transfer.

Salvendy (2006) agreed that motivation influences training and also noted a meta-study by Colquitt et al. (2000) that found that motivation is multifaceted. Colquitt et al. found a number of characteristics influenced motivation. These characteristics included cognitive ability, self-efficacy, anxiety, age, and valence). Colquitt et al. also found that situational factors also influenced motivation. These factors included supervisor support, peer support, organizational support and a positive climate for transfer). Salvendy posited that this was “one of the most important findings from this research” (p. 480) because it
indicated that different training factors intersect (trainee characteristics and work environment) and a wider scope of needs analysis might be needed to determine upfront how the various characteristics of motivation might impact results of the training transfer.

Motivation to learn is another construct of motivation that has been studied. Motivation to learn is defined as the amount of effort an individual is willing to exert to gain new knowledge and skills during a learning event. Burke and Hutchins (2007) report that studies by both Quinones (1995) and Noe (1986) identified motivation to learn as having a strong impact on training effectiveness.

Burke and Hutchins (2007) also singled out motivation to transfer as having an impact whether or not an individual will transfer what he/she has learned to on-the-job performance. Merriam and Leahy (2005) agreed and noted that Kehrhahn (1995) identified motivation to transfer as the only significant individual characteristic variable to influence transfer of training. Motivation to transfer is defined as the intention of the participant to actually apply the knowledge and skills learned to the on-the-job situation. Yamnill and McLean (2001) go further into motivation to transfer and consider motivation to transfer in relation to Vroom’s (1964) Expectancy Theory and Adams (1963) Equity Theory. According to Vroom (as cited in Yamnill & McLean, 2001) expectancy is “a momentary belief concerning the likelihood that a particular act will precede a particular outcome” (p. 197). Equity Theory says that employees wish to be treated fairly in relation to others. These theories are useful to understand an individual’s motivation to transfer learnings back to the job. Individuals with different levels of motivation to transfer will decide they are willing or desire to transfer learnings back to job (Yamnill & McLean, 2001).
Burke and Hutchins (2007) suggest that willingness to transfer learnings back to the job or motivation to transfer could be influenced by the intrinsic and or extrinsic components of motivation, both of which have been well examined by researchers (Rouiller & Goldstein, 1993; Santos & Stuart, 2003; Tracey, Tannenbaum, & Kavanagh, 1995). These researchers note that both intrinsic and extrinsic factors have been found to influence transfer of training and cite Rouiller and Goldstein (1993), Santos and Stuart, (2003), Taylor, Russ-Eft, and Chan (2005), and Tracey, Tannenbaum, and Kavanagh (1995) for identifying the influences of the intrinsic and extrinsic factors. However, Burke and Hutchins lean toward intrinsic factors as carrying more impact and cite Facteau et al.’s (1995) study showing trainees reporting intrinsic motivation being more persuasive to their desire to transfer training.

Yamnill and McLean (2001) presented compelling research however for extrinsic factors by citing Noe (1986). These researchers posit that Noe explains the strong relationship between desire to transfer and equity theory and explained that an individual, who believed that he will get equity in pay or equity in some other area by attending training and then applying it back on the job, was very likely to apply the learnings back on the job.

Yamnill and McLean (2001) conclude that “in studying motivation to transfer of training, it seems logical to focus on what employees feel they should receive from their jobs” (p. 199). Burke and Hutchins (2007) add a final note saying that Taylor et al. (2005) did a meta-analysis on behavioral modeling used as a training methodology and transfer of training was greatest if it was a required part of an individual’s performance review. Individuals transferred training because they were required to transfer training.
Finally, Hattie (2009) noted a study from Dornyei (2001) who found that motivation was highest when individuals had autonomy, worthwhile goals, felt competent, got feedback and felt confirmed by others (see Figure 10).


This study also determined that anxiety caused by embarrassment, conflicts, and poor performance de-motivated learners. Anxiety interestingly, was considered a trainee characteristic by researchers but this dissertation addressed anxiety under training design because it is the trainer and training design that can create or alleviate anxiety.

4. **Perceived value of training.** Knowles (1980), Grossman and Salas (2011), Yamnill and McLean (2001), and Hutchins and Burke (2007) noted that trainees are more likely to transfer training if they perceive the training to be of value. Malcolm Knowles, the Father of Andragogy, posited that one of the key principles of adult learning was that adults learned better if the material was relevant to them (Knowles, 1980). Grossman and Salas (2011) identified the need for trainees to perceive value in training as a key trainee
characteristic to ensure transfer of training. They noted that trainees who see training as useful and valuable are much more likely to transfer new KSAs to on-the-job performance. They cited Chiaburu and Lindsay (2008), Gilpin-Jackson and Bushe (2007), and Velada et al. (2007) in support.

Yamnill and McLean’s (2001) study agreed and noted that trainees who perceived training as valuable for job performance and/or of value to their careers were more motivated and so more likely to transfer the training. The study cited research from Clark, Dobbins, and Ladd (1993) in support. Yamnill and McLean also tied perceived value of training to expectancy theory.

Expectancy theory was originally defined by Vroom (1964) and posited that expectancy was the belief that one act would likely result in particular outcome (Yamnill and McLean, 2001). Vroom’s concept focused on an individual’s ability to perform a certain task and Vroom suggested a formula of $P = f(F \times A)$ where $P$ was performance and performance was a function of force and ability. $F$ was equal to Force and Force was the product of all the possible outcomes. $A$ was equal to ability and this referred to the individual’s ability to perform the task (Yamnill & McLean, 2001).

Yamnill and McLean (2001) carried the discussion of expectancy theory further and into a more business like structure. They discussed how Porter and Lawler (1968) looked at the relationship between employee satisfaction and performance. Porter and Lawler argued if the rewards were high enough then high levels of performance could lead to employee satisfaction. That is, at the beginning, effort is a function of what the reward (valence) will be plus effort / reward ratio of probability. Yamnill and McLean (2001) note, “Effort then combines with abilities, traits, and role perceptions to determine
performance” (p. 198). They then continued to discuss both intrinsic (intangible) and extrinsic (tangible) rewards.

Intrinsic rewards were defined as intangible rewards. For example, self-satisfaction in a job well done or a sense of accomplishment could be considered intrinsic rewards. Extrinsic rewards were defined as tangible rewards. For example, a bonus or a promotion could be considered extrinsic rewards. An individual or a trainee uses a sense of social comparison within the organization to determine if s/he is being treated with equity (fair treatment). If the individual feels satisfied that s/he has been treated fairly in comparison to others then “actual performance following effort influences future perceived effort-reward probabilities” (Yamnill & McLean, 2001, p. 198). Expectancy theory helps better understand why perceived value of training is important. The theory of expectancy helps clarify why perceived value of training is important to the trainee.

Burke and Hutchins (2007) posited a trainee’s perceived utility of the training influenced training transfer. Burke and Hutchins cited findings from Axtell et al. (1997) that showed that trainees who felt training was relevant applied learned skills much quicker. They also cited findings from research by Lim and Morris (2006), which found that trainees transferred training much faster if the training satisfied an immediate need they had on the job. Burke and Hutchins summarized their identification of this influential characteristic by noting that trainees will use or transfer training if they see it is relevant to improving their performance.

These are only four of the many trainee characteristics that have been researched, however these four were the ones most cited as influential from the studies and data examined. Next, this literature review examined training design and how it influences
training transfer. First the dissertation summarized literature covered by Baldwin and Ford (1988). Next it reviewed literature regarding training design after Baldwin and Ford in the years from 1988-2011 searching for training design characteristics most often identified as influencing training transfer.

**Section 2: Training Design**

Training design is the second key input (See figure 1) that Baldwin and Ford (1988) identified as impacting transfer of training. Training design includes the selection of what materials to cover in training, the sequence of materials, instructional strategies to present the materials, the timing of materials presentations (before, during or after training), and the atmosphere of the learning situation.

![Figure 11. Literature framework—section 2: training design.](image)

**Training design: Baldwin and Ford.** The literature review next considers the impact of training design on the transfer of training as found in the Baldwin and Ford (1988) study. They identified training design as the second of the key training inputs (see Figure 1) that impact training transfer. The researchers note that training design was the input factor that had the most research at the time of their study. Table 3 shows the training design factors that they discussed.
Table 3

Training Design Characteristics in Baldwin and Ford

<table>
<thead>
<tr>
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<tbody>
<tr>
<td><strong>a. Principles of Learning</strong></td>
<td></td>
</tr>
<tr>
<td>• Identical elements</td>
<td></td>
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<tr>
<td>(Use stimulus &amp; response elements in classroom identical to job setting)</td>
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<tr>
<td>• Teaching of general principles</td>
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</tr>
<tr>
<td>(Teach not just skills but general rules &amp; theoretical principles underlying training content)</td>
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<tr>
<td>• Stimulus variability</td>
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<tr>
<td>(Use several different types of examples)</td>
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<tr>
<td>• Various conditions of practice</td>
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<tr>
<td>- Massed or distributed training</td>
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<tr>
<td>- Whole or part training</td>
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<td>- Feedback</td>
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<td>- Overlearning</td>
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<tr>
<td><strong>b. Sequencing</strong></td>
<td></td>
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<tr>
<td><strong>c. Training Content</strong></td>
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</table>

Baldwin and Ford (1988) asserted that a “large proportion of the empirical research on transfer has concentrated on improving the design of training programs through the incorporation of learning principles” (p. 66). They noted that three elements composed training design and these were (a) principles of learning, (b) sequencing and, (c) training content. They then discussed the characteristics that they found to impact training transfer under each of these elements. Principles of learning were comprised of four parts (a) identical elements, (b) teaching of general principles, (c) stimulus variability and (d) conditions of practice (McGehee & Thayer, 1961, as cited in Baldwin
and Ford, 1988). It is important to understand what Baldwin and Ford called learning principles because other researchers would discuss the impact of principles of learning on training transfer in later years but either included different factors in their principles of learning or did not describe what they included as principles of learning at all. This seemed to assume that there was some universal agreement on what principles of learning are but clearly there was not because research showed inconsistency in defining what was included as the factors of the principles of learning.

Baldwin and Ford defined each of the factors that they included in principles of learning. They started with identical elements and defined identical elements as having the same stimulus and response components in the training setting as there are in the job site where the transfer is to take place. The authors cited empirical data that supported this when training for motor skills (Crafts, 1935; Gagne, Baker, & Foster, 1950) as well as training for verbal behaviors (Duncan & Underwood, 1953; Underwood, 1951).

Baldwin and Ford defined teaching of general principles as teaching the general rules, principles and theories that support the training content as well as any applicable skills. Baldwin and Ford cited other studies that supported this concept (Crannell, 1956; Goldbeck, Bernstein, Hillix, & Marx, 1957; Hendrickson & Schroeder, 1941; Judd, 1908) however it was interesting to note that these studies had very different learning objectives. Crannel’s objective was to improve abilities in performing card sorting tricks and Goldbeck, Bernstein, Hillix and Marx’s objective was to help their audience locate problems causing electronics to malfunction. Both of these studies dealt with physical skills with observable results.
The next component of principles of learning was stimulus variability. Baldwin and Ford noted that Ellis (1965) demonstrated using a variety of tools and methods of training stimuli help training transfer. The authors also noted empirical work from Shore and Sechrest (1951) that showed that using several examples and repeating these examples several times also helped transfer learning.

Finally, Baldwin and Ford noted that conditions of practice were a component of principles of learning. Conditions of practice included four different design issues including whether to use (a) massed versus distributed training, (b) whole or part training, (c) the issue of feedback, and (d) the concept of overlearning. Here the authors cited researchers who recognized the difference in content in determining which design issue to apply.

Baldwin and Ford first discussed massed versus distributed training. This referred to whether to present the training as a whole or to divide it into modules or segments. The authors cited Briggs and Naylor (1962) and Naylor and Briggs (1963) as finding that transfer was higher when material was divided into segments. However, they then cited Holding (1965) finding that massed training followed by brief sessions and frequent rest intervals worked more effectively for complex, difficult tasks. So it seemed that what worked could be dependent upon the audience, the task or the objective.

The second component of conditions of practice was the issue of whole versus part teaching. This referred to the issue of whether to have trainees learn a segment and then practice that segment or wait until all the training was learned and then practice the whole training. The authors cited Naylor and Briggs (1965) and noted that the whole method produced better transfer under three conditions. The three conditions were (a) a
highly intelligent learner, (b) practice was broken into segments, and (c) the tasks involved were low in task complexity. Only one study was cited for this finding so Baldwin and Ford noted that additional research was needed.

The third component of conditions of practice was feedback. The authors defined this as performance information given to learners. They cited Wexley and Thornton (1972) and their finding that timing and specificity were important in providing useful feedback. However, again there were conditions. Baldwin and Ford noted that Blum and Naylor (1968) hypothesized that effective feedback might depend upon the training and the stage of learning but there was no empirical research at that point to support that hypothesis.

Finally Baldwin and Ford discussed overlearning as a component of conditions of practice. The authors used McGhee and Thayer’s (1961) definition of overlearning and defined it as continuing to give learners practice on a concept or skills well after the task has been performed correctly. Studies from Atwater (1953), Gagne and Foster (1949), Mandler (1954), and empirical support from Hagman and Rose (1983) all supported the value of overlearning to retention of knowledge and skills (as cited by Baldwin & Ford, 1988).

Baldwin and Ford spent time on principles of learning to support their Model of the Transfer Process, but noted there was a lack of empirical research to support the concepts of sequencing and content as characteristics of training design in their model. They noted that while some researchers had emphasized the need for good sequencing and the need for relevant content (Gagne, 1962, as cited by Baldwin & Ford, 1988), there was no empirical data to support that need. They did however raise questions regarding
training content. They noted that researchers had done no research into content of training programs and seemed to assume that training content would be relevant to the needs of job performance as though this were a given.

Baldwin and Ford conducted their training transfer literature review just as organizations and researchers began to focus on competency mapping to ensure a curriculum of courses that map to job needs (Burke & Baldwin, 1999; Paradise, 2007). They recognized early that the training content had to be valid to be of benefit to the organization. Obviously, if the training content had no value then the organization got no benefit even if the learning did transfer.

**Training design: After Baldwin and Ford.** When Baldwin and Ford did their seminal study in 1988 there was already a plethora of research around training design. Research in the area of training design and the impact of training design on training transfer continued to grow after them. Table 4 lists the findings from Baldwin and Ford in the left column and shows just some of the research areas investigated after them in the right column (see Table 4).

<table>
<thead>
<tr>
<th>Training Design Characteristics in and After Baldwin and Ford</th>
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<tbody>
<tr>
<td>In Baldwin and Ford (1988)</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>• Identical elements</td>
</tr>
<tr>
<td>• (Use stimulus &amp; response elements in classroom that are identical to job setting)</td>
</tr>
<tr>
<td>• Teaching of general principles</td>
</tr>
<tr>
<td>c. Training Content</td>
</tr>
</tbody>
</table>
In Baldwin and Ford (1988) | After Baldwin and Ford
---|---
• (Teach not just skills but general rules & theoretical principles underlying training content))
• Stimulus variability
• (Use several different types of examples)
• Various conditions of practice
• Massed or distributed training
• Whole or part training
• Feedback
• Overlearning
d. Other
• Active participation
• Advanced organizers
• Allowing trainee input into content
• Arguing to learn
• Attentional advice
• Behavior modeling
• Building on learner’s prior knowledge
• Cased based reasoning
• Closed skills
• Collaborative conversation
• Combined supervisor and trainee training
• Enactive exploration
• Error management
• Goal setting
• Guided exploration
• Inquiry based
• Instructor impact
• Journaling
• Lecture
• Meta-cognitive strategies
• Narratives
• Novice versus expert
• Open skills
• Participant learning processes
• Peer collaboration
• Positive training pre-information
• Posttraining interventions
• Prepractice briefs
• Reflection
• Relapse prevention
• Realistic training pre-information
• Relevant content
• Role playing
• Scenarios
• Self-management interventions
• Simulations
• Small group dynamics
• Social learning theory
• Varied practice

b. Sequencing

c. Training Content
Table 4 is not inclusive of all the training design characteristics found in the literature reviewed after Baldwin and Ford but does cover the most frequently discussed characteristics found in the literature search. The list gives an idea of the sheer volume of research data that practitioners must now sort through when trying to decide where to focus their company’s investment dollars. The volume of characteristics studied is complicated by the fact that there is little agreement on which characteristics were most effective in training transfer.

There is a hodgepodge of research findings with one or two researchers supporting this or that characteristic (such as error management or behavior modeling) and many others disagreeing and supporting different characteristics. There is no consensus on what type of training design works in what type of training or what industry.

Blume et al. (2010) tried to address the problem of inconsistent results in training design and completed a literature review with the idea of resolving conflicting findings in the training transfer literature. Blume posited that a meta-analytic review would help resolve contradictory findings by “including confidence intervals, corrected estimates, and measures of variability in correlations across studies, permitting more accurate inferences of the strength and consistency of relationships,” (p. 1069). Blume did a meta-analysis of 89 empirical studies and found that there was “the lack of consistent support for any particular transfer interventions” (p. 1096).

In spite of the findings, Blume et al. (2010) noted that they did not think that training transfer was impervious to training design interventions. For example, Blume was hopeful regarding optimistic previews as a training design intervention because they
found a moderate positive relationship between optimistic previews (compared to realistic previews) and training transfer in three studies they reviewed. Blume pointed out that two of the three studies had predicted that realistic previews would have a stronger relationship between the preview and training transfer but the results showed that optimistic previews of training fared better.

Blume et al. (2010) warned that most interventions studied by industrial psychologists were just not very action oriented because the researchers stopped at “identifying, describing, or measuring factors that may influence transfer without investigating how those factors might be effectively managed or changed” (p. 1096). The listing of contrary findings is very useful to psychologists trying to provide all sides of evidence in research; however it is confusing to practitioners who are looking for direction and low hanging fruit that guides them to decisions on where to invest their limited resources.

The only training design intervention that at least three of the industrial psychology meta-studies agreed upon (including Blume et al., 2010) was posttraining interventions. Blume saw a small to moderate correlation between posttraining interventions and training transfer. Alvarez et al. (2004) and zu Knyphausen-Aufseß et al. (2009) agreed.

Research into the educational research and adult learning literature was more productive in supplying research findings regarding effective training design. After extensive research, the following 14 training design characteristics were selected to review in depth. One, posttraining was chosen because it was identified as impacting training transfer in at least three places from the industrial psychology meta-studies.
Twelve others were chosen because they received strong support in *Visible Learning* (Hattie, 2009), *How People Learn: Brain, Mind, Experience and School* (The National Research Council, 2000), *Handbook of Human Factors and Ergonomics* (Salvendy, 2006), *The Modern Practice of Adult Education* (Knowles, 1980), *Planning Programs for Adult Learners* (Caffarella, 2002), *The Cambridge Handbook of the Learning Sciences* (Sawyer, 2006), as well as being discussed in industrial psychology. The 14th characteristic, instructor, was chosen because Hattie’s extensive study showed clear evidence of the impact of the instructor even though none of the other studies even mentioned the instructor. Fourteen were chosen because all training design will not fit all types of training and having fourteen provides options for organizations to customize for effectiveness.

The 14 training design characteristics believed to have the most impact on transfer of training are:

- posttraining interventions,
- safe learning environment,
- content relevance,
- general theory,
- meta-cognition strategies,
- behavioral objectives,
- advanced organizers,
- concept mapping,
- direct instruction,
- worked examples (practice),
• questioning,
• behavioral modeling,
• spaced learning, and
• the instructor.

These 14 are discussed in detail below.

**Posttraining interventions.** Several industrial psychology researchers identified posttraining interventions as valuable in training transfer though findings by Alvarez et al. (2004), Cheng and Ho (2001), and other researchers were difficult to compare because of naming conventions. Some researchers named findings by using the name of the specific intervention. For example, Burke and Hutchins (2007) discussed error management specifically, while others grouped various interventions into broad categories such as posttraining interventions with the individual interventions lumped together. There was inconsistency also around whether an intervention should be considered under the category of training design or considered under the category of the work environment. For the purpose of this dissertation all posttraining interventions were considered part of training design as any posttraining interventions should be designed into the training at the beginning.


Tziner et al. (1991) and Burke (1997) both found relapse prevention interventions helped improve training transfer (as cited in Cheng & Ho, 2001). Relapse prevention was defined by Gaudine and Saks (2004) as a behavioral training program that helps trainees recognize potential problems and obstacles that could interfere with training transfer when they return to work. Relapse prevention taught tools and strategies that would help trainees overcome these problems back on the job (zu Knyphausen-Aufseß et al., 2009). Stevens and Gist (1997) found posttraining interventions designed into the training such as goal setting instruction improved skills transferred to on-the-job performance.

Zu Knyphausen-Aufseß et al. (2009) agreed that posttraining interventions such as goal setting interventions and relapse prevention interventions impacted training transfer. They cited Richman-Hirsch (2001) as finding goal-setting interventions helped training transfer, and cited Brown (2005) for finding that short term or proximal goals (small wins) were useful because these motivated the trainees to persist to achieving distal or long term goals. zu Knyphausen-Aufseß, like Cheng and Ho (2001) and Alvarez
et al. (2004) also found relapse prevention to be useful in training transfer. They cited Gaudine and Saks (2004) and Burke and Baldwin (1999) in support of relapse prevention as effective in training transfer.

**Safe learning environment.** Baldwin and Ford (1988) showed effective training was necessary to ensure learning and retention and that learning and retention were prerequisites for training transfer. Caffarella (2002) emphasized that adults are more receptive to training if their learning environment is physically and psychologically safe. Interestingly, none of the mega-studies reviewed for this dissertation identified a safe environment as necessary for training effectiveness however adult education literature is rich with studies saying a safe environment is needed for adult learners. A safe learning environment is included in this discussion because Hattie (2009) stressed the need for an anxiety reducing environment and recognized education researchers such as Knowles (1980) and Caffarella (2002), and others identified a safe learning environment as basic to adult learning.

Hattie (2009) agreed that a safe environment is needed and noted that motivation was most effective when learners felt safe and were affirmed by others. Hattie also noted that de-motivation occurred when learners felt embarrassed or humiliated so anxiety during the training event needed to be managed. Hattie showed the following gauge, (see Figure 12), to demonstrate that reducing anxiety was needed at a minimum to set the stage for learners to learn. Reducing anxiety created a safe learning environment that was necessary for learners to be able to learn.
Caffarella and Merriam (2002) also noted the importance of the learning environment and said the role of the instructor was “to provide an environment that elicit[ed] the desired behaviors and extinguish[ed] the undesirable ones” (p. 253). Knowles (1980) said adults need an environment where they feel accepted, safe and respected. Knowles also said that adults prefer a friendly, informal atmosphere of collegiality where they feel safe from ridicule or embarrassment. Ginsberg and Wlodkowski (1998) agreed and found that a safe learning environment free of hostility, blame and fault-finding was necessary for learning – especially in the global, culturally rich training environments.

Clearly a physically and psychologically safe learning environment is needed for adult learning and retention. And, not only must the adult feel safe but the adult must also perceive that the content of the training is relevant. Content relevance is an issue that Baldwin and Ford raised in their 1988 study and they worried that researchers seemed to take it for granted that training content would be useful for trainees. They felt that content relevance was key to success and should not be taken for granted.
**Content relevance.** An adult wants the right content that will help him do his job more effectively. Consider that even if there is great training design and the participant transfers the learnings brilliantly to on-the-job performance, there would still be no value-add for the organization if the content is wrong and the wrong learnings are performed well. Baldwin and Ford warned (1988) that some researchers seemed to take it for granted that content was always valuable and useful to participants and so there were no studies that they found that reviewed the need for relevant content. They warned that content should not be assumed to be valuable but rather tested on viability and relevance to the participants.

Cheng and Ho (2001) defined career and job attitudes as an individual’s psychological identification with his job or career recognized that career and job characteristics were influential on training transfer but they categorized career and job factors as trainee characteristics linked to motivation. This dissertation disagrees with that categorization and considers career and job factors as something that needed to be addressed in the content for training design. Organizations have little influence on trainee characteristics once an employee is hired but organizations have much control over training design and can use design to help motivate.

Cheng and Ho (2001) cited Noe (1986) and Noe and Schmitt (1986) as finding that individuals who participated in cognitive activities generally had a better understanding of their own strengths and weaknesses. Cheng and Ho tied this to Facteau et al.’s (1995) research that noted that individuals who know more about their strengths and weaknesses often recognize the value of learning new skills and knowledge that can help them in their careers and jobs. These individuals come to training more motivated
and transfer training easier. It seems obvious that these individuals would look for content that was relevant to improving their careers and jobs.

Zu Knyphausen-AufseB et al. (2009) agreed that focusing training design on training content was an effective tool that was within an organization’s sphere of control and recommended organizations consider training design as a possible way to positively impact training. Burke and Hutchins (2007) also agreed and noted that effective training design interventions should address knowledge, skills and ability deficits. They further noted that content needs to be timely and relevant.

Yamnill and McLean (2001) supported the importance of content relevance. They cited Clark, Dobbins, and Ladd (1993) who found that trainees who recognize that the training will help them in their job and career paths are much more likely to transfer training to on-the-job performance. Yamnill and McLean explained, “These findings are consistent with expectancy theory, which states that individuals will be more motivated to transfer if they perceive that their effort will lead to rewards that they value (Porter & Lawler, 1968)” (p. 200). Content relevance seemed the natural consequence of trainees’ desire to see the perceived value or utility of training which was a key trainee characteristic recognized by industrial psychologists earlier in this dissertation.

Learning scientists and adult-focused educators agree that relevant content is necessary for training retention and training transfer. Caffarella (2002) notes that adults are pragmatic and want content that is meaningful, that fits their personal goals, and that can be applied to their current life situation. How People Learn: Brain, Mind, Experience and School published by the National Research Council (2000) makes it clear that attention has to be given not only to what is taught and why, but also to how it is tied to
competence and performance. Knowles (1980) is clear that content needs to be relevant. Knowles says that adults are motivated to learn when they experience a need that will improve their jobs, careers, or development. Relevant content is clearly needed to engage adults so that they can learn and so that they will transfer training to on-the-job performance.

**General theory.** Yamnill and McLean (2001) discuss several theories about the impact of training design on training transfer. Yamnill and McLean say, “According to Holton (1996), one cause of failure to transfer is that training design rarely provides for transfer of learning” (p. 200). They cite Holton’s study for noting that often training design does not allow for practice during training nor does it include strategies for how to apply their KSAs once the trainees are back on the job.

Yamnill and McLean (2001) note that training designers need to be aware of both Identical Elements theory and Principles Theory. They define Identical Elements Theory as making the training environment as much like the job environment as possible. Laker expands on Identical Elements theory and defines training for tasks that replicate work tasks and are very similar to what happens on the job as near transfer. The Identical Elements Theory would drive training design for near transfer. And, if the training will be the exact task that is done on-the-job, then the organization would expect positive training transfer. Clark and Voogel (1985) noted that making content reflect the workplace, specifying how and where to apply the training on the job and overlearning were suitable design elements for near transfer. However, often training is not just for memorized, specific, repeatable tasks.
Yamnill and McLean (2001) describe Principles Theory as focusing on the general principles needed to understand and learn the tasks and skills and then be able to generalize the learnings to different situations on the job. Yamnill and McLean cite Goldstein (1986) as finding that training experiences could be designed to teach general principles and did not have to reinvent the job environment during the learning experience. Laker (1990) called having to apply learnings from training where the job situation is much different from the learning experience far transfer. Goldstein, (as cited in Yamnill & McLean, 2001), notes that the General Principles Theory supports the concept of far transfer. Goldstein also notes that trainees need to understand underlying concepts and principles, need practice in different contexts, and need to apply the training to situations that they might encounter in order to have positive training transfer.

**Meta-cognition strategies.** Hattie (2009) discusses meta-cognitive strategies that can be applied in training design and notes their effectiveness (see Figure 13). Hattie describes meta-cognition as “thinking about thinking” (p. 189) and notes that training design needs to give individuals tools and strategies to use to help them transfer training. He called these tools meta-cognitive strategies.

For example, Hattie (2009) cites Newell’s (1990) finding that there are two layers of problem solving: “applying a strategy to the problem, and selecting and monitoring that strategy” (p. 188). Meta-cognitive strategies encourage individuals to think about how to solve a problem, how to evaluate progress, and how to monitor comprehension. The National Research Council (2000) agrees that transfer is better when individuals are “more aware of themselves as learners who actively monitor their learning strategies and resources” (p. 67). Rather than just training an individual to do a task or just providing
knowledge, meta-cognitive strategies provide tools for individuals to use back on-the-job when they met with obstacles and problems. Meta-cognitive strategies provide strategies making it easier to adapt concepts to new situations back on-the-job (Hattie, 2009).


**Behavioral objectives.** The American Society for Training and Development (Paradise, 2007) emphasizes that behavioral objectives are essential to any training program. Behavioral objectives provide the destination for the training by establishing the criteria for competent performance expected at the end of training. Establishing behavioral objectives at the beginning of training design forces trainers to think through the training experience to its natural conclusion. The creation of behavioral objectives also establishes the expectations for the instructor and for the trainees and enables the trainer to select the correct content, training methods, and evaluation (Salvendy, 2006).

Goldstein (1993) agrees that behavioral objectives are foundational to training design and provides (a) expectations to trainer and trainee alike, (b) establishes the
conditions where objectives will apply helping both the trainer prepare content and trainee to understand application, and (c) establishes the criterion for performance expected at the end of training. Hattie (2009) cites research from Popham, Eisner, Sullivan, and Tyler (1969) and Kozlow (1978) as support for the need for behavioral objectives. Mager (1997) says, “Instruction that doesn’t change anyone has no effect, no power” (p. 1). Mager also notes that surgeons do not choose tools until they know what operation they are about to perform and this is an excellent analogy for trainers. Setting behavioral objectives clarifies expectations, sets direction, makes training more effective and ensures a better transfer of the training to on-the-job performance.

**Advanced organizers.** Hattie (2009) notes behavioral organizers or advanced organizers’ value in improving training retention and so training transfer (see Figure 14).

![Figure 14. Behavioral organizers.](image)


Hattie cites Stone (1983) as finding that advanced organizers can serve as a bridge
between new learning and past learning. An advanced organizer is information that is sent before training that helps the trainee link past learning to future learning and provides a structure to help facilitate learning. It can be an outline, a mind map, a graphic or whatever is useful to help the trainee bridge the gap between old and new. Hirumi and Bowers (1991), Kenny (1992), and Stone (1983) concur that advanced organizers are effective in improving retention which is necessary before training transfer. Gil-Garcia and Villegas (2003), Kang (2002), and Millet (2000) note that the concept map, a visual organizer, is effective in impacting learning and training transfer. The use of the concept map increases training effectiveness and is useful in retention and the transfer of training.

**Concept mapping.** Hattie (2009) shows concept mapping to be a good tool because it improves retention (see Figure 15). Baldwin and Ford (1988) showed that participants must learn and retain knowledge before transferring it to job performance.

Kim, Vaughn, Wanzek, and Wei (2004) note that concept mapping (see Figure 16) visualizes the training content and helps individuals better organize the learning. Horton, McConney, Gallo, Woods, Senn, and Hamelin (1993) agree that concept mapping is effective. Kim et al. (2004) notes that concept maps are more effective in learning retention if the trainer creates the maps but Nesbit and Adesope disagree and find that there are better results if the trainees create the maps (as cited in Hattie, 2009). While there is disagreement in findings about who should create the concept map, there is agreement that concept maps work to improve retention. Nesbit and Adesope provide a rationale for the effectiveness of concept mapping saying that “there may be a lower cognitive load by arranging information in two dimensional space to represent relatedness, consolidating all references to a concept in a single symbol, and explicitly labeling links to identify relationships” (as cited in Hattie, 2009, p. 169).

*Figure 16. Example of concept map. ([http://www.mindtools.com/pages/article/newISS_01.htm](http://www.mindtools.com/pages/article/newISS_01.htm) April 10)*
Research from the National Research Council (2000) confirms that organizing information “into a conceptual framework allow[s] for greater ‘transfer’; that is it allow[s] the [trainee] to apply what was learned in new situations to learn related information more quickly” (p. 17).

**Direct instruction.** Hattie (2009) synthesizes results from four meta-analyses plus 304 other studies and concludes that direct instruction works (see Figure 17). Hattie is careful to delineate the difference between direct instruction and didactic teaching making it clear that direct instruction is not the same as didactic teaching.


Didactic teaching is described as the trainer standing in front and lecturing. Business organizations sometimes call this *sage on the stage*. Direct instruction is different. Direct instruction is described by Hattie as using the seven steps first outlined by Adams and Engelmann (1996). These seven steps are paraphrased and described as:
1. **Begin with the end in mind.** Before the trainer begins to design content and activities that make up the learning experience, the trainer should have a clear idea of what he wants the participant to learn and be able to do as a result of the training.

2. **Set clear performance criteria.** The trainer should set clear performance criteria in the form of behavioral or performance objectives so that participants know from the beginning how they will be measured and what is required for success.

3. **Capture the attention of trainees.** The trainer should provide what Adams and Engelmann call a hook to capture the attention of the participants so that the participants are committed to learning. Caffarella (2001) notes that adults want training to be meaningful and relevant so explaining why the training is pertinent to their jobs or their daily life is often needed before adults will commit to learning.

4. **Use proven training methodology.** In direct instruction, the trainer uses proven training methodologies such as “…input, modeling, and checking for understanding” (p. 205). Input refers to using a variety of mediums such as lecture, films, small group participation, and so on. Modeling refers to the trainer providing an example of a successful product or skill. Checking for understanding refers to the trainer confirming with the participants that material is understood before proceeding to the next concept.

5. **Provide opportunity to practice.** The trainer provides an opportunity for the participant to apply what he has learned in a safe environment and under the
watchful eye of the trainer. The trainer observes the participants demonstrating the use of the new knowledge or skill and can make corrections or provide additional help while they are still in the learning environment.

6. Provide closure. The trainer pulls the learning experience into a coherent, consolidated picture and reviews the major concepts. According to Hattie (2009), effective closure ensures learnings “...will be applied by the [participant] by ensuring they have become part of the [participant’s] conceptual network” (p. 206).

7. Provide practice applying to new situations. The trainer provides the opportunity to use the newly acquired knowledge or skills in a de-contextualized situation. This means the participant must apply the training to a different situation or event than the one used to teach originally. This helps to generalize the learnings.

Hattie (2009) notes that direct instruction not only works, but that it can accelerate performance. Direct instruction allows trainers to “teach more in less clock time” (p. 206), and provides for learnings beyond just memorization and rote learning. This type of learning aligns with Baldwin and Ford’s (1988) Model of Transfer Process because it allows for generalization from the classroom and helps the participant transfer the learnings from the learning experience to on-the-job performance.

**Worked examples.** Hattie (2009) notes that an effective trainer shows trainees worked examples that show what success looks like and this improves training transfer (see Figure 18). Trainees find worked examples helpful in reducing cognitive load because they can focus on process instead of being concerned about searching for an
answer (Crissman, 2006). Hattie describes worked examples as having three parts: (a) exposure to the worked example, (b) training to use process demonstrated via the worked example and, (c) testing to confirm understanding. Hattie (2009) also describes several of the techniques that various researchers had used to engage trainees with worked examples and noted that they all worked to reduce cognitive load and improve retention. Retention is a necessary step before training transfer can occur. Techniques included using multiple examples, using diagrams, story variation, problem pairs, and fading (omitting some of the steps in the examples).

An additional value in using worked examples is that it helps create a safe environment for adults. Caffarella (2002) confirms the importance of a safe work environment and notes that worked examples help provide a safe environment because worked examples provide correct answers and prevent anxiety concerned with failure.

**Questioning.** Hattie (2009) cites Gadamer (1993), Mantione and Smead (2003), and Craig (2006) as finding that higher level questioning by instructors is effective in the retention of training. Higher level questioning is defined as using open ended questions, inquiry questioning and application, analytical, synthesis and evaluative questions (Prince George, 2012). Unfortunately, Hattie estimates that 35%–50% of time in training is spent on the wrong kind of questioning but even poor questions are more effective for retention than no questioning at all (see Figure 19).


Research shows that most often questions are low-level, cognitive questions to determine if individuals are able to recall information. Added to this finding is that instructors respond to the individuals’ answering the questions with some form of judgment either affirming or non-affirming (Hattie, 2009). Since questioning is common in the training industry, improving the performance of instructors asking questions could
improve understanding and retention. Hattie confirms this by citing Gliessman et al. (1988) as finding that questioning skills are open to change and can be improved. Other than instructor talking, questioning is the second most frequent happening in learning experiences. Given that so much time is spent questioning, it is reasonable to assume that improving the instructor’s questioning skills would improve retention and understanding, which leads to better retention and better transfer of training to on-the-job performance.

**Behavioral modeling.** Burke and Hutchins (2007) and Grossman and Salas (2011) find that behavior modeling is a training design that impacts training transfer. Behavior modeling is described as showing role playing behavior and having trainees observe the behavior demonstrated. They both cite a 2005 meta-analysis done by Taylor, Russ-Eft, and Chan as support that behavior modeling is effective in training transfer.

An analysis of Taylor et al. (2005) shows they reviewed 117 studies on behavior modeling training and concluded that behavior modeling is effective in the transfer of training. Taylor notes that behavior modeling is most effective in training transfer when (a) both positive and negative behaviors are demonstrated, (b) when trainees are allowed to create their own scenarios for practice, (c) when supervisors are included in the training with the trainees, (d) when trainees set goals for work place use of the behaviors and, (e) when trainees are held accountable on the job for using the behaviors.

**Spaced vs. massed practice.** Hattie (2009) notes that the “frequency of different opportunities rather than merely spending ‘more’ time on task that [makes] the difference in learning” (p. 185). Instructors are urged to provide deliberate practice opportunities spaced over time rather than in long massed practice (see Figure 20) until the performance success criteria is met (Walker et al, 1994, as cited in Hattie, 2009). Hattie is
clear that deliberate practice is not overlearning just for the sake of overlearning. Deliberate practice is also not just drill and practice and rote repeating. Effective, deliberate practice is needed to provide opportunities to include contextual variability, extensive feedback, different experiences, and so the learnings can be imbedded in conceptual understanding to promote thinking.

Hattie (2009) cites Peladeau, Forget, and Gagne (2003) as finding that spaced practice leads to longer retention. Hattie agrees that spaced practice with correctly implemented, deliberate practice also leads to deeper understanding. Nuthall (2005) posits that trainees often need two or three exposures to learning spread over several days before learning is internalized with the length of time needed between practices dependent upon the complexity of the learning.

Research shows that adults can use the time between deliberate practices to reflect on the learnings and give meaning to them. Mezirow (1991) proposes a theory of
transformative learning “that [explains] how adult learners make sense or meaning of their experiences” (p. xii). Having time between deliberate practices provides time for reflection and adults to frame understanding. Knowles (1990) agrees that reflection time is essential to effective learning retention for adults and that retention always precedes transfer of training to on-the-job performance.

**Instructor.** Interestingly, not one of the industrial psychology meta-studies even mentioned the importance of the instructor. Hattie (2009) invested 15 years in educational research and synthesized over 800 meta-analyses on achievement results for school-aged individuals (through college) and he concluded that ““teachers [instructors] are among the most powerful influences in learning” (p. 238). Hattie demonstrated the importance of the instructor by discussing teacher clarity (see Figure 21).


Hattie (2009) cites research from Fendick (1990) to illustrate why teachers have
such a strong impact on learning. In Hattie, teacher clarity is defined by Fendick as the
teacher being well organized, clearly explaining concepts, providing examples and
guided practice, and assessing the individual’s learning effectively.

Other research supports the strong impact the teacher or instructor has during the
researched teacher impact working for the National Board for Professional Teaching
Standards and found that National Board for Professional Teaching Standards certified
teachers emphasize teacher clarity are more likely, in a “systematic and consistent way,
to challenge students to think; [and] they regularly promoted varied and appropriate
assignments that were demanding and engaging” (Hattie, 2009, p. 117), which made a
difference in learning retention and the ability to transfer learning to other situations.
Figure 22 shows the impact of using varied and appropriate assignments.

Figure 22. Varied and appropriate assignments. Drawn from data in Visible Learning (p.

Teachers who had been certified by the National Board for Professional Teaching
Standards stood out in other ways which included that they: (a) had deep understanding
of their subject matter (d = .87), (b) had a problem solving attitude (d = .82), (c) created a safe environment for learning (d = .67), and (d) had respect for their learners (d = .61). Instructors impact materials delivery, the learning environment, and the feedback that participants receive. Instructors impact learning not only for the time that they are working with the participants but for years to come. To clarify the importance of having a quality instructor, it helps to understand how devastating it can be to have a poor teacher.

Sanders and Rivers (1996) found that students gained an average of 14% annually with the least effective teachers compared to the most effective teachers who averaged student gains of 52% points annually. Figure 23 below shows the difference. Clearly, a parent would prefer the most effective teacher just as a manager would prefer the most effective instructor. To make matters worse, Sanders and Rivers (1996) showed that it was difficult to overcome the effects of poor teaching in subsequent years (Hattie, 2009).

![Average Percentage Gain Per Student Annually](image)

Yet, the industrial psychology meta-studies that focus on adult learning rarely mention the instructor’s importance. While industrial psychology has mostly ignored the instructor’s importance, the International Board of Standards for Training, Performance and Instruction (IBSTPI) agrees that the trainer influences training results (Russo, 1999). Most of the learnings from Hattie seem to apply equally to adults and children alike with the exception of critical reflection which applies more to adults because it is a learned skill (Tuinjman, 1995). Knowles (1990) points out another distinction between training adults and children. He notes that adults are more likely to want training that they can apply immediately and so the relevancy of the training is more important to an adult.

Teacher effectiveness matters. And since, organizations often use internal subject matter experts as the instructors to do their training (Paradise, 2007) organizations need to become aware of the importance of having an effective instructor. Being a subject matter expert in content does not automatically ensure that the individual will also be an effective instructor. Different content knowledge and skill sets are required. This is a wake-up call for organizations who believe that anyone who knows a subject matter can teach effectively. Instructor effectiveness is an area of research that needs exploration.

There are many training design strategies used to improve training’s effectiveness. The design characteristics believed to have the most impact on transfer of training were:

- posttraining interventions,
- safe learning environment,
- content relevance,
- general theory,
• meta-cognition strategies,
• behavioral objectives,
• advanced organizers,
• concept mapping,
• direct instruction,
• worked examples (practice),
• questioning,
• behavioral modeling,
• spaced learning and
• the instructor

This dissertation summarized Baldwin and Ford’s (1988) training transfer literature review as it concerned the first two training inputs to training transfer. Work environment (see Figure 24) is the final training input Baldwin and Ford identified as impacting training transfer.

Section 3: Work Environment

The work environment is the third training input (See Figure 24) in the Baldwin and Ford Model of the Transfer Process.

<table>
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<tr>
<th></th>
<th>Section 1 Trainee Characteristics</th>
<th>Section 2 Training Design</th>
<th>Section 3 Work Environment</th>
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<tr>
<td>Baldwin and Ford (1988)</td>
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<td>After Baldwin and Ford (1988-2011)</td>
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Work environment: Baldwin and Ford. Blume et al. (2010) identify “transfer climate, social support from supervisors and peers, and the constraints on or opportunities for performing learned behavior on the job” (p. 1068) as the factors in the work environment that impact training transfer. Table 5 below shows the factors that Baldwin and Ford include in their discussion of the work environment.

Table 5

<table>
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<th>Work Environment Characteristics in Baldwin and Ford</th>
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<td>In Baldwin and Ford</td>
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<tr>
<td>a. Support</td>
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<td>b. Opportunity to Use</td>
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Baldwin and Ford (1988) reviewed seven studies that considered the impact of the work environment on the transfer of training. These studies did not try to change the work environment but rather looked at the correlation of variables in the work environment to determine how these factors impacted transfer of training. Baldwin and Ford readily acknowledge that there was meager empirical evidence in 1988 to show that the work environment has any impact on training transfer. They cited the work of Baumgartel and his associates (Baumgartel & Jeanpierre, 1972; Baumgartel et al., 1984; Baumgartel, Sullivan, & Dunn, 1978) to show that research had begun to look at the environment as factor in the transfer of training but results were slim when they did their study.

Baumgartel and his associates defined a favorable work environment for managers as one that allowed them to set goals on their own and provided them a
supportive place to work. They then suggested that managers who worked in supportive work environments were more likely to try and apply new learnings on the job. This was as close as Baldwin and Ford came to providing research that trainees needed an opportunity to use new learnings on the job to transfer training but clearly the work environment must let the trainee try the new learnings or the trainee can never apply the learnings. If the trainee cannot apply the learnings, then the trainee can never transfer the training to on-the-job performance. Certainly, there may be factors in the work environment that keep a participant from actually trying new knowledge and skills such as the attitude of the supervisor, lack of equipment and so forth that keep the transfer of training from occurring.

Baldwin and Ford examined other studies for more input into the impact of the work environment. They cited work from Hand, Richards, and Slocum (1973) showing that organizational factors that gave extrinsic rewards of salary and promotions reinforced attitudes that had been learned in training. However, this does not say that on-the-job performance improved. It seems that employees could have improved attitudes about training they received and be pleased about it and still not necessarily translate that to on-the-job performance improvements. It might imply that transfer occurs but the results are unclear. It does underscore Baldwin and Ford’s premise at the beginning that empirical data was scant at the time.

Baldwin and Ford go on to cite Huczynski and Lewis (1980) who find that the supervisor plays the most important role in the transfer of training. Huczynski and Lewis note that participants with the most transfer of skills have a supervisor who has had discussions with the trainee prior to training regarding the course and then the supervisor
encourages the participant afterwards to use the training. This clearly showed the importance of support from the supervisor.

Employees place more importance of training and transferring and using that training for on-the-job performance if they believe that their supervisor thinks that the training is important (Baldwin & Ford, 1988). Baldwin and Ford note that supervisory support is a multidimensional construct that needs further investigation. To support this, they identify several ways that a supervisor can convey his opinion about training without ever addressing the issue head-on. They say a supervisor can show support by encouraging an employee to attend training or show lack of support by being reluctant to allow employees to attend training. Supervisors can show lack of support by continually rescheduling training or placing other work before the training. Supervisors can also provide or not provide opportunities for trainees to actually use the training. They go on to discuss how supervisors can use reinforcement or the lack of it after the trainees return from training to influence trainees. Supervisors can use reinforcement to praise or recognize the trainee for trying new skills or knowledge or can ignore the trainee or criticize the trainee for trying new things. Either way, the trainee will know quickly what is approved of or disapproved of in the work environment.

Baldwin and Ford also cite the work by Sims and Manz (1982) on behavioral modeling and its affect on behavioral change. Sims and Manz show that employees often model their behavior after their supervisor in order to gain favor. Clearly supervisors who value training would have a positive impact on training transfer.

Indeed, Baldwin and Ford (1988) step back and review the idea of the expectancy model and how it impacts the work environment. They note that the expectancy model
impacts perceptions and perceptions impact motivation. The authors are concerned that the concept of the expectancy model had not been given enough attention in research at the time of their study. They cite Lawler (1973) and note that factors such as locus of control, communications from others, past experience, etc. need to be examined to determine how these impact the desire to transfer. Baldwin and Ford recognize early that “individuals are seen as active information processors who adapt their attitudes, behaviors, and beliefs to their social context and to their own past experiences” (p. 92). Given this, clearly the attitudes of the supervisor would impact training transfer.

They cite Daft and Weick (1984) who note that individuals will construct the reality of their work environment from interactions with their supervisor, with their peers and from organizational policies and procedures. All of this would have an impact on perceptions of the individuals and on their motivation. As things change in the work environment, perceptions will change so Baldwin and Ford view motivation as a dynamic changing factor that is not static. This was contrary to how the studies so far had examined motivation. Baldwin and Ford called for more research on the work environment and how it impacted transfer of training and they were not disappointed.

**Work environment: After Baldwin and Ford.** There was ample research into how the work environment impacts training transfer after Baldwin and Ford (1988). Table 6 (see Table 6) lists the characteristics shown in the 1988 study as compared to the characteristics that were reviewed after. Table 6 is not an all inclusive list but it does reflect the most often reported findings in the literature search for work environment characteristics that impact transfer of training.
Table 6

*Work Environment Characteristics in and After Baldwin and Ford*

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<th>In Baldwin and Ford</th>
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<td><strong>a. Support</strong></td>
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<td>• Coaching</td>
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<td>• Communities of practice</td>
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<td>• Subordinate support</td>
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<td>• Organizational climate</td>
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<td>• Transfer climate</td>
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<td>• Manager goals</td>
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<td>• Collaborative training</td>
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<td><strong>b. Opportunity to use</strong></td>
<td><strong>b. Opportunity to Use</strong></td>
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<td></td>
<td><strong>c. Equipment availability</strong></td>
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<td><strong>d. Organizational constraints (Ex: time)</strong></td>
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<td></td>
<td><strong>e. Other</strong></td>
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<td>• Leadership pattern</td>
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<td>• Positive feedback</td>
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<td>• Variation in order of tasks</td>
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<td>• Quality Circles</td>
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<td>• Situational cues</td>
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<td>• Influential patterns of department</td>
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<td>• Opportunities for interaction</td>
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<td>• Job involvement</td>
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While Table 6 is by no means exhaustive of all the areas of work environment that have been studied since Baldwin and Ford, it does provide awareness to great
number of factors that can affect training transfer. It also provides rationale for the need to consolidate what factors are most valuable for an organization to focus.

Again, there was often inconsistency in these findings and it was difficult to compare findings because of sample differences that included types of industries, sample sizes, demographic impacts on samples as well as global cultural differences that impact work environments. The robustness of the research reflects awareness that business is now operating in a global economy, however the diversity of results does lead to inconsistency in findings and confusion for organizations.

Organizations are particularly interested in the work environment because the work environment is largely within the organization’s sphere of control. Organizations are also interested in the work environment because of the amount of time that an employee spends in the work environment compared to the amount of time the employee spends in training. Common sense suggests that since the employee spends much more time in on-the-job environment, the job environment would have greater influence on an individual than time spent in the training environment. For example, O’Leonard (2012) notes the average, individual employee got approximately 15.3 hours of formal training in 2011. The average employee works approximately 2,000 hours a year excluding vacation time. This means that the average employee spends approximately 1,970 more hours on the job with peers and a supervisor than in formal training and time alone would indicate that the on-the-job environment is going to have a greater influence.

Blume’s et al. (2010) review of training transfer literature since Baldwin and Ford (1988), divides findings about the work environment into three sub-categories which are (a) support (peer and supervisor), (b) transfer climate, and (c) organizational constraints
(situational constraints, degree of autonomy). After analysis of these three sub-categories of the work environment, Blume and colleagues note that support has the most consistent transfer of training influence. These authors note that supervisor support seems to have a greater influence than peer support however they do recognize that they are basing their results on a small sample size.

Studies by Bates et al. (2000), Colquitt et al. (2000) Cromwell and Kolb (2004), Chiaburu and Marinova (2005), and Kirwan and Birchall (2006) are cited by zu Knyphausen-AufseB as studies which provide information about the impact of social support on whether or not training will be transferred. Facteau et al. (1995) categorized social support in the work environment into three areas: (a) peer support, (b) supervisor support and, (c) organizational support (zu Knyphausen et al., 2009). Bates et al. (2000), Colquitt et al. (2000), Cromwell and Kolb (2004), Chiaburu and Marinova (2005), and Kirwan and Birchall (2006) found that peer support is most important in enabling transfer of training.

Zu Knyphausen-AufseB et al. (2009) identify social support which includes both peer and supervisor support as the most promising approach for organizations to take to improve transfer of training. This aligns with the same conclusion from Blume, et al. that a supportive environment is important to the transfer of training.

Burke and Hutchins (2007) agree that getting support from managers (supervisors) and peers is needed for successful training transfer and also brings up Baldwin and Ford’s original concept of opportunity to use as important. Burke and Hutchins cite research from Burke and Baldwin (1999), Clarke (2002), and Nijman, Nijhof, Wognum, and Veldkamp (2006) as showing the positive impact of the role of
supervisors on the transfer of training. Hutchins (2009) then cites Holton et al. (2000), Bates, Holton, and Seyler (2000), Chiaburu and Marinova (2005), and Hawley and Barnard (2005) as demonstrating the importance of peer support on transfer of training. Hutchins discusses how Hawley and Barnard (2005) show that peer networking and idea sharing help to continue learning transfer even 6 months after training. Hutchins summarizes the importance of supervisor and peer support by citing the research of Cromwell and Kolb (2004), who found trainees who had supervisor and peer support communicated positive training transfer a year after training.

Hutchins (2009) also discusses Baldwin and Ford’s original interest on the importance of opportunity to use training so that transfer can occur. Hutchins provides research to support Baldwin and Ford’s original concept that individuals must be provided the opportunity to apply learnings on the job. She notes that research has “consistently shown that positive transfer is limited when trainees do not have opportunities to use new learning in their work setting” (p. 74). Hutchins cites research by Gaudine and Saks (2004) and Lim and Morris (2006) to support her view. She then concludes with the work of Lim and Johnson (2002) showing that opportunity to use skills was rated at the best form of support for learners to transfer training and the lack of opportunity to use skills was rated as the biggest obstacle for training transfer. The Handbook of Human Factors and Ergonomics (Sawyer, 2006) supports Hutchins in her assessment that a supportive environment is necessary for training transfer.

Baldwin et al. (2009) agrees and acknowledge Eddy and Tannenbaum (2003) for suggesting that “the first step and expeditious path to transfer is to focus less on carefully orchestrated interventions and more on removing the obstacles that are so commonly
present in organizational contexts” (p. 48). Baldwin and Ford, partnered with Blume and Huang (2010) to examine research done since the Baldwin and Ford’s (1988) seminal study and review 140 journal articles that have been published since 1988 that include reference to the original Baldwin and Ford work. They specifically note that they are pleased to see that research has moved outside the training design arena to focus more on the pre-training and post-training influences especially in the work environment.

Baldwin et al. (2009), as did Hutchins (2009), note the importance of the work environment in the transfer of training. They cite work from Ford et al. (1992) who confirms the importance of needing an opportunity to use learned skills in the transfer of training to the worksite. They also cite research from Bates (2003) regarding the influence of the relationship between the trainee and the supervisor in the transfer of training. They go on to identify the work from Mathieu, Tannenbaum, and Salas (1992) as showing that feedback and coaching can be a predictor of training transfer. Research from Tracey, Tannenbaum, and Kavanah (1995) examines the group norm of openness to change and notes that it has a significant influence on the transfer of training.

Review of training transfer literature by Cheng and Ho (2001) adds some robustness to the discussion of work environment by discussing the concept of transfer climate. They agree that support in the work environment is important and cite Noe (1986) for work on the value of social support in the organization. Cheng and Ho specifically mention the work of Tracey (1992) and introduce the term transfer climate. They then divide the social support into four groups: (a) subordinate, (b) peer, (c) supervisor, and (d) top management, based on work by Facteau et al. (1995). Knowing this is valuable but again the industrial psychologists stop at the theory level and do not
summarize what recommendations they would make to practitioners.

Cheng and Ho (2001) cite Tziner et al. (1991) saying that a supportive environment alone is not enough to ensure the transfer of training. They note that Rouiller and Goldstein (1993) find that there is not a significant relationship between learning and transfer climate. Then they cite Olsen (1998) and Tracey et al. (1995) who suggest that a positive work environment does encourage training transfer. They then discuss specific studies such as Seyler et al. (1998) who found that peer support and opportunity to use the training moderately impacted training transfer and Facteau et al. (1995) who found that subordinate support can impact training transfer. Cheng and Ho go on to note, by-the-way, that Brinkerhoff and Montesino (1995) find that strong relationships among involved parties such as trainers, managers or trainees can also help positive transfer. This is a valuable accumulation of research findings but leaves an organization unsure what to do with it.

Given the research findings on the importance of social support in the work environment, it is surprising that more research has not been done in this area. Blume (2010) is clear that there continues to be an urgency to determine what works and what does not in the transfer and use of training on the job to improve performance. They note that it is not enough that trainees use the training but that the trainees must use the training effectively and performance must improve as a result. Blume et al. (2010) posit that after their review of transfer of training literature over the last decade, it seems clear that social support in the on-the-job environment is an area that needs more exploration.
Baldwin and Ford (1988) focus first on individual trainee characteristics and their discussion focuses mainly on the individual transferring training back to the job. Baldwin and Ford are recognized for having the most used transfer of training model and perhaps their first attention to the individual and the United States culture of focus on individualism have influenced the focus of training to be at the individual level. The human sciences, as a rule also still see the individual as the owner of his own behavior, and the organization still sees the individual (at least in the United States) as the “primary source of the expertise that drives organizational performance” (Swanson & Holton, 2001, as cited in Korte, 2007, p. 166). However, there is growing support for considering group behavior in organizations. Generally, employees interact and work in group settings to do the work of organizations (Hodgkinson, 2003; Hogg & Terry, 2000).

Blume et al. (2010) raise other issues and note that how research is designed can bias the results of research and cause misleading recommendations for organizations. Measurement is part of the design of training that determines its effect of training on improving performance at the work place. Blume shows particular concern for the use of same source and same measurement context (SS/SMC) in research studies and is concerned that the use of SS/SMC biases results. For example, Blume and colleagues posit that measuring the effectiveness of support in the environment for training and the effectiveness of the training transfer at the same time via self-reporting skews results. These authors identify a growing concern over this type of design and encourage others to disregard its use. They note that other researchers have examined this methodology and results show that “on average the amount of variance accounted for when common
method variance was present was approximately 35% versus approximately 11% when it was not present” (p. 1071). This type of methodology can lead to skewed results.

Blume et al. (2010) note that most researchers measure transfer immediately after training while the training is still fresh in the minds of the trainees. Blume credits Barnett and Ceci (2002) for identifying this phenomenon as near transfer and note that this applies to both the physical location and the timing. Far transfer would then be measurement taken after a time lag. Blume found that time and space impact results. They found that as time increased, knowledge decreased.

Baldwin et al. (2009) agree that there are issues within the transfer of training research that need to be resolved so that organizations can use the richness of the research to actually translate it into something that organizations can operationalize. Their 2009 review of literature acknowledges the vast research that has occurred since their original review and acknowledges that there is a multidimensional aspect to all three of their original training inputs of (a) trainee characteristics, (b) training design and, (c) work environment. They acknowledge confusion in the measurement of training transfer and the lack of a common vocabulary to help organizations understand how best to implement recommendations as well as the continued inconsistencies in recommendations.

However, Baldwin et al. (2009) depart into a discussion of personalization of transfer training and the impact of change on transfer of training that serves only to confuse the issue of transfer of training. While these are issues that Baldwin and Ford indicate may be future areas of research, it seems that the current literature needs to be analyzed and summarized for operational use by organizations before leaping to new
research areas. This explains the interest of this study in wanting to consolidate the current literature into a meaningful and useful tool for organizations.
Chapter 3: Methodology

Problem Formulation

A vast, often contradicting database exists on the transfer of training and that makes it difficult for organizational practitioners to identify which training transfer characteristics actually impact the transfer of training. Organizations need specific recommendations to help them focus their resources where they can get the best value for the least cost.

Baldwin and Ford’s (1988) work covering from 1907-1987 (Blume et al., 2009) was the seminal study on the transfer of training. “As noted by Brown and Sitzmann (2010), the most frequently cited model of training transfer is one presented by Baldwin and Ford (1988)” (Blume et al., 2009, p. 4). The purpose of this study was to provide a clear business means for organizational practitioners to identify which training transfer characteristics impact training transfer. The study built on Baldwin and Ford’s seminal 1988 study by providing a comprehensive, integrated review of the transfer of training literature from 1989 to 2011. This allowed a thorough review of findings from 1907 – 2011. Results were then plotted on a 3 X 3 matrix, common in the business world, for ranking findings. The matrix compared value to cost verses sphere of organizational control to identify where organizations can get the best value for the least cost to improve transfer of training to on-the-job performance.

This dissertation identified meta-studies with strong empirical results and integrated these findings to pinpoint these high value and cost-effective characteristics and the 3 X 3 matrix to rank them. The study followed Torraco’s (2005) guide, Writing Integrative Literature Reviews: Guidelines and Examples supplemented by information
from Randolph’s (2009) *A Guide to Writing the Dissertation Literature Review* to answer the following research questions:

**Research Questions**

1. What characteristics in the transfer of training literature influence transfer of training?

2. Where can organizations focus their investments to leverage results for training transfer?

**Research Design**

Creswell (2009) noted that qualitative research is interpretive and as such a researcher should purposefully select sites or documents for the study that will help him understand the problem. Creswell recommended a number of strategies that can be used in a qualitative research study: These strategies are paraphrased below:

1. Using different sources of information and then triangulating that information so that the data can be considered from different perspectives and then sorted into themes.

2. Using very descriptive narrative to show results so readers have a rich sense of shared experience (makes the findings more realistic, and adds validity).

3. Exposing any researcher biases towards the study (transparency is created by exposing biases and adds credibility). The researcher should provide information that exposes how his background and experiences could influence interpretations of the findings.
4. Presenting contrary information along with information that supports chosen themes. Presenting both sides of the evidence makes the account more credible, more realistic and more valid.

5. Using peers to debrief findings improves accuracy of the account (additional interpretation beyond the researcher’s adds validity).

The five strategies listed above were used in this study to create a stronger, more credible and more valid study.

**Nature of the Study**

Transfer of training to on-the-job (OTJ) performance remains an elusive goal. OTJ application remains the great economic incentive for organizations to fund training. It is only through OTJ application of improved employee skills that organizations can generate the additional revenues and profits needed to continue to pay for the substantial costs of such training and to advance the productivity of the business.

Baldwin and Ford (1988) recognized the problem of lack of training transfer in their meta-analysis review of the literature and also recognized that there was no overarching structure to compare the findings of the limited number of studies which had been conducted from 1907 through 1987. Baldwin and Ford created the Model of Transfer Process (see Figure 1) and identified three key inputs that influence the success of training transfer. Those three inputs were: trainee characteristics, training design and work environment. It has been 24 years since the Baldwin and Ford study; yet training transfer has not shown marked improvement in all that time. Something is wrong.

Researchers in study after study have proposed improvements but with limited success. Conflicting results and conclusions have been common among the many studies
done around transfer of training. Grossman and Salas (2011) suggested that there have been so many suggestions for improving transfer of training that it would be impossible for an organization to implement all of them. They reviewed studies done since Baldwin and Ford (1988) and identified the characteristics that they determined to have the strongest relationships with the transfer of training. They then integrated these findings with more current reviews to provide organizations a means to identify those characteristics that seemed to most likely to impact training transfer in the workplace. Grossman and Salas recognized that organizations have finite resources and that organizations need to use those resources to achieve the greatest impact on transfer of training. However, Grossman and Salas stopped at the discussion and did not provide a means for organizations to rank the characteristics.

This dissertation reviewed the Grossman and Salas (2011) work along with output from 8 additional relevant and respected training transfer studies done between 1989 and 2011 for a total of 9 meta-studies from industrial psychology. The dissertation organized, analyzed and synthesized the findings, and ranked them against business criteria of value versus cost and provided actionable, practical recommendations for organizational practitioners. These studies include Alvarez et al. (2004), Baldwin et al. (2009), Blume et al. (2010), Burke and Hutchins (2007), Cheng and Hampson (2008), Cheng and Ho (2001), Ford and Weissbein (1997), Grossman and Salas (2011), and zu Knyphausen-AufseB et al. (2009). Additional studies within the 1989-2011 time range were also reviewed since each of the studies above limit their analysis of each of the three training input factors and focus some results to the exclusion of others. The idea was to provide
organizations with options that can be chosen based upon their particular needs and audiences so this dissertation aims to be as inclusive as possible.

This dissertation acknowledges the numerous contributions that have been made over the last several decades to understand the issue of training transfer. However, despite the vast database of knowledge about characteristics that influence training transfer, training transfer is still a problem and good solutions and their applications still elude organizations. Perhaps it is time for a different vantage point and a different approach in attempting to solve this problem. Baldwin and Ford’s three-component model identifies the key major inputs impacting training transfer but the problem is so complex and the components so interrelated, that a more holistic approach is needed. Furthermore, as Grossman and Salas (2011) suggest, the transfer of training findings need to be organized and integrated so that businesses can action the findings. No one business can implement all the individual suggestions because to do so would be time and cost prohibitive. And, even if a business could – many of the findings contradict each other so to institute one could diminish the other.

Since I work in the global training department of a major Fortune 100 organization, I have a bias that believes that training transfer is not as effective as it could be and that the research has been muddled and confusing to practitioners. I have identified analyzed, ranked and recommended findings that businesses can institute to begin improving transfer of training. A business lens has been used to rank findings. The findings were ranked against cost and value. The ranking also indicated the range of the findings against what is within the business’s sphere of control giving the practitioners a
clear indication of which findings are possible for the business to impact, which are the

low hanging fruit that can be implemented quickest.

A review of the literature indicated that Baldwin and Ford’s Model of the
Transfer Process was the seminal work in training transfer (Alvarez et al., 2004; Blume et
al., 2009; Burke & Hutchins, 2007; Cheng & Hampson, 2008; Cheng & Ho, 2001;
Grossman & Salas, 2011; Kopp, 2006; Merriam & Leahy, 2005; Yamnill & McLean,
2001; zu Knyphausen-AufseB et al., 2009). I used Baldwin and Ford’s Model of the
Transfer Process as the conceptual framework to review the literature that has occurred
since their original meta-analysis in 1988 (see Figure 1).

Analysis Unit and Search Procedure

This qualitative study focused on meta-studies in the literature which addressed
Baldwin and Ford’s (1988) three training inputs that impact transfer of training. The
following databases were used for the initial searches: Academic Search Complete,
Business Source Premier, Econ Lit, ERIC, Educational Full Text, Psyc ARTICLES, Psyc
INFO, and Proquest Dissertations and Theses.

The following terms were searched individually and in various combinations:
training, training transfer, trainee characteristics, training design, training interventions,
work environment, and on-the-job performance. Representative searches of transfer of
training paired with each of these terms were expanded using most frequently cited
references and most relevant sounding titles from references provided from each initially
identified source. Sources with relevant titles from the meta-studies were also reviewed,
after culling of non-relevant and duplicate sources. Initial searches were made to ensure
adequate understanding of the topics and current thinking on each of the individual areas,
in addition to looking for sources that make connections among the characteristics.
Except for seminal sources, searches were limited to the years 1989 – 2011. Once
relevant titles were selected from the online search and reference titles and redundancies
removed, the abstract was read for the remaining articles. If the abstract indicated that it
was an empirical study that considered the impact of trainee characteristics, training
design (interventions) or work environment on the transfer of training, then the whole
article was included in the analysis for this dissertation.

Cooper’s (1988) taxonomy of literature reviews was used to structure the
investigation. Cooper’s taxonomy addresses six characteristics of the literature review
which are (a) focus, (b) goal, (c) perspective, (d) coverage, (e) organization, and (f)
audience.

First, the focus of this dissertation was a combination of looking at research
outcomes along with looking at practices or applications. The dissertation focused on
how research outcomes, practices, and applications could be identified to meet the needs
of organizations trying to improve training transfer. It seemed that, at least to some
extent, training was not transferring because organizations do not have clear direction
about which characteristics are the most effective and do not know which characteristics
to implement.

Randolph (2009) noted that “[a]n outcomes-oriented review may also deal with
theories related to phenomenon being investigated and introduce practical applications of
the knowledge that will ultimately be gained” (p. 3). Randolph also notes that a focus on
practices or applications can lead to identifying solutions for issues and so helps
organizations use the findings from studies to improve their organization. It helps
organizations take action, that is, to implement or operationalize findings. Taking a business-like focus which was searching for characteristics over which the organization has power, narrowed the options so that operationalized actions could be recommended.

The goal of this dissertation was to review, organize and synthesize the findings of studies within the extant literature demonstrating how trainee characteristics, training design, and work environment impact the training transfer problem. The goal was to identify central issues around these three training inputs to explicate how they impact training transfer. Once their impact was better understood, analysis revealed specific actions a practitioner can use to apply these findings in the real world.

This dissertation took a practical, action-focused perspective. It recognized that there was a tremendous amount of research available in the literature around training transfer but that no organization could ever implement all the findings. There was a wealth of knowledge that could be used to improve organizational performance but the sheer size of the database limited its use. The dissertation synthesized findings in a way that provided a ranking mechanism that enabled organizations to sort through the mass of materials and find recommendations that could be made actionable because they were proven and within the organization’s sphere of control.

The dissertation’s literature review covered respected and highly referenced meta-studies carried out between 1989 and 2011 that targeted transfer of formal training to the workplace. It was an exhaustive review with the data population bounded between the years 1989 and 2011. The review only considered articles from published, peer-reviewed journals and conference papers were excluded. Conference papers were excluded because
they had not been peer-reviewed and so lacked the validity found in peer-reviewed journals.

The organization for the dissertation review was in a mixed structure using a conceptual and a methodological format. The dissertation began with an introduction, defined the methods and then presented the results in a conceptual format based upon the three broad training inputs identified by Baldwin and Ford (1988) as the inputs that most influenced training transfer. Then the dissertation moved to a discussion of results. This mixed format is often used in meta-analytic reports and was suitable for this literature review.

The audience for this dissertation was primarily the review committee for the dissertation but it will hopefully find and provide recommendations for practitioners. While the dissertation was not written for the general non academic audience, hopefully the findings will be adaptable to the business environment.

**Data Collection and Recording**

Training transfer was described by Burke and Hutchins (2007) as the “use of trained knowledge and skill back on the job” (p. 265). Baldwin and Ford (1988) noted that “for transfer to occur ‘learned behavior must be generalized to the job context and maintained over a period of time on the job’” (as cited in Burke & Hutchins, 2007, p. 265). The ultimate reason why organizations are willing to support training for their employees is to enable them to perform their tasks more effectively. If training does not flow all the way through application, there is no reason for organizations to continue to support training.
The data collection process was carefully documented to show all the steps that were taken so that another researcher could replicate the study if desired. Data for this study was collected from a selection of eight meta-studies published between 1988 and 2011, plus Grossman and Salas (2011) and the seminal study by Baldwin and Ford (1988). These meta-studies were chosen based on lengthy reviews of the training transfer literature and appeared to be the most respected and most cited meta-studies on the topic. The 8 studies, other than Grossman and Salas (2011) were Alvarez et al. (2004), Baldwin et al. (2009), Blume et al. (2010), Burke and Hutchins (2007), Cheng and Hampson (2008), Cheng and Ho (2001), Ford and Weissbein (1997), and zu Knyphausen-AufseB et al. (2009). This dissertation was limited to findings in empirical studies only. The industrial psychology meta-studies alone included several hundred distinct empirical studies and educational and government data-bases added hundreds more findings to provide a robust review.

Training events were looked at for time periods; before, during, and after the event. There are potential hurdles to transfer during each of these times. Before the event, attitude in participants could be such that they are either unwilling or reluctant to participate. During the event, participants may agree to participate, but then see that the material being offered is not relevant to their work, or the training design is ineffective in stimulating learning. After the event, learning may have occurred, but the participant may not be motivated to apply what he’s learned on-the-job, or his job environment may not allow application, or learnings could be forgotten before there’s any opportunity to apply them (Eddy & Tannenbaum, 2003).
Holton and Baldwin (2003) proposed a number of actions that should be encouraged to improve training transfer. They proposed that trainers and management should focus attention on actions needed before and after the training, rather than during the training alone. They also suggested the use that managers and supervisors should be used as transfer agents making sure the importance of transferring training to the workplace is communicated. Holton and Baldwin felt organizations needed to pay more attention to training and audience alignment saying that audiences for training should be targeted and training should not be composed of audiences who are just the first to sign up. Holton and Baldwin emphasized that merely moving to the latest fad (like e-learning or just-in-time training) would not solve the transfer problem. They noted that training transfer is maximized only when training transfer becomes the explicit reason for learning and is not considered just a postlearning event activity.

Researchers often used the three training inputs (trainee characteristics, training design and work environment) from Baldwin and Ford’s (1988) Model of Transfer to categorize their findings. However there was little agreement among the researchers on which characteristics were most effective under each input. For example, Burke and Hutchins (2007) discussed the three inputs that impact training transfer and noted that the trainee characteristics of cognitive ability, self-efficacy, personality, perceived value, career variables, and locus of control impacted training transfer. They provided strong evidence to support that these characteristics impacted training transfer. Burke and Hutchins noted that needs analysis, learning goals, content relevance, instructional methods, self-management strategies, and technological support impacted training design
and that strategic linkage, transfer climate, supervisor and peer support, opportunity to
perform and accountability were characteristics that impacted training transfer.

In comparison, zu Knyphausen-AufseB et al. (2009), who also used Baldwin and
Ford’s process to categorize their findings, identified thirty-six sub-characteristics
beneath Baldwin and Ford’s three inputs. zu Knyphausen-AufseB then consolidated the
thirty-six into thirteen discrete training transfer influence characteristics. Creation of
these somewhat larger categories made classification of findings more manageable for
that study but made it difficult for others to compare their findings to other studies such
as Burke and Hutchins (2007).

This study coded findings about characteristics from the meta-studies and
research into the three inputs identified in Baldwin and Ford’s (1988) model. Findings
were named as the specific characteristic that the original researcher identified. All
characteristics identified in the meta-studies were captured in Table 7. Table 8 shows the
characteristics that each meta-study identified under each of Baldwin and Ford’s original
three inputs to training transfer.

A second analysis was done in parallel with the results generated in Table 8. This
analysis used a business lens to apply business practicality to the analysis by including
value and do-ability for the various identified categories. Among the meta-studies
reviewed, only zu Knyphausen-AufseB et al. (2009) compared results to a business focus.
Zu Knyphausen-AufseB plotted results on a 3 X 3 matrix looking at a value-cost ratio.
According to zu Knyphausen-AufseB, the Value-Cost- ratio was the “quotient of the final
training transfer (output)” and “organizational and financial effort (input)” (p. 298).
Using a business lens was seen as key to understanding the value of training transfer.
This study follows the zu Knyphausen-AufseB et al. (2009) example and but posited that a key goal of a business should be to maximize value at minimal cost. Note that this study inverted the calculation (Cost/Value) used by zu Knyphausen-AufseB and colleagues and portrayed value as the desired valuable component as demonstrated by Value/Cost. This study assumed that it is not the lowest cost that is important but rather getting the best value for the cost.

Before a business can take any action based upon recommendations, the action must be within the organization’s sphere of control. Zu Knyphausen-AufseB et al. (2009) again were the only study to state this (while it may have just been assumed in others). They defined sphere of control as the extent that a Human Resource Department could influence the variable. This dissertation did not assume the Human Resource Department was the only department within the organization that could impact the organization’s sphere of control. This dissertation assumed that organizational structure and policies identified which department(s) can impact results of transfer of training. It was assumed that no matter how high a value a certain finding might be, if the organization did not have control or at least influence over that finding, then the organization should not waste time and effort (cost) in focusing on it.

Additional agents beyond the Human Resource Department such as trainee supervisors and department management would also be in a position to take advantage of their own different spheres of control, and their impact was also considered and discussed in this dissertation. There is clearly a need for understanding which components of trainee characteristics; which interventions in training design and what types of work environment actually impact training transfer. Further there is a need to understand how
these training inputs fit within an organization’s sphere of control so that the business can determine what actions to take to make training transfer more effective.

**Data Analysis**

Each of the articles was read thoroughly and the findings codified. A coding process was used to classify the identified sources into subcategories under the three Baldwin and Ford (1988) identified inputs that impact training transfer. The findings were coded under this classification system to identify which characteristics impacted training transfer most successfully.

Bogdan and Biklen (2003) described the use of a coding system. They advised to watch for concepts, words, phrases, patterns of behavior, ways of thinking and events that stand out as the data is read. Coding system development involved a number of steps which included: searching for patterns and regularities along with topics the data covers, and then capturing phrases and words that represent those patterns and topics. These phrases and words are coding categories. They provided a means of sorting the data collected so that material relevant to a given topic gets physically separated from the other data.

Creswell (2009) further explained coding:

Coding is the process of organizing the material into chunks or segments of text before bringing meaning to information. It involves taking text, data or pictures gathered during data collection, segmenting sentences or paragraphs or images into categories, and labeling those categories with a term, often a term based in the actual language of the participant. (p. 186)
Creswell advised several techniques for qualitative researchers to use in data coding. These included analysis with an expectation based on past literature and common sense, allowing for inclusion of codes that are surprising and were not anticipated at the beginning of the study, and codes that addressed a larger theoretical perspective in the research. Hutchins and Burke (2008) suggested further that coding should be carried out by a peer coder in addition to the primary researcher.

This researcher used a peer to assist in coding. The peer is an engineer with an MBA in finance and is a retired manager of a core competency technical disciple from a Fortune 100 company. He led the knowledge management efforts for his firm for 10 years and brings knowledge of actual application of training from the business world. My Dissertation Chair and Dissertation Committee were also very familiar with training transfer and business applications so their knowledge was indispensable.

Table 7 shows the coding structure that was utilized, including the colors chosen to represent the various positive and negative results found for the characteristics. As many categories as needed was created. Data was captured in Table 7 and then analyzed to determine likely value to cost relationships for each of the subcategories. The engineering manager peer reviewed the coding system and played a strong role in analysis of value/cost relationship as he had implemented most if not all of the subcategories at least once within his career and could speak to the value/cost relationship. Sphere of control for each category was also separately assessed for each of the categories. With these assessments in hand, the data was plotted into Figure 2 adapted from Zu Knyphausen-AufseB et al. (2009) to show the relationship between value/cost and sphere of control.
Table 7

*Training Transfer Categories Coding*

<table>
<thead>
<tr>
<th>Category</th>
<th>Supporting View Color</th>
<th>Opposing View Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category 1</td>
<td>Red</td>
<td>Striped Red</td>
</tr>
<tr>
<td>Category 2</td>
<td>Orange</td>
<td>Striped Orange</td>
</tr>
<tr>
<td>Category 3</td>
<td>Yellow</td>
<td>Striped Yellow</td>
</tr>
<tr>
<td>Category 4</td>
<td>Green</td>
<td>Striped Green</td>
</tr>
<tr>
<td>Category 5</td>
<td>Blue</td>
<td>Striped Blue</td>
</tr>
<tr>
<td>Category 6</td>
<td>Indigo</td>
<td>Striped Indigo</td>
</tr>
<tr>
<td>Category 7</td>
<td>Violet</td>
<td>Striped Violet</td>
</tr>
<tr>
<td>Category 8</td>
<td>Brown</td>
<td>Striped Brown</td>
</tr>
<tr>
<td>Category 9</td>
<td>Aqua</td>
<td>Striped Aqua</td>
</tr>
<tr>
<td>Category 10</td>
<td>Olive</td>
<td>Striped Olive</td>
</tr>
<tr>
<td>Category 11</td>
<td>Silver</td>
<td>Striped Silver</td>
</tr>
<tr>
<td>Category 12</td>
<td>Gold</td>
<td>Striped Gold</td>
</tr>
<tr>
<td>Category 13</td>
<td>White</td>
<td>Striped White</td>
</tr>
</tbody>
</table>

Summary

This qualitative research study provided a comprehensive, integrated review of the transfer of training literature from 1988 to 2011, identified meta-studies with strong empirical results and consolidated these findings to pinpoint most appropriate focus areas for researchers and provided action oriented, go forward suggestions for practitioners. Chapter 3 of the dissertation presented the methodology. This included research design,
nature of the study, search procedure, characteristics studied, data collection methodology and data analysis methodology.

Chapter 4 provides the results and conclusions of the study and offer suggestions and recommendations about how learnings from the study might be academically advanced and applied in the workplace.

As stated earlier in this study, organizations do not have enough time or money to begin to implement all the recommendations found in the literature around transfer of training. This study provided organizations with a tool to rank their investment decisions regarding training transfer. It provided a consolidation of transfer of training literature that identified areas within the sphere of control of the organization so that the organization can make meaningful choices to improve the transfer of training to on-the-job performance.

Characteristics were placed into categories identified in Table 7 and were then compared and categorized under the 3 training inputs identified by Baldwin and Ford for easier comparison (see Table 8). If a training characteristic was identified in at least three of the meta-studies (see Table 9), it was then analyzed against value and cost and sphere of control. After analysis, the most frequently mentioned training characteristics were ranked in the Recommendations for Practitioners Matrix (see Figure 25). Businesses should concentrate their efforts on those characteristics that been proved to be effective by research, that have produce the greatest value/cost ratios, and are within the organization’s sphere of control. These most fruitful areas were highlighted on the Figure 25 and were shown as Area 2, Area 3 and Area 6.
Chapter 4: Results and Conclusions

Business spends billions of dollars on training but training that does not transfer to on-the-job performance means wasted financial resources. Wasted financial resources can be only the tip of the iceberg when compared to costs to human life, environmental impact and economic damage which can also be the result of lack of training transfer. The 2010 BP Oil Spill was a rare occurrence, and lack of training transfer was only one component in the tragedy but it demonstrated a worst case scenario of failure in different parts of an organization coming together for a tragedy. Looking only through the lens of training, why did training fail to transfer to the job that fatal day? For that matter, why does training fail to transfer to on-the-job performance much of the time?

Baldwin and Ford (1988) noted two viewpoints on why training does not transfer existed when they did their seminal study. First some researchers felt that training transfer research had nothing to offer practitioners and so practitioners did not use the research available to them. The second viewpoint held that practitioners knew the research was there and valuable but opted not to use it.

Almost 20 years after Baldwin and Ford’s work, researchers such as Burke and Hutchins (2007), zu Knyphausen-Aufseß et al. (2009), and Grossman and Salas (2011) suggested another reason that practitioners might not be using available research findings. Burke and Hutchins suggested that that it is difficult for practitioners to pinpoint where to focus their organization’s resources because of the sheer volume of the data with inconsistent and sometimes contradictory findings. Michael Fullan, a recognized change management expert, notes that a key problem facing education is “the fragmentation,
overload, and incoherence resulting from the uncritical and uncoordinated acceptance of too many different innovations,” (as cited in Hattie, 2009, p. 2).

America’s fascination with the new is also part of the puzzle and consultants rush to sell the newest technology and the newest program that will solve all problems. This dissertation did not fall prey to that bias and rush out to find only what was new since Baldwin and Ford’s (1988) study. It presumed that research shown in their study was still valuable and indeed it was since more recent research confirmed their findings. The dissertation built on Baldwin and Ford’s work by first summarizing their findings, keeping what had proven successful from their original study and then building on it with more current literature. The dissertation provided an exhaustive literature of training transfer literature that came after Baldwin and Ford for the years 1988-2011 so that practitioners had one-stop shopping for data.

Once the data had been accumulated, it was coded and the most frequently recommended characteristics were categorized under Baldwin and Ford’s (1988) Model of Transfer training inputs. These resulting characteristics were then analyzed to correspond to the limited constraints of time, cost, effort and sphere of control that a business must use to make business investment decisions. The results of the analysis were ranked on the 3 X 3 matrix Action Recommendations for Practitioners. The matrix and the rationale for why the characteristic was ranked where it was in the matrix are explained in this chapter. This dissertation used meta-studies with strong empirical results and individual studies from industrial psychology and education and integrated these findings to pinpoint recommendations for organizations and practitioners that are action oriented and can be operationalized providing the best value/cost results.
Key Findings

Research question 1. What characteristics in the transfer of training literature influence transfer of training? Characteristics that influenced training transfer are listed from each of the meta-studies and classified under the three areas of trainee characteristics, training design, and work environment (see Table 8).

Table 8

Key Recommendations Training Meta-Studies

<table>
<thead>
<tr>
<th>Author/Year</th>
<th>Trainee Characteristics</th>
<th>Training Design</th>
<th>Work Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baldwin 88</td>
<td>• Cognitive ability</td>
<td>• Identical elements</td>
<td>• Supervisor support</td>
</tr>
<tr>
<td></td>
<td>• Motivation</td>
<td>• General principles</td>
<td>• Transfer climate</td>
</tr>
<tr>
<td></td>
<td>• Personality</td>
<td>• Practice conditions</td>
<td>• Opportunity to perform</td>
</tr>
<tr>
<td>Alvarez 04</td>
<td>• Pre-training self-efficacy</td>
<td>• Learning principles</td>
<td>• Positive transfer environment</td>
</tr>
<tr>
<td></td>
<td>• Pre-training motivation</td>
<td>• Posttraining interventions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Experiences</td>
<td>• Cognitive Ability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Posttraining mastery</td>
<td>• Age</td>
<td></td>
</tr>
<tr>
<td>Baldwin 09</td>
<td>• Decision to transfer lies w/i individual</td>
<td></td>
<td>• Social environment</td>
</tr>
<tr>
<td></td>
<td>• Self-Accountability</td>
<td></td>
<td>• Organizational context of training activity</td>
</tr>
<tr>
<td>Blume 09</td>
<td>• Focus on increasing their motivation</td>
<td>• None make any difference</td>
<td>• Supervisor and peer support</td>
</tr>
<tr>
<td></td>
<td>• Proactive selection of cohorts</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(table continues)
<table>
<thead>
<tr>
<th>Author/Year</th>
<th>Trainee Characteristics</th>
<th>Training Design</th>
<th>Work Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burke 07</td>
<td>• Self-efficacy</td>
<td>• Learning goals</td>
<td>• Transfer climate</td>
</tr>
<tr>
<td></td>
<td>• Cognitive ability</td>
<td>• Content relevance</td>
<td>• Supervisor &amp; peer support</td>
</tr>
<tr>
<td></td>
<td>• Pre-training motivation</td>
<td>• Practice &amp; feedback</td>
<td>• Opportunity to perform</td>
</tr>
<tr>
<td></td>
<td>• Anxiety</td>
<td>• Behavior model</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Openness to experiences</td>
<td>• Error based training</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Perceived utility</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Career planning</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Org commitment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cheng 08</td>
<td>• Locus of control</td>
<td>• Opportunity to transfer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Conscientiousness</td>
<td>• Transfer climate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Anxiety</td>
<td>• Intervention strategies</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Goal orientation</td>
<td>• Organizational commitment</td>
<td></td>
</tr>
<tr>
<td>Cheng 01</td>
<td>• Self-efficacy</td>
<td>• Posttraining interventions (feedback and relapse prevention)</td>
<td>• Supervisor &amp; peer support</td>
</tr>
<tr>
<td></td>
<td>• Locus of control</td>
<td></td>
<td>• Subordinate support</td>
</tr>
<tr>
<td></td>
<td>• Career/job variables</td>
<td></td>
<td>• Mgmt support</td>
</tr>
<tr>
<td></td>
<td>• Org commitment</td>
<td></td>
<td>• Reduce task constraints</td>
</tr>
<tr>
<td></td>
<td>• Opportunity for input into training</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ford 97</td>
<td>• Self-efficacy</td>
<td>• Posttraining</td>
<td>• Opportunity to perform</td>
</tr>
<tr>
<td></td>
<td>• Adaptability</td>
<td></td>
<td>• Supervisory support</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Situational cues/self-control</td>
</tr>
<tr>
<td>Grossman 11</td>
<td>• Self-efficacy</td>
<td>• Behavioral modeling</td>
<td>• Positive work climate</td>
</tr>
<tr>
<td></td>
<td>• Cognitive ability</td>
<td>• Error based training</td>
<td>• Supervisor and peer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Realistic training environment</td>
<td>• Application opportunity</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Feedback</td>
</tr>
</tbody>
</table>

*(table continues)*
With the characteristics summarized, frequency counts were made to determine which characteristics were recommended most in the meta-studies. Data for these meta-studies was taken mainly from the industrial psychology literature. To supplement this data, findings from the 800+ studies investigated by Hattie (2009) were reviewed to represent the field of education as well as data from government and learning sciences.

Characteristics that were recommended three or more or the meta-studies were captured in Table 9. Characteristics are listed sequentially with the most frequently listed first under each category heading and least frequent last under each of the three areas of training transfer input categories. While the breakdown of characteristics provided a good start at choosing optimal areas upon which to focus organizational training transfer efforts, the list still seemed too long to be useful for a business to implement. A business must focus its training because all business initiatives must compete for scarce resources. Along with competing for scarce resources, trying to do too many things dilutes the efforts. Finding the most valuable characteristics to focus upon is necessary for achieving strong business results.
Research question 2. The second part of the study was to answer the question:

Where can organizations focus their investments to leverage results for training transfer?

This added the business aspect of value versus cost and applied organizational boundaries by looking at the sphere of control that an organization has over the various characteristics. This reduced the list of characteristics and brought focus to the characteristics where the organization had most influence and gave the best value for the cost.

Looking at the concepts of value-cost and sphere of control proposed by Knyphausen-AufseB et al. (2009) was much more difficult than the already difficult prioritizing of values for the various characteristics carried out as shown in Table 8. It was recognized that the cost of implementing each recommendation would vary among different organizations and different industries. The ASTD compiled data and proposed
numbers which can be used to approximate cost of developing and implementing various training initiatives as had O’Leonard (2012). The dimension of sphere of control had no similar effort made, and no addressing of this topic as it relates to transfer of training could be found in the literature. This kind of information would often be looked upon as sensitive and even proprietary in many organizations. Even if organizations had quantified these areas, most will be unwilling to share it. Sphere of control is highly dependent on an organization’s structure, culture and politics.

In order to overcome these impediments, the author enlisted a highly qualified peer reviewer (a line manager responsible for setting up structures and systems and overseeing technical consulting services delivered globally) to help estimate sphere of control for a typical organization. Both the author and the peer reviewer have many decades of experience working with hundreds of in-house SMEs responsible for training employees, and have dealt broadly with both successes and failures in transfer of training.

The author and the peer reviewer plotted the characteristics identified in Table 8 on a 3x3 matrix (See Figure 25) in order to rank the characteristics according to best value for cost, while being within greatest organizational sphere of control. The purpose of this exercise was to limit the categories to recommend for business focus. Business initiatives must compete for scarce resources and so the fewer the recommendations, the greater the likelihood that businesses can implement them successfully.

The characteristics in the shaded area with medium to high value-cost and medium to high sphere of control appear to have the greatest promise for influencing training transfer in a real world organization (see Figure 25). It is recommended that businesses hoping to improve training transfer should focus their efforts on motivation,
opportunity to perform, supervisor support, content relevance, instructor training and training design strategies.

<table>
<thead>
<tr>
<th>Sphere of Control</th>
<th>Value /Cost Ratio</th>
<th>Recommendations for Practitioners</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>High</td>
<td>A. Cognitive Ability</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B. Motivation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>H. Opportunity to Perform</td>
</tr>
<tr>
<td></td>
<td></td>
<td>J. Supervisor Support</td>
</tr>
<tr>
<td></td>
<td></td>
<td>D. Content Relevance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>G. Instructor Training</td>
</tr>
<tr>
<td></td>
<td></td>
<td>E. Training Design Strategies*</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>F. Posttraining Interventions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>K. Peer Support</td>
</tr>
<tr>
<td></td>
<td></td>
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Note: The letters A, B, C, etc. relate to Table 9. Yellow denotes areas where practitioners should focus.
*Training designs recommended under letter E are: general theory, safe environment, meta cognitive strategies, conceptual mapping, spaced practice, direct instruction, behavioral modeling, worked examples, questioning, and advanced organizers.

*Figure 25. Action recommendations for practitioners matrix.*
Discussion of Findings and Ranking

Each characteristic is lettered (A, B, C, etc.) to make it easy to track the discussion of the characteristic with its placement on the Recommendations for Practitioners Matrix. Each characteristic is discussed by its value, cost and sphere of control below. First, the characteristics that a training practitioner should not focus upon, shown in boxes one and five, are discussed. These are cognitive ability, self-efficacy, posttraining interventions, peer support, and transfer climate. While these have value, a business needs to focus its resources where it can get the best value for the cost expended. Business also should focus its efforts where it has the most sphere of control to impact improvements.

**Characteristics not recommended for focus.** The characteristics of (A) cognitive ability and (C) self-efficacy rank in the top left box of the matrix and show as having a high value to cost ratio but low sphere of influence. The training practitioner also should not focus resources on the characteristics of (F) posttraining interventions, (K) peer support, and (L) transfer climate. These benefits from these characteristics can either be achieved via another strategy (strong content relevance and supervisor support offset the need for posttraining interventions) or are outside the influence of the training practitioner.

**Cognitive ability.** Cognitive ability was placed in the top left box because of its high value to cost ratio but low sphere of influence.

*Value.* Cognitive ability has high value. Grossman and Salas (2011) noted that a trainee’s cognitive ability was a strong predictor of transfer. They cited research from
Blume et al. (2010), Colquitt et al. (2000), Kanfer and Ackerman (1989), and Velada et al. (2007) as researchers who found that “trainees higher in cognitive ability have more success in processing, retaining, and generalizing trained skills” (p. 107). Clark and Voogel (1985) agreed that individuals with higher general ability scores were more able and more likely to transfer training. Hattie (2009) noted “it should not be surprising that given the correlation between ability and achievement is very high” … that “brighter [individuals] tend to achieve more and not so bright [individuals] achieve less” (p. 41).

Cost. There is little that training practitioners can do about cognitive ability once the individual is hired since cognitive ability is a characteristic that is a result of genetics and early childhood development (Feinstein, 2003). Once an individual is hired, cognitive ability is a sunk cost and so the cost of cognitive ability is considered to zero by the time that organizational training is available to the employee. Its low cost but high value gives cognitive ability a high value to cost ratio.

Sphere of control. Since cognitive ability is set long before the individual enters the workforce there is little to nothing that can be done to influence this characteristic after recruitment, selection and hiring so the organization has very little, if any, control over improving cognitive ability. The way that an organization influences cognitive ability is by hiring individuals with high cognitive ability appropriate for the work to be performed. Selection of employees with appropriate cognitive ability lies with the hiring and staffing department of the organization and not within the domain of the training department. So, while cognitive ability has a high impact on the employee’s ability to learn and retain knowledge and skills, it is not something that the training practitioner should focus upon because it is a given by the time the employee comes to training.
**Self-efficacy.** *Value.* Grossman and Salas (2011) identified self-efficacy as one of the most consistent relationships with training transfer. They cited Blume et al. (2010), Burke and Hutchins (2007), Chiaburu and Lindsay (2008), Chiaburu and Marinova (2005), and Velada et al. (2007) as studies that confirm the influence of self-efficacy on training transfer. Grossman and Salas concluded that individuals with high self-efficacy had more confidence in their abilities and so were more likely to persist with difficult tasks and so more likely to achieve performance. Clearly, self-efficacy is a high value characteristic for individuals to have in order to transfer training to on-the-job performance.

**Cost.** Opportunities to develop self-efficacy are much higher in the normal work environment than during training. The supervisor and the day to day work environment will have more influence on the individual’s capability to develop self-efficacy, so resources to try and increase self-efficacy should be spent in the work environment.

**Sphere of control.** O’Leonard (2012) noted the individual employee received approximately 15.3 hours of formal training in 2011. The average employee works approximately 2,000 hours a year excluding vacation time. This means that the average employee spends approximately 1,974 more hours on the job with peers and a supervisor than in formal training and time. Given that the employee spends so much more time on the job as compared to taking formal training, any efforts to increase self-efficacy should be made on the job site.

Posttraining interventions (F), peer support (K), and transfer climate (L) all have a medium value to cost ratio and fall within the medium sphere of control for an organization.
**Posttraining interventions. Value.** Alvarez et al. (2004) identified posttraining interventions as influential in ensuring training transfer. Alvarez cited research from Burke (1997), Gist and Stevens (1998), Krijger and Pol (1995), Morin and Latham (2000), and Richman-Hirsch (2001) as finding various posttraining interventions that helped training transfer. These interventions included visualization, goal setting, feedback, and relapse prevention. Alvarez and colleagues found a positive relationship between posttraining interventions and training transfer so clearly, posttraining interventions are valuable. The value of posttraining interventions is offset by their cost.

**Cost.** There are a wide variety of posttraining interventions available. Posttraining interventions include things such as visualization, goal setting, feedback, and relapse prevention. The time to design these strategies into training is relatively inexpensive, but the cost to implement, monitor and evaluate would likely be expensive. Posttraining interventions could require additional staff for extensive follow up. There would also be a lost opportunity cost because supervisors, trainers and trainees would have their focus diverted from day to day work.

**Sphere of control.** Sphere of control is medium at best because of the time demands on all the stakeholders. In the business environment, training is given a lower priority than day to day deliverables and posttraining interventions can consume scarce resources. As a result of the higher cost and lower priority given to training versus day to day deliverables, posttraining interventions is ranked as medium value to cost and medium sphere of control. An organization could certainly have full control over posttraining interventions, but a business is very unlikely to place a priority on posttraining interventions instead of focusing on delivery of its products and services.
Training practitioners will not get best results from focusing their efforts on posttraining interventions.

**Peer support. Value.** Zu Knyphausen-AufseB et al. (2009) cited Bates et al. (2000), Colquitt et al. (2000), Cromwell and Kolb (2004), and Seyler et al. (1998) as finding that peer support influences transfer of training. Hutchins (2009) agreed and cited Bates, Holton and Seyler (2000), Chiaburu and Marinova (2005), Hawley and Barnard (2005), and Holton et al. (2000), as demonstrating the importance of peer support on the transfer of training. Hutchins elaborated on how Hawley and Barnard (2005) showed that peer networking and idea sharing helped to continue learning transfer even six months after training. Hutchins summarized the importance of supervisor and peer support by citing the research of Cromwell and Kolb (2004) who found trainees who had both supervisor and peer support communicated positive training transfer a year after training. Peer support is valuable.

**Cost.** The out of pocket cost for peer support would likely be minimal but there would be a cost related to employee time. Individuals would need slack time to be able to communicate and share experience and information. Slack time is rare in today’s business world where individuals even in highly technical sciences often have to account for every hour of every day.

**Sphere of control.** Sphere of control was ranked medium because of the time demands on all the stakeholders and because organizations do not have direct control on whether or not a peer will support another peer even if they are given the time to do so. Peer support is not considered an area where training practitioners should focus their resources because of the lost opportunity cost to the business if the employees are
focusing on training instead of producing day to day deliverables and because an organizational cannot control whether peers will support an individual who returns from training with new skills or knowledge.

**Transfer climate. Value.** Bates and Khasawneh (2005), and Salas et al. (2006) noted that transfer climate or organizational culture influences transfer of training. Grossman and Salas specifically identified transfer climate as key to transfer of training. Clearly the transfer climate has high value.

**Cost.** The cost of creating and sustaining an effective transfer climate offset the value to cost ratio down from high to medium. Dennison (1990) noted that “culture management is a long-term strategy and a difficult asset to cultivate” (p. 194). Schein (2004) concurred and noted that culture is so difficult to change that individuals and organizations will hold on to cultures even when it is obviously dysfunctional. There is a large effort and time cost to creating a business culture that places a high value on training transfer. Furthermore, research showed that a supervisor’s influence is so high that it would be difficult to delineate where a supervisor’s influence stops and a transfer climate begins. Training practitioners have little ability to change the culture of the organization so they would do better to focus their resources on trying to influence the supervisor in the work environment.

**Sphere of control.** Schein (2004) emphasized the role of upper management in establishing the priorities and allocating resources and in creating the overall culture of the organization. Training practitioners have little ability to change the overall culture of the organization since this is dependent upon upper management. Local transfer climate is however, very dependent upon the supervisor and on what the organization will permit
him autonomy in doing. Given this, the trainer practitioner is more likely to have
influence upon the supervisor than upon the general culture of the organization. Even so,
the training practitioner is unlikely to be able to do much to influence the transfer climate.
This is not an area where the training practitioner should focus.

**Characteristics recommended for focus.** The training practitioner should focus
upon those characteristics shown in boxes two, three and six. These are (B) motivation,
(H) opportunity to perform, (J) supervisor support, (D) content relevance, (G) instructor
training, and, (E) training design strategies. These are the characteristics that impact
training transfer that will provide the best value for cost to the training practitioner.
Motivation has a high cost to value ratio and is important because it encourages the use of
discretionary effort and because it influences results in other characteristics. Opportunity
to perform, supervisor support, content relevance, instructor training and training design
strategies have high value to cost ratios and rank in high sphere of control. These six
characteristics are recommended for organizations to implement. Organizations can take
action on these characteristics and begin to see results quickly. These are discussed below
with characteristic B discussed first since it can influence and be influenced by the other
five.

**Motivation.** Baldwin et al. (2009) note, “the decision to transfer ultimately
resides with each individual trainee” (p. 53). Motivation is an individual characteristic
that has a high value/cost ratio and while the organization cannot control motivation, the
organization can certainly influence it. Motivation refers to the persistence and intensity
trainees apply to their learning before, during and after the learning event. Bransford et
al. (2000), Merriam and Leahy (2005), Grossman and Salas (2011), Salvendy (2006),
Burke and Hutchins (2007), Yamnill and McLean (2001), and Hattie (2009) agree that motivation influences training transfer.

Motivation is purposefully placed on the X axis in Figure 25 so that it falls between low sphere of control and high sphere of control within the organization. Motivation is low hanging fruit that the organization can influence if it chooses. Organizations need people to run them and work in them. People need organizations to achieve goals and provide livelihood. Boleman and Deal (2009) recognized that a positive relationship between organizations and people within the organization can lead to competitive advantage. And while, the organization cannot control the individual’s motivation, the organization can do much to motivate the individual to give discretionary effort and cooperation to the organization. The Hawthorne studies proved the individual motivation on worker productivity and morale to the organization almost a century ago (Burke, 2002).

Being motivated is also valuable to the individual. Csikszentmihalyi (1990) noted that “most people spend the largest part of their lives working and interacting with others” (p. 6) and so finding flow is crucial. Csikszentmihalyi (1990) defined flow as “the way people describe their state of mind when consciousness is harmoniously ordered, and they want to pursue whatever they are doing for its own sake” (p. 6). Flow is a form of intrinsic motivation. Whenever people are motivated the relationship between organization and people is positive and transfer happens.

Motivation has a very high value and research has shown that motivation can come as a by-product of implementing the five highest recommendations in Figure 25. Motivation goes hand-in-hand with well planned training.
Cost. The cost of motivation is negligible because motivation is essentially a by-product of implementing the five recommendations in Figure 25, which are the foundation for well planned training. Once Maslow’s basic needs are met, motivation becomes a very individual characteristic and, as Baldwin, et al. noted, it is the individual who will decide to transfer or not transfer learning to on the job performance.

Research has shown that the individual is most often motivated by the opportunity to use the training, the immediate supervisor, content relevance and the instructor and good training design. All five together create a system of well planned training. If the organization implements the five characteristics, motivation becomes a sunk cost and comes as a result of careful planning and execution within the organization.

First, motivation tied to the opportunity to perform the training on the job. Burke and Hutchins (2007), Clarke (2002) Cromwell and Kolb (2004) and Salas et al. (2006) all note that employees need the opportunity to perform or use the training they have learned if they are going to transfer the learnings into on-the-job performance. Knowles (1990) confirmed that adults learn something when it is needed and this is a principle of adult learning. If the trainee knows that he will be required to use the training on the job then he will be more motivated to transfer the training.

Motivation is tied to supervisor support. Buckingham and Coffman (2002) noted that the relationship between the trainee and his/her immediate supervisor was key to employee satisfaction. Buckingham and Coffman (1999) state that the “manager - not pay, benefits, perks, or a charismatic corporate leader – was the critical player in building a strong workplace” (p. 32). Grossman and Salas (2011) cite Blume et al. (2010), Burke and Hutchins (2007), Chiaburu and Marinova (2005), and others as finding that
supervisor support is important for training transfer. If the supervisor is supportive and pays attention to training, then the trainee will be more motivated to transfer.

Motivation is tied to content relevance. For example, research has found that a trainee’s perceived value of training influences whether or not he/she will transfer training to on the job performance (Burke & Hutchins, 2007; Chiaburu & Lindsay, 2008). Clearly, the organization wants to design training so that the content of the training is relevant to the trainee’s work. The organization is investing its scarce resources to improve the performance of the individual so that the individual can improve the success of the organization. The need for relevant content is something that Baldwin and Ford (1988) identified as important in their initial study and something that they were surprised to see missing in research at the time. Researchers filled this gap by determining that a trainee’s perceived utility of training impacted the willingness to transfer (Burke & Hutchins, 2007; Chiaburu & Lindsay, 2008, Gilpin-Jackson & Bushe, 2007; Velada et al., 2007 as cited in Grossman and Salas, 2011). Perceived utility of training is not identified as a separate characteristic to implement in this dissertation because it is assumed to exist if the content is relevant.

Motivation is tied to instructor training. If the instructor is effective then s/he sets a safe learning environment (Knowles, 1990), provides clarity (Hattie, 2009) and connects the relevance of the content to the individual’s job. Hattie left no doubt as to the importance of the instructor.

There has been research into intrinsic and extrinsic factors to see if these influence motivation and they can (Rouiller & Goldstein, 1993; Santos & Stuart, 2003; Tracey, Tannenbaum, & Kavanagh, 1995); however. Facteau’s et al. (1995) study
showed that intrinsic factors have a bigger impact on motivation to transfer training. Hattie (2009) supported Facteau’s findings and noted that motivation to achieve was highest when individuals had autonomy, worthwhile goals, felt competent, got feedback and felt confirmed by others. The instructor sets the boundaries in the training environment.

Finally, training design strategies help motivate the individual. Posttraining interventions such as relapse prevention (Alvarez et al., 2004) and goal setting (zu Knyphausen en-AufseB et al., 2009) and others have been valuable in supporting training transfer. One shoe does not fit all. Noted educator, Barbara Gross Davis (1993) makes it clear that “there are no sure-fire recipes for excellent teaching, only endless ways to improve your teaching skills” (as cited in Rosensitto, 1999, p. xiv). Rather than singling one strategy out as the silver bullet, it is assumed that effective practitioners will use a variety of strategies (Hattie, 2009) and match strategies to content and audience needs. Motivation, then, becomes a by-product of effectively designed and delivered training and there is a win-win for the organization and the people within the organization.

*Sphere of control.* Motivation was purposefully ranked in the middle of sphere of control because it is here that the organization and the individual come together. Baldwin et al. (2009) noted, “the decision to transfer ultimately resides with each individual trainee” (p. 53). Motivation is the conduit between training and training transfer to on the job performance. The organization will get the results of its careful planning and executive of well designed training.

*Opportunity to perform.* Value. Burke and Hutchins (2007), Clarke (2002), Cromwell and Kolb (2004), and Salas et al. (2006) all noted that employees need the
opportunity to perform or use the training they have learned if they are going to transfer the learnings into on-the-job performance. Grossman and Salas (2011) are explicit in saying “for training to successfully transfer, trainees need the resources and opportunities to apply their new skills and abilities to the workplace” (p. 114). This seems like common sense. Clearly allowing the trainee to transfer learnings helps the trainee transfer learnings. There is high value to allowing the opportunity to perform.

Cost. The cost of allowing individuals actually should be negative. If employees get training before having to learn it on the job, time is saved, work is faster and work is safer. There is a high value/cost ratio.

Sphere of control. Opportunity to perform is completely within the sphere of control of the organization. Supervisors and competency planners need to work closely with the training department to ensure that employees are being trained in what is needed for them to succeed and in what they will actually implement.

Supervisor support. Value. Buckingham and Coffman (1999) noted that the “manager—not pay, benefits, perks, or a charismatic corporate leader—[is] the critical player in building a strong workplace” (p. 32). O’Leonard (2012) showed that the individual employee got approximately 15.3 hours of formal training in 2011. Since, the average employee works approximately 2,000 hours a year excluding vacation time, this means that the average employee spends approximately 1,970 more hours on the job with peers and a supervisor than in formal training. Time alone would indicate that the on-the-job environment is going to have a greater influence on the trainee than formal training. Supervisor support has a very high value.
Cost. There would be a cost to train supervisors and make them aware of the importance of their influence. Organizations also would have to free up time to allow supervisors to be trained and open time to allow them time to focus on the development needs of their employees. Too often organizations add trainee development on top of the already full plates of supervisors and so supervisors simply do not have the time needed to support their employees. Middle management is the lever that can improve results and performance. Middle managers are the translators that turn initiatives into action. Focus on developing supervisors pays off in the leverage they produce in their employees.

Sphere of control. This is within the organization’s sphere of control and should be an organizational priority.

Content relevance. Value. Content relevance and opportunity to perform are two sides of the same coin. Baldwin and Ford (1988) recognized early on that content was very important. They noted in their original study that researchers seem to take it for granted that content was going to be useful to the trainees and noted that this was not something that could be taken as a given. Research has found that a trainee’s perceived value of training influences whether or not he/she will transfer the training (Burke & Hutchins, 2007; Chiaburu & Lindsay, 2008). Research has also found supervisor/trainee discussion prior to training or after training can influence intent to transfer by demonstrating that the supervisor is supportive and in helping the trainee see the relevance of the training to the job. And, obviously if the content is not relevant there is a lesser chance that the employee will have the opportunity to perform those new learnings on the job.
There is no benefit to the organization if the content is not relevant to the needs of the aligned goals of the individual and the business.

Cost. There is a high cost to content relevance. It is not simple to assess the current skills, knowledge and attitudes of individuals. It is not easy to identify all the competencies that are needed to create skills across a wide diversity of job positions. None-the-less, there is no point to training if the content is not relevant.

Sphere of control. Content relevance is within the sphere of control of the organization. Supervisors and competency planners need to work closely with the training department to ensure that employees are being trained in what is needed for them to succeed and in what they will actually implement.

Instructor training. Value. Interestingly, not one of the industrial psychology meta-studies even mentioned the instructor. Hattie (2009) invested 15 years in research and synthesized over 800 meta-analyses on achievement results for school-aged individuals (through college) and he concluded that “teachers [instructors] are among the most powerful influences in learning” (p. 238).

There seems to be a strongly entrenched mindset that there is a huge difference between pedagogy (study of strategies for teaching children) and andragogy (study of strategies for teaching adults) but this may be weakening as more and more research shows that learning is learning (National Research Council, 2000). Most of the learnings from Hattie apply equally to adults and children alike with the exception of critical reflection which applies more to adults because it is a learned skill (Tuinjman, 1995). The International Board of Standards for Training, Performance and Instruction (IBSTPI) agreed that the trainer influences training results (Russo, 1999).
Hattie (2009) cited the research from Fendick (1990) to illustrate why teachers have such a strong impact on learning. Fendick defined teacher clarity as how well organized the teacher was; how clearly s/he explained; whether s/he provided examples and guided practice, and how effective s/he was in assessment of the [individual’s] learning.

That was just the beginning of how impactful the teacher or instructor during the learning experience. Hattie and Clinton (2008) and Smith et al. (2008) researched teacher impact working with the National Board for Professional Teaching Standards and found that teachers who had been certified by the National Board for Professional Teaching Standards were more likely, in a “systematic and consistent way, to challenge students to think; [and] they regularly promoted varied and appropriate assignments that were demanding and engaging (d = 1.37)” (Hattie, 2009, p. 117). Other areas where teachers who had been certified stood out included: (a) had deep understanding of their subject matter (d = .87), (b) had a problem solving attitude (d = .82), (c) created a safe environment for learning (d = .67), and (d) had respect for their learners (.61).

Effective instructors have high value.

*Cost.* Many organizations make the assumption that because an individual is an expert in his/her content, then he/she is an expert in teaching. Becoming an effective instructor takes work and effort. Rosensitto (1999) noted the high value of teacher preparation and the need for instructor effectiveness. Using a Subject Matter Expert (SME) to teach a course takes a scarce resource from the organization. A SME’s expertise is very valuable so it is incumbent upon the organization to maximize their effectiveness if they are used to teach.
Russo (1999) noted in ASTD’s Teaching SMEs to Train that it important to provide SMEs training and support if they are to be effective. Training SMEs to be effective trainers is expensive. Taking SMEs from their operational work because they are experts in a content area and having them do an ineffective job because the organization does not provide them the training they need is doubly wasteful. This is a cost that they organization must accept if SMEs are used as trainers.

*Sphere of control.* This is within the sphere of control of the organization. This is a matter of priority setting.

*Training design strategies.* *Value.* Blume et al. (2010) did a meta-analysis of 89 empirical studies and one of their findings was that there was “the lack of consistent support for any particular transfer interventions” (p. 1096). However, various researchers found the twelve training design characteristics listed to impact retention and learning and so to impact training transfer. These appeared most frequently in the literature review. They are:

- posttraining interventions,
- safe learning environment,
- general theory,
- meta-cognition strategies,
- behavioral objectives,
- advanced organizers,
- concept mapping,
- direct instruction,
- worked examples (practice),
questioning,
behavioral modeling, and,
spaced learning.

Clearly, knowledge of adult learning and good instructional theory can ensure training is well designed just as Rosensitto (1999) and Hattie (2009) have demonstrated through extensive research. Well designed training has high value to an organization.

Cost. There is a cost to ensuring effective training design because there is a need for professional competency in training design. Training design and instruction is a profession and organizations need the right expertise to get the right results. The use of professionals in the learning sciences can be used to leverage the expertise and time of Subject Matter Experts, free up the SME time for operations in his/her area of expertise and provide added value to the learners. Properly designed training will become even more important as remote technology is used to reach learners. Effective instruction is not easy in face-to-face circumstances and it will be harder long-distance especially if the training materials are poorly designed. For small organizations there is a wealth of data available in books and on-line that discusses how to design learning. For larger organizations, and especially those in the global market place, learning expertise is needed either in house or through consultancy.

Sphere of control. Using effective training design strategies is within the sphere of control of the organization. Expertise can be hired or contracted.

Implications for Practitioners

This dissertation reviewed meta-studies from industrial psychology and supplemented with articles from education, government, business, learning sciences, and
organizational capability to identify the quickly implementable and best value/cost training transfer characteristics to provide recommendations for organizational practitioners making resource investment decisions. The resulting recommendations were ranked against value to cost since organizations have limited resources and against sphere of control.

First, recognize that all organizations are different. This ranking was done based upon the needs and resources of a Fortune 100, decentralized energy company. Some organizations will have more control in different areas and more or less resources and circumstances. It is suggested that the Recommendations for Practitioner (see Figure 25) be used as a tool for practitioners to plot the research findings as it relates to their own company. The discussion and dialogue from such a ranking process will be very useful in and of itself.

Second, it is suggested that the training departments wherever they may be located in the organizations and regardless of size, work to form a partnership with the recruitment and hiring individuals (departments) within their company. The fact is that once individuals are hired there is little that can be done to change the essence of who they are. The selection and hiring function of the organization need to select on specific criteria the organization has established so that the right people are hired. The two most important trainee characteristics which are cognitive ability and motivation are established long before an individual joins an organization and there is little that can be done to change these characteristics. Selection and recruitment personnel need to know what skills and character are needed before an individual is hired.
The organization can influence perceived value of training by making the training content valuable. The organization can also impact self-efficacy by providing well designed training experiences with high value content that is taught by trained, competent instructors. Many of the instructors in large organizations are senior Subject Matter Experts (SMEs) who are the backbone of the organization’s operational capability and also have a passion for teaching and so do both (Williams, 2001). However, teaching is more than standing up and reading PowerPoint slides and telling war stories so it is incumbent upon the organization to provide training for instructors so that their very valuable content is retained by the trainees and transfers to on-the-job performance. Barbara Gross Davis’s book, *Tools for Teaching* (2009) is an excellent toolkit for instructional strategies to help match teaching styles and trainee needs. Truly good instructors can help improve self-efficacy because trainees will become more confident in their KSAs as they participate in learning events.

**Conclusions**

There is no point in investing resources in training transfer characteristics over which the organization has little or no control. The five recommended characteristics that organizations can action quickly for greatest impact are: (a) opportunity to perform, (b) supervisor support, (c) content relevance, (d) instructor training and (e) training design strategies.

Motivation is not singled out as a characteristic to implement because it is a by-product of producing well designed and effectively implemented training. An organization cannot implement motivation. An organization can plan effectively, design well and effectively deliver relevant training that is meaningful to the organization and to
the individual. Training is expensive. There is some value to training if training is done in the organization and if some training transfer but organizations are squandering scarce resources. It is just good business to utilize the extensive research that has been done on effective training transfer and put it to use to ensure relevant training and effective training transfer. Implementing the five recommendations in this dissertation will jump-start training transfer and effectiveness to on-the-job performance

**Recommendations for Future Research**

Future research is needed regarding instructor impact on retention and training transfer. More research is needed also in regards to what makes a good instructor. It is acknowledged that excellent instructors come in all shapes and sizes (outgoing, introvert, quiet, demonstrative, etc.). It is also acknowledged that there is a plethora of teaching strategies already recommended as the silver bullet to solve all problems (error based training, relapse training, Socratic methodology, etc.) and Baldwin et al. (2009) found and this dissertation found no magic strategy that satisfies all training needs. The focus of future research might be to determine what behaviors from an instructor produce best results. It is urged that the research provide a robust description of content, the objectives for the training, the audience, and the organization so that practitioners can best understand how the research fits their organization.
REFERENCES


Rosensitto, A. M. (1999). *Faculty perceptions of the need for graduate programs to include formal curricula designed to prepare candidates to teach in college and university settings*. Available from ProQuest Dissertations and Theses database. (UMI No. 9943986)


APPENDIX A

Model of the Transfer Process

A Model of the Transfer Process
Baldwin and Ford (1988)

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<td>&amp; Maintenance</td>
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1. Trainee Design → Learning & Retention
2. Learning & Retention → Generalization & Maintenance
3. Learning & Retention ← Work Environment
4. Generalization & Maintenance ← Conditions of Transfer
5. Generalization & Maintenance ← Work Environment
6. Learning & Retention ← Training Outputs
APPENDIX B

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