

## **ABSTRACT**

CATHCART, STEPHEN MICHAEL. A Case Study of Human Resource Development Professionals' Decision Making in Vendor Selection for Employee Development: A Degrees-of-Freedom Analysis. (Under the direction of Dr. James Bartlett II)

Much literature on training and development examines the aspects of why and how organizations train employees. While there are a number of models on assessment, design, development, implementation, and delivery (variation on the ADDIE model [Analysis, Design, Development, Implementation, and Evaluation]), very little literature pertains to deciding on the selection of vendors from who organizations purchase training. After the analysis phase it is possible that the human resource development (HRD) professional might not want to design and deliver the training. In that case, there is an option for the organization to purchase training through vendors. Understanding the administrative decision-making HRD professionals use to make organizational training purchases is important. In addition to building theory in administrative decision-making to better understand organizational purchase, this study develops understanding of the process HRD professionals use to purchase training. This will benefit the HRD professional as well as the vendors selling training solutions. The decision to develop or purchase training in organizations theoretically occurs after a needs assessment process, however, it is known that many organizations may skip this step or do it very informally when using the ADDIE model. Limited discussion in the literature is geared toward how the process of decided to purchase training is conducted.

This mixed method study examines HRD professionals' decision-making processes when making an organizational purchase of training. The study uses a case approach with a degrees of freedom analysis. The data to analyze will examine how HRD professionals in manufacturing select outside vendors human resource development programs for training, coaching, and developing employees.

The purpose of this study is to better understand how HRD professionals select training once the decision has been made to purchase rather than design internally. Specifically, the study will (a) Identify the theory (rational, bounded rationality, political, or garbage can) that best describes HRD professionals decision-making in relation to external vendor use for training and development; (b) Describe the counts on a prediction matrix based on theories of decision- making regarding how HRD professionals select external vendors for training and development; and (c) Describe the process used in relation to the theory most often used by HRD professionals when deciding which external vendor to use for training and development.

This study uses a case study research design with a degrees of freedom analysis (DFA) approach. The DFA was used to create a prediction matrix that sorted decisions on which vendors to use into four decision-making models: the rational model, bounded rationality model, political model, and garbage can model.

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A Case Study of Human Resource Development Professionals' Decision Making in Vendor  
Selection for Employee Development: A Degrees-of-Freedom Analysis

by  
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## **DEDICATION**

I dedicate this dissertation respectfully to my father who modeled manhood, strength, and sacrifice. These characteristics guided and pushed me to achieve my goals. Also, all the teachers and professors along the way that had confidence in me. Lastly, I dedicate this work to my brothers Ronald W. Cathcart and Kenneth W. Cathcart: gone but never ever forgotten.

## **BIOGRAPHY**

Stephen “Steve” M. Cathcart has facilitated workshops all over the United States as well as internationally and is regarded as an expert in many areas of employee development including leadership, diversity, performance management, and customer service. Steve has a unique blend of experience in both the public and private sectors as both an employee and consultant for Fortune 500 companies, government entities, NGOs, and non-profit agencies. A lifelong resident of North Carolina, Steve was educated in the Charlotte-Mecklenburg public school system. He has both a Bachelor of Arts in History and a Master of Science attained from North Carolina Agricultural and Technical University. Steve is a proud member of Omega Psi Phi Fraternity, Incorporated, and Prince Hall Affiliated Mason. He enjoys spending time with his family and friends and has many interests and several hobbies. Steve resides in Charlotte, NC with his wife, Nefertari Cathcart and two children, Kenneth and Mikayla Cathcart.

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## **CHAPTER ONE INTRODUCTION**

Human resource development professionals have very complex jobs with a wide variety of roles based on the organizations in which they work. One role that human resource development professionals (training managers and/or human resource managers) conduct in their positions is making administrative decisions to purchase training for organizations. For the purposes of this research, training managers, human resource managers, and senior training specialists will be referred to as human resource development (HRD) professionals. While there are many definitions of HRD, the definition used in this study is: “HRD is a process of developing and unleashing expertise for the purpose of improving individual, team, work process, and organizational system performance” (Holton & Swanson, 2009, p.4). The HRD professional works to ensure that employees in an organization are professionally developed in order to be more productive in their roles. This professional development not only benefits organizations but also benefits employees in terms of marketability and upward mobility.

This study specifically examined the manufacturing sector to understand how HRD professionals make administrative decisions for the selection of outside vendors that help professionally develop employees to improve individuals and organizations. Manufacturing was chosen because training and development initiatives are common in current manufacturing environments due to the technical nature of manufacturing combined with the need to work across multicultural boundaries. Additionally, the need to train employees to operate in a safe manner is paramount.

This chapter provides background that serves as context to the study. Following the background is the statement of the problem and the significance for both HRD professionals in organizations purchasing training, as well as vendors providing the training options. The purpose of the study provides a foundation for the research questions. Following the research questions is a brief overview of the conceptual framework and description of the research design; the significance of the study is presented to explain the importance of the research followed by the limitations, delimitations, and summary.

### **Role of HRD Professionals**

Training employees is a critical function of many organizations for which the HRD professional is essential. The need for organizations to conduct quality training programs that provide significant return on investment (ROI) is important: “Well trained employees benefit organizations in increased productivity and profits while also benefitting employees in the form of increased earnings and wages” (Philip, 2010, p. 1177). By developing individuals and organizations with effective training it is possible to gain a competitive advantage in the market:

Employers are increasingly depending on the skills of all their employees for improvements in efficiency, quality, and customer service, and for the development of new applications for existing products and services. In addition, the USA may be facing a growing human-capital deficit that threatens our competitiveness, our ability to provide work for every able-bodied citizen, and the nation’s security. Workforce training must become a corporate obsession. It is on this variable that the outcome of

the overall competitive struggle may most strongly depend. (Frahm, L., Kathawala, Y., & Motwani, J., 1994, p.35)

As organizations strive to gain a competitive edge in the new, global economy there is a need to examine why and how employees are developed. Training and development is more often than not the first casualty of a down economy, but this may be the wrong approach:

The continued need for individual and organizational development can be traced to numerous demands, including maintaining superiority in the marketplace, enhancing employee skills and knowledge, and increasing productivity. Training is one of the most pervasive methods for enhancing the productivity of individuals and communicating organizational goals to new personnel. In 2000, U.S. organizations with 100 or more employees budgeted to spend \$54 billion on formal training.

(Arthur, Bell, Bennett, & Edens, 2003, p. 234)

The aforementioned needs to develop employees are always present whether the economy is thriving or not.

There are a number of theories that can be used to examine human resource development. Holton and Swanson (2009) placed theories that support human resource development research into three broad categories: psychology, systems, and economic theories. Human capital theory provides a solid economic background to support the need for training and the benefits of having well-trained employees. Additionally, to understand the decision-making processes, administrative decision-making theory provides a lens through which to view the work processes or systems in human resource development.

Human capital theory was first researched and presented by Schultz in 1961. Human capital theory was further developed by Becker beginning in 1964 with the book *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*. In his writings, Becker differentiated the concept of specific human capital from general human capital. Swanson and Holton (2009) stated, “General human capital development increases the skills and productivity of people by the same amount in organizations providing the training as it would if they went to work for another organization” (p.122). Examples of specific human capital development include training of explicit company policies, software that a company uses, and on-the-job-training for skills that are needed for a particular organization. Examples of general human development capital are leadership, soft-skills, customer service, teamwork, and critical thinking.

Human capital theory has not only been used in the study of human resource development but is a theory that has been used in multidisciplinary research. Human capital refers to the studies of investments by individuals, organizations, or nations that accumulate stocks of productive skills and cognitive or technical knowledge. Human capital theory was initially introduced as an explanation for individual decision-making related to education and training choices. Later it was broadened to encompass more wide-ranging economic decisions.

Human capital theory posits that the development of employees is seen as an investment for the organization and the employee as well. This investment leads to increased productivity and profits for the organization and to higher wages for the employee. Human capital development has an impact on both macroeconomic and microeconomic levels: “The

increased value of human capital derived from human resource development is likely to influence productivity, wages, prices, and other factors at an aggregate level of the economy” (Holton & Swanson, 2009, p.125).

Many times HRD professionals make the decision to purchase training to develop the workforce rather than developing and delivering the training internally. The HRD professional is often the person in the organization that selects or is part of the selection process for purchasing employee development programs. The selection of training is an administrative decision-making process that is critical to ensure quality employee development is offered to improve individuals and organizations. To better understand the HRD professionals’ selection of purchased training, administrative decision-making theory can provide a framework.

Administrative decision-making theory was developed by Herbert Simon and can be viewed through the lens of organizational design: “Organizational design is the process of first diagnosing and then selecting the structure and formal system of communication, authority, and responsibility to achieve organizational goals” (Holton & Swanson, 2009, p. 83). Individuals who work from this core belief realize how both work tasks and the organization structure impact the development of the organization’s human resources.

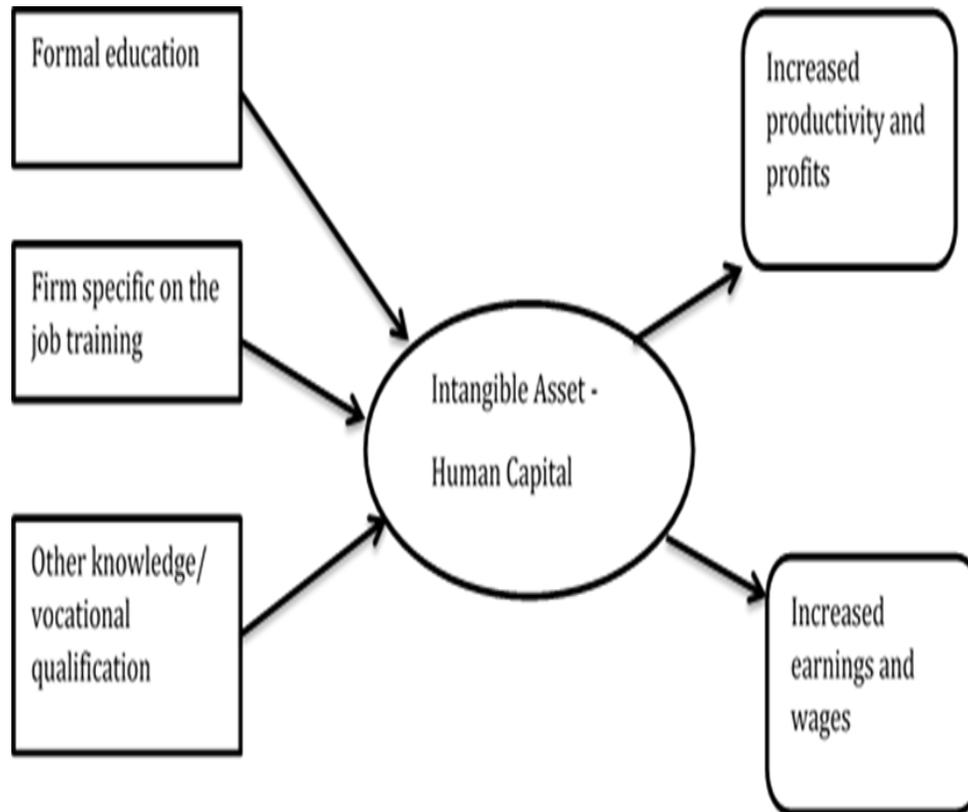
The role of HRD professionals can be an organizational function that provides employees with the knowledge, skills, and abilities to work effectively. Specifically, having a well-trained workforce can impact how employees make decisions and communicate within organizations. Hunt (1989) also noted that the development of human resources and communication are the driving forces of any organization: “Although it sounds simplistic, it

is nonetheless true that all organizations are made up of people. People manage organizations, people do the work of organizations, and people provide the knowledge that organizations use to grow and develop” (p. 5). If employees are not provided training and development, they will not be as likely to reach their potential which in turn negatively impacts the individual and the organization. The importance of training and development can be difficult to measure at times. However, the literature stresses the importance and need for training and development.

Before conducting training in an organization many decisions are made by the HRD professionals. Many organizations follow a variety of models that help guide the HRD professionals’ role in training and development. The most widely adopted model is the ADDIE model which includes assessing needs, designing training, developing training, implementing training, and evaluating training (Swanson & Holton, 2009). When going through this model decisions such as whether or not to train, the desired outcomes, when to conduct training, and if training is formal or informal need to be answered. These decisions are fluid based on a number of factors including who makes the decision and the economic landscape at the time: “The ability to respond flexibly to changing circumstances is fundamental to adaptive behavior in humans and other animals, and to artificial systems such as autonomous software agents and robots” (Fox, Cooper, Glasspool, Luhmann, & Schooler, 2013, p. 1). Training is not only used to develop the individual employee with knowledge, skills, and abilities related to specific job tasks, training and development can also be used to drive change in organizations and to improve organizational performance. Training can also be used as a communication vehicle to impart organizational values and assert influence:

Training may supply the trainee with the facts necessary in dealing with these decisions, it may provide him a frame of reference for his thinking, it may teach him "approved" solutions, or it may indoctrinate him with the values in terms of which his decisions are to be made. (Simon, 1944, p.24)

Training is a critical function in many organizations that impacts the day-to-day functions of employees and organizations. The benefits of training can be viewed from both individual and organizational perspectives. Much research has been conducted on assessing, designing, developing, implementing, and evaluating training. However, one area that often goes overlooked is how an organization makes decisions about selecting vendors if the organization does not want to design and develop their own training. This is a critical aspect of HRD professionals' roles that has gone unknown. This study will start to provide an understanding of and predict how HRD professionals determine who will conduct trainings for their respective organizations.



*Figure 1.* Conceptual model of human capital theory

### **Statement of the Problem**

Literature shows that employee training is a key function for any organization. Training employees has shown to increase employees' knowledge, skills, and abilities (KSAs) in order to perform their jobs, be more productive, communicate more effectively, and work safely. The literature shows that training increase employee satisfaction: "Training is listed as one of the five most important ways to influence employees and that the lines of communication on what is to be learned must be clearly understood" (Simon, 1944, p.24). Employees may be experts in their fields, but they still need training to operate effectively in

organizations. For example, well trained business professionals, such as accountants, may need soft skills training in order to function as supervisors.

If accurate assessment of how vendors are selected is not determined then organizations may not be able to ascertain who the most qualified providers of services are for their organizations. Selecting poor vendors may have a negative effect on return on investment (ROI) of employee development initiatives, and organizations may then be less likely to implement employee development initiatives. Also, if vendors do not understand how organizations are making decisions they will not know how to market, sell, and, produce the necessary trainings for organizations. If research is not conducted, this will remain an area that is not understood in the role of the HRD professional.

### **Purpose**

The purpose of this study is to understand the decision-making process HRD professionals use when selecting external vendors to conduct training for their organizations and ultimately to try to determine and subsequently predict how HRD professionals decide which vendors to use for training and development of their employees. To that end, a degrees of freedom analysis (DFA) was used to understand the decision-making process. “The research technique of DFA was introduced by the noted psychologist, experimental methodologist, and philosopher of science Donald Campbell, in the late 1960s” Wilson & Woodside, 1999, p. 217). The purpose of DFA is not to generalize to a specific population, but to better understand theory. Completion of this study will help to develop theory on decision-making for organizations and specifically the decision-making of HRD professionals in vendor selection.

The use of DFA to examine cases helps predict how decisions are made about which external vendors are hired to conduct training. This study also seeks to further the research in the use of DFA in making business decisions based on Wilson and Woodside's (1999) work. DFA can be useful but has been used very little: "While it has been mentioned in passing by other case methodologists there are few published examples of applications of this technique" (Wilson & Woodside, 1999, p. 216). DFA is a method that was specifically useful in answering the research questions for this study.

### **Research Questions**

The overarching goal for this study was to examine the decision-making process of HRD professionals in selecting outside vendors. To do this, the study sought to determine the theory that best describes the decision-making process of HRD professionals and to report the methods they use in the process. There are three specific questions that provide the underpinning for this research:

1. Do the decisions that HRD professionals make about which external vendors to use for training and development fall into any of the four models that are being studied: rational, bounded rationality, political, or garbage can?
2. What are the counts (hits and misses) compared to the prediction matrix for decision-making on how HRD professionals select external vendors for training and development?
3. Which theoretical decision model is most often used by HRD professionals when deciding which external vendors to use for training and development?

### **Significance of the Study**

There is an abundance of literature on the assessment and development of training. Needs assessment, design models, implementation, and evaluation have been researched and written about thoroughly. There is also a significant amount of literature on decision-making theory as it applies to marketing, management of employees, and capital expenditures. However, the literature does not do a good job of addressing how decisions on selection of training vendors are made. This study contributes to the knowledge of how decisions are made to select vendors and conduct training and will help build theory around decision-making when deciding who conducts training.

Critics typically state that single cases offer a poor basis for generalizing. However, such critics are implicitly contrasting the situation to survey research, in which a “sample” (if selected correctly) readily generalizes to a larger universe. *This analogy to samples and universes is incorrect when dealing with case studies.* This is because survey research relies on *statistical* generalization [from a sample to a population], whereas case studies (as with experiments) rely on *analytic* generalization. In analytic generalization, the investigator is striving to generalize a particular set of results to some broader theory. (Wilson & Woodside, p. 221, 1999)

Theory building is a critical aspect of HRD. Theory building is critical in any field but may be more so in the in the field of Human Resource Development (HRD). While theory building has been promoted and advanced in other academic fields there remains a need to continue to build theory in HRD:

Scholars have accomplished a great deal to date to broaden and strengthen the theoretical foundation of the relatively young academic field of HRD. Nonetheless, there is little doubt that more theoretical research is needed to advance our understanding of the human and organizational phenomena of interest to HRD.

(Torraco, 2004, p.172)

This study not only furthers research into HRD but also adds to theory building surrounding HRD and decision-making given varying organizational environments. Figure 2 conceptualizes the role of HRD in relation to an organization and the environment.

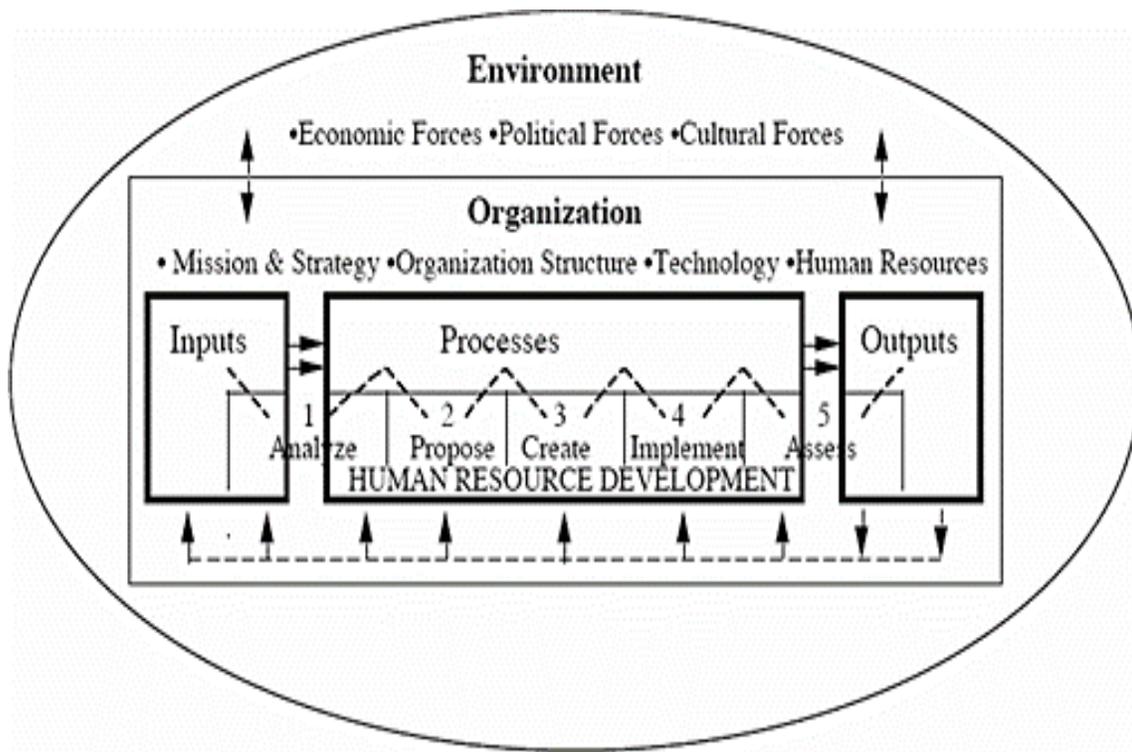


Figure 2. Human resource development in context of the organization and environment.

### Conceptual Framework

The conceptual framework for this study focused on the relationship of one aspect of the ADDIE model to the administrative decision-making process to purchase employee training and development. HRD is interconnected with training development (T&D) as well as organizational development (OD) (Holton & Swanson, 2009). Human resource development, training development, and organizational development all have five phases that describe the processes conducted in each field of study. As Table 1 shows, while there are slight differences in the wording for the HRD, T&D, and OD processes there is a commonality that runs through all of them (Holton & Swanson, 2009).

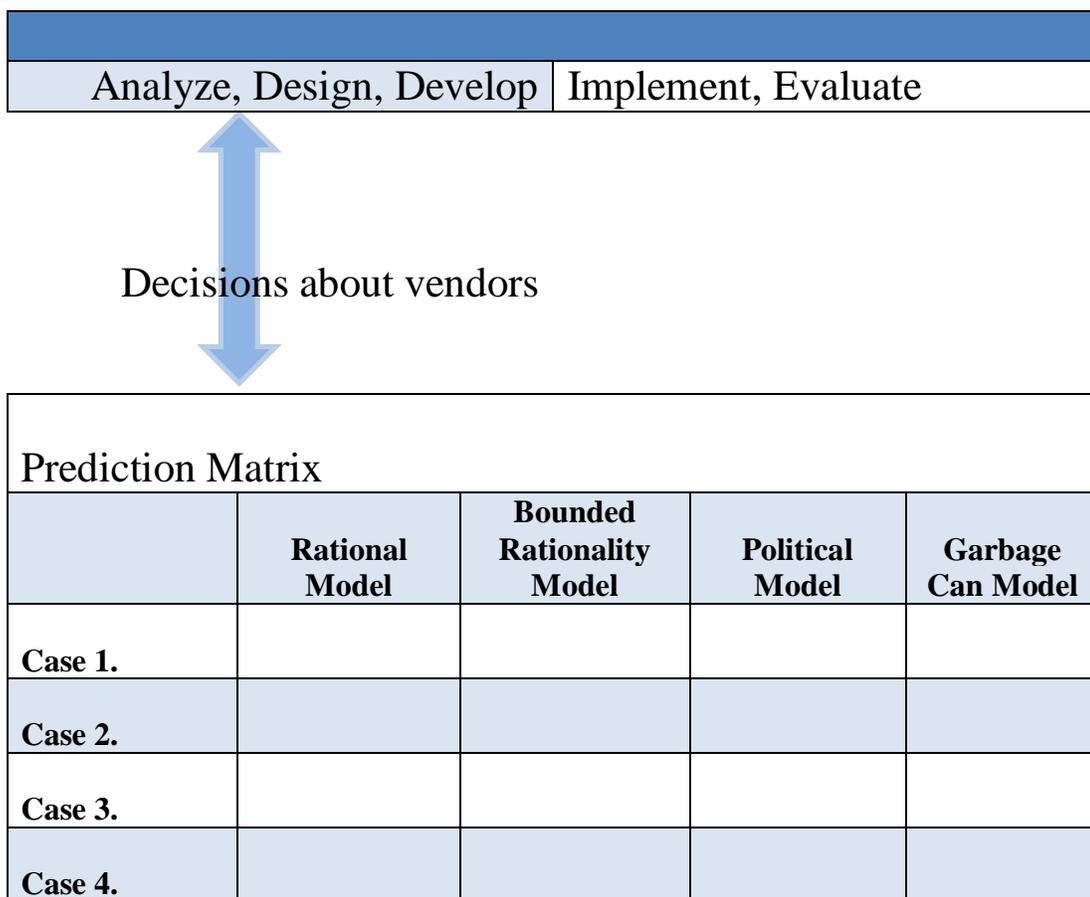
Table 1

*The Five (5) Phases of Human Resource Development, Training & Development, and Organizational Development*

	<b>Human Resource Development</b>	<b>Training and Development</b>	<b>Organizational Development</b>
<b>Phase 1</b>	Analyze	Analyze	Analyze//Contract
<b>Phase 2</b>	Propose	Design	Diagnose/Feedback
<b>Phase 3</b>	Create	Develop	Plan/Develop
<b>Phase 4</b>	Implement	Implement	Implement
<b>Phase 5</b>	Assess	Evaluate	Institutionalize

According to Holton and Swanson, “The ADDIE model is most widely used methodology for developing systematic training” (2009, p. 233). In the model there is an option to select vendors rather than conduct the phases internally. The decision as to which

vendor to select when conducting training is made at a variety of points. The decision can be made before an analysis is conducted, during the analysis, during design, and/or during development phases. The conceptual model in Figure 3 illustrates the decision-making timing as it relates to the ADDIE training process and the creation of a prediction matrix.



*Figure 3.* Conceptual framework of vendor selection decision making during ADDIE.

### Definition of Terms

*ADDIE*—The dominant instructional systems design (ISD) model with five distinct phases: Analysis, Design, Development, Implementation, and Evaluation.

*Chi-Squared*—A test statistic for categorical data use to test the difference between observed data and the hypothesis. “As a test statistic it is used as a test of independence, but is also used as a goodness-of-fit test. The chi-squared test statistic can be converted into one of several measures of association, including the phi coefficient, the contingency coefficient, and Cramér's *V*” (Vogt, W., 2005, p. 43).

*Decision-making*—“Decision-making may be defined in very general terms as a process or set of processes that result in the selection of one item from a number of possible alternatives” (Fox et al., 2013, p. 2).

*Human Resource Development (HRD)*—“Training and development, career development, and organization development. Training and development included both classroom training as well as coaching” (Werner, 2014, p. 128).

*Instructional Systems Design (ISD)*—The dominant methodology for developing training programs is more often than not called instructional systems design (ISD).

*Bounded Rationality Model*—“Decision makers try to be rational but, they are constrained by cognitive limitations, habits, and biases (i.e., human nature)” (Wilson & Woodside, 1999, p. 218).

*Garbage Can Model*—“Decisions are the result of an unsystematic process. That is, problem definitions can change, preferences are unclear, and people may come and go from the decision group” (Wilson & Woodside, 1999, p. 218).

*Political Model*—“Decision makers are competing to satisfy their own goals, and choice is a function of an individual’s power” (Wilson & Woodside, 1999, p. 218).

*Rational Model*—“Derived from microeconomics, posits that members of organizations will make decisions that will provide maximum benefit (i.e., utility) to the firm.” (Wilson & Woodside, 1999, p. 218)

### **Limitations/Delimitations**

The purpose of the analysis of a case study is not to make generalization to a population but to better understand the specific case that is being studied. The results of this study are not generalizable to a population, but are able to help develop administrative decision-making theory. These results would be able to provide an initial understanding of which theory can best describe the purchase of employee training and development.

The results of this study are bound by the population, which comprised four HRD professionals all within the manufacturing environment. Additionally, the study is bound by the four theories that were selected to be examined in relation to the decision-making for the organizational purchase of employee training and development: rational model, bounded rationality model, political model, and garbage can model. This study is further delimited by the fact that DFA analysis only requires a small population.

### **Summary**

This study is divided into five chapters. The first chapter discussed the importance of training in organizations and presented the need to understand how decisions are made by HRD professionals regarding which vendors are hired to conduct trainings for their organizations. This chapter provided the statement of the problem, the purpose of the study,

the research questions, the conceptual framework used to guide the study, and the limitations and delimitations of the study. Chapter two begins with a discussion of the ADDIE model and how the model is used to design and implement training. There is a review and summary of the extant literature on training design and development as well as the four decision-making models used for the DFA: the rational model, bounded rationality model, political model, and garbage can model. The third chapter includes a detailed description of the DFA research methodology. Data collection methods are described as well. Chapter four includes a description of the four case studies used for this study and the presentation of findings from the analyzed case. A complete review of the prediction matrix is also included. The fifth and final chapter presents an overall summary of the study. Furthermore, the fifth chapter reviews the findings and conclusions and makes recommendations, and suggestions for future research.

## **CHAPTER TWO LITERATURE REVIEW**

This literature review provides an understanding of the process of training and development and the role of the HRD professional. Specifically, the role of instructional design and training models is presented. The review will examine the process of decision-making and specifically how it can relate to administrative decision-making in the selection of vendors to provide training. The review provides an overview of the theoretical frameworks in the decision-making model. The chapter ends with a summary of the literature.

### **Instructional Design and Training Models**

The literature clearly shows that assessment and development of training are important to any organization. Training is not only a way to develop employees, it is also a way to increase employee productivity, wages, and satisfaction, and to influence their decision-making processes as well. Additionally, the literature explains that training is one of the primary forms of communication in organizations.

The dominant methodology for developing training programs is more often than not instructional systems design (ISD).

ISD evolved from post–World War II research in the U.S. military to find a more effective and manageable way to create training programs. In the beginning, the primary focal point was on creating technical training programs for new recruits that were to function in a variety of standardized military work roles. (Allen, 2006, p.430)

Early ISD models were designed and implemented throughout the 1960s. During the 1970s there was an explosion of instructional design (ID) models. According to Andrews and Goodson (1980, pp. 3-4), instructional design models serve four purposes:

1. Improving learning and instruction by means of the problem-solving and feedback characteristics of the systematic approach.
2. Improving management of instructional design and development by means of the monitoring and control functions of the systematic approach.
3. Improving evaluation processes by means of the designated components and sequence of events, including the feedback and revision events, inherent in models of systematic instructional design.
4. Testing or building learning or instructional theory by means of theory-based design within a model of systematic instructional design.

Andrews and Goodson (1980) also asserted that instructional design typically entails 14 overarching tasks:

1. Formulation of broad goals and detailed sub goals stated in observable terms.
2. Development of pretest and posttest matching goals and sub goals.
3. Analysis of goals and sub goals for types of skills/learning required.
4. Sequencing of goals and sub goals to facilitate learning.
5. Characterization of learner population.
6. Formulation of instructional strategy to match subject matter and learner requirements.
7. Selection of media to implement strategies.

8. Development of courseware and strategies.
9. Empirical tryout of courseware with learner population, diagnosis of learning and courseware failures, and revision of courseware based on diagnosis.
10. Development of materials and procedures for installing, maintaining, and periodically repairing the instructional program.
11. Assessment of need, problem identification, occupational analysis, competence, or training requirements.
12. Consideration of alternative solutions to instruction.
13. Formulation of system and environmental descriptions and identification of constraints.
14. Costing instructional programs. (p. 5)

However, there are thousands of instructional design models. While many encompass the aforementioned steps, others have five steps or fewer.

### **The Pebble-In-The-Pond Model**

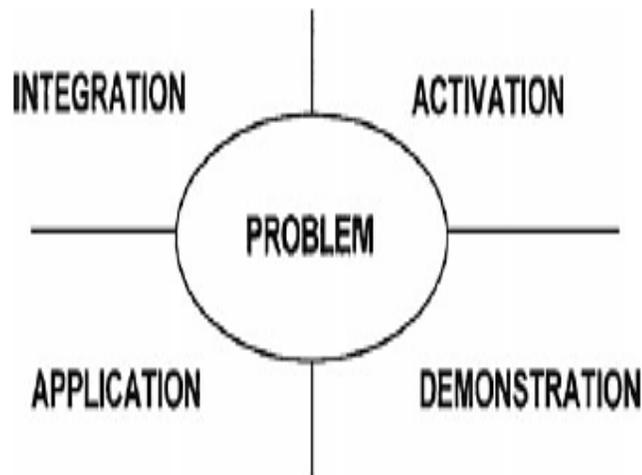
The Pebble-In-The-Pond model is just one of the many ISD models used for training development. This model, like many others, stresses the need for instructional design to be problem-based. The design of the instruction is meant to serve as a solution to the problem which needs to be solved.

Many current instructional models suggest that the most effective learning products or environments are those that are problem-centered and involve the student in a cycle of learning with four distinct phases:

- Activation of prior experience

- Demonstration of skills
- Application of skills
- Integration of these skills into real-world activities. (Merrill 2015, pp.42-43)

Also, Merrill's conceptual model is meant to illustrate how these phases should be viewed in relation to instructional design (see Figure 4).



*Figure 4.* Merrill's conceptual model of instructional design. (Merrill, 2015, p. 43)

The Pebble-In-The-Pond model is predicated on what Merrill calls the first principles of instruction:

First, learning from a given program will be promoted in direct proportion to its implementation of first principles. Second, first principles of instruction can be implemented in any delivery system or using any instructional architecture. Third, these principles are design oriented or prescriptive rather than learning oriented or

descriptive. They relate to creating learning environments and products rather than describing how learners acquire knowledge and skill from these environments or products. (Merrill, 2015, pp. 42-43)

As Figure 5 shows, the Pebble-In-The-Pond model has 5 stages known as ripples:

1. The first ripple is identification of the initial problem.
2. The second ripple in the design pond is to identify a progression of such problems of increasing difficulty or complexity such that if learners are able to do all of the whole tasks thus identified, they would have mastered the knowledge and skill to be taught.
3. The third ripple, which is also part of analysis, in the design pond is to identify the component knowledge and skill required to complete each task or solve each problem in the progression.
4. The fourth ripple is to determine the instructional strategy that will be used to engage learners in the problems and help them acquire the component knowledge and skill required to complete the tasks or solve the problems.
5. The fifth ripple is interface design. It is at this point in the design process that the content to be learned and the strategy used to engage learners is adapted to the delivery system and instructional architecture of the learning situation or product.

(Merrill, 2015, p. 43)

The ripples have now expanded sufficiently to engage in the production of the instructional material or situation.

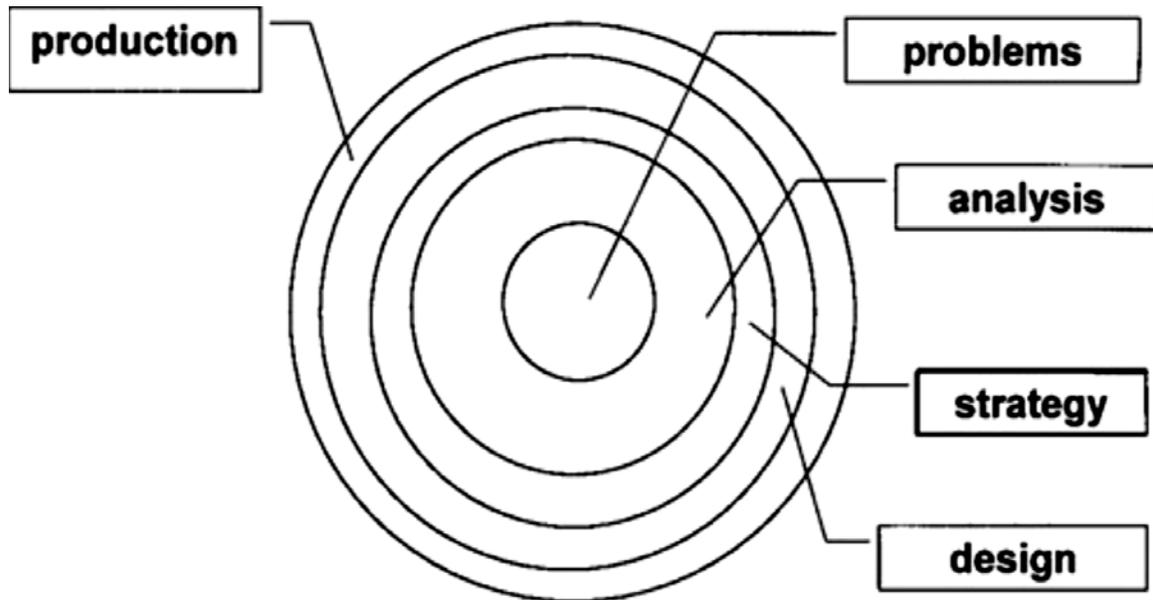


Figure 5. Pebble-In-The-Pond model.

### **The Training Performance Systems (TPS) Model**

The Training Performance Systems (TPS) Model is a variation of the ADDIE model and encompasses the same five phases of Analyze, Design, Develop, Implement, and Evaluate with two subheadings added to each phase (see Table 2). TPS is described as “a process for developing human expertise for the purpose of improving organization, process, and individual performance” (Holton & Swanson, 2009, p. 233).

Phase 1—Analyze: “Diagnose the performance requirements of the organization that can be implemented through training, and document the expertise required to perform in the workplace” (Holton & Swanson, 2009, p. 237).

Phase 2—Design: Create and/or acquire general and specific strategies for people to develop workplace expertise. T&D design is at the program and lesson plan levels. At the

program design level, the overall design strategy must be economically, systematically, and psychologically sound. Critical information that will influence the design is gathered (Holton & Swanson, 2009, p. 238).

Phase 3—Develop: “Develop and/or acquire participant and instructor training materials needed to execute the training design” (Holton & Swanson, 2009, p. 241).

Phase 4—Implement: Manage individual training programs and their delivery to participants. The issues around managing and delivering T&D to participants suggests that the strategies for both have been thought through and planned into the program materials (Holton & Swanson, 2009, p. 242).

Phase 5—Evaluate: Determine and report training and development effectiveness in terms of performance, learning, and satisfaction. The TPS draws upon a results assessment system that is conceptually connected to the first phase - analysis. In effect, it is first and foremost a checkup on those three goal-focused questions from the analysis phase: (a) Does the organization perform better? (b) Does the work process perform better? (c) Do the individuals (group) perform better? With learning being an important performance variable, assessing learning in terms of knowledge and expertise is seen as an essential intermediate goal (Holton & Swanson, 2009, p. 233).

Table 2

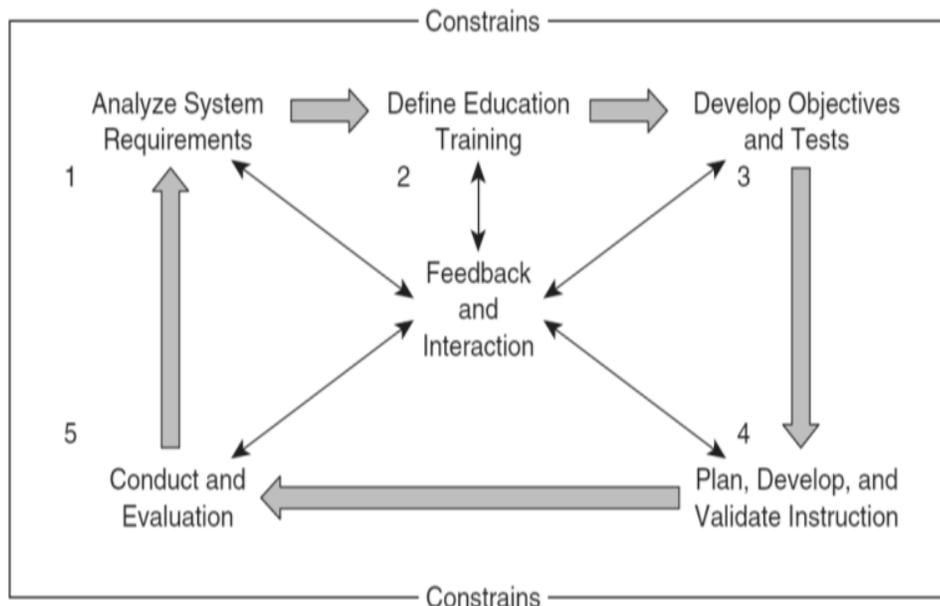
*Steps within the Process of the Training for Performance Systems*

<b>1.0 Analyze</b>	<b>2.0 Design</b>	<b>3.0 Develop</b>	<b>4.0 Implement</b>	<b>5.0 Evaluate</b>
1.1 Diagnose Performance and Propose Intervention	2.1 Design Training Program	3.1 Develop Training Materials	4.1 Manage Training Program	5.1 Evaluate Training Effectiveness
1.2 Document Expertise	2.2 Design and Plan Lessons	Pilot-test Training program	4.2 Deliver Training	5.2 Report Training Effectiveness
<b>Lead the Training and Development Process</b> Champion T&D Mission/Goals • Manage the Process • Improve the Process				

**The ADDIE Model**

The ADDIE model was initially designed as a training model for use in the military. It was meant to be an efficient and organized method of designing and implanting training (see Figure 6):

When the ADDIE process was originally defined, it represented the then state-of-the-art specification for the design and development of systematic training within a military context of learning highly specified job tasks by a continuous cadre of homogeneous learners. At that time, behavioral learning theory held that efficient job instruction could teach the behaviors without dwelling on the cognitive understanding of the theoretical foundations of the activity being performed. (Allen, 2006, p. 432)



*Figure 6.* Original ADDIE model.

The original goal of ADDIE was to increase the effectiveness and efficiency of education and training by fitting instruction to jobs—eliminating peripheral knowledge from courses while ensuring that students acquired the necessary knowledge and expertise to do the job. Instruction was to be provided in the areas most critical to job performance and was not to be wasted in areas having a low probability of meeting immediate or critical long-term needs. The ADDIE process prescribed a series of procedures that addressed decisions about exactly what, where, how, and when to teach the skills, knowledge, and attitudes needed to perform every task selected for instruction. (Allen, 2006, p.431)

While there are many training design, development, implementation, ISD and/or ID models; the ADDIE model is the most widely used:

There are more than 100 different variations of the model; however, almost all of them reflect the generic “ADDIE” process - analysis, design, develop, implement, and evaluate. The ADDIE approach provides a systematic, process for the determination of training needs, the design and development of training programs and materials, implementation of the program, and the evaluation of the effectiveness of the training. (Allen, 2006, p.432)

The ADDIE model has five phases:

**Analysis phase.** Course content should be tied to preparing class participants to do a job or perform certain tasks. Instructional developers analyze the job performance requirements and key performance indicators (KPIs) to develop learning objectives. The developer then analyzes the job tasks and KPIs and compares them with the knowledge, skills, and abilities of the participants. “The difference between what they already know and can do and what the job requires them to know and be able to do determines what instruction is necessary. The activities of formative evaluation begin” (Allen, 2006, p. 436).

**Design phase.** “In the design phase, the instructional developer develops a detailed plan of instruction that includes selecting the instructional methods and media and determining the instructional strategies” (Allen, 2006, p. 436). Current instructional materials are reviewed, evaluated, and revised if necessary. Also, learning objectives are created and refined during this phase. “The implementation plan for the instructional system is developed in this phase and on a training information management system is designed, if required. Formative evaluation activities continue in this phase” (Allen, 2006, p. 437).

**Development phase.** In this phase, the participant materials and facilitator guides are developed. Method of delivery is decided on and the media that will be used is either designed or acquired. If the media selected in the design phase included items such as videotapes, sound and/or slides, interactive courseware (ICW), and training devices, these are developed. If a training information management system was developed for the instructional system, it is installed in this phase. As a final step in this phase, the implementation plan is revised. During this phase, instructional developers also validate each unit and/or module of instruction and its associated instructional materials as they are developed. They correct any deficiencies that may be identified. Validation includes

- internal review of the instruction and materials for accuracy,
- individual and small-group tryouts,
- operational tryouts of the “whole” system, and
- revision of units and/or modules occurs as they are validated, based on feedback from formative and summative evaluation activities.

The final step in this phase is to finalize all training materials (Allen, 2006, p.437).

**Implementation phase.** “With the instructional system designed and developed, the actual system is ready to become operational in the implementation phase. In this phase, the instructional system is fielded under operational conditions” (Allen, 2006, p. 437).

**Evaluation phase.** Evaluation is a continuous process beginning during the analysis phase and continuing throughout the life cycle of the instructional system. Evaluation consists of

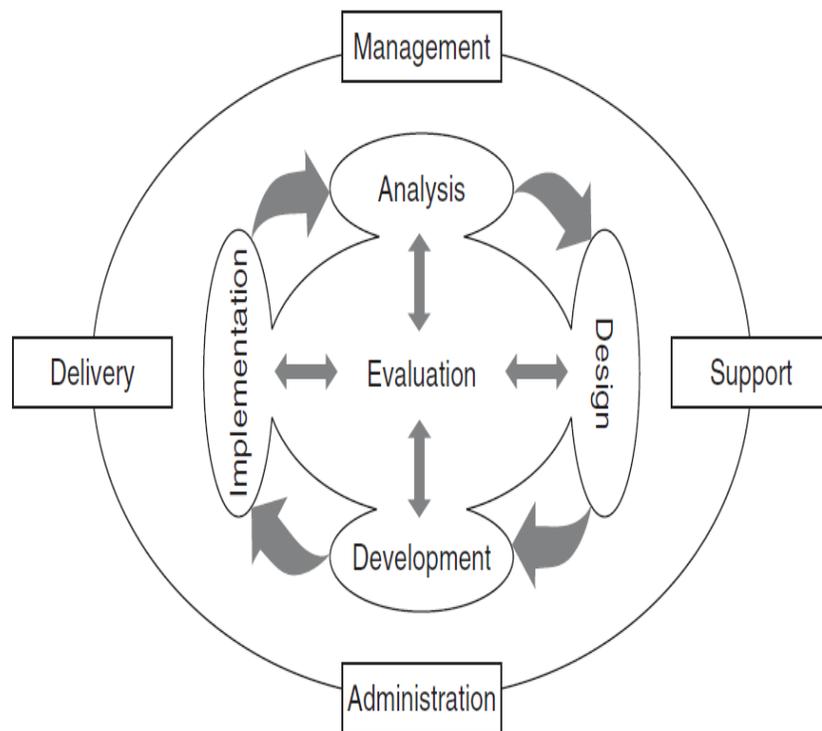
- formative evaluation, consisting of process and product evaluations conducted during the analysis and design phases, and validation that are conducted during the development phase;
- summative evaluation, consisting of operational tryouts conducted as the last step of validation in the development phase; and
- operational evaluation, consisting of periodic internal and external evaluation of the operational system during the implementation phase.

Each form of evaluation should be used during development, update, and revision of instruction, if possible, and if the form of evaluation is applicable. “Evaluation done to improve or change a program while it is in progress is termed *formative evaluation*. When evaluation focuses on results or outcomes of a program, it is called *summative*” (Caffarella, 2002, p. 186).

ADDIE remains the most used ISD model to date but, it is not without problems:

The fundamental flaws in the original ADDIE model have been twofold: (a) the complexity of the original ADDIE system and (b) the lack of a systemic connection to the needs of the host organization. Given that the original model served the military’s large and homogenous training function, the detailed ADDIE steps exceeded the needs and resources of most other organizations. As a result, many versions of ADDIE have evolved during the years to be responsive to other settings. (Allen, 2006, p. 440)

The conceptual phases of systematic training—analyze, design, develop, implement, and evaluate—have stood the test of time. Part of the reason for their resilience is that they have allowed adaptation and revision (see Figure 7).



*Figure 7.* Updated ADDIE model.

### **Decision Making**

Four decision-making models were used to support the research of this topic: the rational model, bounded rationality, the political model, and the garbage can model.

Decision-making may be defined in very general terms as a process or set of processes that result in the selection of one item from a number of possible alternatives. Within this general definition, processes might be natural and conscious,

as in deliberate choice amongst alternatives, but also unconscious (as in selecting the grip to use when grasping an object) or artificial (as in an expert system offering decision support). Moreover, decisions can be about *what to do (action)*, but also about *what to believe (opinion)*. (Fox et al., 2013, p. 2)

Understanding these theories provides the underpinnings for this research as the goal is to create a prediction matrix of which decision model is used most often when HRD professionals select vendors for employee development initiatives. Future research may add other decision-making models. A clear understanding of these theories is necessary in order for scholars, researchers, and vendors to be able to apply what is learned from predicting which decision-making model is most commonly used among the political, rational, bounded rationality, and garbage can models.

Since decision-making is a key function for any organization it is important to gain an understanding of the methods used. A simple six-step process can be used to illustrate how decisions can be made.

1. Identify problem.
2. Clarify and prioritize goals.
3. Generate options.
4. Evaluate options.
5. Compare predicted consequences of each option with goals.
6. Choose option with consequences most closely matching goals. (Fox et al., 2013, p. 2)

### **Decision-Making Theories**

Each of the four models (rational, bounded rationality, political, and the garbage can model) explains decision making differently as it relates to behavior in relation to outcomes and processes.

The rational model, derived from microeconomics, posits that members of organizations will make decisions that will provide maximum benefit (i.e., utility) to the firm. The bounded rationality model proposes that while decision makers try to be rational, they are constrained by cognitive limitations, habits, and biases (i.e., human nature). According to the political model, decision makers are competing to satisfy their own goals, and choice is a function of an individual's power. Finally, in the garbage can model, decisions are the result of an unsystematic process. That is, problem definitions can change, preferences are unclear, and people may come and go from the decision group. (Wilson & Woodside, 1999, p. 218)

#### **Rational Model**

The rational model suggests that decisions are made in a rational manner that is beneficial to the organization and is more a function of pure effectiveness than anything else.

According to the best encyclopedic definitions, the term 'rationality' comes from the Latin word ratio, and it is 'the principle governing the activity of knowing': something is rational if it proceeds from reason, if it is founded on logically sound procedures, on scientific method. (Grandori, 2010, p. 628)

These explanations of rationality align with the meaning of the word rationality in the reasoning and beliefs of science. The goal of rationality is to use a logical and systematic

process to gather and analyze information that will be used in decision making. According to the rational Model all available information should be used in order to make sound decisions. This logic should be applied to every step in the decision-making process: “Rationality has little to do with knowing everything, but a lot to do with following good rather than bad procedures in data gathering, hypothesis testing, assessing probabilities, and comparing options” (Grandori, A., 2010, p. 628). In order to follow the rational model it must be assumed that only logical choices are available and that decision makers will only act in the most logical manner regardless of the environment or circumstances. Behavioral sciences, in particular economics, have trusted the principles of rationality to understand human behavior for quite some time. “Rational-choice theory assumes that the individual is a self-interested expected utility maximizer, and has well-defined, stable, and consistent preferences or tastes. Further assumed is the strict application of these preferences to final outcomes (but not to changes)” (Marnet, 2005, p.195). It is assumed that decision makers have access to all relevant information, including all barriers and potential changes. Further, it is assumed that decision makers can predict any and all potential outcomes of their decisions.

For a more concrete frame of reference, consider the following formulation of the classical economic model of individual choice, where uncertainty is integrated as probabilistic states of the world, with a utility function that may depend on these states of the world, and the assumption that the person maximizes expected value:  $\text{Max}_{x \in X} \sum_{s \in S} \pi(s)U(x|s)$ , where  $X$  is choice set,  $S$  is state space,  $\pi(s)$  are the person’s subjective beliefs updated by Bayes’ Rule, and  $U$  are stable, well-defined preferences. (Rabin, 2002, pp. 6-7)

## **Bounded Rationality**

Rationality is customarily interpreted as a normative idea: it endorses certain actions, or even declares what actions should be taken. Bounded Rationality accounts for external influences that affect why and how decision makers determine what decisions will be made:

It may therefore not surprise that these principles of rationality are not universally obeyed in everyday choices. Bounded Rationality accounts for the fact that environment also plays a part in decision-making and that it cannot be strictly based on rationality. (Grüne-Yanoff, 2007, p.535)

Simply put, bounded rationality is the idea that the choices people make are decided by not just some constant global objective and the components of their environments, but by other internal and external factors that drive the decision-making process.

The knowledge that decision makers do and don't have of the world, their ability or inability to evoke that knowledge when it is relevant, to work out the consequences of their actions, to conjure up possible courses of action, to cope with uncertainty (including uncertainty deriving from the possible responses of other actors), and to adjudicate among their many competing wants. Rationality is bounded because these abilities are severely limited. Consequently, rational behavior in the real world is as much determined by the "inner environment" of people's minds, both their memory contents and their processes, as by the "outer environment" of the world on which they act, and which acts on them. (Simon, 1959, p.25)

There are four major reasons that bounded rationality is a popular and widely used model:

First, there is abundant empirical evidence that it is important. Second, models of bounded rationality have proved themselves in a wide range of impressive work. Third, the standard justifications for assuming unbounded rationality are unconvincing; their logic cuts both ways. Fourth, deliberation about an economic decision is a costly activity, and good economics requires that we entertain all costs. (Conlisk, 1996, p. 669)

Additionally, there are four uses of bounded rationality that have been deemed important, “1) To criticize standard theory; 2) To enrich behavioral models and theory; 3) To provide appropriate rational advice; 4) To explicate the concept of rationality” (Grüne-Yanoff, 2007, pp. 534–535).

### **The Political Model**

According to the political model, decision makers are competing to satisfy their own goals and choice is a function of an individual’s power: “Power has been defined as the ability of an actor A to influence an actor B over some period of time with respect to some set of activities” (Pfeffer & Salancik, 1974, p. 142). There are two primary groups that play key roles in the politics of organizations and society in general. These groups are partisans and authorities. “By virtue of their positions, authorities are entitled to make decisions binding their subordinates. Any member of the coalition who wants to exert bottom-up pressure is a potential partisan” (Bolman & Deal, 2008, p.201). The authority-partisan relationship can be illustrated by using a family as an example:

In a family, parents function as authorities and children as partisans. Parents make binding decisions about bedtime, television viewing, or which child uses a particular

toy. Parents initiate social control, and children are the recipients of parental decisions. Children in turn try to influence the decision makers. They argue for later bedtime or point out the injustice of giving one child something another wants. They try to split authorities by lobbying one parent after the other has refused. They may form a coalition (with siblings, grandparents, and so on) in an attempt to strengthen their bargaining position. (Bolman & Deal, 2008, p.201)

Authority is obviously one form of power, however, there are many different categories of power. There are numerous sources from which partisans can gain and utilize power. The sources of partisan power are position power (authority), control of rewards, coercive power, information and expertise, reputation, personal power, alliances and networks, access and control of agendas, and framing: the control of and meaning of symbols. Table 3 lists each type of power and gives a brief description.

Table 3

*Sources of Power*

<b>Source of power</b>	<b>Description</b>
Position power (authority)	Power based on title, designation and/or tenure.
Control of rewards	The ability to deliver jobs, money, political support, or other rewards.
Coercive power	The ability to constrain, block, interfere, or punish.
Information and expertise	Experts that have information and know how to solve problems.
Reputation	Building on information and expertise to produce a track of getting positive outcomes.
Personal power	Individuals who are attractive and socially adept because of charisma, energy, stamina, political smarts, gift of gab, and vision for the future, or some characteristic are imbued with power independent of other sources.
Alliances and networks	Building a network of friends and allies in complex organizational structures in order to achieve goals.
Access and control of agendas	A by-product of alliances and networks. Having access to decision arenas. When decisions are made those with “a seat at the table” are well represented while the views and needs of those that are not present are distorted or ignored completely.
Framing: control of and meaning of symbols	Establishing the framework within issues will be viewed and decided is often tantamount to deterring the result. Elites and opinion leaders often have substantial ability to shape meaning and articulate myths that express identity, beliefs and values. This can either foster meaning and hope or convince others to support things not in their own best interest.

*Note.* Table adapted from Bolman & Deal, 2008, p. 203-204.

Both authorities and partisans exercise political influence, navigate the political landscape, and ultimately make decisions based on their sources of power or the sources of power of those that they have access to. Thus, the struggle for power links to the political model as individuals and groups jockey for control.

The political frame views organizations as roiling arenas hosting ongoing contests of individual and group interests. Five propositions summarize this perspective:

1. Organizations are coalitions of assorted individuals and interest groups.
2. Coalition members have enduring differences in values, beliefs, information, interests, and perceptions of reality.
3. Most important decisions involve allocating scarce resources—who gets what.
4. Scarce resources and enduring differences put conflict at the center of day-to-day dynamics and make power the most important asset.
5. Goals and decisions emerge from bargaining and negotiation among competing stakeholders jockeying for their own interests. (Bolman & Deal, 2008, pp.194–195)

### **The Garbage Can Model**

Finally, in the garbage can model, decisions are the result of an unsystematic process. That is, problem definitions can change, preferences are unclear, and people may come and go from the decision group. “The garbage can (GC) model is a framework for analyzing decision making in ‘organized anarchies’—organizations characterized by problematic preferences, unclear technologies, and fluid participation” (Ansell, 2001, p. 5883).

Organized anarchies are not limited to any one particular type of organization. In fact, every organization has tendencies of an organized anarchy at any given point in time:

These properties of organized anarchy have been identified often in studies of organizations. They are characteristic of any organization in part of the time. They are particularly conspicuous in public, educational, and illegitimate organizations. A theory of organized anarchy will describe a portion of almost any organization's activities, but will not describe all of them. (Cohen, March, & Olsen, 1972, p. 1)

It is important to understand the concept of organized anarchies and their relationship to other decision-making theories as applied to organizations. The previous theories discussed (rational, bounded rationality, and political model) assume that organizations operate in a logical, interdependent manner. Even bounded rationality, which accounts for environmental stimuli in decision-making, assumes that rationality is dependent on environment. In order to expand current behavioral theories and to explain the idea of organized anarchy, two critical points are necessary and must be examined. "The first is the manner in which organizations make choices without consistent, shared goals. Situations of decision making under goal ambiguity are common in complex organizations" (Cohen et al., 1972, pp. 2–3). Decisions are made under ever-changing market conditions, unclear reporting structures, and rapidly changing social, political, and economic environments.

The second phenomenon is the way members of an organization are activated. This entails the question of how occasional members become active and how attention is directed toward, or away from, a decision. It is important to understand the attention patterns within an organization, since not everyone is attending to everything all of the time. (Cohen et al., 1972, pp. 2–3)

The rational model, bounded rationality model, and political model decision-making theories depend on factors that are dependent on one another in order for the decisions to be made. On the other hand, in the case of the garbage can model a decision is an outcome or interpretation of several relatively independent streams within an organization (Cohen et al., 1972, pp. 1–2). Goals, technology, and employee participation in organizational decision-making are seen as unclear, dynamic, and independent of each other.

The model conceives of organizations as conglomerates of semiautonomous decision arenas or ‘garbage cans’ through which problems and solutions flow as independent streams. Decision outcomes are sensitive to the precise mix of problems and solutions represented in a garbage can at the moment of decision. This mix, in turn, depends on the number of decision arenas, the structure of access to them, the overall organizational load of problems and solutions, and the allocation of energy and attention across arenas. (Ansell, 2001, p. 5883)

There are four critical streams that are necessary to understand for the garbage can model and four variables that are considered. The streams are problems, solutions, participants, and choice opportunities:

- Problems—The concerns of all stakeholders in an organization.
- Solutions—The products that are created in order to address problems.
- Participants—Those in the organization that dedicate time, energy, and other resources to solving problems.
- Choice Opportunities—Simply put, these are the times when it is necessary to make decisions.

The four variables that need to be considered are just as important as the streams themselves and consider the time and energy it takes to navigate the four streams:

Four basic variables are considered; each is a function of time. *A stream of choices.* Some fixed number,  $m$ , of choices is assumed. Each choice is characterized by (a) an entry time, the calendar time at which that choice is activated for decision, and (b) a decision structure, a list of participants eligible to participate in making that choice. *A stream of problems.* Some number,  $w$ , of problems is assumed. Each problem is characterized by (a) an entry time, the calendar time at which the problem becomes visible, (b) an energy requirement, the energy required to resolve a choice to which the problem is attached (if the solution stream is as high as possible), and (c) an access structure, a list of choices to which the problem has access. *A rate of flow of solutions.* The verbal theory assumes a stream of solutions and a matching of specific solutions with specific problems and choices. A simpler set of assumptions is made and focus is on the rate at which solutions are flowing into the system. It is assumed that either because of variations in the stream of solutions or because of variations in the efficiency of search procedures within the organization, different energies are required to solve the same problem at different times. It is further assumed that these variations are consistent for different problems. Thus, a solution co-efficient, ranging between 0 and 1, which operates on the potential decision energies to determine the problem solving output (effective energy) actually realized during any effective energy) actually realized during any given time period is specified. *A stream of energy from participants.* It is assumed that there is some number,  $v$ , of participants.

Each participant is characterized by a time series of energy available for organizational decision-making. Thus, in each time period, each participant can provide some specified amount of potential energy to the organization. (Cohen et al., 1972, p. 3).

Literature addressing the garbage can model also suggests that the chaotic and ambiguous nature of organized anarchies can be altered to become orderly environments. “It is very possible, for instance, that disorder and ambiguity may be tidied up on the output side of decision-making processes: order and certainty then represent *post hoc* rationalizations of essentially *ad hoc* decisions” (Ansell, 2001, p. 5885). The two other means by which anarchies organize according to the literature are leadership and learning. This is especially pertinent to this study because leadership, in terms of decision makers, and learning in terms of employee development initiatives, are at the heart of this study.

With respect to leadership, this literature suggests that unobtrusive leadership that embraces rather than rejects the disorder and ambiguity of decision-making may be successful in steering organized anarchies toward collective purposes. Learning in organized anarchies is problematic because the lessons we should draw from experience are themselves ambiguous. While learning under conditions of ambiguity may lead to superstitious beliefs, the GC literature suggests that organized anarchies may adapt and learn successfully. In fact, it is currently fashionable to see a bit of chaos as necessary for producing creativity and innovation. (Ansell, 2001, p. 5885)

## Summary

The extant literature on instructional system design, decision-making, and four decision-making theories (rational, bounded rationality, political, and garbage can model) was reviewed. The literature review began with an examination of the most widely used instructional systems design method: the ADDIE (Analysis, Design, Develop, Implement, and Evaluate) model. ADDIE was first used as the primary ISD model for the United States military before becoming the mostly widely used instructional design model in use today.

Decision-making was discussed next with focus given principally to the four decision-making models that provide the underpinnings for this study: rational, bounded rationality, political and garbage can model.

## **CHAPTER THREE METHODS**

The purpose of this chapter is to outline the specific methods used to complete the study. This chapter provides a summary of the purpose and research methods. The research design, which utilized degree of freedom analysis, is described. In addition, the application of degree of freedom analysis in reference to this specific study of HRD decision-making in terms of vendor selection is explained. Specifically, the methods section describes the participants of the study, the instrumentation, data collection, and data analysis.

### **Purpose and Research Questions**

The purpose of this study is to understand how human resource development professionals make decisions in the selection of vendors for employee training and professional development. Three research questions are answered by this study:

1. Do the decisions that HRD professionals make about which external vendors to use for training and development fall into any of the four models that are being studied: rational, bounded rationality, political, or garbage can?
2. What are the counts (hits and misses) compared to the prediction matrix for decision-making on how HRD professionals select external vendors for training and development?
3. Which theoretical decision model is most often used by HRD professionals when deciding which external vendors to use for training and development?

### **Degrees of Freedom Analysis**

The research design for this study is a study of cases that integrates degrees of freedom analysis (DFA). This mixed methods approach uses the quantitative analysis of qualitative case data in order to gain a better understanding of case data. The DFA requires that the researcher create a prediction matrix to record case data. This predication matrix gives the researcher the ability to quantify case data.

Given the richness of case data and its prevalence in business marketing research, degrees of freedom analysis has the potential to become an important addition to one's "research workbench" (Wilson & Woodside, 1999, p. 216). The technique, first proposed by Donald Campbell in *Degrees of Freedom and the Case Study* is described in detail by Wilson and Woodside (1999). Since then the technique has not been wildly used. Wilson and Woodside duplicated Dean's study in the context of organizational buying decisions. This study builds on the work of Wilson and Woodside to further the understanding of administrative decision-making in the context of organizational buying of training. The most detailed literature on the DFA technique is the work of Wilson and Woodside (1999) and this implemented their approach to DFA.

Using DFA as a research process in this context is not widely addressed in the literature: "While it has been mentioned in passing by other case methodologists there are few published examples of applications of this technique" (Wilson & Woodside, 1999, p. 217). While this methodology is not widely used it can be a useful and distinctive means of examining data: "One reason why this technique is so interesting and unique is that DFA employs a quantitative framework to gain insight and understanding about qualitative case

data” (Wilson & Woodside, 1999, p. 217). This understanding of the qualitative data can then be used to examine, understand, and potentially expand on theories. The theories may then be better understood and applied in practice.

The heart of DFA is the development and testing of a “prediction matrix”. The prediction matrix sets up the “pattern,” based on theory, to be either confirmed or disconfirmed by the case data. The statements in the prediction matrix are analogous to hypotheses in the sense of traditional statistical hypothesis testing. Campbell states that “one should keep a record of all the theories considered in the creative puzzle-solving process. To represent the degrees of freedom from multiple implications, one should also keep a record of the implications against which each was tested, and the box score of hits and misses.” (Wilson & Woodside, 1999, p. 217)

The creation of the prediction matrix and the identification of patterns helps to establish a reliable means from which to begin to understand qualitative data.

An example that illustrates DFA is a doctor examining a sick patient. Upon examining a sick child, the doctor, after a series of questions, determines symptoms of fever, irritability, loss of appetite, nausea, and a dull pain in the lower, right quadrant of the abdomen. The pattern of observed symptoms (quantitative data) leads the doctor to diagnose her patient as suffering from appendicitis (the theoretical condition). In the same fashion, case data collected in social science contexts can be examined to note the degree of match to a pattern that is set forth by theory. Related to the medical diagnosis example, a key problem found in the literature is the tendency of medical doctors to use only one or two points of observations and their

most easily retrieved knowledge; this may not represent sufficient coverage of issues to indicate a pattern of responses. (Wilson & Woodside, 1999, p. 218)

As a result, the wrong conclusions are drawn which leads to misdiagnosis. To put it simply, when more patterns can be identified, categorized, and subsequently matched, the confidence level in the correctness of the diagnosis increases and the concerns about subject bias decrease.

Campbell maintains that this pattern-matching activity is analogous to having degrees-of-freedom in a statistical test: In a case study done by an alert social scientist who has thorough local acquaintance, the theory he uses to explain the focal difference also generates predictions or expectations on dozens of other aspects of the culture, and he does not retain the theory unless most of these are also confirmed. In some sense, he has tested the theory with degrees of freedom coming from the multiple implications of one theory. For such analysis, case data are considered quantitatively because the researcher notes the degree of match to the theory in terms of “hits and misses.” (Wilson & Woodside, 1999, p. 216)

The ultimate goal of the degrees of freedom analysis is the construction of a prediction matrix. Construction of the prediction matrix allows the researcher to generalize to a theory but not necessarily to a population.

An overview of the DFA process is shown in Figure 8. In this specific study, the prediction matrix was constructed around four decision-making theories: rational, bounded rationality, political, and garbage can model. For the DFA, “Research may be motivated by an established theory or a ‘theory-in-use.’ A theory-in-use is the set of propositions guiding

the behavior of a decision maker, and theories-in-use are usually stated implicitly rather than explicitly” (Wilson & Woodside, 1999, p. 217). With that in mind, the first step in DFA is for the researcher to have an understanding of the existing knowledge base surrounding what is to be studied. Fieldwork can begin after the development of the prediction matrix. “Data may be in the form of personal interviews, document analysis, participant or nonparticipant observation, or other case data collection methods” (Wilson & Woodside, 1999, p. 217).

This particular study used personal interviews for data collection. The interviews were recorded to reduce the risk of misinterpreting the data. After data collection the researcher and two trained judges reviewed the interview information to note hits or misses to items in the prediction matrix. The box-score of hits and misses was then subjected to a Chi-square test to note the significance of the ratio of confirmed versus unconfirmed predictions found in the data.

Chi-Square is a test statistic for categorical data. As a test statistic it is used as a test of independence, but is also used as a goodness-of-fit test. The chi-square test statistic can be converted into one of several measures of association, including the phi coefficient, the contingency coefficient, and Cramér's *V*. (Vogt, 2005, p. 43)

Chi-square was used in this research to test the hypothesis of which decision-making model is used most often. In other words, is there a goodness-of-fit between observed data and the prediction matrix? As is this case with this study,

Testing rival theories, that is, doing a comparative theory test or critical test, via DFA deepens the value of case data. That is, when several theories exist, the number of

confirmed predictions can be noted to see which theory tends to be supported relative to hers. (Wilson & Woodside, 1999, pp. 217-218)

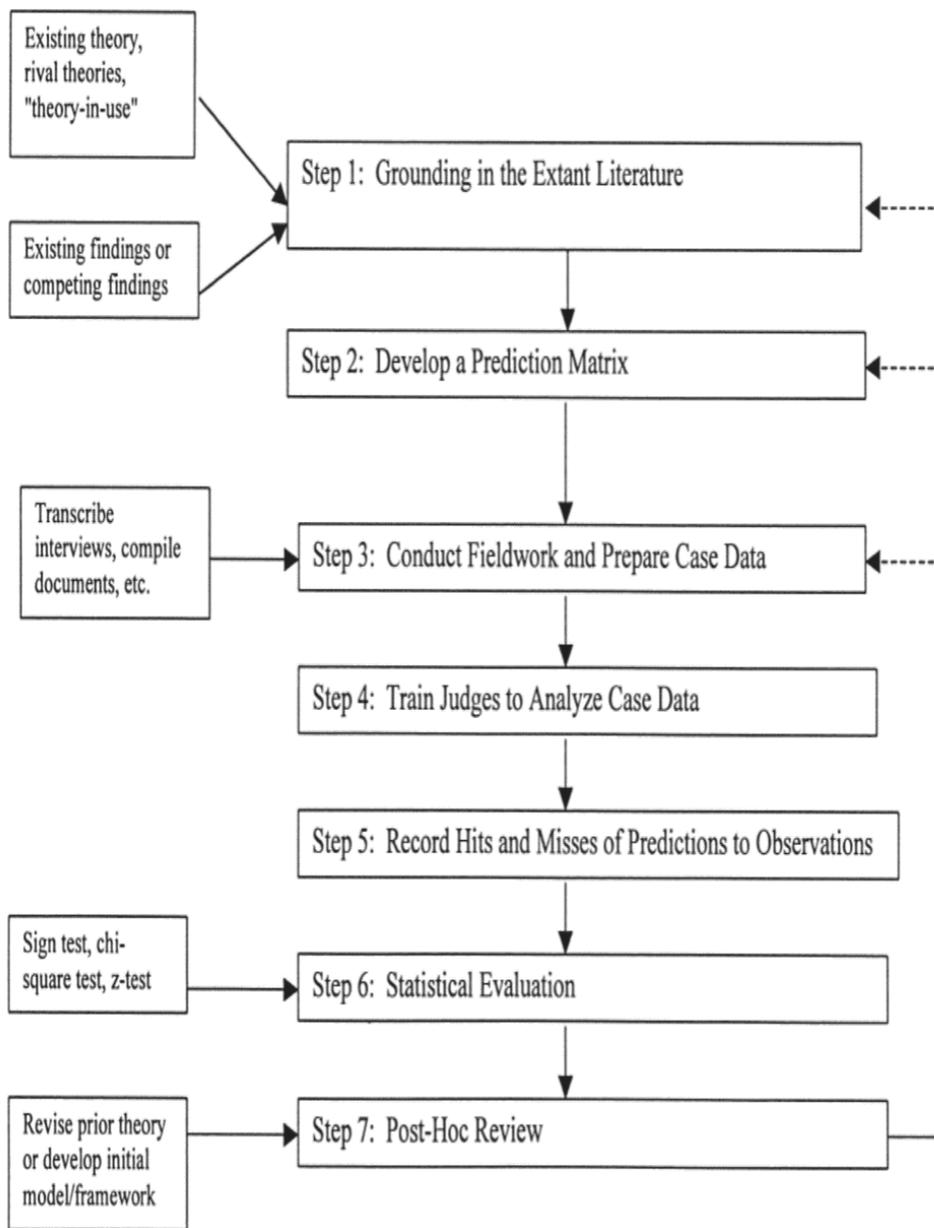


Figure 8. Overview of DFA as a research process. (Wilson & Woodside., 1999, p. 224)

This study used DFA to analyze and predict how HRD professionals make decisions as to what vendors will be used to conduct employee development for their organizations.

Dean applied DFA to examine the degree of support for four theories of organizational decision-making in the context of adoption decisions of advanced manufacturing technology. Because Dean's research is focused on adopting and acquiring new manufacturing technologies, his empirical application of DFA may be of particular interest for industrial purchasing and marketing researchers. From the literature, the four theories include: (1) the rational model of decision making; (2) the bounded rationality model; (3) the political model; and (4) the garbage can model. Dean's central finding was that while no single theory was supported in all cases, one theory, the bounded rationality model, tended to have more of its predictions confirmed while the garbage can model tended to have the fewest confirmed predictions. (Wilson & Woodside, 1999, p. 218)

### **Participants**

All of the participants are HRD professionals in manufacturing organizations. This group was purposefully selected. The participants are a training manager, two HR directors, and a senior training specialist. Each participant is tasked with the responsibility of selecting which vendors will participate in employee development initiatives for their organizations. All participants, with the exception of one, have at least one or two direct reports that assist with training coordination and management of employee development initiatives.

## Research Design

The research design for this study implemented a degrees of freedom case study approach. This study used the four decision-making theories: rational, bounded rationality, political, and garbage can model. The theories were examined in the context of vendor selection for employee training and development in manufacturing. The steps in the process included instrumentation, data collection, data coding, and data analysis. Instrumentation was based on the theoretical frameworks and the prediction matrix. The interview protocol probed for questions related to the prediction matrix.

“The four theories are a mixture of similar, complementary, competing, and orthogonal predictions about organizational decision-making behavior” (Wilson & Woodside, 1999, p. 218). The prediction matrix was developed based on seven basic decision activities:

1. Problem definition—the conceptualization of the decision problem or process by HRD professionals.
2. Solution search—the existence, degree, and type of search for alternative solutions to the problem(s).
3. Data collection, analysis, and use—the extensiveness, type, and function of attempts to collect and use information.
4. Information exchange—the ways in which HRD professionals share information during the decision process.
5. Individual preference formation—the existence, nature, and resistance to change of HRD professionals’ preferences.

6. Evaluation criteria—how decision criteria are developed and used.
7. Final choice—how, when, and why choices between vendors are made.” (Wilson & Woodside, 1999, p. 219)

Consequently, each theory or model of organizational decision-making has predictions for HRD professional behavior in each of the seven aspects.

The following discussion of these behaviors is adapted from Wilson and Woodside (1999) in the HRD vendor selection context. According to the rational model, HRD professionals would be expected to develop comprehensive problem definitions, conduct an exhaustive information search, develop an *a priori* evaluation criteria, and exchange information in an unbiased manner. Individual preferences and final vendor selection should reflect the alternative that offers the maximum benefit to the organization.

Under the bounded rationality model, HRD professionals simplify the problem definition, the search is sequential and limited to familiar areas, and information exchange is biased by individual preferences. Preferences originate from either personal or departmental sub-goals for each HRD professional. Evaluation of alternatives follows a conjunctive decision rule where criteria are expressed in terms of cutoff levels. Choice depends on which alternative first exceeds the minimum cutoff levels of the evaluative criteria.

The Political model proposes that HRD professionals will compete for decision outcomes to satisfy personal and/or departmental interests. Preferences are based on these interests and formed early in the decision process. Problem definition, search, data collection, and evaluation criteria are weapons used to tilt the decision outcome in one's favor. Choice is a function of the relative power of the HRD professionals.

Finally, the garbage can model suggests that HRD professionals' decisions are analogous to garbage cans into which problems, solutions, and choice opportunities are dumped. Problem definitions are variable, changing as new problems or people are attached to choice opportunities. Data are often collected and not used. Preferences are unclear and may have little impact on choice. Evaluation criteria are discovered during and after the process, and choices are mostly made when problems are either not noticed or are attached to other choices. A prediction matrix can be constructed given the outcomes of each model across the seven decision phases.

Rather than have a general statement for each model and decision phase, operational items may be developed to make the data judging task clear. Such is the case for assessing the need for employee development and the actual development initiatives; two operational items for each decision phase were developed. The resulting 56-cell table (2 statements x 7 phases x 4 models) contains the predictions that a theory is confirmed (Y), partially confirmed (P), or not confirmed (N). (Wilson & Woodside, 1999, p. 219)

Table 4 illustrates how the prediction matrix was constructed.

Table 4

*Predictions of Four Models on Decision Process Activities in Vendor Selection*

Decision Phase and Operating Mechanism	Rational	Bounded Rationality	Political	Garbage Can
<i>1. Problem definition</i>				
Is the problem viewed in the same way in the organization?	Y	P	N	P
Does the problem definition represent the goals of the organization?	Y	Y	N	Y
<i>2. Search for alternative solutions</i>				
Is search limited to a few familiar alternatives?	N	Y	P	P
Are potential solutions considered simultaneously and compared with each other?	Y	P	N	N
<i>3. Data collection, analysis, and use</i>				
Is information collection so that an optimal decision can be made?	Y	N	N	N
Is control over data collection and analysis used as a source of power?	N	N	Y	N
<i>4. Information exchange</i>				
Is information biased so as to conform to the preference (position) of the person transforming it?	N	Y	Y	N
Is information exchange negatively affected by people entering and leaving the decision process and changing their focus of attention?	N	P	N	Y

Decision Phase and Operating Mechanism	Rational	Bounded Rationality	Political	Garbage Can
<i>5. Individual preferences</i>				
Do preferences change as problems become attached to or detached from the decision?	N	P	N	Y
Are individual preferences a function of personal goals and limited information about the alternative?	N	Y	P	P
<i>6. Evaluation criteria tradeoffs</i>				
Are criteria for a solution agreed on <i>a priori</i> ?	Y	P	P	N
Do tradeoffs across solution criteria occur?	Y	N	P	N
<i>7. Final choice</i>				
Is the first alternative that exceeds the cutoff level(s) selected?	N	Y	P	N
Is the alternative chosen one that is expected to maximally benefit the organization, compared with other alternatives?	Y	P	N	P

*Note.* Table from Wilson & Woodside, 1999, p. 220. Y = confirmed N = not confirmed , P = partially confirmed

### Data Collection and Coding

Four participants were interviewed for this study. Data was collected during the interviews with a personal recorder. Additionally, handwritten notes were taken during the interviews.

The interviews were semi structured; similar questions were asked of each respondent, but questions were open ended. The questions were across broad areas of

decision activities and as such, the interviewer could ask for details on relevant points. In other words, the question order and probes did not follow exactly the same route for all interviews because of elaborations by respondents when answering. The interview format and questions were not designed to operationalize any one theory.

(Wilson & Woodside, 1999, p. 221)

Once the data was collected, each case was coded based on the prediction matrix. All of the participants are HRD professionals in manufacturing organizations with the responsibility of selecting which vendors will participate in employee development initiatives for their organizations. Specifically, two of the participants are human resource managers, one participant is a training manager, and one participant is a senior field-training specialist.

As with any study, data collection was critical. Care was taken by the researcher to conduct the data collection in such a way as to avoid introducing bias into the data. The way that this study avoided bias was to use judges to review the interview transcripts. After the data was collected, trained judges reviewed the interview transcripts to note hits or misses to items in the prediction matrix. The box-score of hits and misses was then subjected to a chi-square test to note the significance of the ratio of confirmed versus unconfirmed predictions found in the data.

Based on a judge's review of the interview transcripts and archival material, a judge could say that a theory was confirmed (Y), partially confirmed (P) or not confirmed (N).

Wilson and Woodside (1999) evaluated inter-judge reliability using the following levels of agreement: "perfect (YYY, PPP, NNN), near perfect (YYP, YPP, NNP, NPP), some (YYN, YNN), or none (YPN)" (p.221).

## Summary

A degrees of freedom analysis was used to examine case data on how HRD professionals make decisions on which vendors to hire for employee development initiatives. First, a prediction matrix was created for how HRD professionals make decisions on which vendors to hire for employee development initiatives. Next, four HRD professionals were interviewed and asked questions that determined what decision-making theory they most often use: rational, bounded rationality, political, or garbage can model.

The interview transcripts were then scored/evaluated by three trained judges to determine which theories were best described by each of the participants. Statistical analysis was then performed to determine how closely the prediction matrix hits the actual interview results.

## **CHAPTER FOUR DATA ANALYSIS**

This chapter provides the analysis and findings from collected data concerning how HRD professionals make decisions on what vendors to hire for employee development initiatives. The chapter is divided into five sections. The first section is a discussion of inter-judge reliability. The next three sections are dedicated to each of the three research questions:

1. Do the decisions that HRD professionals make about which external vendors to use for training and development fall into any of the four models that are being studied: rational, bounded rationality, political, or garbage can model?
2. What are the counts (hits and misses) compared to the prediction matrix for decision-making on how HRD professionals select external vendors for training and development?
3. Which theoretical decision model is most often used by HRD professionals when deciding which external vendors to use for training and development?

The final section provides an overall data analysis summary.

### **Inter-judge Reliability**

The assessment of inter-judge reliability was adopted directly from the Wilson and Woodside (1999) study.

An examination of the level of agreement among the three judges offers information about the reliability of the findings. Based on their review of the interview transcripts and archival material, a judge could say that a theory is confirmed (Y), partially

confirmed (P) or not confirmed (N). Four levels of agreement exist for the three judges—perfect (YYY, PPP, NNN), near perfect (YYP, YPP, NNP, NPP), some (YYN, YNN), or none (YPN). (Wilson & Woodside, 1999, p. 221)

The pattern of agreement displayed by the judges was much greater than what one would expect to see by chance. Each judge made 56 evaluations (seven phases x two statements each x four cases). When compared to the prediction matrix, judges were in “perfect” agreement 40 times or 71%, “near perfect” agreement nine times or 16%, and “some” agreement seven times or 13%. Tables 5 through 8 display the results of the judges scoring for each case.

Table 5

*Case 1 Inter-judge Reliability*

Decision Phase and Operating Mechanism	Judge 1	Judge 2	Judge 3
<i>1. Problem definition</i>			
Is the problem viewed in the same way in the organization?	N	N	N
Does the problem definition represent the goals of the organization?	P	P	P
<i>2. Search for alternative solutions</i>			
Is search limited to a few familiar alternatives?	N	N	Y
Are potential solutions considered simultaneously and compared with each other?	Y	Y	Y
<i>3. Data collection, analysis, and use</i>			
Is information collection so that an optimal decision can be made?	Y	Y	Y
Is control over data collection and analysis used as a source of power?	Y	Y	Y
<i>4. Information exchange</i>			
Is information biased so as to conform to the preference (position) of the person transforming it?	P	P	P
Is information exchange negatively affected by people entering and leaving the decision process and changing their focus of attention?	Y	Y	Y
<i>5. Individual preferences</i>			
Do preferences change as problems become attached to or detached from the decision?	P	Y	Y
Are individual preferences a function of personal goals and limited information about the alternative?	P	N	P
<i>6. Evaluation criteria tradeoffs</i>			
Are criteria for a solution agreed on <i>a priori</i> ?	P	N	P
Do tradeoffs across solution criteria occur?	Y	Y	Y
<i>7. Final choice</i>			
Is the first alternative that exceeds the cutoff level(s) selected?	N	N	N
Is the alternative chosen one that is expected to maximally benefit the organization, compared with other alternatives?	Y	Y	Y

Table 6

*Case 2 Inter-judge Reliability*

Decision Phase and Operating Mechanism	Judge 1	Judge 2	Judge 3
<i>1. Problem definition</i>			
Is the problem viewed in the same way in the organization?	Y	Y	Y
Does the problem definition represent the goals of the organization?	Y	Y	Y
<i>2. Search for alternative solutions</i>			
Is search limited to a few familiar alternatives?	P	N	P
Are potential solutions considered simultaneously and compared with each other?	Y	Y	Y
<i>3. Data collection, analysis, and use</i>			
Is information collection so that an optimal decision can be made?	Y	Y	Y
Is control over data collection and analysis used as a source of power?	N	N	Y
<i>4. Information exchange</i>			
Is information biased so as to conform to the preference (position) of the person transforming it?	N	N	Y
Is information exchange negatively affected by people entering and leaving the decision process and changing their focus of attention?	N	N	N
<i>5. Individual preferences</i>			
Do preferences change as problems become attached to or detached from the decision?	P	N	Y
Are individual preferences a function of personal goals and limited information about the alternative?	N	N	N
<i>6. Evaluation criteria tradeoffs</i>			
Are criteria for a solution agreed on <i>a priori</i> ?	P	N	N
Do tradeoffs across solution criteria occur?	N	N	N
<i>7. Final choice</i>			
Is the first alternative that exceeds the cutoff level(s) selected?	N	N	N
Is the alternative chosen one that is expected to maximally benefit the organization, compared with other alternatives?	Y	Y	N

Table 7

*Case 3 Inter-judge Reliability*

Decision Phase and Operating Mechanism	Judge 1	Judge 2	Judge 3
<i>1. Problem definition</i>			
Is the problem viewed in the same way in the organization?	P	N	N
Does the problem definition represent the goals of the organization?	Y	Y	Y
<i>2. Search for alternative solutions</i>			
Is search limited to a few familiar alternatives?	N	N	N
Are potential solutions considered simultaneously and compared with each other?	Y	Y	Y
<i>3. Data collection, analysis, and use</i>			
Is information collection so that an optimal decision can be made?	Y	Y	Y
Is control over data collection and analysis used as a source of power?	Y	Y	Y
<i>4. Information exchange</i>			
Is information biased so as to conform to the preference (position) of the person transforming it?	Y	Y	Y
Is information exchange negatively affected by people entering and leaving the decision process and changing their focus of attention?	P	P	P
<i>5. Individual preferences</i>			
Do preferences change as problems become attached to or detached from the decision?	N	N	N
Are individual preferences a function of personal goals and limited information about the alternative?	N	N	N
<i>6. Evaluation criteria tradeoffs</i>			
Are criteria for a solution agreed on <i>a priori</i> ?	N	N	P
Do tradeoffs across solution criteria occur?	N	N	Y
<i>7. Final choice</i>			
Is the first alternative that exceeds the cutoff level(s) selected?	N	N	N
Is the alternative chosen one that is expected to maximally benefit the organization, compared with other alternatives?	Y	Y	Y

Table 8

*Case 4 Inter-judge Reliability*

Decision Phase and Operating Mechanism	Judge 1	Judge 2	Judge 3
<i>1. Problem definition</i>			
Is the problem viewed in the same way in the organization?	Y	Y	Y
Does the problem definition represent the goals of the organization?	P	Y	Y
<i>2. Search for alternative solutions</i>			
Is search limited to a few familiar alternatives?	P	N	N
Are potential solutions considered simultaneously and compared with each other?	Y	Y	Y
<i>3. Data collection, analysis, and use</i>			
Is information collection so that an optimal decision can be made?	N	N	N
Is control over data collection and analysis used as a source of power?	N	N	N
<i>4. Information exchange</i>			
Is information biased so as to conform to the preference (position) of the person transforming it?	Y	Y	Y
Is information exchange negatively affected by people entering and leaving the decision process and changing their focus of attention?	Y	Y	Y
<i>5. Individual preferences</i>			
Do preferences change as problems become attached to or detached from the decision?	P	P	P
Are individual preferences a function of personal goals and limited information about the alternative?	Y	Y	P
<i>6. Evaluation criteria tradeoffs</i>			
Are criteria for a solution agreed on <i>a priori</i> ?	N	N	Y
Do tradeoffs across solution criteria occur?	Y	Y	Y
<i>7. Final choice</i>			
Is the first alternative that exceeds the cutoff level(s) selected?	Y	Y	Y
Is the alternative chosen one that is expected to maximally benefit the organization, compared with other alternatives?	N	N	Y

### **Research Question One**

*Do the decisions that HRD professionals make about which external vendors to use for training and development fall into any of the four models that are being studied: rational, bounded rationality, political, or garbage can model?*

Each of the four models of decision-making vary greatly in methods and processes that lead to a final decision. For example, the rational model stresses maximum benefit to the organization while the political model of decision-making focuses the power of individuals in any given structure and how individuals can leverage their power to attain their personal goals. A brief description of each of the decision-making models will help provide the foundation to answer research question one.

The rational model, derived from microeconomics, posits that members of organizations will make decisions that will provide maximum benefit (i.e., utility) to the firm. The bounded rationality model proposes that while decision makers try to be rational, they are constrained by cognitive limitations, habits, and biases (i.e., human nature). According to the political model, decision makers are competing to satisfy their own goals, and choice is a function of an individual's power. Finally, in the garbage can model, decisions are the result of an unsystematic process. That is, problem definitions can change, preferences are unclear, and people may come and go from the decision group. (Wilson & Woodside, 1999, p. 218)

For Case 1 the total number of confirmed hits across the four decision models was 43: rational model (18) + bounded rationality model (5) + political model (10) + garbage can model (10) = 43. This means that the expected number of hits across the four models would

be  $43 \div 4 = 10.75$  or 25% per decision model. The decisions that the Case 1 participant (Participant 1) made in the context of vendor selection for human resource development initiatives fell into the rational model 18 times (43%), the bounded rationality model 5 times (12%), the political model 10 times (24%), and the garbage can model 10 times (24%). This would suggest that the Participant 1 believes that the decisions made about vendor selection for human resource development initiatives will have maximum benefit to the organization. When asked to think about and explain how vendor selection decisions are made the Participant 1 stated,

I think about it in the “end result format.” So what is the end result that I’m trying to accomplish? And then I look at the vendors that I’m looking at to see what their reputation is, what their cost is, and what other organizations have said about them. Any type of details or information that I can get that can substantiate their ability to deliver the training that they need to deliver in a way that can be understood and applied in the work place.

This does seem to align with the Rational model in that Participant 1 has a specific set of criteria in mind. The end result is putting the main objective first while various measures for vendors such as reputation and cost come second. Knowledge, skills, and abilities that can be immediately applied to workplace are the desired result and not bounded by other factors.

Participant 1 further stated,

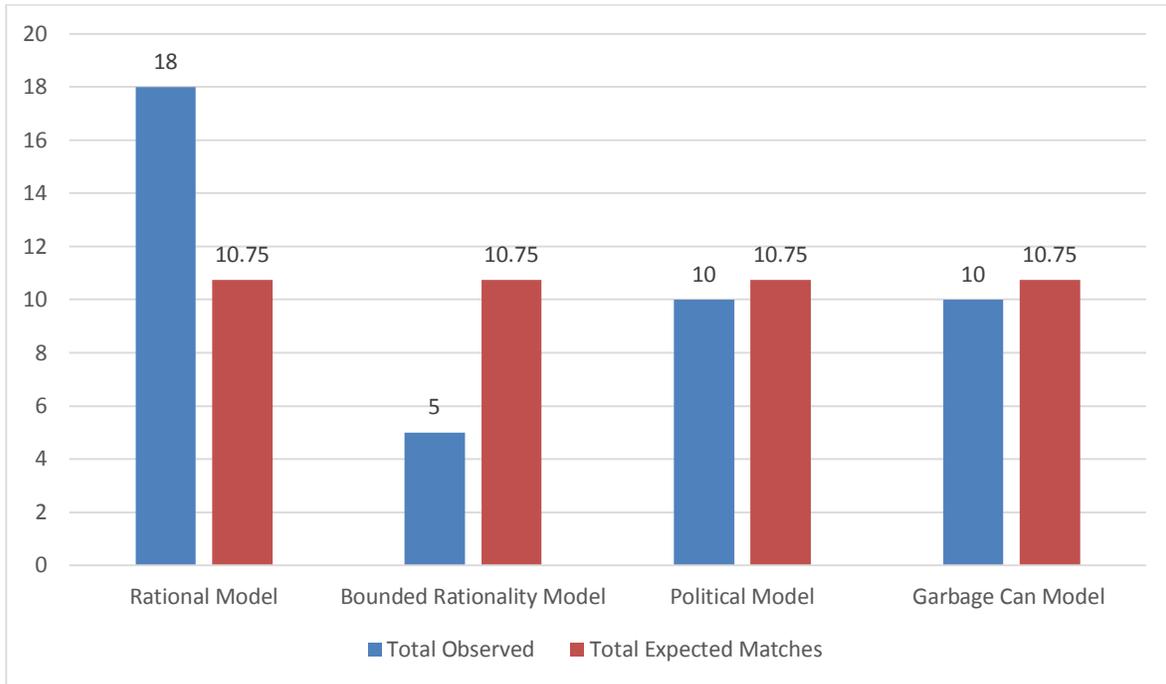
Once I determine it’s a training issue, I look to see what trainings are out there. What the curriculum looks like. What they say the objectives are that they are going to accomplish. I look at the way it’s delivered. Whether or not it’s going to be a

webinar. Whether or not there's going to be some interactive capabilities in it. For me, if it's not an adult learning type situation for our supervisors, it's not something that's going to be applied in the work place. So they need to see it, read it, and do it. And if the training does not do that, it's not helping me accomplish my goal.

Furthermore, the results would suggest that the participant does not feel constrained by limitations their organization may have, as the bounded rationality model has the least number of confirmed hits.

Let's say it's for a manager and they're saying that they're having trouble with a number of different issues and it's one for that one individual person. I might look at Dale Carnegie. I may look at... You know, it's unlimited. If I'm looking for 360, I'm going to look for those groups that are within this area that I can send a supervisor to. So it really depends on what the need is that determines what vendors I'm going to. (Participant 1)

Participant 1 did mention that cost, amount of time that a particular training would take to complete, the impact to workers' production, and reputation of the vendors were all factors. However, the overriding and absolute most important aspects of consideration for vendor selection were the usefulness of the training and the application of training in in the workplace. It is interesting that the political model and garbage can model both have the same number of confirmed hits, 10, which was very close to the expected hits of 10.75 (see Figure 9).



*Figure 9.* Case 1 observed hits versus expected hits.

For Case 2 the total number of confirmed hits across all decision models was 68. This means that the number of expected hits per decision model would be  $68 \div 4 = 17$  or 25% per model. There were 30 confirmed hits for the rational model. This was the most confirmed hits for any of the four decision-making models across all four of the cases. This was not surprising because the Case 2 participant (Participant 2) was clear that the needs of the organization were what guided the vendor selection decisions. The needs of the organization combined with four set criteria, pricing, geographic location of the vendor, subject matter expertise, and the vendor's reputation across the industry, are the basis for how decisions on vendor selection are made. When asked what training was most prevalent or most likely to be purchased the participant pointed back to the organization's needs, Participant 2 answered

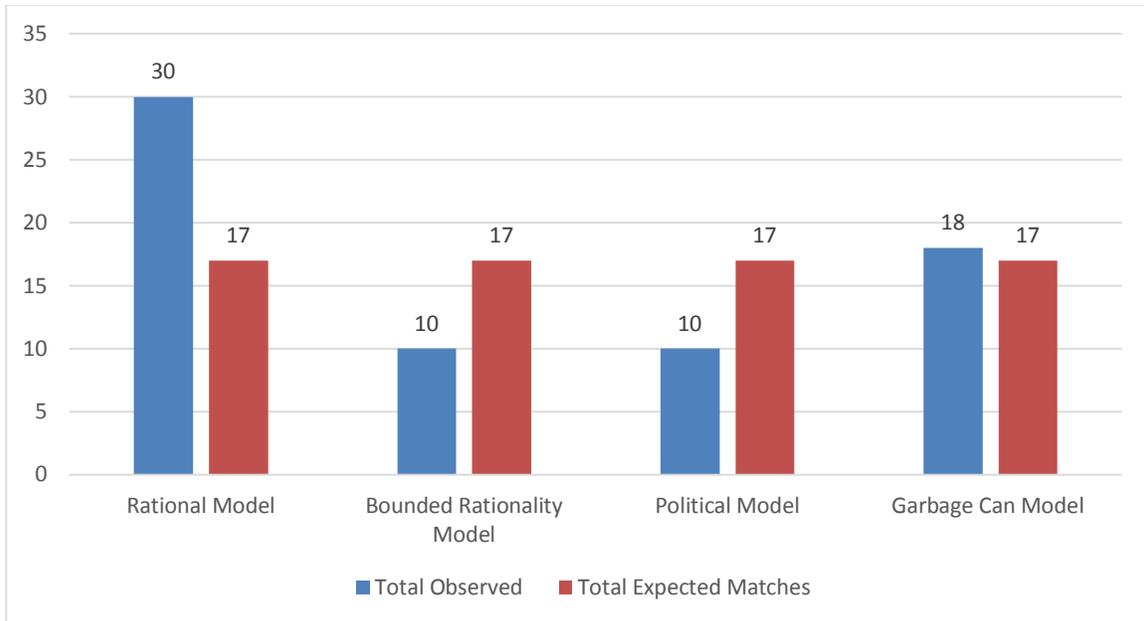
I can't choose one because it will depend on what direction our organization needs to focus on. I have no preference, it's only what's best for the organization. Training is crucial in our industry so close attention from upper management is placed on the course design, material given, and even instructors teaching the class. Student surveys are even reviewed by upper management and discussed with training departments for continuous improvement.

Also, the rational model may have had such a high number of confirmed hits for this case because of how problems are filtered to the training areas through a formal process that identifies gaps in training. Usually this is initiated at the organizational level. However, the training area involved may also conduct a needs analysis to verify the problem outlined by this formal process.

The bounded rationality model and the political model both had 10 observed hits (see Figure 10). For the bounded rationality model Participant 2 did not feel constrained by any particular barriers or guidelines that would prevent the purchasing of training or the selection of a particular vendor. For example, while price of the vendor is the overriding factor, the participant will disregard the pricing if the vendor offers a training that will be useful. Noting that while the first criteria is price, return on investment often outweighs price and therefore a much higher dollar amount will be paid to a vendor if the expected return on investment is sufficient.

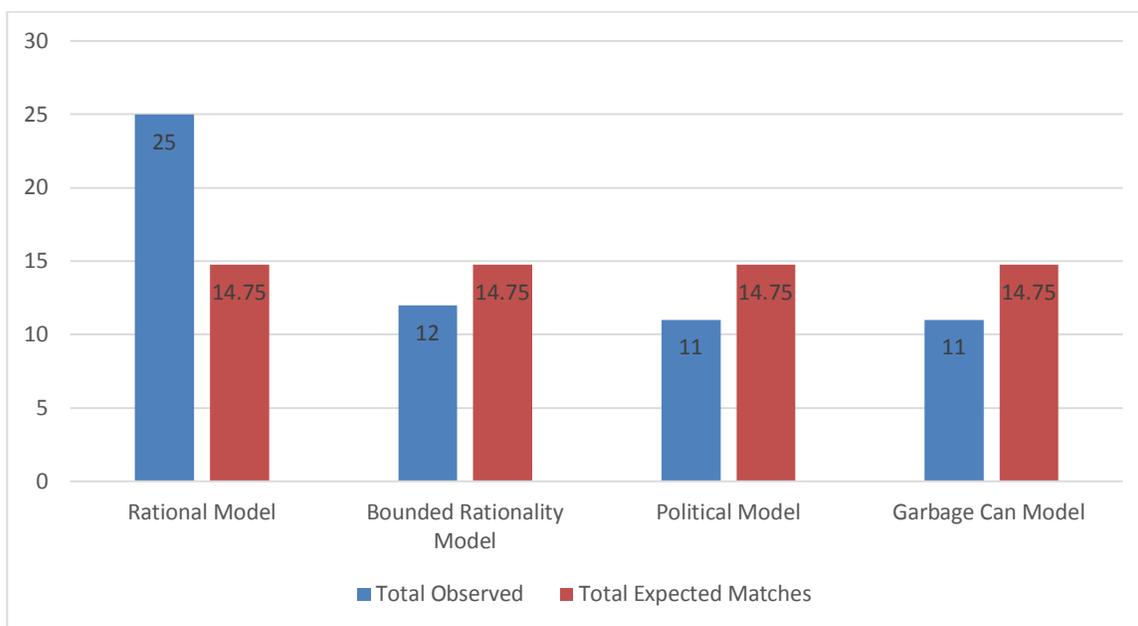
The garbage can model had 18 confirmed hits which was the second most hits of the four decision-making models. The explanation for the garbage can model having the second most hits for Case 2 could be attributed to the fact that Participant 2 stated that although there

is a very specific criteria for selecting vendors to conduct training and other HRD initiatives, top decision makers sometimes choose vendors for no other reason than the fact that they have worked with them in the past.



*Figure 10.* Case 2 observed hits versus expected hits.

For Case 3 the total number of hits was 59 which means that the expected number of hits for each decision model was  $59 \div 4 = 14.75$ ; 25% per decision model. The rational model had the most confirmed hits with 25. The bounded rationality model had 12 hits, while both the political model and garbage can model had 11 hits (see Figure 11).



*Figure 11.* Case 3 observed hits versus expected hits.

The expected number of hits per decision model for Case 4 was 15.5. The confirmed hits for the rational model was 13. There were 24 confirmed hits for the bounded rational model which was the most number of confirmed hits for Case 4 or any of the other cases. This is not surprising as the Case 4 participant (Participant 4) noted that there were many constraints to vendor selection for their organization. Some of the constraints that were mentioned included a lack of time to train, no established budget for training, and competing priorities such as the need to meet and exceed production goals. According to Participant 4,

Cost constraints are, I think, the number one factor for us, so. And that's sort of the culture of the organization that I'm in right now. Typically cost comes up as a number one. Time is the number two. So, generally we're all on the same page as that. I think we come from different perspectives as far as what priority training

should take, and that's where the difference is between myself and other team members.

Also, HRD initiatives in this organization are bound by time. Time or lack thereof affects not only vendor selection but also HRD initiatives in general. According to the Participant 4, the amount of time it takes to select a vendor and conduct a training program can be negatively impacted if time constraints are not met:

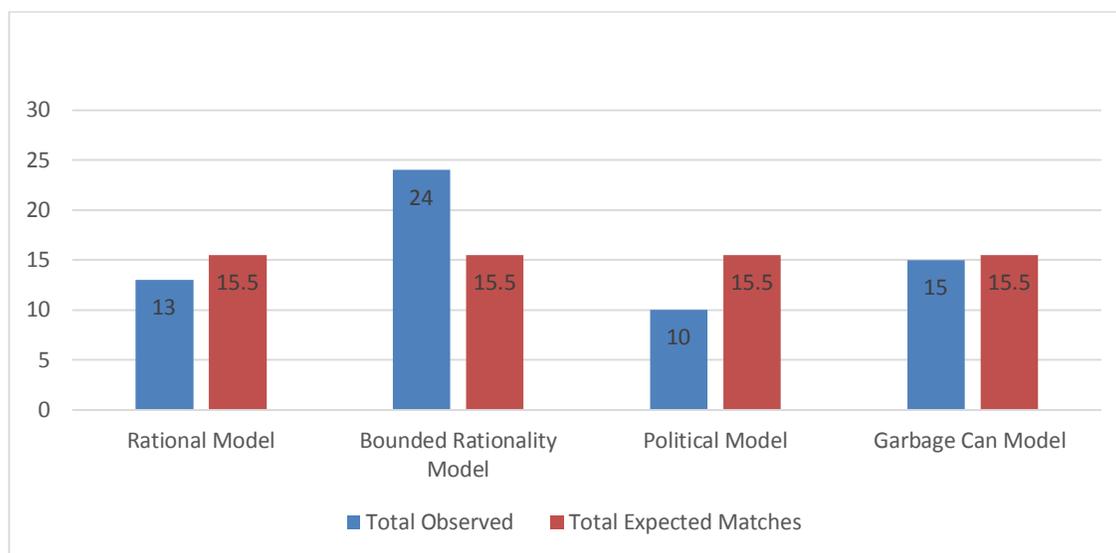
So, for example, if we have a 6-course program that we are teaching and they are extremely gun-hoe during the first class, and by the time we complete the 6<sup>th</sup> class, the class size has diminished because of other business needs. And I think that that's a reflection of the decision making process as well. So we may all start out very enthusiastic that we need to accomplish X, Y, Z training, and that goes back to the decision making based on time. If I can find somebody who can do it and provide it within our cost and within our time frame very quickly, there will be a lot more energy behind it. If I take my time and look around and source, by the time I return to the group, the interest level has decreased. And if it takes too long at all, I may be preaching to myself. I may be preaching to the choir and have nobody who is on board with getting it accomplished.

When asked if any of these constraints could be circumvented, Participant 4 responded,

Generally not. Time is of the essence. I think the other thing too is the audience that my environment has and the manufacture environment. You know, the other managers are engineers, and so their thought process is, you know, the shortest distance between point A and point B as readily available as it can be. You know,

how quickly can we make it happen, and what's the easiest way we can make it happen? And so I think that influences a lot, and everything is very time sensitive. So, the amount of time it would take to source two or three different vendors for a training program. Generally we don't have that luxury. If we don't jump on it and come up with an immediate solution, then that window of approval, that window of opportunity to go ahead and provide training often closes very quickly, and the priorities are shifted. The priority might be totally gone.

The political model had the least confirmed number of hits (10) which makes sense given that the culture of this organization does not view training initiatives as a value add for their customers or production goals. Unlike the other organizations that were a part of this study, this organization is more production focused than people focused. In other words, production is more important than developing the workforce. This may be due to the fact that the Case 4 organization employs a much higher number of temporary employees to work in their production areas. The garbage can model came closest to the expected number of hits with 15 confirmed hits (see Figure 12).



*Figure 12.* Case 4 observed hits verses expected hits.

Decisions that the HRD professionals make about which external vendors to use for training and development initiatives do fall into the decision models that are being studied. Each of these four models had at least some confirmed hits which indicates that decisions in the context of vendor selection are not completely bound to any one particular theory.

### **Research Question Two**

*What are the counts (hits and misses) compared to the prediction matrix for decision-making on how HRD professionals select external vendors for training and development?*

For each judge there is a possibility of 14 hits per decisions model: seven sections multiplied by two questions per section ( $7 \times 2 = 14$ ). Therefore, the total number of possible hits for each decision model equals 42: seven sections multiplied by two questions per section multiplied by three judges ( $7 \times 2 \times 3 = 42$ ).

To evaluate this result statistically, a chi-square test was used to determine whether there is a significant difference between the observed distribution of “hits” (i.e., confirmed predictions) and the distribution one would expect by chance. “Use of the chi-square test in this manner is appropriate since we are examining the extent to which two distributions (observed and expected) are different from each other” (Wilson & Woodside, 1999, p. 221).

$$X^2 = \sum \frac{(\text{observed} - \text{expected})^2}{\text{expected}}$$

### **Case 1**

Table 9 summarizes the results for Case 1. There were a total of 18 confirmed hits for the rational model. Judge 1 had six hits, Judge 2 had seven hits, and Judge 3 had five hits. In other words, for the rational model Judge 1 had six hits and eight misses for a 43% hit rate. Judge 2 had seven hits and seven misses for the rational model for a 50% hit rate. Judge 3 confirmed five of the predictions which is a 36% hit rate. The total number of confirmed predictions, 18, represents a 43% hit rate.

For the bounded rationality model Judge 1 had two hits and 12 misses (14% hit rate), Judge 2 had one hit and 13 misses (7% hit rate), and Judge 3 had two hits and 12 misses (14% hit rate). The bounded rationality model had a total hit rate of five, or a 12% hit rate.

The political model and garbage can model each had a total hit rate of 10, or 24%. For the political model Judge 1 confirmed four hits and 10 misses (29% hit rate), Judge 2 confirmed two hits and 12 misses (14% hit rate), and Judge 3 confirmed four hits and 10 misses for a hit rate of 29%. For garbage can model Judge 1 confirmed three hits and nine

misses (21% hit rate), Judge 2 confirmed three hits and nine misses (21% hit rate), and Judge 3 confirmed four hits and 10 misses (29% hit rate).

Table 9

*Case 1: Box Score Results for Hiring Vendors—Absolute and Percentage Matches (Hits) to Predictions*

Organizational Decision-Making Model				
	Rational Model	Bounded Rationality Model	Political Model	Garbage Can Model
Judge 1	6 (.43)	2 (.14)	4 (.29)	3 (.21)
Judge 2	7 (.50)	1 (.07)	2 (.14)	3 (.21)
Judge 3	5 (.36)	2 (.14)	4 (.29)	4 (.29)
Total Observed	18 (.43)	5 (.12)	10 (.24)	10 (.24)
Total Expected Matches	10.75	10.75	10.75	10.75

*Note.*  $\chi^2 = 8.07$ , 3 d.f.,  $p = .0446$ ,  $p < .05$

The chi-square test is significant, ( $\chi^2 = 8.07$ , 3 d.f.,  $p = .0446$ ,  $p < .05$ ) which validates that the distribution of matches is significantly different than what would be expected by chance. When the matches to the predictions are examined as proportions they are further proven to be significantly different:

$$p = \frac{(p_1 - p_2) - 0}{\sqrt{(p)(1 - p)\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

$$p = \frac{Y1+Y2}{n1+n2}$$

$$p = \frac{(.43-.24)-0}{\sqrt{(.80)(.20)\left(\frac{1}{42}+\frac{1}{42}\right)}} = 1.8447$$

$$Z= 1.8447, p = .0651, n = 42.$$

## Case 2

Table 10 summarizes the results for Case 2. The rational model had a total of 30 confirmed hits and 12 misses for a 71% hit rate. Judge 1 confirmed 10 hits and four misses (71% hit rate), Judge 2 confirmed 12 hits and two misses (86% hit rate), and Judge 3 confirmed eight hits and six misses (57% hit rate). For the bounded rationality model Judge 1 confirmed four hits and 10 misses (29% hit rate), Judge 2 confirmed three hits and 11 misses (21% hit rate), and Judge 3 confirmed three hits and 11 misses (21% hit rate). There were a total of 10 hits and 32 misses for a hit rate of 24%.

For the political model Judges 1 and 2 both confirmed two hits and 12 misses for a hit rate of 14%. Judge 3 confirmed six hits and eight misses (43% hit rate). The total confirmed hits for the political model were 10 hits and 32 misses for a hit rate of 24%. Judge 1 confirmed seven hits and seven misses for the garbage can model (50% hit rate). Judge 2 confirmed six hits and eight misses (43% hit rate). Judge 3 confirmed five hits and no misses (36% hit rate). The total number of hits for the garbage can model were 18 with 24 misses for a hit rate of 43%.

The chi-square test is significant, ( $\chi^2 = 15.77$ , 3 d.f.,  $p = .0013$ ,  $p < .05$ ) which validates that the distribution of matches is significantly different than what would be

expected by chance. When the matches to the predictions are examined as proportions they are further proven to be significantly different ( $z = 2.591, p = .001$ ).

Table 10

*Case 2: Box Score Results for Hiring Vendors—Absolute and Percentage Matches (Hits) to Predictions*

	Organizational Decision-Making Model			
	Rational Model	Bounded Rationality Model	Political Model	Garbage Can Model
Judge 1	10 (.71)	4 (.29)	2 (.14)	7 (.50)
Judge 2	12 (.86)	3 (.21)	2 (.14)	6 (.43)
Judge 3	8 (.57)	3 (.21)	6 (.43)	5 (.36)
Total Observed	30 (.71)	10 (.24)	10 (.24)	18 (.43)
Total Expected Hits	17	17	17	17

*Note.* ( $\chi^2 = 15.77, 3 \text{ d.f.}, p = .0013, p < .05$ )

### Case 3

The results for Case 3 are summarized in Table 11. For the rational model, Judge 1 confirmed eight hits and six misses (57% hit rate), Judge 2 confirmed eight hits and six misses (57% hit rate), and Judge 3 confirmed nine hits and five misses (64% hit rate). The total observed for the rational model was 25 hits confirmed and 42 misses which is a 60% hit rate. The results for the bounded rationality model for Judge 1 was five confirmed hits and nine misses (36% hit rate). Judge 2 confirmed four hits and 10 misses (29% hit rate). Judge

3 confirmed three hits and 11 misses (21% hit rate). The total hit count for the bounded rationality model was 12 hits and 30 misses for a 29% hit rate.

Table 11

*Case 3: Box Score Results for Hiring Vendors—Absolute and Percentage Matches (Hits) to Predictions*

For the political model Judge 1 confirmed three hits and 11 misses (21% hit rate), Judge 2 confirmed four hits and 10 misses (29% hit rate), and Judge 3 had four hits and 10 misses (29% hit rate). The total hit count for the political model was 11 hits and 31 misses for a hit rate of 26%. For the garbage can model Judge 1 confirmed five hits and nine misses (36% hit rate), Judge 2 confirmed four hits and 10 misses (29% hit rate), and Judge 3 confirmed two hits and 12 misses for a hit rate of 14%. The garbage can model had a total of 11 hits and 31 misses for a hit rate of 26%.

The chi-square test is significant, ( $\chi^2 = 9.542$ , 3 d.f.,  $p = .0229$ ,  $p < .05$ ) which validates the distribution of matches is significantly different than what would be expected by chance. When the matches to the predictions are examined as proportions they are further proven to be significantly different ( $z = 2.8585$ ,  $p = .004$ ).

Organizational Decision-Making Model				
	Rational Model	Bounded Rationality Model	Political Model	Garbage Can Model
Judge 1	8 (.57)	5 (.36)	3 (.21)	5 (.36)
Judge 2	8 (.57)	4 (.29)	4 (.29)	4 (.29)
Judge 3	9 (.64)	3 (.21)	4 (.29)	2 (.14)
Total Observed	25 (.60)	12 (.29)	11 (.26)	11 (.26)
Total Expected Hits	14.75	14.75	14.75	14.75

*Note.*  $\chi^2 = 9.542$ , 3 d.f.,  $p = .0229$ ,  $p < .05$

#### Case 4

The results for Case 4 are summarized in Table 12. For the rational model, Judge 1 confirmed three hits and 11 misses (21% hit rate), Judge 2 confirmed four hits and 10 misses (29% hit rate), and Judge 3 confirmed six hits and eight misses (43% hit rate). The total observed hits for the rational model was 13 hits and 29 misses (31% hit rate). For the bounded rationality model Judges 1, 2, and 3 all confirmed eight hits and six misses (57% hit rate). The total hits count for the bounded rationality model was 24 hits with 18 misses, or a hit rate of 57%.

Judge 1 confirmed three hits and 11 misses (21% hit rate) for the political model, Judge 2 confirmed four hits and 10 misses (29% hit rate), and Judge 3 confirmed 3 hits and 11 misses (21% hit rate). The total hits count confirmed for the political model was 10 hits with 32 misses for a hit rate of 24%. For the garbage can model Judge 1 confirmed four hits and 10 misses (29% hit rate). Judge 2 confirmed six hits and eight misses (43% hit rate), and

Judge 3 confirmed five hits and nine misses (36% hit rate). The total confirmed hits for the garbage can model were 15 hits and 27 misses for a hit rate of 36%.

The chi-square test is not significant, ( $\chi^2 = 7.032$ , 3 d.f.,  $p = .0709$ ,  $p < .05$ ) which indicates the distribution of matches is not significantly different than what would be expected by chance. When the matches to the predictions are examined as proportions they are further proven not to be significantly different ( $z = 1.9294$ ,  $p = .05$ ).

Table 12

*Case 4: Box Score Results for Hiring Vendors—Absolute and Percentage Matches (Hits) to Predictions*

Organizational Decision-Making Model				
	Rational Model	Bounded Rationality Model	Political Model	Garbage Can Model
Judge 1	3(.21)	8 (.57)	3(.21)	4 (.29)
Judge 2	4 (.29)	8(.57)	4 (.29)	6 (.43)
Judge 3	6 (.43)	8(.57)	3(.21)	5 (.36)
Total Observed	13 (.31)	24 (.57)	10 (.24)	15 (.36)
Total Expected Hits	15.5	15.5	15.5	15.5

*Note.* ( $\chi^2 = 7.032$ , 3 d.f.,  $p = .0709$ ,  $p < .05$ )

### Research Question Three

*Which theoretical decision model is most often used by HRD professionals when deciding which external vendors to use for training and development?*

It is crucial to this study to understand that all hits and misses were confirmed in comparison to the prediction matrix. “The heart of DFA is the development and testing of a ‘prediction matrix.’ The prediction matrix sets up the ‘pattern,’ based on theory, to be either confirmed or disconfirmed by the case data” (Wilson & Woodside, 1999, p. 217).

Table 13 presents the prediction matrix used in this study. There were a total of 232 confirmed hits. A chi-square test shows that the distribution of hits to the prediction matrix is significantly different than that expected by chance: ( $\chi^2 = 19.621$ , 3 d.f.,  $p = .0002$ ,  $p < .05$ ). The assumption was that any model would fit as well as another model. This means that all four models had an equal chance of confirmed predictions (25%). The total number of confirmed predictions across the models for this study was 232. Therefore, the expected distribution was 25% per decision model or 58 hits per cell ( $232 / 4 = 58$ ). The chi-square statistic is significant at  $p < 0.05$  which shows that the two distributions have a significant difference. Also, when the matches to the predictions are examined as proportions they are further proven to be significantly different ( $z = 3.5342$ ,  $p = .0004$ ,  $N = 168$ ) and a clear pattern is shown from the data. The rational model shows a pattern of having the most predictions confirmed of the four decision-making models with 86 observed hits for a 37% hit rate. Table 14 presents a meta-analysis of the experimental data in the study.

Table 13

*Predictions of Four Models on Decision Process Activities in Vendor Selection*

Decision Phase and Operating Mechanism	Rational	Bounded Rationality	Political	Garbage Can
<i>1. Problem definition</i>				
Is the problem viewed in the same way in the organization?	Y	P	N	P
Does the problem definition represent the goals of the organization?	Y	Y	N	Y
<i>2. Search for alternative solutions</i>				
Is search limited to a few familiar alternatives?	N	Y	P	P
Are potential solutions considered simultaneously and compared with each other?	Y	P	N	N
<i>3. Data collection, analysis, and use</i>				
Is information collection so that an optimal decision can be made?	Y	N	N	N
Is control over data collection and analysis used as a source of power?	N	N	Y	N
<i>4. Information exchange</i>				
Is information biased so as to conform to the preference (position) of the person transforming it?	N	Y	Y	N
Is information exchange negatively affected by people entering and leaving the decision process and changing their focus of attention?	N	P	N	Y
<i>5. Individual preferences</i>				
Do preferences change as problems become attached to or detached from the decision?	N	P	N	Y
Are individual preferences a function of personal goals and limited information about the alternative?	N	Y	P	P
<i>6. Evaluation criteria tradeoffs</i>				
Are criteria for a solution agreed on <i>a priori</i> ?	Y	P	P	N
Do tradeoffs across solution criteria occur?	Y	N	P	N
<i>7. Final choice</i>				
Is the first alternative that exceeds the cutoff level(s) selected?	N	Y	P	N
Is the alternative chosen one that is expected to maximally benefit the organization, compared with other alternatives?	Y	P	N	P

*Note.* Table from Wilson & Woodside, 1999, p. 220. Y = confirmed N = not confirmed, P = partially confirmed.

Table 14

*Meta-Analysis Across All Cases: Observed Hits to Predictions*

	Organizational Decision-Making Model			
	Rational Model	Bounded Rationality Model	Political Model	Garbage Can Model
Case 1	18 (.43)	5 (.12)	10 (.24)	10 (.24)
Case 2	30 (.71)	10 (.24)	10 (.24)	18 (.43)
Case 3	25(.60)	12 (.29)	11 (.26)	11 (.26)
Case4	13 (.31)	24 (.57)	10 (.24)	15 (.36)
Total Observed Hits	86 (.37)	51 (.22)	41 (.18)	54 (.23)
Total Expected Hits	58	58	58	58

Note:  $\chi^2 = 19.621$ , 3 d.f.,  $p = .0002$ .,  $p < .05$

## **CHAPTER FIVE SUMMARY**

The fifth and final chapter contains the summary, conclusions, recommendations, and limitations extracted from the study. Summaries of findings are given for the three research questions. Conclusions are presented for each research question. Further, a discussion includes a synthesis of findings and extant literature. Recommendations for HRD professionals, training vendors and developers, and higher education and human resource development researchers are provided. As mentioned earlier, the purpose of this study was to better understand how HRD professionals select training once the decision has been made to purchase training rather than to design it internally. Specifically, the study attempted to (a) identify the theory (rational, bounded rationality, political, or garbage can) that can best describe HRD professionals' decision making in relation to external vendors to use for training and development; (b) describe the counts on a prediction matrix based on theories of decision making on how HRD professionals select external vendors for training and development; and (c) describe the process used in relation to the theory most often used by HRD professionals when deciding which external vendors to use for training and development.

This study implemented the research technique of degrees of freedom analysis to study how HRD professionals in organizations select vendors when they are purchasing training. Understanding the administrative decision-making process HRD professionals use to make organizational purchases of training is important for a number of stakeholders including the HRD professional as well as the vendors selling training solutions. This mixed

method study included four cases that examined HRD professionals' decision-making process specifically within manufacturing organizations. The case approach included three HRD professionals reviewing cases to implement the degrees of freedom analysis to examine which decision-making theory (rational model, bounded rational model, political model, and garbage can model) fits the cases best. The purpose of this study was to better understand how HRD professions select training once the decision has been made to purchase rather than design it internally. The findings from the study were presented by the research questions.

### **Conclusions**

The conclusions provide an understanding of how the findings identify the theory that can best describe HRD professionals' decision making in relation to external vendors to use for training and development. Additionally, the conclusions provide a description of how the findings describe the counts on a prediction matrix based on theories of decision making on how HRD professionals select external vendors for training and development. Lastly, the conclusions describe the process used in relation to the theory most often used by HRD professionals when deciding which external vendors to use for training and development.

### **Research Question One**

*Do the decisions that HRD professionals make about which external vendors to use for training and development fall into any of the four models that are being studied: rational, bounded rationality, political, or garbage can?*

Overall, the rational model had the greatest number of predictions confirmed by the case data when compared to the competing models of bounded rationality, political, and garbage can. This supports the hypothesis that one decision-making theory would dominate

the other competing theories. In three of the four cases the rational model was by far the most frequently used theory by HRD professionals. Participant 1 described a step-by-step process for selecting a vendor that seems to fall in line with rational model:

First I have to determine whether or not the actual thing I'm trying to resolve is a training issue. Once a training issue, I look to see what trainings are out there. What the curriculum looks like. What they say the objectives are that they are going to accomplish. I look at the way it's delivered. Whether or not it's going to be a webinar. Whether or not there's going to be some interactive capabilities in it. For me, if it's not an adult learning type situation for our supervisors, it's not something that's going to be applied in the work place. So they need to see it, read it, and do it. And if the training does not do that, it's not helping me accomplish my goal.

Participants 2 and 3 echoed similar sentiments. All of the first three case study participants cited the cost of the vendor, objectives of the training, goals of the organization, and amount of time that would be dedicated to the project as the primary factors in their decision-making processes. It is not surprising that the organizations which employ the participants are very similar. All are very large companies that have a variety of operations all over the world and are publicly traded. This may contribute to the reason why each of the participants appears to view the vendor hiring process from the rational model perspective. The goals of each of these organizations is to be a global leader in their respective area of manufacturing expertise, increase their market share, and get the maximum return on investment for their shareholders.

Participant 4 was the outlier as the garbage can model was the theory that received the most hits. Again, this is not surprising since the organization that employs the Participant 4 has a much different structure than the other organizations. The organization does sell its products worldwide, but all operations are located in the United States. Also, the organization is not a publicly traded company and there is a much more pronounced command and control structure. Furthermore, while the company is extremely profitable, both ownership and management seem to operate as if the company is perpetually on the verge of bankruptcy. Cost factors and time (production goals) are the main two factors that dictate decision making about training vendors for the organization. This was confirmed in a statement made by Participant 4:

Cost constraints are, I think, the number one factor for us, so. And that's sort of the culture of the organization that I'm in right now. Typically cost comes up as a number one. Time [production goals] is the number two. So, generally we're all on the same page as that. I think we come from different perspectives as far as what priority training should take, and that's where the difference is between myself and other team members.

Clearly the structure of the organization plays at least some part in why the bounded rationality model is the chief model used in making the decision to hire vendors for human resource development initiatives.

It should be noted that the garbage can model was the second most confirmed theory across all cases. The researcher initially believed that the garbage can model would be the most confirmed theory followed by the bounded rationality model, but that was not the case.

Also, it is noteworthy that the political model had the least confirmed hits across all four cases with 41 (18%). This would suggest that none of the participants felt that the authorities and partisans in their respective organizations compete to achieve their own personal goals and objectives but rather that they operate from a premise of what is most beneficial to the organizations.

### **Research Question Two**

*What are the counts (hits and misses) compared to the prediction matrix for decision-making on how HRD professionals select external vendors for training and development?*

The counts (hits and misses) for Case 1 were 18 hits and 24 misses (43% hit rate) for the Rational model, five hits and 47 misses (12% hit rate) for the bounded rationality model, 10 hits and 32 misses (24% hit rate) for the political model, and 10 hits and 32 misses (24% hit rate) for the garbage can model. In three out of the four cases the rational model dominated the other decision-making theories in terms of confirmed hits verses misses. While the political model and garbage can were tied for the number of confirmed hits, 10 or 24% each, the bounded rationality model had the least number of hits for Case 1. This may be due to the fact that the Participant 1 is the only participant who consistently uses the data collected during the decision-making process in order to arrive at the decision the participant alone deems most favorable to the organization. When asked if control over data collection and analysis is used as a source of power Participant 1 responded, "If you're smart, yes. You can skew data any kind of way you want to, you know. Unfortunately a lot of people don't go back and check your data behind you."

While the other participants agreed that control over data can be used as a source of power they did not agree they necessarily use that power to the fullest extent possible. Participant 1 was clear in the assertion that they did use data as much as possible to gain power over what decision was made. This may explain why the participant may not feel as bound by other constraints since the participant is the one responsible for collecting, interpreting, and disseminating the vast majority of the data that is used to make decisions about which vendors to use for human resource development initiatives.

For Case 2 the rational model had a total of 30 confirmed hits and 12 misses for a 71% hit rate. The bounded rationality model had 10 hits and 32 misses (24% hit rate). The political model also had 10 hits and 32 misses (24% hit rate). The total number of hits for the garbage Can model was 18 with 24 misses for a 43% hit rate. Case 2 had the highest number of confirmed hits for the rational model with 30 hits (71% hit rate). The garbage can model had 18 hits (24%). This seems unusual considering that the rational model and garbage can model are diametrically opposed. However, the Participant 2's organization is very complex. This complexity in organization can lead to ambiguous decision making which is a hallmark of the garbage can model. Even though the need for training, how to select vendors, and which vendors could be selected have a clear, systematic, rational approach the details within that systematic approach can be ambiguous and so can the decision making. "Decision outcomes are sensitive to the precise mix of problems and solutions represented in a garbage can at the moment of decision" (Ansell, 2001, p. 5883). The negotiation with the vendor and even which vendor to select is both semiautonomous and ambiguous even within the structure that is in place at this organization. This was made evident when the Participant 2

was asked: *How are decisions and criteria developed and used in selection of training, and what decision criteria are used and what criteria are you looking for when you're looking for training vendors?* Participant 2 responded,

That varies. It depends on the type of training, the length of training, and the longevity of the training. Um, if it's a right-now type of training that has to be done by lectures, 9 times out of 10, we might not look for a vendor right off the bat. That's more of an in-house thing, but if it's something of longevity we're going to carry over the next 20 years, and 60,000 of our employees are going to need to do it, we might put a vendor in place.

There is clearly a mix of what the criteria may be used to determine when a vendor may or may not be selected. "This mix, in turn, depends on the number of decision arenas, the structure of access to them, the overall organizational load of problems and solutions, and the allocation of energy and attention across arenas" (Ansell, 2001, p. 5883).

The fairly rigid structure of the organization combined with the fact that training is looked at as an essential part of their business model explains why Case 2 had the most confirmed hits in the rational model while the ambiguity of the actual decision making may explain why the garbage can model had the second most confirmed hits. Also, it should be mentioned that the vast majority of training for Case 2 is strictly of a technical nature solely related to specific job functions (specifically human capital training).

For Case 3 the total observed hits for the rational model were 25 hits confirmed and 17 misses which is a 60% hit rate. The total confirmed hit count for the bounded rationality model was 12 hits and 30 misses for a 29% hit rate. The total confirmed hit count for the

political model was 11 hits and 31 misses for a 26% hit rate. The garbage can model had a total of 11 hits and 31 misses for a hit rate of 26%. Case 3 stayed true to form and the Rational model had the most confirmed hits at 25 (60% hit rate). This was the second most confirmed hits for the rational model which is not surprising. Participants 2 and 3 are both employed with the same organization, however, the participants operate in different divisions within the organization. They share the same general structure which could account for the high number of hits that both had for the rational model even though decision making on vendor selection is less ambiguous for the Participant 3. The funding stream for training in the Participant 3's division is gained in large part from state and federally funded grants, and the vendors used must be state approved vendors that are connected with the local community college. Therefore, the decision about which vendors to use are basically already decided and the participant is able to focus strictly on organizational goals and objectives of whatever particular human resource development initiatives are at hand. This is not to say that other vendors are not used. Other vendors are used when the terms of the grant funding do not align with organizational goals. Also, the Participant 3's division is not focused solely on technical, job specific training (specifically human capital) but is also tasked with training for customer service, communication, diversity, emotional intelligence, and human performance.

For Case 4 the total observed hits for the rational model were 13 hits and 29 misses for a 31 % hit rate. The total hits for the bounded rationality model were 24 hits with 18 misses for a 57 % hit rate. The total hits count confirmed for the political model was 10 hits

with 32 misses for a 24% hit rate. The total confirmed hits for the garbage can model were 15 hits and 27 misses for a hit rate of 36%.

Case 4 was the outlier across the four cases for two reasons. First, Case 4 was the only case that had the highest number of confirmed hits in a decision-making theory other than the rational model; the highest number of confirmed hits for Case 4 was the bounded rationality model. Second, the observed matches were not statistically different than would be expected by chance from the observed matches. Chi-square analysis demonstrated that the distribution of matches is not significantly different than what would be expected by chance: ( $\chi^2 = 7.032$ , 3 d.f.,  $p = .0709$ ,  $p < .05$ ). Also, when the matches to the predictions are examined as proportions they are further proven not to be significantly different ( $z = 1.9294$ ,  $p = .05$ ). As mentioned earlier, not only is the Participant 4's organization structured much differently than the other organizations in this study but the Participant 4 feels that training is much more constrained or bounded by time and money. For example, when asked does the problem definition and/or buying process represent the goals of the organization? Participant 4 responded,

I think in spirit it does. Ultimately they all want to get to the goal and they want to be very successful, but how we get there from here? Our organization does not have a training budget. There is no support either in time or in money. So within the facility it might be a priority. Outside the facility [at the corporate level] they might talk about it being a priority, but there's no structure in place to support actually accomplishing it.

Time is such a prominent constraint that alternative vendors are not considered simultaneously. When asked if several different vendors are looked at for a comparison of services offered, Participant 4 responded,

Generally not. Time is of the essence. I think the other thing too is the audience that my environment has and the manufacturing environment. You know, the other managers are engineers, and so their thought process is, you know, the shortest distance between point A and point B as readily available as it can be. You know, how quickly can we make it happen, and what's the easiest way we can make it happen? And I think that influences a lot, and everything is very time sensitive. So, the amount of time it would take to source two or three different vendors for a training program. Generally we don't have that luxury. If we don't jump on it and come up with an immediate solution, then that window of approval, that window of opportunity to go ahead and provide training often closes very quickly, and the priorities are shifted. The priority might be totally gone.

Clearly Participant 4 feels bound by the structure of the organization, time, and the lack of a training budget.

### **Research Question Three**

*Which theoretical decision model is most often used by HRD professionals when deciding which external vendors to use for training and development?*

As mentioned earlier, the rational model had the greatest number of predictions confirmed by the case data when compared to the bounded rationality, political, and garbage can models. The final step in the degrees of freedom analysis is to evaluate the findings in

comparison with the existing knowledge base in the context of vendor selection for human resource development initiatives. The findings indicated that the rational model provides the best structure for beginning to come to an understanding of how HRD professionals make their decisions.

Using the rational model in this context makes sense in that vendor selection decisions are aimed at solving specific problems in the respective organizations. Also, the premise is that the initiatives or problem solving measures must have specific and measureable outcomes for the end users that can be evaluated and in most cases duplicated. Return on investment for human resource development initiatives is also a top priority.

In other contexts, such as decisions made by buying centers when purchasing equipment, the results could easily be different. For example, the theory that was the most dominant in buying center decision making, which is the basis for this study, was the bounded rationality model. In fact, all of the studies conducted that have researched decisions made about buying practices have focused on capital goods and products such as printers or other materials needed, not on training or other organizational development or human resource development initiative.

### **Recommendations for Practice and Research**

The recommendations for research and practice provide suggestions for future research and how practitioners can utilize the findings from this study. Specifically, there are six suggestions for research and four suggestions for practice.

From the results of the study it could be assumed that the rational model is the best fit for decision making by HRD professionals. Since this particular type of study cannot be

generalized to other populations that assumption would be incorrect. As mentioned earlier, the purpose of degrees of freedom analysis (DFA) is not to generalize to a specific population, but to better understand theory. The rational model may be the best fit for large, complex, global manufacturing organizations, but it may not be the best fit for organizations that do not fit that profile. As mentioned earlier, theory building in the field of HRD is still necessary:

Scholars have accomplished a great deal to date to broaden and strengthen the theoretical foundation of the relatively young academic field of HRD. Nonetheless, there is little doubt that more theoretical research is needed to advance our understanding of the human and organizational phenomena of interest to HRD.

(Torraco, R., 2004, p.172)

More research into decision making is needed, specifically research on decision making of HRD professionals when deciding which vendors to hire for human resource development initiatives in their organizations.

The fact that the researcher has been heavily involved as an HRD professional has helped the researcher to formulate seven specific recommendations for HRD practitioners, HRD vendors, and HRD researchers and academics. The researcher has made and currently makes decisions on which vendors to hire and has worked as a vendor selling training to organizations.

## **Practice**

**Recommendation one.** HRD practitioners should be more deliberate about how selection of vendor decisions are made, since the rational model as defined by Wilson &

Woodside “posits that members of organizations will make decisions that will provide maximum benefit (i.e., utility) to the firm” (Wilson & Woodside, 1999, p. 218). HRD practitioners should attempt to understand and utilize the rational model and implement specific processes that are understood by their organizations. More specifically, when following the rational model, HRD professionals should consider each step carefully.

- *Is the problem viewed in the same way in the organization?* Practitioners should make sure that determining the need for HRD initiatives and how those initiatives will be implemented is clearly defined and understood by participants in the decision-making process.
- *Does the problem definition represent the goals of the organization?* In short, only solutions that align with organizational goals should be considered. Solutions that do not align with the goals of the organization should be rejected because they would inherently not benefit the organization or lead to effective training. In terms of vendor selection, the only vendors that should be considered in the context of the rational model would be vendors that align their products and services strictly with organizational goals. This would mean that all HRD initiatives would be effective and have a high return on investment.
- *Is the search limited to a few familiar alternatives?* Alternative vendors both known and unknown to the decision makers should be evaluated for potential selection to conduct the organization’s HRD initiatives. The consideration of more vendors would potentially expose decision makers to a wider array of services and options to choose from. With more options to choose from decision makers could potentially

- choose from vendors that offer products more closely aligned with the goals of the organization.
- *Are potential solutions considered simultaneously and compared with one another?* Vendors should be compared to each other simultaneously in order help form an objective opinion of what vendors are offering in terms of service. Comparison of vendors would allow decision makers to not only to make selections that are a better fit for their organizations, but could also give decision makers a pool of vendors to selectin from in the future.
  - *Is information collected so that an optimal decision can be made?* All information should be used to come to a decision that is beneficial to the organization without consideration to personal goals. In the context of the rational model only what is best for the organization is considered.
  - *Is control over data collection and analysis used as a source of power?* Data should be used objectively and shared openly. Control over data and analysis should not be used as a tool to gain leverage over other decision makers for the purpose of achieving personal objectives that may or may not align with organizational goals.
  - *Is information biased so as to conform to the preference (position) of the person transforming it?* The decision process should be transparent so that information is not easily manipulated and biased in favor of one decision maker's choice of vendor. If information is unbiased then all decision makers would be better able to make objective vendor selection decisions that are based on impartial as opposed to skewed data.

- *Is information exchange negatively affected by people entering and leaving the decision process and changing their focus of attention?* All available information should be readily available and easily disseminated at every stage of the process so that people entering and leaving at different stages of the process are able to help make informed decisions. Also, all decision makers should have a clear understanding of how, when, and what type of information is pertinent in the selection of vendors.
- *Do preferences change as problems become attached to or detached from the decision?* Since solutions to problems and vendor selection should be tied to the goals of the organization, preferences as to which vendors are selected should not change unless organizational goals change. Goal-driven decision making helps all decision-making participants understand what and why certain criteria are being used. Personal goals may only be known to an individual and have no alignment with the greater good of the organization.
- *Are individual preferences a function of personal goals and limited information about the alternative?* Individual preferences should not play a role in vendor selection since all decisions are based on what is best for the organization. Also, all pertinent information should be shared without restrictions and be free from bias.
- *Are criteria for a solution agreed on a priori?* The *a priori* model that was most selected in this study was the rational model, which should be used as the basis for vendor selection decisions. In order to agree on a vendor *a priori*, decision makers

must have understanding of decision-making models and apply the rules of the decision-making model in a systematic approach

- *Do tradeoffs across solution criteria occur?* Rational tradeoffs that promote what is best for the organization during vendor selection are needed when certain criteria may not apply to the problem at hand. Also, as priorities change criteria that were seen as critical may become less important and need to be replaced with the criteria that are now critical.
- *Is the first alternative that exceeds the cutoff level(s) selected?* Alternative vendors should still be evaluated even after a vendor meets the minimum requirements for selection. Continued evaluation of vendors will allow decision makers to be able to have a wider range of vendors to choose from and potentially find vendors that not only meet the minimum requirements but, exceed those requirements. Ultimately, this would lead to selecting a vendor that is the best fit and most capable achieving organizational goals.
- *Is the alternative chosen one that is expected to maximally benefit the organization, compared with other alternatives?* The desired end result of the rational model is to make a decision that has maximum benefit to the organization in terms a vendor selection. All decisions about vendor selection should be viewed through the lens of what would be of greatest benefit to the organization regardless of the personal preferences of the decision makers.

**Recommendation two.** This study revealed that community colleges can play an essential role for human resource development initiatives for organizations. This could be

due to the strong economic development initiatives within the North Carolina Community College System. When they search for alternative solutions, HRD practitioners should make sure that they engage with community colleges in their regions, develop relationships, and find ways to tap into the knowledge and vendor base that community colleges have. For organizations that already use community colleges as vendors, a review of the initiatives that community colleges are helping those organizations with should be conducted. From those reviews it should be determined where community colleges may be under-utilized. For organizations and HRD professionals that are not using community colleges, a concerted effort should be made to partner with community colleges and leverage their potential as vendors.

**Recommendation three.** HRD practitioners should make a concentrated effort to understand how decisions are being made in relation to vendor selection. This effort should include practitioners' understanding of decision-making theory such as the rational model. Additionally, the practitioner should contribute to the development of research to build theory as it relates to practice. Creating a partnership of HRD researchers and practitioners working together collaboratively will help to provide support for theory to match how business is actually conducted and how decisions are actually made. This could help practitioners be sure that they are making decisions in a systematic way.

**Recommendation four.** For HRD vendors it is also important to provide the information needed for the HRD practitioner to make decisions about training. If the HRD vendor provided more information, it is possible the training would be better aligned in the organization. Providing vendors the information about how the practitioner makes decisions

would help vendors be aware of existing theories and practices related to decision making so that they know what to provide to organizations. HRD vendors should use findings from current and future research to help develop theory-driven solutions for their customer bases. Also, vendors should use HRD theory to understand and market to their customers.

### **Future Research**

**Recommendation one.** This study revealed that the rational model may be the best fit for HRD professionals to use to make decisions on which vendors to select for HRD initiatives in their organizations. A quantitative study designed to predict if training is effective or not based on what decision model was used during vendor selection should be conducted.

**Recommendation two.** A study of HRD vendors should be conducted to determine if any models are in use for them to determine how potential clients may make decisions. Understanding how potential purchasers make decisions can help vendors to offer products more tailored to specific organizations.

**Recommendation three.** The seven areas of the prediction matrix should be examined to determine if they are the most appropriate areas to study when trying to predict vendor selection decisions: (a) problem definition; (b) alternative solutions search; (c) data collection, analysis, and use; (d) information exchange; (e) individual preferences; (f) evaluation criteria tradeoffs; and (g) final choice. Specifically, the area of problem definition should be changed to be training and/or vendor selection specific. For example, problem definition could be changed to training and human resource development criteria.

**Recommendation four.** The questions in each section should be examined to determine if they are the most appropriate to help predict vendor selection for HRD initiatives. For example, questions one and two in section the area of problem definition should be changed from *Is the problem viewed in the same way in the organization?* and *Does the problem definition represent the goals of the organization?* to *Do decision makers in your organization value training?* and *Do human resource development efforts address specific problems in your organization effectively?* Also, the questions in the area of evaluation criteria tradeoffs could be changed from *Are criteria for a solution agreed on a priori?* and *Do tradeoffs across solution criteria occur?* to *Who determines the criteria for vendor selection in your organization* and *How are those criteria ranked in order of importance?*

As mentioned earlier, all previous degrees of freedom analysis studies have been focused solely on the purchase of capital goods. Also, all studies, including this one, used manufacturing as the target industry. More studies using degrees of freedom analysis should be conducted and other industries should be targeted.

**Recommendation five.** There is a significant gap in the literature regarding decision making in the context of vendor selection for HRD initiatives. HRD scholars, researchers, and academics must conduct more research into decision making in this context and close the gap in the literature.

**Recommendation six.** HRD scholars, researchers, and academics must continue to build theory surrounding HRD practices in general and specifically in decision making in order to help practitioners better understand how their decisions are made.

### **Limitations**

This study had three major limitations. First, the nature of the case study approach lacks external validity and does not provide a way to generalize from a sample to a population. However, the method does create “analytic generalization. In analytic generalization, the investigator is striving to generalize a particular set of results to some broader theory” (Yin, 1994, p. 36). This means that we can make generalizations about the theory used to make decisions for training. Second, training budgets varied greatly from organization to organization with some budgets being virtually unlimited while others were all but non-existent. This led to very different views as to the importance of training and vendor selection among the participants. Finally, only one person from each organization was tasked with making decisions about vendor selection for training. There was no way to verify if the participants’ views on vendor selection were shared with other members of their organizations.

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**APPENDICES**

## Appendix A

A Case Study of Human Resource Development Professionals Decision Making in Vendor Selection for Employee Development: A Degrees-of-Freedom Analysis

Stephen M. Cathcart, North Carolina State University

RE: Revised Request for Interview for Dissertation Titled: A Case Study of Human Resource Development Professionals Decision Making in Vendor Selection for Employee Development: A Degrees-of-Freedom Analysis

Dear Participant:

I spoke with you some time ago in relation to interviewing you for my dissertation titled A Case Study of Human Resource Development Professionals Decision Making in Vendor Selection for Employee Development: A Degrees-of-Freedom Analysis.

You were selected because in your current role at work you make decisions on which vendors will be used for training purposes within your organization; which is the focus of my dissertation. This is a follow up confirming your willingness to participate. As a reminder from our previous conversation this is strictly voluntary, no compensation will be given, and there will be no information used to identify you either now or in the future.

I would like to begin interviewing by October 1<sup>st</sup>, 2015; your schedule permitting.

Thank you so much for your time.

Best regards,

Stephen M. Cathcart

## Appendix B

A Case Study of Human Resource Development Professionals Decision Making in Vendor Selection for Employee Development: A Degrees-of-Freedom Analysis

Stephen M. Cathcart, North Carolina State University

Written Consent Form

You are invited to participate in a research study conducted by Stephen Cathcart from North Carolina State University. My specific department is Leadership, Policy, and Adult and Higher Education. I hope to learn how human resource professionals make decisions on what outside vendors to use in their organizations for human resource development (HRD) initiatives. You were selected as a possible participant in this study because you make decisions on what vendors to use and not use for HRD initiatives in your organization

If you decide to participate, I will interview you for approximately 3 hours. These interviews will be audio recorded.

Any information that is obtained in connection with this study and that can be identified with you will remain anonymous and confidential. This means that your name will not appear anywhere and no one except me will know about your specific answers. Also, I will assign a number to your responses, and only I will have the key to indicate which number belongs to which participant. In any articles I write or any presentations that I make I will not reveal any details about where you work, where you live, any personal information about you, and so forth.

Your participation is voluntary. If you decide to participate, you are free to withdraw your consent and discontinue participation at any time.

If you have any questions about the study, please feel free to contact me. You may also contact my advisor, Dr. James Bartlett at 919-208-1697 or james\_bartlett@ncsu.edu. If you have questions regarding your rights as a research participant, please contact the IRB at North Carolina State University at 919-515-2444 or <http://research.ncsu.edu/sparcs/compliance/irb/>. Their mailing address is 2701 Sullivan Drive, Suite 240 Campus Box 7514 Raleigh, NC 27695-7514.

You will be offered a copy of this form to keep.

Your signature indicates that you have read and understand the information provided above, that you willingly agree to participate, that you may withdraw your consent at any time and discontinue participation without penalty, that you will receive a copy of this form, and that you are not waiving any legal claims.

Signature \_\_\_\_\_ Date \_\_\_\_\_

**Appendix C**

**Case 1: Hits v. Misses Scoring Sheet**

Decision Phase and Operating Mechanism	J1	R	BR	P	GC	J2	R	BR	P	GC	J3	R	BR	P	GC
<b>1. Problem definition</b>															
Is the problem viewed in the same way in the organization?	N	Y	P	N	P	N	Y	P	N	P	N	Y	P	N	P
Does the problem definition represent the goals of the organization?	P	Y	Y	N	Y	P	Y	Y	N	Y	P	Y	Y	N	Y
<b>2. Search for alternative solutions</b>															
Is the search limited to a few familiar alternatives?	N	N	Y	P	P	N	N	Y	P	P	Y	N	Y	P	P
Are potential solutions considered simultaneously and compared with one another?	Y	Y	P	N	N	Y	Y	P	N	N	Y	Y	P	N	N
<b>3. Data collection, analysis, and use</b>															
Is information collected so that an optimal decision can be made?	Y	Y	N	N	N	Y	Y	N	N	N	Y	Y	N	N	N
Is control over data collection and analysis used as a source of power?	Y	N	N	Y	N	Y	N	N	Y	N	Y	N	N	Y	N
<b>4. Information exchange</b>															
Is information biased so as to conform to the preference (position) of the person transforming it?	P	N	Y	Y	N	P	N	Y	Y	N	P	N	Y	Y	N

Is information exchange negatively affected by people entering and leaving the decision process and changing their focus of attention?	Y	N	P	N	Y	Y	N	P	N	Y	Y	N	P	N	Y
5. Individual preferences															
Do preferences change as problems become attached to or detached from the decision?	P	N	P	N	Y	Y	N	P	N	Y	Y	N	P	N	Y
Are individual preferences a function of personal goals and limited information about the alternative?	P	N	Y	P	P	N	N	Y	P	P	P	N	Y	P	P
6. Evaluation criteria tradeoffs															
Are criteria for a solution agreed on a priori?	P	Y	P	P	N	N	Y	P	P	N	P	Y	P	P	N
Do tradeoffs across solution criteria occur?	Y	Y	N	P	N	Y	Y	N	P	N	Y	Y	N	P	N
7. Final choice															
Is the first alternative that exceeds the cutoff level(s) selected?	N	N	Y	P	N	N	N	Y	P	N	N	N	Y	P	N
Is the alternative chosen one that is expected to maximally benefit the organization, compared with other alternatives?	Y	Y	P	N	P	Y	P	N	P	Y	Y	P	N	P	
<b>T</b>		6	2	4	3	<b>T</b>	7	1	2	3	<b>T</b>	5	2	4	4

**Appendix D**

**Case 2: Hits v. Misses Scoring Sheet**

Decision Phase and Operating Mechanism	J1	R	BR	P	GC	J2	R	BR	P	GC	J3	R	BR	P	GC
<b>1. Problem definition</b>															
Is the problem viewed in the same way in the organization?	Y	Y	P	N	P	Y	Y	P	N	P	Y	Y	P	N	Y
Does the problem definition represent the goals of the organization?	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y
<b>2. Search for alternative solutions</b>															
Is the search limited to a few familiar alternatives?	P	N	Y	P	P	N	N	Y	P	P	P	N	Y	P	P
Are potential solutions considered simultaneously and compared with one another?	Y	Y	P	N	N	Y	Y	P	N	N	Y	Y	P	N	N
<b>3. Data collection, analysis, and use</b>															
Is information collected so that an optimal decision can be made?	Y	Y	N	N	N	Y	Y	N	N	N	Y	Y	N	N	N
Is control over data collection and analysis used as a source of power?	N	N	N	Y	N	N	N	N	Y	N	Y	N	N	Y	N
<b>4. Information exchange</b>															
Is information biased so as to conform to the preference (position) of the person transforming it?	N	N	Y	Y	N	N	N	Y	Y	N	Y	N	Y	Y	N

Is information exchange negatively affected by people entering and leaving the decision process and changing their focus of attention?	N	N	P	N	Y	N	N	P	N	Y	N	N	P	N	Y
5. Individual preferences															
Do preferences change as problems become attached to or detached from the decision?	P	N	P	N	Y	N	N	P	N	Y	N	N	P	N	Y
Are individual preferences a function of personal goals and limited information about the alternative?	N	N	Y	P	P	N	N	Y	P	P	N	N	Y	P	P
6. Evaluation criteria tradeoffs															
Are criteria for a solution agreed on a priori?	N	Y	P	P	N	N	Y	P	P	N	N	Y	P	P	N
Do tradeoffs across solution criteria occur?	N	Y	N	P	N	N	Y	N	P	N	N	Y	N	P	N
7. Final choice															
Is the first alternative that exceeds the cutoff level(s) selected?	N	N	Y	P	N	N	N	Y	P	N	N	N	Y	P	N
Is the alternative chosen one that is expected to maximally benefit the organization, compared with other alternatives?	Y	Y	P	N	P	Y	Y	P	N	P	N	Y	P	N	P
<b>T</b>		10	4	2	7	<b>T</b>	12	3	2	6	<b>T</b>	8	3	6	5

**Appendix E**

**Case 3: Hits v. Misses Scoring Sheet**

Decision Phase and Operating Mechanism	J1	R	BR	P	GC	J2	R	BR	P	GC	J3	R	BR	P	GC
<b>1. Problem definition</b>															
Is the problem viewed in the same way in the organization?	P	Y	P	N	P	N	Y	P	N	P	N	Y	P	N	P
Does the problem definition represent the goals of the organization?	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y
<b>2. Search for alternative solutions</b>															
Is the search limited to a few familiar alternatives?	N	N	Y	P	P	N	N	Y	P	P	N	N	Y	P	P
Are potential solutions considered simultaneously and compared with one another?	Y	Y	P	N	N	Y	Y	P	N	N	Y	Y	P	N	N
<b>3. Data collection, analysis, and use</b>															
Is information collected so that an optimal decision can be made?	Y	Y	N	N	N	Y	Y	N	N	N	Y	Y	N	N	N
Is control over data collection and analysis used as a source of power?	Y	N	N	Y	N	Y	N	N	Y	N	Y	N	N	Y	N
<b>4. Information exchange</b>															
Is information biased so as to conform to the preference (position) of the person transforming it?	Y	N	Y	Y	N	Y	N	Y	Y	N	Y	N	Y	Y	N

Is information exchange negatively affected by people entering and leaving the decision process and changing their focus of attention?	P	N	P	N	Y	P	N	P	N	Y	P	N	P	N	Y
5. Individual preferences															
Do preferences change as problems become attached to or detached from the decision?	N	N	P	N	Y	N	N	P	N	Y	N	N	P	N	Y
Are individual preferences a function of personal goals and limited information about the alternative?	N	N	Y	P	P	N	N	Y	P	P	N	N	Y	P	P
6. Evaluation criteria tradeoffs															
Are criteria for a solution agreed on a priori?	N	Y	P	P	N	N	Y	P	P	N	P	Y	P	P	N
Do tradeoffs across solution criteria occur?	N	Y	N	P	N	N	Y	N	P	N	Y	Y	N	P	N
7. Final choice															
Is the first alternative that exceeds the cutoff level(s) selected?	N	N	Y	P	N	N	N	Y	P	N	N	N	Y	P	N
Is the alternative chosen one that is expected to maximally benefit the organization, compared with other alternatives?	Y	Y	P	N	P	Y	Y	P	N	P	Y	Y	P	N	P
<b>T</b>		8	5	3	5	<b>T</b>	8	4	4	4	<b>T</b>	9	3	4	2

**Appendix F**

**Case 4: Hits v. Misses Scoring Sheet**

Decision Phase and Operating Mechanism	J1	R	BR	P	GC	J2	R	BR	P	GC	J3	R	BR	P	GC
<b>1. Problem definition</b>															
Is the problem viewed in the same way in the organization?	Y	Y	P	N	P	Y	Y	P	N	P	Y	Y	P	N	P
Does the problem definition represent the goals of the organization?	P	Y	Y	N	Y	Y	Y	Y	N	Y	Y	Y	N	Y	Y
<b>2. Search for alternative solutions</b>															
Is the search limited to a few familiar alternatives?	Y	N	Y	P	P	Y	N	Y	P	P	Y	N	Y	P	P
Are potential solutions considered simultaneously and compared with one another?	P	Y	P	N	N	N	Y	P	N	N	N	Y	P	N	N
<b>3. Data collection, analysis, and use</b>															
Is information collected so that an optimal decision can be made?	N	Y	N	N	N	N	Y	N	N	N	N	Y	N	N	N
Is control over data collection and analysis used as a source of power?	N	N	N	Y	N	N	N	N	Y	N	N	N	N	Y	N
<b>4. Information exchange</b>															
Is information biased so as to conform to the preference (position) of the person transforming it?	Y	N	Y	Y	N	Y	N	Y	Y	N	Y	N	Y	Y	N

Is information exchange negatively affected by people entering and leaving the decision process and changing their focus of attention?	Y	N	P	N	Y	Y	N	P	N	Y	Y	N	P	N	Y
<b>5. Individual preferences</b>															
Do preferences change as problems become attached to or detached from the decision?	P	N	P	N	Y	P	N	P	N	Y	P	N	P	N	Y
Are individual preferences a function of personal goals and limited information about the alternative?	Y	N	Y	P	P	Y	N	Y	P	P	Y	N	Y	P	P
<b>6. Evaluation criteria tradeoffs</b>															
Are criteria for a solution agreed on a priori?	N	Y	P	P	N	N	Y	P	P	N	Y	Y	P	P	N
Do tradeoffs across solution criteria occur?	Y	Y	N	P	N	Y	Y	N	P	N	Y	Y	N	P	N
<b>7. Final choice</b>															
Is the first alternative that exceeds the cutoff level(s) selected?	Y	N	Y	P	N	Y	N	Y	P	N	Y	N	Y	P	N
Is the alternative chosen one that is expected to maximally benefit the organization, compared with other alternatives?	N	Y	P	N	P	N	Y	P	N	P	Y	Y	P	N	P
<b>T</b>	<b>3</b>	<b>8</b>	<b>3</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>8</b>	<b>4</b>	<b>6</b>	<b>6</b>	<b>8</b>	<b>3</b>	<b>5</b>		

## Appendix G

### Combined Hits and Misses

	<b>RM</b>	<b>BRM</b>	<b>PM</b>	<b>GCM</b>		<b>Rational</b>	<b>Bounded Rationality</b>	<b>Political</b>	<b>Garbage Can</b>
	6	2	4	3	<b>Case 1</b>	18	5	10	10
	7	1	2	3	<b>Case 2</b>	30	10	10	18
	5	2	4	4	<b>Case 3</b>	25	12	11	11
	10	4	2	7	<b>Case 4</b>	13	24	10	15
	12	3	2	6	<b>Total</b>	86	51	41	54
	8	3	6	5					
	8	5	3	5					
	8	4	4	4					
	9	3	4	2					
	3	8	3	4					
	4	8	4	6					
	6	8	3	5					
<b>Actual</b>	86	51	41	54					
<b>Expected</b>	58	58	58	58					