Biases in Decision Making and Implications for Human Resource Development

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The problem and the solution. Effectively solving problems is a common goal for individuals and organizations, and successful problem solving is dependent on the quality of decisions made along the way. Making decisions to diagnose and direct organizational performance improvement efforts is a continual task throughout the human resource development (HRD) process. However, evidence shows that there is a large gap between theory and practice in effective decision making. In practice, the decision-making process is heavily influenced by the assumptions and biases of the decision makers. This article describes decision-making processes and the many sources of bias that confound decision makers in their attempts to solve problems. Furthermore, it describes the implications of these biases for HRD professionals and suggests ways to minimize the influence of biases in the decision-making process. Attending to the pitfalls of decision-making biases is crucial to improving the success of decisions that drive HRD professionals' efforts.

Keywords: *biases; decision-making; HRD*

Traditional models of decision making are built on logic and rationality. Although such models may be elegant in the logical structure of their processes, reality shows that decision making rarely follows such a logical structure. Decision-making processes vary and are often confounded by various assumptions and biases held by the decision makers. Finding a more successful model of decision making requires recognition of the assumptions and biases affecting decisions, along with recommendations to minimize their ill effects.

The purpose of this article is to present a brief survey of the literature on decision making and the ways in which biases undermine decisions. In addition, it describes the implications of decision-making biases for human

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resource development (HRD) professionals and suggests ways to minimize the hazards of biased decision making in HRD.

Decision-Making Processes

Decision-making models have traditionally identified a series of steps that help the decision maker arrive at the best solution out of a field of alternative solutions. Such a rational model is based on a linear decision-making process that includes the steps summarized by Bazerman (1994), as follows:

1. Define the problem.
2. Identify the criteria or objectives of the decision.
3. Weight or prioritize the criteria or objectives of the decision.
4. Generate alternative courses of action to solve the problem.
5. Evaluate the alternatives against each criterion or objective.
6. Compute the optimal decision.

Although the rational model is explicit, general, and based on scientific reasoning and the principles of logic, it contains three serious weaknesses. First, it does not represent reality. Second, there is growing skepticism of the validity of using general principles in the absence of specific content knowledge. Finally, there is an increasing awareness of the biases and other limitations that characterize the thinking of individuals (Wagner, 1991).

The impracticality of the rational model of decision making stems from core assumptions seldom realized in practice. It assumes the decision maker (a) has complete knowledge of the situation; (b) knows all the alternative solutions, along with their consequences and probabilities; (c) objectively follows the process; and (d) has the goal of maximizing economic gain or utility. Empirical evidence gathered from decision-making behavior in real-life situations uncovered major flaws with these assumptions (Beach, 1990; March, 1999).

Decision makers, in real life, seldom balance costs with benefits or strive to maximize profit. They seldom consider multiple options—usually considering only one option against the status quo—and they seldom make decisions in isolation—usually decisions are made to incrementally reach toward a larger goal and offer protection against failure (Beach, 1990). In organizations, managers have been found to make decisions opportunistically, to "satisfice," and to jump into action at the first sign of a plausible idea (Isenberg, 1986).

Decision making is not completely rational. Several studies of managers in action found little adherence to the rational, linear model of decision making (Wagner, 1991). These studies describe the tendency of managers to

1. act before all the information was gathered;
2. be preoccupied with one or two concerns that governed their decisions;

3. have a high tolerance for ambiguity, misinformation, and a lack of information;
4. use either complex, iterative decision processes or quick, autocratic processes; and
5. rely heavily on intuition.

Studies over the past few decades describe processes of decision making based more on the limitations of human information processing, the ambiguity and subjectivity of individual preferences, the inherent conflicts among decision makers, the unpredictability of future preferences, and the extreme complexity of systemic interrelationships (March, 1999). Complex decisions are more often at the mercy of the confluence of situational, preferential, and political factors than a rational process of diagnosis, evaluation, and selection of the best solution (Mintzberg, Raisinghani, & Theoret, 1976). From these empirical studies of decision making, researchers are developing a greater appreciation for the complexity of problem situations and the irrationalities of decision-making processes.

Lyles and Thomas (1988) categorized strategic decision-making processes into five approaches that range from systematic, sequential processes to random processes. Each of these approaches differs in its overriding conceptual framework, the assumptions and biases that predominate, and how the problem is formulated. Generally, the more certainty and structure in a problem situation, the more the decision-making process is systematic and sequential (rational), and the more uncertain and ill-structured the problem, the more random the decision-making process.

Different decision-making approaches are appropriate for different situations depending on the nature of the problem and the importance of the outcome. Choosing the best decision-making approach requires knowing the strengths and weaknesses of each approach and matching the approach to the situation. Critical weaknesses to be understood are the biases inherent in each approach (Das & Teng, 1999).

Biases in Decision-Making Processes

Das and Teng (1999) categorized general biases inherent within various decision-making approaches. First, they reviewed the literature on cognitive biases related to decision making and synthesized the multitude of bias constructs into four broad categories. These are, as follows:

1. *Prior hypotheses and focusing on limited targets:* Decision makers bring prior beliefs, or orientations, to the analysis process and focus on selected interests and outcomes—often ignoring conflicting information.
2. *Exposure to limited alternatives:* Decision makers reduce problems to simpler constructs, seek fewer alternatives, and rely on intuition over rational analysis.

3. *Insensitivity to outcome probabilities:* Decision makers rely on subjective judgments rather than rational probabilities of outcomes and tend to see problems as unique—thereby not relevant to the outcomes of past experiences.
4. *Illusion of manageability:* Decision makers tend to be overly optimistic—overestimating their level of control—believing they can manage and correct the consequences of their decisions along the way.

These biases are more or less prominent depending on the decision-making approach used by the decision maker. The first two biases, prior hypotheses and focusing on limited targets and exposure to limited alternatives, are mainly driven by the philosophical orientation of the decision maker. The latter two, insensitivity to outcome probabilities and illusion of manageability, describe general information-processing biases.

Many of the current behavioral models of decision making follow a descriptive approach, concentrating on the information-processing activities of decision makers. Research in this area has shown that decision makers tend to (a) reduce problems into simple constructs and (b) use information selectively based on their beliefs (assumptions and mental models) and preferences (biases). Decision makers often create analyses and solutions that reflect their experiences and beliefs and interpret their experience in ways that support and preserve their beliefs (March, 1999; March & Simon, 1993).

Reducing Problems Into Simple Constructs

Bereiter and Scardamalia (1993) have studied the phenomenon of expertise as it relates to problem solving and decision making. To them, it is a continuing process whereby the individual acquires ever more depth of experience and knowledge about a particular domain. This depth helps the individual solve problems more successfully, but it is not the depth of experience and knowledge alone that makes an expert. It is the skill to efficiently and effectively solve problems that differentiates the expert from the knowledgeable and experienced nonexpert (Swanson & Holton, 2001, p. 238).

Experts and nonexperts can be differentiated by their methods of problem solving. *Problem reduction* and *progressive problem solving* are two different methods for solving complex, real-world problems. Problem reduction reduces a problem into simpler definitions that can be resolved more easily and is characteristic of nonexpert problem solving. Although breaking problems down into simpler constructs aids in the resolution of these simplified problems, it also may lead the decision maker further away from the true nature of the problem. The more a problem is reduced or simplified, the less it represents the true problem—especially if the problem is complex. The assumption that reducing a problem into more manageable (simpler) subgoals allows the organization to eventually achieve the overall goal

is often problematic. It causes decision makers within the organization to ignore factors not perceived to be directly related to the problem (Sterman, 2000).

Progressive problem solving is more successful for problems that are complex and ill-structured and therefore not well-served by reduction into simpler definitions (Bereiter & Scardamalia, 1993). Newell and Simon (1972) described ill-structured problems as having goals that are not well-defined up front. These problems may generate large sets of possible solutions, lead to solutions not feasible within normal activity, and require costly testing to verify. Under these conditions, the goal may only take shape as a solution is implemented. Progressive problem solving is an iterative strategy that often implements successive or partial solutions to better define a problem at higher levels of complexity (Bereiter & Scardamalia, 1993).

Restructuring a problem can enlarge the scope of a problem as well as reduce the scope. Reducing the scope or simplifying the definition does not effectively resolve complex problems—particularly those of a strategic nature. Brightman (1980) recommended the ongoing use of multiple definitions of a problem from multiple viewpoints and resisting the desire to craft a singular, simple definition. Retaining multiple definitions of a problem requires a higher level of thinking about a problem.

Higher level thinking, as described in cognitive development models, is dialectic and characterized by an understanding that knowledge is contextual and complex. At lower levels of thinking, thinkers seek the clarity of right and wrong answers (Merriam & Caffarella, 1999). Higher levels of thinking are required of decision makers in order to assess the facts and perceptions surrounding complex, systemic problems. Progressive problem-solving strategies strive to forestall the tendency by decision makers to focus too narrowly on a problem and jump to conclusions.

Selective Use of Information

Decision-making strategies employed by individuals usually are based on loosely defined rules (heuristics). Although these "rules of thumb" often allow individuals to reach satisfactory and successful outcomes, they also inject systematic biases into decision-making processes and increase the risk of failure as problems become more complex and ill-structured (Bazerman, 1994). These biases stem from individual orientations and the methods of information processing employed by individuals.

Researchers studying decision making are increasingly aware of the biases and other cognitive limitations that characterize the use of information by individuals as they solve problems. Hogarth (1987) has identified 14 common biases in the information-gathering, information-processing, and information-response phases of decision making.

During the information-gathering phase, individuals tend to overestimate the importance of information that is highly visible and acquired early in the process. Also, individuals will have greater difficulty understanding problems outside of their direct experience. This tends to lead people to discover what they expect to discover. In the information-processing phase, individuals tend to evaluate information inconsistently and to retain preconceived opinions and solutions. In the information-response phase, individuals are prone to wishful thinking, including the tendency to overestimate their control over outcomes (Hogarth, 1987). These biases influence the consequences of decisions and increase the risks as problems become more complex and ill-structured.

At a strategic level, problems are often complex and ill-structured, and decision makers tend to rely more on intuition, heuristics, and uninformed judgment. In these situations, decision makers are bounded by the constraints of their memory, preferences (biases), and the environment. Therefore, it is wise to continuously challenge decisions and the assumptions on which they are based.

The prevalence of biases in the decision-making process is a major source of concern for effective problem solving. In practice, little attention is given to the quality of the information-gathering, information-processing, and information-response phases that frame the initial direction for problem resolution. This leaves decision makers at the mercy of confounded processes in their efforts to define problems and construct solutions.

Individuals must continuously challenge the assumptions and orientations that bound their decision-making processes. Assumptions range from strongly held philosophical beliefs to more simple beliefs of cause and effect. *Paradigmatic assumptions* are those that are believed to be the objective facts or truths about reality (i.e., philosophical orientations). They are the hardest to uncover, and challenging them is usually met with great resistance. *Prescriptive assumptions* involve what people think should be happening. For example, many believe that training is the primary method to improve performance. This particular prescription is based on an assumption that deficient individual knowledge and skills are the major cause of poor performance. *Causal assumptions* are the predictors used to develop recommendations and solutions. These are the easiest to identify and challenge (Brookfield, 1995). Throughout the decision-making process, decision makers must rigorously challenge their thinking to uncover the assumptions and biases that control the decision-making process.

Biases and assumptions influence problem-solving activities and decisions in a variety of ways, leading to the high probability that different problem solvers will reach different conclusions about a problem. If one considers that problem-solving processes are built on a series of decisions made by the decision makers in an organization, then one has to take into account the

multitude of biases and misjudgments as well as the insights and intelligence that lead to the outcomes of problem solving (see Table 1).

Successful Decision-Making Strategies for Coping With Biases

An extensive study of management decision-making processes identified methods that were prone to success or failure. Over a 20-year period, Nutt (2002) studied more than 400 management decisions and identified common characteristics that improved the success of decisions or led to suboptimal or failed decisions.

Nutt (2002) found two types of decision-making processes—one that increases the chances of success and one that increases the chances of failure. The *discovery process* is the more successful of the two. Key components of this process are, as follows:

1. a deliberate and thorough study of the claims made by a variety of stakeholders,
2. early attention to social and political interests, and
3. setting a direction based on a cross-section of informed opinion (Nutt, 2002, pp. 46-49).

The second process is prone to suboptimization or failure. He calls this the *idea-imposition process*, whereby pragmatism and the urgency to act push decision makers to settle on an idea too early. A key flaw of this approach becomes evident when evaluating alternative solutions, whereby most of the effort is spent defending the chosen idea rather than evaluating a range of possible ideas (Nutt, 2002).

In contrast, a systems view of the organization sees it as a complex of various inputs, processes, and outputs interacting at multiple levels. This view correlates to the success-prone discovery process of decision making. Nutt (2002) advocated the assessment of input from multiple stakeholders representing various positions inside and outside the organization: He described this as the "arena of action" (p. 50), and it is effective when broad-based and collaborative.

Two of the chief benefits of the discovery process are (a) the collection, analysis, and understanding of a large amount of information related to the decision and (b) the broader network of informed people who understand what the decision is about and why it is wise to act. Rigorous attention to the breadth of information and the sociopolitical influences of decisions leads to better results.

Nutt (2002) also identified the pervasive tendency to abort the discovery process at any time and switch to the idea-imposition process as a result of increasing impatience from stakeholders. Besides the pressure to find a

TABLE 1: Biases in Decision Making

Bias	Sources of Bias	Consequence of Bias
Prior hypothesis and focus on limited targets	Philosophical orientation, memory, assumptions, experience, mental models	Framing the problem or situation narrowly, failing to recognize multiple causes and complex interrelationships
Exposure to limited alternatives	Narrowly framed problem or situation, incomplete information, reliance on intuition	Missing important causes of the problem, overlooking important alternatives for resolution
Insensitivity to outcome probabilities	Influenced by the value of an outcome rather than the probability, considering each problem as unique	Subjective selection of alternative solutions, little attention to related experience or prior outcomes
Illusion of manageability	Overly optimistic estimates of success, overly optimistic assessments of control over outcomes	Alternatives selected subjectively based on unrealistic estimates of success, risk unduly minimized, undue belief in the ability to control the problem
Information gathering	Memory, recall, expectations, influence of framing	Selective attention or disregard to information
Information processing	Inconsistent judgment, heuristics, anchoring, environmental influences	Information is subjectively analyzed and assessed
Information response	Wishful thinking, illusion of control, misperceptions of success or failure, hindsight	Unrealistic expectations of success, subjective construction of responses

Source: Based on Das and Teng (1999) and Hogarth (1987).

solution quickly (efficiently), powerful stakeholders may themselves identify the problem, define it, and dictate a solution. They then impose their view on the process and push to "get on with it." Consequently, the decision maker may be pressured to impose the favored solution on the other stakeholders by resorting to persuasion and authority. The benefits of generating multiple ideas and building support among stakeholders are then lost.

The evidence shows the idea-imposition process to be less successful than the discovery process. Evidence also shows that there is a large gap between theory and practice in decision making. The cause of this gap is a combination of the complexity of problems and the limitations of decision makers to effectively analyze a problem and avoid the influences of biases in the process (Brightman, 1980). Awareness of these limitations is the first step to guarding against their influence. Knowledge and understanding of the types of biases inherent in the decision-making process, along with action to reduce their effects, will inevitably lead to better decisions.

Decision-Making Biases in HRD

Theoretical concepts regarding organizational performance garner widespread support among HRD professionals. However, in practice, differing philosophical orientations, preferences, and assumptions create different outcomes when these theories are applied.

One of the commonly agreed-on concepts in HRD is the need to systematically analyze a situation before a solution is designed, developed, and implemented (Sleezer, 1992). Although decision-making activity is inherent throughout the HRD process, the analysis phase of this process is often cited in the literature as the most critical for achieving successful outcomes (Gilley, 2001). This article continues the discussion of decision-making biases by focusing on the often ill-structured and complex conditions found in the analysis phase of HRD. It is perhaps the least structured phase of the HRD process.

Most process models of HRD start with a systematic analysis of the situation, followed by the design, development, implementation, and evaluation of a solution. Analysis is the foundation that drives the HRD process (Rossett, 1992). Analysis identifies the problem or opportunity, gathers data, and recommends a solution (Swanson, 1994). To do this successfully, the analyst and the organization depend on their skills as decision makers and problem solvers.

In the analysis phase, decisions are made regarding how to represent the problem, where to collect data, what data to collect, how to analyze the data, what conclusions to draw, and what recommendations to make for resolving the problem. All these decisions reflect the assumptions (beliefs) and preferences (biases) of the decision makers and are extraordinarily arbitrary and

random (March & Simon, 1993). Whether the problem requires improving organizational performance, implementing organizational change, or fostering individual learning—the assumptions and biases of the analyst, decision makers, and stakeholders will inevitably direct the definition of the problem and the proposed solution (Sleezer, 1993).

Most analysis methods start with a prescription for defining the problem, but few explicitly recognize the level of difficulty, or near impossibility, of this crucial task. Although some of the up-front analysis processes used in HRD acknowledge the effect of the preferences held by the organization, decision maker, and analyst (Sleezer, 1991), little guidance is subsequently offered for conducting successful decision making within these constraints. The purpose of the next section is to identify some of the sources of the biases that affect decision making in the analysis phase of HRD and to describe the expertise required to improve decision making within this critical phase.

Decision Making in the Analysis Phase of HRD

HRD professionals disagree about exactly what the analysis phase involves (Sleezer, 1992). Even reaching agreement on the terminology and clarifying expectations is troublesome in a group with different philosophical orientations and expectations about the HRD process.

Sleezer (1992) identified four perspectives associated with the analysis phase and, in her review of the literature, found various definitions for each. *Needs assessment*, *needs analysis*, *front-end analysis*, and *performance analysis* each have different meanings to different people in the field. For example, the term *needs assessment* was used by some to label the specific information-gathering process within the analysis phase. Others used the same term to describe only one of four information-gathering processes, and still others used this term to identify the entire analysis phase. A lack of clarity about the terms describing the analysis process contributes to various interpretations among members of the analysis team, leading to various expectations and outcomes from the analysis.

Behind the various interpretations of key terms, there are differing beliefs about the purpose of HRD. Different philosophical orientations guide professionals along different paths within the analysis phase. Gilley (2001) identified three philosophical orientations within HRD and described the purposes and preferences that drive each of these. Professionals oriented toward learning and development prefer learning solutions, those oriented toward performance improvement prefer management action, and those oriented toward organizational change prefer change management solutions.

Underlying one's philosophical orientation is a set of biases and assumptions that govern decision-making strategies. The preferred solutions men-

tioned above do not identify objective facts about these orientations—they identify the assumptions and biases that drive the different orientations. These assumptions and biases may be attributed to the organization as easily as they are attributed to the individual.

Explicit biases toward a predetermined outcome are more easily challenged than the implicit biases and assumptions that drive one's cognitive approach to decision making. As Sleezer (1993) pointed out, the experiences, biases, and assumptions of the organization and the analyst are one of the critical determinants of the analysis outcome (e.g., the problem statement). Although an outcome is more explicit, the identification of the cause is generally more implicit. Identifying a problem to be solved often entails the assumption of a pre-determined cause, and the analysis of the problem may follow the assumption in supporting the cause. Brinkerhoff (1998) challenged decision makers to remain nonjudgmental in seeking causal evidence for a problem and to avoid the temptation to selectively interpret data supporting predetermined outcomes.

The danger of a restricted philosophical orientation is the tendency to narrowly define a problem. Swanson (1994) called this a single-dimension view of organizations. He described four single-dimension views (orientations) that are prevalent among performance improvement professionals:

1. The *power view* is focused on the politics of the organization and is usually behind the delivery of solutions to meet with the approval of upper management.
2. The *economic view* concentrates on financial transactions, looking for the best return on investment.
3. The *mechanistic view* sees the organization narrowly as a machine that needs to be fixed or maintained.
4. The *humanistic view* puts the importance of the individual above all other priorities.

According to Nutt (2002), adherence to any of these singular views risks making decisions under the failure-prone idea-imposition process. This process latches onto an idea early and dismisses the viewpoints of stakeholders outside the decision maker's orientation. In addition, a decision maker with this restricted view often uses information selectively to support the predetermined idea rather than using broad-based information to fully understand the situation.

Defining problems is an important component of the analysis process. Inevitably, the analysis process leads to differing formulations of a problem based on the various orientations and biases of stakeholders, organizational cultures, and the decision-making team (Sleezer, 1991). Even expert analysis is not an exact science leading to the one best solution as prescribed in the rational model of decision making.

For HRD professionals to contribute to the improvement of the organization, the quality of their problem-solving and decision-making skills must

be at a consistently high level. Current HRD competency models require problem-solving and decision-making skills but do not offer guidance for the practitioner, nor do they describe the expertise required. Without this expertise, the analyst is at the mercy of hidden biases and failure-prone processes. With this expertise, the analyst can minimize the effects of biases and better optimize the analysis phase. Rothwell (1996) described this expertise for HRD professionals as requiring a high level of analytical and observational skills, problem-solving skills, communication skills, and business acumen. Add to that a high level of decision-making skills.

HRD professionals focused on improving the performance of the organization must push themselves to tackle complex problems that spread beyond the realm of their professional orientations. To do this successfully requires the skills to efficiently and effectively manage the complex interrelationships among organizational stakeholders, politics, competing philosophies, and individual perceptions and assumptions. It also requires the use of rigorous problem-solving and decision-making processes.

Problem Solving and Decision Making in Practice: A Case Study Example

The value of expert problem solving and successful decision-making strategies comes from their practicality in practice. A case study by MacDuffie (1997) provides a good example of the influence of context and orientation on analysis outcomes. He analyzed the problem-solving and decision-making processes involving identical types of quality improvement problems in three different automobile manufacturing plants. The problems were chosen for their complexity and were characterized as

1. not easily traced to one source,
2. involving the interaction of multiple departments with human and technological factors, and
3. not resolvable through standard procedures or methods.

Comparing the differences in problem-solving strategies among the three plants identified the influence of differences in the structure and culture of the organizations as well as their quality systems. The differences in structure and culture ranged from an organization with a traditional, authoritarian hierarchy to a more collaborative, less hierarchical organization.

Differences in these environments produced differences in the definitions, analyses, and solutions to a similar problem in each case. For example, a culture based on rigid departmental structures inherently defined problems to avoid crossing departmental boundaries, whereas the culture that encouraged flexibility and interdepartmental collaboration concentrated on finding the cause of the problem wherever it led. Another key dif-

ference was whether the analysis of the problem was for accountability (blame) or diagnostic (cause) purposes. This study highlighted the diverse outcomes possible from the analysis of identical problems due to the various influences of cultural biases.

MacDuffie (1997) concluded from his study that problem solving and decision making are improved by the following:

1. a rich set of data capturing multiple perspectives;
2. information about the context of the problem;
3. using "fuzzy" categories instead of forcing problems into rigid categories;
4. framing problems as opportunities, not liabilities;
5. an organizational culture that facilitates communication across boundaries and develops a common language regarding a problem; and
6. an organization that evaluates problems and solutions first in terms of quality, then cost.

This case study supports the characteristics of successful problem-solving and decision-making processes described by Nutt (2002), Hogarth (1987), and Berieter and Scardamalia (1993). It also places these processes within the context of organizational cultures, systems, and the decision-making assumptions and biases that influence the outcomes of analyses.

Implications for Research and Practice

Faced with the ambiguous and dynamic nature of problem solving, it is critical to minimize the detrimental effects of subjectiveness and bias when identifying and defining performance problems. Decision makers must solicit and examine diverse viewpoints, and consider a broad range of alternative solutions. According to the research on decision making, both of these actions increase the chances of finding successful solutions (Nutt, 2002).

The decisions made in the HRD process must be rigorously analyzed. Evaluating decisions is a form of quality control often overlooked in HRD methods. Rothwell and Kazanas (1992) recommended that decision makers thoughtfully describe how decisions will be made from the data, keep track of the reasons for the decisions that are made, and justify them to others based on the data collected and the methods of analyzing the data. This type of reflection and evaluation of the decision process is not explicit in many HRD models or methods. Furthermore, a formal analysis and evaluation of potential assumptions and biases affecting the decision process is not built into most methodologies. Although detailed methods are prescribed for analyzing behaviors, tasks, and performance gaps, little attention is paid to the important process of making the decisions that drive these methods. The lack of attention toward the decision-making process by decision makers risks the continued reinforcement of existing assumptions and biases within decision makers and organizations.

Further research is needed to increase understanding of the relationships between cognitive biases, problem solving, decision making, and the outcomes of HRD efforts. Expert problem solving requires high-level analytical and decision-making skills, along with an appreciation for the complex, systemic nature of problems. More research is also needed to close the gap between decision-making theory and practice. There is a need to better understand the complex reality of problem solving and decision making to design better models and tools for HRD professionals.

The following principles provide guidance that can be used by decision makers (see Table 2). The purpose of these principles is to make explicit the need for evaluating and rationalizing the decision process and the subsequent decisions that drive the identification and definition of problems and the selection of solutions. As stated earlier, the identification and definition of a problem direct the design, implementation, and evaluation of HRD efforts, all of which are highly influenced by the preferences and biases of the organization and decision makers (Sleezer, 1993).

Conclusion

Complex problems consume a large portion of an organization's resources. These problems are not easily solved through simple procedures, methods, or intuition. Rigorous analysis and expert problem-solving skills are required.

To be effective, decision making must account for the characteristics of the stakeholders, decision makers, and the analyst as they interact to define a problem and generate a solution. If undertaken from a broader, performance-improvement viewpoint, problem solving is a complex process rife with social and political agendas, individual biases, and rapidly changing relationships. Yet, no matter how rigorous the process, the definition of a problem is only a representation of the true nature of the problem. This may lead to the conundrum that many complex, real-world problems are incapable of being defined completely or accurately (Gause & Weinberg, 1990).

It is a formidable challenge to make the right decisions—especially when there is little agreement, support, or evidence that a decision is right. However, there is evidence that the success of decisions is improved by attending to the principles described above and working to minimize the biases that undermine decision-making processes.

A rigorous decision-making process must include an explicit examination and challenge of the assumptions and biases underpinning the process and a prescription to mitigate the stifling effects of these orientations. Based on the research into problem-solving and decision-making processes, the principles offered in Table 2 provide guidance for making better decisions throughout the HRD process.

TABLE 2: Optimizing and Suboptimizing Practices for Decision Making in HRD

	Optimizing Practices for Decision Making	Suboptimizing Practices for Decision Making
Bias analysis	Identify, assess, and challenge the orientations and underlying assumptions of the analysis and decision-making team.	Ignore or gloss over the orientations and assumptions of the team.
Information-gathering phase	Challenge the information-gathering process to identify potential biases from (a) visibility, (b) timing, (c) limits of understanding, (d) expectations, (e) comparisons, (f) experience. Search out and consider a wide variety of perceptions and claims about the situation, include perceptions from outside the analysis team and the organization (triangulation). Generate multiple definitions and solutions of the problem and do not settle on a definition of the problem or solution until late in the process, if at all.	Choose sources of information based on (a) experience, (b) visible sources, (c) preferred sources. Consider a limited variety of perceptions and claims about the situation, focus on select sources.
Information-processing phase	Challenge the information-analysis process to identify potential biases from (a) inconsistency, (b) conservatism, (c) miscalculation, (d) inertia, (e) overconfidence, (f) anchoring. Collaboratively analyze the claims and data related to the problem. Explain reasons for processing information and justify the reasons based on the data. Use "fuzzy" categories to classify problems.	Analyze data (a) with inconsistent use of criteria, (b) to support preferences, (c) with overconfidence on biased data. Unilaterally analyze the claims and data related to the problem. Offer analysis of information without rigorous justification of methods. Use predetermined, rigid categories to classify problems.

Information-response phase	Enlist several nonaligned sources for reality checks of analysis, definitions, and solutions. Attend to the perceptions, expectations, and impulses of the stakeholders throughout the process.	Unduly hope for the best and overestimate the degree of control or the ability to fix things later. Stick to the objective facts and downplay the subjective characteristics of stakeholders.
General problem-solving and decision-making practices	Consider that the problem can never be completely defined or completely resolved. Follow the natural, convoluted flow of problem-solving processes. Avoid the impulse to act early in the process (undertake early action only to test possible ideas and solutions).	Focus on a single definition of the problem and solution. Follow a linear, mechanistic problem-solving process. Take action early in the process.

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