A Process Model of Judging and Deciding

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Abstract

Ethical, professional, and research judgments and decisions are often made quickly, inconsistently, and in contexts that make time pressure, perception of risks, and invalid assumptions unduly influential, even for experts. Decisions are specific to situations in which choice is a possibility or opportunity but in which there also are constraints such as legal requirements, published moral or ethical principles, problem-solving or research standards, and longer-term consequences. Selected theory and research will be highlighted in this article with the purpose of establishing main factors that operate when judging and deciding are used; it is argued that judging and deciding are "meta-processes" analogous to assessment because of their universality. Key insights about applied decision making include the importance of slowing down the process to make it possible to discern biases, recognizing that avoidance of potential losses is highly motivating in most contexts, and that individual judging and deciding must advance to a new level of wisdom when group or organizational changes are the focus or aspiration. The process model presented includes background theory and principles, criteria for effective judging and deciding, description of common biases, the DADA Loop decision-making methodology, the holistic Judgment and Decision Making Rubric*, and illustrations of how process educators might improve the quality of their judging and deciding processes by using these tools when faced with complex decisions.*

Introduction

In his well-known poem, *The Road Not Taken,* Robert Frost (1916/1995) reflects on how sensing, perceiving, and judging (assessing or evaluating) play subtle roles in the decisions we all make as life "travelers." In the poem, a situation arises on a fine autumn morning for a traveler who must decide which of two roads to select; there being no particular goal and no definite knowledge of where each road goes. The narration occurs in the first person; sensory information is shared, e.g., the traveler presents some observations about each road. However, after a long look at the first road, the second is quickly selected without any particular reason except that it seems "just as fair" and has some perceived advantages due to its less-worn condition, though these factors are not large enough to determine which road is the better overall. The narrator ends by imagining that in the future, when telling others of his choice to take the second road, he might "tell with a sigh" of regret about his decision that "made all the difference."

Frost captures the experience all of us have when faced with the ambiguities inherent in any decision that requires conscious attention. Research on judgment and decision making incorporates all of the elements reflected on by Frost, including the frequent likelihood of some feelings of uncertainty and aversion due to the real or perceived risks of loss associated with every decision. In real contexts, judgment and decision making obviously involve many more processes than those that are strictly rational. These are analogous to the processes of assessment/evaluation in

that the quality of how they are applied will have universal features that will be detectable in all contexts. However, assessment and evaluation are conceptually superordinate to judging and deciding because all processes must be defined in a way that allows for valid assessment and evaluation. The presentation of a methodology and a holistic rubric in this article is a step in the direction of establishing standards for assessing the processes of judging and deciding, especially in educational contexts but with more universal purposes also in mind.

This article presents a general model of judging and deciding that is consistent with Process Education (PE) principles and practices. A holistic rubric along with a supporting methodology and annotated case studies provide strategies and tools for describing and elevating performance with judging and deciding as newly considered process areas. Successful conceptualization and applications have been presented for many process areas in the *Faculty Guidebook*, e.g., communicating, teaming, learning, problem solving, designing, and assessing.

Definition of Judgment and Decision Making

How are the processes of judging and deciding used by process educators? Providing evaluative ratings or preparing SII (Strength, Improvement, Insight) assessments are examples of judging. Inputs to judgments are based on sensation, perception, and cognition which make it possible to observe, attend, and infer. A wise decision can be made if judgments are relatively unbiased in terms of in-

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formation, observations, knowledge, inferences, and expertise. A decision is a dividing point at which the judging process is considered complete enough to determine the better of competing hypotheses or options. Though decisions occur at particular points in time, all decisions are preceded by a history of experiences and judgments. The consequences or outcomes of a decision also influence future judgments and decision making, as is seen when thoughtful assessment and reflection, e.g., Leise (2010), are used to improve a pattern of decision making.

Authors frequently use the terms *judgment* and *decision making* in ways that create some ambiguity as to their distinction, e.g., by considering the results of clinical or legal judging as essentially coincident with deciding. The *Oxford English Dictionary* (OED) emphasizes judiciousness in the sense of thoughtful consideration of the issues at hand preceding a decision. To decide is to "cut the knot" in the sense of coming to a determination that one "side" is the winner; sound judgment lies on that side. *Webster's Unabridged Dictionary, (2nd ed.)*, emphasizes the process of judgment involved in comparing ideas and facts related to the truth of a proposition or a legal decision. A synonym of judgment is *discernment*: the wise and penetrating perception of differences of things or ideas. Judgment is a process for determining where the truth lies; decision making is the step of declaring that one concept or status will be accepted over the alternatives. To decide does not necessarily support the inference that action will follow but it directs attention to what appears to be a wise basis for action.

Judging: Comparative discernment of choices or options expected to provide better accuracy or benefits and fewer errors or risks than alternatives

Deciding: Selection of an alternative as a conclusion or a basis for action

Philosophical Insights Relevant to Judgment and Decision Making

John Dewey (1938) examined judgment from the widest possible perspectives, including biologically-based choices represented by behaviors that have emerged through evolution. He assumed that the "logic of inquiry" applied equally to all unsettled conditions including problem solving and research methods, which were the focus of his treatise *Logic: The Science of Inquiry*. The use of categories and sets supports the logical (conceptual) narrowing of options required in both problem solving and research. Dewey strongly criticized the traditional reliance of philosophers on logical tools such as the syllogism because of the lack of empirical reference of such methods.

Judgments are used in all aspects of life, scholarship, and science; however, as Dewey argues, only properly formulated methodologies and criteria will guide the inquiry process in a fruitful direction. Providing ways to test ideas without prematurely defining "truth" is the essence of empirical science. Philosopher of science Karl Popper (1963) proposed falsifiability as a prime criterion of the scientific method. No research result should be considered final because there always is the possibility of future alternative empirical data that could support a revised or different theory. Assessment and evaluation of both judging and deciding are essential for identifying benefits as well as shortcomings in application.

Judgments are necessary across the full range of human experience but some authorities argue that judgments based on facts are of an entirely different kind than judgments

Table 1 Criteria for Judging and Deciding

Themes	Judging	Deciding
Initiation of Process	Clarity of the Selected Focus of Inquiry	Level of Awareness/ Information about Options
Exploration	Sufficiency of Exploration of Relevant Knowledge	Degree of Readiness to Manage the Decision
Control of Influencing Factors	Quality of Management of Bias and External Influences	Degree of Control/Influence over Contingencies
Mental Representation	Relevance of Information for a Judgment	Level of Expertise in the Domain of Inquiry
Benefit/Risk Analysis	Adequacy of Judgment Outcomes for a Decision	Potential for Beneficial/ Positive versus Risky/Negative Outcomes
Context for Action	Level of Applied Expertise for Implementation	Timeliness/Importance for Window of Opportunity
Assessment	Quality of Assessment of the Judging Process before a Decision	Wisdom of Action Considering the Risks

about the value of something or of some process. Putnam (2011) argues against making a clear distinction between judgments of "value" and those involving supposedly "empirical"—meaning factual—observations. For example, in all scientific disciplines there are successful tests of hypotheses related to constructs that cannot be directly observed such as dynamic mechanisms of star formation or chemistry of biological organisms. The main reason there is no definitive difference between judgments of fact and judgments of value is that criteria and measurement standards must be set in either case to reflect current concerns and conditions related to each "unsettled condition." This is consistent with the PE philosophy which incorporates consideration of all parts of the educational system as a general criterion for long-range improvements. Putnam's point supports the PE model by providing a logical basis for assessment/evaluation of performance (process) quality as well as outcomes quality.

Criteria for the Processes of Judging and Deciding

The differences between judging and deciding are clarified by criteria that appear most relevant for each (Table 1). For judging, it is most important that accurate knowledge or information is used and that biases and influences are reduced as much as possible. Decision making will be better if criteria such as benefit, practicability, and timing are consciously addressed. Some decisions require specialized knowledge or expertise; being aware of this could lead to useful strategies such as getting assistance, e.g., legal or financial advice, to assure that errors are avoided while pursuing otherwise important and beneficial goals. Wise decisions are based on full awareness of relevant alternatives and of how sources of bias or influence are likely to affect each decision.

Janis and Mann (1977) propose a set of seven "procedural criteria" (p. 11) that match well with most of the criteria in Table 1: Quality Criteria for Judging and Deciding, but do not distinguish between the judging and deciding functions. In Table 1, sets of criteria are presented that support assessment/evaluation of each process; these criteria are relevant to both the *DADA Loop Methodology* (Table 3) and to the holistic *Judgment and Decision Making Rubric* (Table 4).

Science of Judgment and Decision Making

It could be argued that psychology became a distinct scientific discipline in the mid-Nineteenth century when it became clear, from experimental laboratory research, that there is not a linear relationship between empirical sensory data, i.e., what is seen, heard, felt, tasted, and smelled, and human perception. In much of this early research, judgments were based on the method of paired comparisons—restricting choices to just two stimuli at a time to reduce bias, but with many counterbalanced trials for each subject. Early in the Twentieth century, social and cognitive research, which was focused on personality and intelligence testing, used ratings or briefly-presented problems as important methods for obtaining judgments from individuals.

To be useful in applied settings, e.g., for educational or clinical evaluations, measurement research must be done to obtain evidence that measures have high enough reliability (consistency) and validity (realistic results) for each purpose and context. Burke, Ouellette, Miller, Leise, and Utschig (2012) present reliability and validity results for a Process Education rubric measure of writing in the disciplines. Bias in measurement is detectable mainly through well-designed empirical studies that show how errors are unevenly distributed, for a particular measure, when administered to contrasting groups or situations. Availability of research data for base rate statistics and standardized norms has provided the potential for significant improvement of bias management by clinical and industrial psychologists. Nunnally (1978) provides a classic treatment of the statistical foundation of paired comparisons, ratings, and other methods used in psychological and educational measures.

Problems studied by Kahneman and Tversky (summarized in Kahneman, 2011) have clarified ways in which "quick," intuitive strategies incorporate misperceptions and biases that result, very often, in decisions motivated to avoid loss more than to achieve aims. This intuitive path occurs on the basis of habit and emotions and with limited reasoning or awareness of how the "decision" occurred. In contrast, decisions made on the basis of the "slow" path (reasoning) tend to benefit from improved quality of analysis and greater awareness of the emotional and cognitive biases that can result in erroneous judgments and decisions.

Krueger (2012), in his introduction to an edited volume on the social psychology of judgment and decision making, further elaborates the perspective and research of Kahneman and Tversky by showing how humans often quickly evaluate probabilities by assuming that what seems obvious, especially in social situations, is the "full" story. Much of what is reported by individuals about their judgments reflects an "egocentric" perspective with more emphasis on *post hoc* ("hindsight") efforts to convince themselves rather than a realistic basis for estimating probabilities. Social psychologists have extensively researched the many sources of bias articulated by Kahneman and Tversky and recognize that humans have great difficulty with including future probabilities along

with what has already occurred, e.g., how to fairly divide up winnings at a stopping point before a full series of planned trials is complete or how to estimate when a competitor will cooperate when there could be a win-win solution.

Individual versus Group/Community Perspectives

There is evidence for individual competence in decision making that can be measured with scales; de Bruin, Parker, and Fischhoff (2007) found consistent (reliable) self-report results using their Adult Decision Making Competence (A-DCM) index, which was based on seven decision factors such as resistance to biasing ("framing"), influences, and overconfidence. Results from this index correlated with socioeconomic status, cognitive ability, and decision-making style in ways that make evident the external factors that influence the quality of individuals' decisions in addition to personal decision-making competence. The variations suggest that facilitating improvements in judgment and decision making could benefit those with maladaptive styles, whether a style is a result of developmental experiences or from contextual problems beyond the control of individuals.

Although an individual perspective has been typical in decision-making theory and research, a communitarian perspective helps ethical decision makers by including wider contexts and stakeholders. For example, Johnson, Barnett, Elman, Forrest, and Kaslow (2012) argue that a "competent community" is essential as a basis for improving ethical judgments and decisions due to the difficulty of avoiding biases and inappropriate norms for judging. Rogerson, Gottlieb, Handelsman, Knapp, and Younggren, J. (2011) recommend moving past a purely rational approach to ethical decision making by including nonrational influences such as the sources of "cognitive" bias known from the research and theory of Kahneman and Tversky as summarized in Kahneman (2011).

The evidence from research suggests that individual decision skills are an essential foundation that must be expanded when group or organizational judging and deciding are needed. What is valued by individuals in an organization must be superseded by larger perspectives, values, and wisdom when many are asked to work together to achieve integrated outcomes. The first three levels of the *Judgment and Decision-Making Rubric* presented here involve quality of individual performance; Levels 4 and 5 incorporate the larger perspective with the assumption that quality decision making at this level will occur only if managers and leaders facilitate engagement of everyone through transparent and equitable processes that include ongoing shared assessment and evaluation.

A significant challenge that is not fully addressed by the rubric is how individuals can improve in quality of judging and deciding, as individuals, when there is a need to facilitate change at management and leadership levels of an organization, i.e., performance at Levels 4 and 5 of the rubric. Due to stressful power differentials in relationships and roles, e.g., Mather and Lighthall (2012), it is not always possible to consider concerns or expertise that could be important for enhancement of the quality of managing and leading. Janis and Mann (1977) describe some examples of how individuals and small groups can overcome major obstacles by being more prepared than other "players," e.g., a white women's group developed a strategy for integrating schools in San Francisco in 1971 that ended up being accepted because politicians and school administrators failed to demonstrate enough diligence to meet the court requirements in time with a better plan. From a different perspective, professional associations provide some support in terms of guidance regarding norms and methods, e.g., following principles of ecological leadership (Harms & Leise, 2011), that have been successful in other organizations.

Universal Sources of Bias

Psychologist Daniel Kahneman (2011), who won a Nobel Prize in economics in 2002, summarizes in his book *Thinking: Fast and Slow*, what he has learned about judgment and decision making in "conditions of uncertainty" from many years of experimental research with his long-time collaborator Amos Tversky--who died in 1996. The title refers to the great differences between decisions based on intuition ("fast" thinking) and reason ("slow" thinking). The situations that arise in daily life tend to be managed with quick judgments, followed, as needed, by problem solving; this "quick" approach is usually helpful for getting things accomplished when time is limited or if consequences of mistakes are minor. Unfortunately, as Kahneman documents, people frequently make serious mistakes in judgment because they react too quickly and are not aware or expert enough to detect sources of influence and bias that result in regrettable decisions.

Rogerson, Gottlieb, Handelsman, Knapp, and Younggren (2011) emphasize that professional ethics practices must go far beyond conceptual learning of a code of principles because judgments and decisions in real situations require critical thinking "in the moment" and often have substantial consequences for clients as well for the clinical process itself. For example, if a concern arises about observed or suspected child abuse there is a requirement—for all citizens--to report but there are multiple options for how this may be achieved. Handling the communication and clinical information in a sensitive

way could result in a parent making the call rather than the clinician—thereby preserving the working relationship. The traditional way of teaching ethical decision making emphasizes a "normative" assumption that individuals can reach valid decisions through rational application of published principles of conduct. If assessment practices are facilitated in clinical supervision, it is much more likely that interns will learn how their performance in risky situations actually needs to vary according to interactions of personal emotions, values, and cognitive framing with each problem.

Johnson, Barnett, Elman, Forrest, and Kaslow (2012) add to Rogerson et al. (2011) by proposing a "communitarian" perspective for ethical decisions by psychologists, counselors, and other clinicians; this is in contrast to the normative assumption that each individual can remain rational and ethical in any situation once the principles are learned. They provide philosophical and empirical evidence that individual assessment is flawed, but can be improved when team and other perspectives are added and external standards of validity are consistently applied.

Based on research involving decision making in stressful situations, e.g., involving emergencies, social psychologists Janis and Mann (1977) identified five distinctive styles of decision making within their "conflict-theory model." The most beneficial style, labeled *vigilant,* involves intentionality and purposiveness: vigilant individuals explore options and use resources when analyzing what decision may be best. Four other styles contrast with the vigilant. The *hypervigilant* style results in so much emotional arousal that attention cannot be given to a search for alternatives to resolve current problems. Janis (1954) found that high arousal is associated with ease of persuasion due to lack of confidence and concern about social approval. The *defensive avoidance* style is associated with discounting of risks, e.g., that smoking could lead to lung cancer, by shifting responsibility, procrastinating, or "bolstering" or emphasizing "evidence" supporting a minimal-change option. For example, one might cut back on smoking, but choose not to quit, because the consequences from smoking will not manifest until far into the future and coping with present stressors is easier if the change isn't too big. Another example is the apparent reaction of those who are at risk for Type II diabetes: a rapidly increasing number; fast food is convenient and familiar while the future consequences assumedly can be managed with medical interventions or unpleasant changes in food choices—rarely is the option considered that it would be an interesting challenge to learn to cook healthful and tasty food. The *unconflicted adherence* style results in staying with decisions regardless of consequences, e.g., keep on drinking too much. *Unconflicted change* is a style

involving frequent changing of the mind due to emotional reactions unregulated by a stable frame of reference or identity, e.g., trying all kinds of diets. These styles help to operationalize, especially for anxious individuals, a "way of being" in the PE Knowledge Map model (Quarless, 2007) that can be assessed and changed.

Process educators recognize that improvements in educational practices and standards require effective tools, skills, and support from a larger "community of scholars." The theory of judgment and decision making presented here is intended to articulate the major factors involved and how individuals and teams can improve decisions about all aspects of Process Education. Peer coaching, mentoring, and ecological leadership are processes that support a more communitarian perspective that also reflects the intent behind the "star chart" model of the *Faculty Guidebook (FGB)* (Beyerlein, Holmes, & Apple, 2007). The learning skill domains in the *FGB* as well as the "life enrichment skills in Leise (2011) help with articulation of new and varied skills that may make it possible to change the ways to resolve some problem situations through growth in performance. The availability of the PE professional community results in more opportunities for assistance and assessment related to how each individual or group initiative has implications for—and from—multiple elements of the system. Levels 4 and 5 of the *Judgment and Decision Making Rubric* reflect this larger context of judging and deciding.

Table 2 is a list of common sources of bias as articulated in the research and theory literature. In the column on the left are listed the bias-enhancing reactions using labels that have become well-known, e.g., availability heuristic refers to the tendency to be overly influenced by current information, e.g., discounting the validity of alternative evidence or failing to seek out new information as a way to avoid resolving uncomfortable inconsistencies. Awareness of the many forms and contexts of bias is important for application of the *DADA Loop Methodology* to any decision.

"DADA Loop" Decision Making Methodology

The "DADA Loop" (Discern, Analyze, Decide, and Act) methodology (Table 3) incorporates many of the concerns and biases that the literature has addressed. It is assumed that many decisions required in other methodologies, e.g., the PE Problem Solving Methodology, could be enhanced by applying the DADA loop. Argyris (1976) explored the challenges related to "double-loop learning," by which he means awareness of the actual strategy one is using. (Meta-cognition is a term with similar meaning.) Argyris found that a substantial majority of performers were unaware that they actually were using a different "theory-in-use"

Table 2 Sources of Cognitive, Affective, and Social Bias

Bias Enhancing Stimuli or Reactions	Explanations/Exemplars
Cognitive Biases	
Focus on personal traits as "causes" of observed behaviors	The "fundamental attribution error" occurs frequently in individualistic cultures; personality traits are assumed as "explanations"; situational "causes" are minimized; assumption that "will power" is always a valid source of motivation
Illusory assumptions about causes of change	Lack of awareness of how data patterns tend to be "self-correcting" over time due to random but pervasive influences that are called "regression to the mean"
Self-serving bias	Assuming self to have much less bias than others
Availability heuristic	Assumption that one's awareness includes enough information
Representative heuristic	Comparison of current example to a prototype in one's mind; "framing" effects
Anchoring	Capture by initial impressions about information or data that results in unfounded assumptions about real range of data values; estimating or judging without knowing base rates in the population for a behavior or trait
Confirmation bias	Staying with an initial hypothesis--ignoring inconsistencies and neglecting assessment
Hindsight bias	Assumption that how a situation resolves could have been predicted beforehand; can result in a focus on assigning blame
Discounting	Defensive avoidance style that results in ignoring value of uncomfortable or cognitively dissonant information; tendency to procrastinate even when faced with important decisions
Rationalizing	Hypervigilant or defensive avoidance style that results in defense mechanism of accepting personal reasoning as valid; failure to be skeptical; unreliable or no use of assessment procedures
Task difficulty	Misjudging nature or requirements of a task; expertise correlates with performance comfort/success but "boundaries" are often ignored
Sources of Bias from Social Factors	
Authoritarianism	Milgram's "obedience" studies and Zimbardo's "prison" study demonstrated the breakdown of judgment in authoritarian contexts
Distortion of personal moral norms	The *Lucifer Effect* (Zimbardo, 2008) is a label for how situations can seriously distort norms and moral judgment to produce evil behavior by good people, e.g., Zimbardo's prison study
Norms/Community standards	Influences from real or perceived sharing of values and behavioral expectancies; expectations from others can enhance or distort reliability and validity of personal judgments and decisions
Empathy	Openness to affective reactions of others must be self-managed to avoid distortions and unrealistic assumptions
Groupthink	Tendency to accommodate judgments to perceptions or assumptions of a leader's preference or to group norms about expectations regarding cohesion or consensus
Cultural world view or context	Having unconscious individualistic or communitarian perspectives that may be influencing judgments in some social situations

Bias Enhancing Stimuli or Reactions	Explanations/Exemplars
Affective Sources of Bias	
Affect heuristic	Judging on basis of sense of loyalty, comfort, or avoidance; a generic label for causes of bias arising from emotional style or distortions in self-regulation
Perfectionism/catastrophizing	Hypervigilant or self-critical style that results in excessive emotional arousal; can override attention to realistic alternatives or valuable feedback; excessively self-critical
Minimizing emotional costs	Misperceiving or failing to predict emotional costs of specific decisions, e.g., medical treatments, is a typical coping mechanism (Luce, 2005)
Rigidity	Unconflicted adherence style; staying with decisions even when negative consequences are obvious to others
Impatience/impulsiveness	Frequent and unconflicted change of mind without sound reasons; limited self-regulation of emotions

Table 3 Decision-Making Methodology: Discern, Analyze, Decide, Act (DADA Loop)

LOOP	SUBSTEPS	SKILLS
Discern	History of the situation	Recalling, testing perceptions, using prior knowledge, reacting to history
	Clarification of what decision is needed	Inquiring--asking key questions, Recognizing the problem, choosing alternatives
	Identification of relevant aspirations, motives, and values	Envisioning, accepting ownership, aligning with social values—acting according to mutually empowering ethics
	Recognition of competing priorities	Thinking skeptically, accepting constraints, using culture-specific expertise, creating productive environments
Analyze	Articulation of multiple decision alternatives	Defining the problem, Establishing criteria, Selecting word usage to match the audience's background
	Identification of influences and biases of concern	Thinking opportunistically—using positive strategies to predict and reduce risk
	Estimation of risks/benefits of each alternative	Analyzing risks, Ensuring robustness
	Setting of tentative plans, criteria, measures, and resources	Strategizing, Securing resources, Establishing requirements—articulating solution criteria
Decide	Articulation, in writing, of the most promising decision	Being decisive—choosing with confidence, Making proposals,
	Specification of essential roles, processes, and timelines	Preparing—realistically envisioning performances, Defining processes—for individual or team, Defining team roles
	Planning of facilitation requirements	Self-management for individuals; For teams Building consensus, Motivating, Negotiating, Politicking, Recruiting
	Specifying how and what to communicate with stakeholders	Organizing a message, sharing a vision, persuading
Act	Implementation of processes	Being patient—staying the course,
	Collection of data	Measuring, Recording, systematizing
	Assessment/evaluation of processes and outcomes	Assessing performance, Evaluating performance, Validating results
	Reporting of results and recommendations	Extracting results, Connecting with shareholders, Benchmarking

than they assumed; this resulted in biased judgments and decisions. PE practitioners, like all educators, face decisions related to how to improve professionally, how to deal with ethical conflicts, and how to allocate time and other resources. The DADA Loop Methodology will be more useful to the extent that the metacognitive recommendations of Argyris are applied when assessing performance within and across the four phases. Because the assessment process itself is always subject to biases that must be carefully analyzed, the decisions coming out of the DADA model should be considered from both individual and community perspectives in order to ensure their reliability and validity.

Description of the Methodology

The purpose of the Discern phase of decision making is to establish the history and priorities that should play a major role in articulating a decision domain or concern. Recognizing what level of expertise is needed or what the resource constraints are will make a substantial difference as to what decision is operationally possible. Judgments about values or productivity concerns also should be assessed early in the process, e.g., Janis and Mann (1977) used a decisional balance sheet to help individuals assess utilitarian and personal benefits and losses. Essentially, this phase involves clarification of the nature of the problem to which a decision is related. Ownership and buy-in are essential issues to review before moving to phase two: Analysis.

After the "boundaries" and operational nature of the decision have been defined in the Discern phase, it becomes feasible to apply analysis techniques to clarify sources of bias and influence that may create risks that need to be evaluated because they may make it difficult or impossible to make a sound decision. The type of decision, e.g., a personal ethical choice, the amount of financial resources to dedicate to a project, or to whom to assign a leadership role, will direct attention to the analysis tools and strategies likely to improve judgments about the facts and other information relevant to the problem. Much of the empirical literature about judgment and decision making has resulted in clarifications about biases, risks, and decision tools; however, attention to plans, criteria, measures, and resources can improve awareness in a "praxis" sense. The *Judgment and Decision Making Rubric* is a tool for assessing quality of judgment whether the context is individual, team, or organizational. Individuals usually make decisions based on personal criteria and experience; however, the rubric also directs attention to factors beyond the individual. Individuals operate differently when they are part of a larger group or organization but it is assumed that they can achieve high quality in those decisions as much as for personal decisions as described by Level Three.

The Decide phase is initiated when a decision is clearly articulated in a way that reflects background, operational, and stakeholder concerns. At this stage, stakeholders will vary substantially in their ways of envisioning how everything will play out in the future, so roles, processes, and timelines may need to be worked out in facilitated sessions. Maintaining communication and engagement are significant concerns that must be attained in an "ecological" manner to avoid presenting a sense that follow-through decisions are pre-determined.

The PE Theory of Performance (Elger, 2007) provides a framework of key factors that clarify the use of judging and deciding in practice situations and provides insights relevant to the action phase of the *DADA Loop Methodology*. The Act phase is important for creating a "loop" because action steps result in at least qualitative data (reliable and valid evaluation measures should be planned as well) about how well processes are being implemented and whether they are leading to desired outcomes. For individuals, this phase involves processes such as self-assessment and reflection on performance. For teams and organizations, even though analysis of biases and influences occurred in the Analysis phase, the true nature of these often comes to light from interpretation of measurement data and information about qualitative features of the implementation experience, e.g., unexpected inability to provide support or resources to key stakeholders.

Exemplars of the Methodology

A decision-making methodology will create differing impressions depending on the type of decision one is making. This list of eight decision types is not intended to be complete and some types of decisions involve combinations. For example how one perceives a present role, e.g., as a program evaluator, could create biased motives depending on whether one is employed by the institution or is performing as an "external" professional—or, for example, as a representative of an accrediting organization. Different decisions could result depending on whether judgments are evaluative or assessment-based, or whether a decider, consciously or unconsciously, takes an empathetic perspective or a reasoned perspective (e.g., Weber & Stern, 2011). Knowing the kind of context can provide significant insight into probable sources of bias and risk that should be assessed before proceeding.

1. Intuitive decisions (usually quick and based on immediate perceptions or habits)

2. Idealistic decisions (based on theoretical "should" criteria from statements of ethical principles)

3. Norm-based decisions (assumption that there are typical ways to judge and decide)

4. Empathetic decisions (focused on how a decision could affect another or others)

5. Reasoned decisions (principles based; logical use of tools to estimate probability of risk)

6. Role-based decisions (involve "reframing" of consequences depending on one's role, e.g., discounting of unfavorable student ratings by an instructor)

7. Ego-motivated decisions (involve biases related to self-interest or perception of pressure to make judgment and decisions in a "favorable" way for self)

8. Integrated factors decisions (guided by multiple factors to fully assess judgments and then the articulation of the decision)

Holistic Factors of Judging and Deciding

Making judgments is the foundation of measurement and decision-making. For process educators, the distinction between assessment and evaluation (Baehr, 2007) is very significant because both are "meta-processes" that apply to every performance skill and to every step in process methodologies. Individuals and groups, therefore, must recognize, as a first principle, that quality of judgment will improve only through iterative cycles of assessment/evaluation. This principle is central to the *DADA Loop Methodology* (Table 3) and to the five quality levels of the *Judgment and Decision Making Rubric* (Table 4). The research summarized provides a basis for the five factors of the rubric: (a) Information Sampling, (b) Mental Representation, (c) Social Context, (d) Use of Resources, and (e) Assessment. The goal is to have a balanced set of factors that reflect cognitive, social, affective, and situational sources of influence involved in judging and deciding, especially for educational contexts and purposes.

Information Processing Challenges

Judgments are always based on perception or analysis of multiple kinds of data—usually qualitative--that emerge when a situation arises that requires movement toward a decision. Janis and Mann (1977, p. 149) quote a letter from Benjamin Franklin to Joseph Priestly (Sept. 19, 1772) in which Franklin describes his "moral or prudence algebra" method for assessing pros and cons on two halves of a page; he crossed off items when weights of two or three essentially balanced out across the sides—a method that still frequently comes to mind when "sampling" the relevant concerns.

Krueger (2012), using a social psychological approach, observes that it is essential, for a given decision, to know when one has the requisite kinds of information and also when there is enough information to make a decision—in his letter to Priestly, Franklin recommended taking a day or two so it is likely that one has thought of most of the relevant considerations and has had time to work through "…various Purposes or Inclinations…." It often is unclear what the best information is for a given judgment or decision and, as Newell, Lagnado, and Shanks (2007) emphasize, there are limits to what humans can access and take account of in terms of amount of information. A distinction between information "sampling" and data "analysis" is thus of considerable value for understanding the quality of how decisions are made. The sampling perspective also is important for selecting the most relevant or appropriate presentation of information as an example from medical decision making illustrates.

Newell, et al. (2007) and Gigerenzer, Gaissmaier, Kurz-Milcke, Schwartz, and Woloshin (2007), argue that how information, especially statistical data, is presented will substantially influence medical and other decisions. Much confusion arises from failing to distinguish the various purposes of data, e.g., percentages used for risk probabilities. Relative medical risk—how differently a treatment works for experimental versus control conditions in well-designed experiments--is important to researchers but can lead to misjudgments if used for informing patients or for informing the public through the media. Patients benefit from an "absolute" frame of reference, e.g., four of 100 failed to benefit, in contrast to researchers who benefit from a "relative" frame of reference, e.g., the experimental treatment was 50% more effective than the control.

The distinction between absolute and relative medical risk indicates why it is important to be aware of how information is "sampled." Experts recognize definite boundaries to the application of their knowledge and will use caution to avoid involvement in judging and deciding for which they are not qualified—but still are prone to misjudgments such as overgeneralizing how their knowledge can be applied. Much of the bias that occurs in typical decisions arises from limited awareness of this "sampling of knowledge" problem.

Another way that accurate sampling of knowledge is related to risk assessment occurs when there are multiple sources of data to evaluate. Validity criteria are often unknown or inaccurately applied when considering the quality of each source. For example, Newell et al. (2007) present research on jury decision making which shows that people tend to assume that the most precise statistical presentations, e.g., DNA data, define the basis for

judgment; however, even though DNA evidence is highly precise, it is also important to consider the error rate for the lab that produced the results. The lab error rate is the more relevant risk factor, even if it is not known, because that can create doubt about the validity of any scientific measurement procedure reported by the lab. Convergent data from independent labs is a way to reduce this error factor.

Peters (2012) summarizes ways to assist with information sampling. Most people, even those who are experts in certain areas of numeracy and data analysis, tend to succumb to the typical biases that afflict everyone; therefore it is important for information providers to use techniques known to channel attention to the main points of focus needed for effective judgments and decisions. Peters recommends the following strategies.

1. Reduce the cognitive effort requirements by presenting the fewest number of attributes or options for comprehension of risks

2. Support information integration by providing evaluative meaning, e.g., that a high value is beneficial, for quantitative data because this helps to create affective associations that are more likely to provide corrective cues for later recall

3. When appropriate, provide visual or graphical representations that direct attention to key inferences, e.g., as Newell, et al. (2007) argue, medical patients benefit from highlighting probabilities based on absolute risk probabilities rather than on relative benefits or risks—such as statistical differences

Awareness that no one is able to fully understand the information and knowledge that could be applied in a decision situation supports an emphasis on sampling across types of knowledge and expertise so decisions can be made about whether assistance is needed from specialized experts or tools. The *Judgment and Decision Making Rubric* (Table 4) incorporates both sampling of information (factor "a") and use of resources (factor "d") because of the likelihood that external guidance will be important for any complex decision.

Level of Awareness of Decision Processes

The way that a person or group thinks about or represents a decision situation makes a substantial difference in the probability that a decision will be made on a valid basis and that biased judgments will be limited as much as is feasible. Janis and Mann (1977) provide their analyses of interesting historical episodes, e.g., why a higher level of alert was not authorized by Admiral Kimmel before the attack on Pearl Harbor on Dec. 7, 1941. Kahneman (2011) and other researchers have documented and explained

many of the ways in which people fail to show awareness of how their judgment can be biased or influenced by well-established, but not always well-known, errors such as being "captured" by available information or by assumptions related to tacit (non-conscious) beliefs and norms.

Double-loop learning, e.g., Argyris (1976), is a model of higher-order or metacognitive awareness that is needed for conscious identification of biasing influences in real time. Similarly, Chiaverino, Apperly, and Humpreys (2012) present a three-level model of mental representation: *mirroring* is based on observing, *representation* is intermediate and means that a person knows what mental process is being used; *mentalized* means that inferences can be analyzed, etc. from the intermediate "representation" level. A significant way that sources of bias (Table 2) tend to reduce individual or group accuracy is by influencing attention away from metacognitive analyses and assessments.

Some types of decisions can be made very effectively by using what Kahneman (2011) refers to as "quick" or intuitive thinking. Errors tend to occur when the requirements of a decision situation are more complex than an individual or group assumes. Personal style or "way of being" plays a role in whether bias factors and alternative decision options are noticed and taken into account. When decision makers consider immediate observations or impressions to be a full representation they can be too limited in their consideration of expert knowledge and future consequences. Much of the theory and research about judgment and decision making is based on cognitive or "rational" models that tend to neglect the social and affective influences. Despite these limitations, a solid body of theory and research has been accumulated and reported by authors such as Kahneman (2011) and Krueger (2012). Kahneman and his collaborators have basically defined the area of cognitive bias by studying how decisions represented in various ways are interpreted or reacted to. Social psychologists such as Krueger are adding to the knowledge about social dimensions, which are incorporated in factor "c": Social Influence.

Krueger (2012) describes research that has been done using game theory, which involves social predictions about how another person or group will decide to cooperate or to divide a set of resources. The information problems in this context tend to involve discerning the role of egocentric or *ad hoc* explanations; experimental models, e.g., the work described by Kahneman (2011), have shown that *ad hoc* kinds of bias occur in most decision situations. Huber (2012) discusses gambling paradigms including the traditional utility theory and the prospect theory of Kahneman but emphasizes the role of heuristics that

individuals use to reduce the effort necessary to make a decision. An example is the *maximin* heuristic which is simply identifying the worst outcome and then choosing the alternative that is *relatively best*. Huber discusses a methodology for making such judgments more reliable.

Quality of judging and deciding depends, significantly, on whether a person or group has metacognitive awareness of what kind and level of expertise is reflected in the mental representation of the decision problem. This issue, recognizing the need for additional inputs, is incorporated as one aspect of factor "d" (Use of Resources) in the *Judgment and Decision Making Rubric*.

Social Influence Factors

Much of the theory and research about judgment and decision making is based on how individuals process information and analyze probabilities. It is important to augment this important body of research with a full recognition of how much influence social contexts—other people, groups, society—have on individual judging and deciding. Influences from authority, whether positive or negative, play a substantial role on judging and deciding as can *groupthink*, the tendency of members of cohesive groups to emphasize agreement with a respected or feared leader. Individuals have personal styles that tend to increase or decrease the influence of persuasion such as in sales or opinion contexts.

Zimbardo (2008) explores the implications of well-known experiments such as those by Milgram and his own "prison experiment" that show the strong effects of authoritarian influences. Janis and Mann (1977) discovered the very significant effects of *groupthink* from their analysis of how President Kennedy and his senior advisors decided to go ahead with the disastrous and incompetently implemented Bay of Pigs invasion of Cuba during the Castro revolution. *Groupthink* is now a widely known phenomenon—but often a source of social bias that is known only in hindsight, e.g., Roese and Vohs (2012).

Davenport and Manville (2012) present positive cases of organizational decision making to illustrate how judging and deciding can be improved through collaborative processes. In most of the organizational stories they present, success occurred due to extensive involvement of all employees or stakeholders and through open assessment of the problems at hand. An advanced approach in some organizations involved conceptualizing and implementing processes that led to shared knowledge and especially to improvement of knowledge management related to achievement of high-quality processes and desired outcomes for clients as well as the organization itself. Above all, the authors emphasize that individual decision-making, e.g., of "Great

Leaders" approach, has never actually been as effective overall as has been assumed because most organizational decisions are much too complex for one person to handle. Davenport and Manville provide citations for exploring how misjudgments led to poor outcomes in other historical case examples.

Many other insights are available about how and why social factors play a large role in judging and deciding processes. Modecki (2008), in a review of research related to adolescent maturity of judgment concludes that youth are especially prone to influences from peers and group norms. Adolescents generally have more limited ability to be responsible in an independent way, more limited skills in assessing situations, and less insight into the perspectives of others. Teams often fail because of limited skills and structure for taking advantage of the typically larger knowledge base of groups over individuals. For example, Schulz-Hardt, Frey, Luthgens, and Moscovici (2000) found that decisions made by homogeneous groups tend to be based on biases in their information seeking and on tendencies to confirm what others appear to accept. Groups with more diverse membership more often avoid over confidence about previously confirmed information. Schulz-Hardt et al. caution that contextual factors such as time pressure or competitive goals may result in benefits from quickness in confidently confirming agreement about relevant information--even though more prolonged deliberation produces more reliable outcomes.

Because the focus of most researchers has been on individual rationality of judging and deciding, the social influences such as *groupthink* and authoritarian control appear to be under-represented in typical decision models. Increasingly, social and developmental factors are being studied; social influences are therefore represented as factor "c" in the *Judgment and Decision Making Rubric*. A further insight is that increases in quality of judging and deciding reflect awareness of group, institutional, and community norms and goals. The first three levels in the rubric have a mostly individual perspective; at levels 4 (Effective Facilitator of Decision Processes) and 5 (Integrator of Collective Wisdom) a communitarian perspective is dominant. The "competent community" model of professional ethics is an example (Johnson, Barnett, Elman, Forrest, & Kaslow, 2012); individual ethical decisions generally become wiser when consultation becomes the norm for reducing bias and for improving problem solving.

Use of Resources

When preparing to make decisions, it is necessary to consider the problem of "What comes next?" Often, a decision may be "right" but questions arise as to how to implement or follow through in a way that will be true to

the assumptions and intent. Adams (1991), an engineer, observes that clean, beautiful designs sometimes cannot be used because they don't match the resources or expertise at hand. For example, many of Leonardo da Vinci's drawings were for machines that could not actually be achieved for 400 years. The factor of "inventiveness" is required for judgment and decision making to actually work out as intended. Making a decision leaves many future details to be worked out, especially if conditions and resources turn out differently from what was assumed or known. The degree to which judging and deciding include assessment of needed, as well as available, resources makes a significant difference in the quality of these processes.

Decisions often depend upon social and operational resources because these influence the nature of what decision alternatives make sense in a given problem context. The *Conservation of Resources (COR) Theory* (Hobfoll, 2002), which is well-supported by empirical research, argues that the type of task or situation, which can be either a stressor or an opportunity, can result in either a downward "spiral" or an upward one. Feeling overwhelmed and having no support, e.g., being a low-wage employee or a single parent, will reduce self-esteem and other personal resources; having strong competencies and support, e.g., from a wide social network and organizational finances, will tend to open up or enhance resources, including personal motivation, because of active initiatives that are possible. ten Brummelhuis and Bakker (2012) illustrate how the COR model can be applied in work-home conflict and enrichment situations to understand how and why important decisions are made differently depending on a person's circumstances, availability of resources, and awareness of beneficial strategies for putting resources to work for ones goals.

Davenport and Manville (2012) explore a variety of real cases in which creative inventiveness played an important role in how decisions were made, even in contexts that required collaboration. One intriguing case these authors examined is how a democratic process became integral to the political decision making in ancient Athens when a huge Persian army was threatening. Themistocles, the leader in 480 BC, worked through all the information with the citizens, e.g., an ambiguous augury from the oracle of Delphi as well as the military resources such as a large navy, until a clear decision was passed, by a majority vote. They decided to empty Athens of all women and children and to require all men to man the oars or join the army. There were alternative ways that the citizens could have responded, e.g., submit to the Persians as other city-states had, but a tradition of democratic process made it possible to be creative by incorporating many kinds and sources of input that ultimately coalesced around the very important

navy resources—which won the day--built by a previous administration but not used for a previous threat. Fellow citizens can be a very significant resource when they are providing input—or votes—as part of an "open society" (Popper, 1966).

Clinical professionals must go through extensive residencies or internships in order to learn first-hand how to make judgments and decisions in the service world they plan to enter. One of the most important resources is the clinical supervisor who has substantial influence over how well the process goes with each individual. Some supervisors are much more inventive and open than others about how they facilitate learning and growth from daily clinical experiences of an intern or resident. Supervision involves differences in power related to the levels of expertise of the two parties, which tends to mean that growth in individual judging and deciding of a normative type—typically modeled by the supervisor--is likely to be facilitated by supervision. As a professional gains in expertise and identity with his or her field it becomes increasingly possible to operate in a flexible manner at Level 3 and to move to Levels 4 and 5 of the *Judgment and Decision Making Rubric*—which require attention to group and organizational goals.

Use of resources is factor "d" in the *Judgment and Decision Making Rubric.* Among the resources that are most important for quality judging and deciding are the support and guidance from others in the processes. Another reason for including this factor is the recognition that each decision occurs in an operational situation or context. Decisions based on personal preferences often fail in actualization because resources, whether personal, social, or organizational, do not match up with the intent.

Assessment and Evaluation in Judging and Deciding

As emphasized in the sections on the types of bias and social influences, assessment is the key to learning about how things actually work or turn out. By inference from real assessments and evaluations it is usually possible to decide on next steps or remedial steps that will carry intentions forward. PE as an educational model has the advantage of operationalized processes, procedures, and tools that can be relied on as best estimates for educational problems at all levels of a system. Assessment is used to achieve insights about how to improve both processes and outcomes in specific contexts. Utschig and Apple (2009) provide guidance for improving assessment in academic contexts.

Evaluation must be used in making a final decision, i.e., to answer the question of whether the decision meets preset

standards. Assessment, i.e., the ongoing collection of interim or formative insights from empirical observations, is of better quality if criteria and standards are available and consciously used during all four phases of the *DADA Loop Methodology*. Important criteria (Table 1) are similar to those that define excellence in educational processes, e.g., Hintze-Yates, Beyerlein, Apple, and Holmes (2011) and ecological leadership (Harms & Leise, 2011).

The large volume of research on judgment and decision making that has a focus on expert models involving statistical evaluation and algorithms or on identification of biased reasoning makes it a challenge to create a balanced working process that also includes other factors. As can be seen from examination of the five factors in the holistic decision making rubric presented here, it is equally important for a decider to consider what knowledge or expertise is needed, the social context, the nature of resources available, and to apply assessment and evaluation skills.

Ultimately, the major challenge in making sound decisions is how to become aware of how and why current articulation of alternatives may lack validity in terms of even bigger or more important concerns. Decision makers must find a middle ground between ideal or total system solutions; decisions focused too narrowly on procedures or roles are unlikely to "move" from "Red" ("traditional") to "Green" ("growth-oriented") as defined by Hintze-Yates, Beyerlein, Apple, and Holmes (2011). For example, Stross (2012), in a column in the Business section of the *New York Times*, described how the U. S. Air Force decided, in late 2012, to cancel certain parts of a complex modernization of its logistics software system. It became clear, years after the initial decision, that assumptions for creating a complete system were flawed because parts of the system could not be integrated without costs escalating beyond available budgets. Hintze-Yates et al. argue that staying in a "red zone" without consideration of what could be possible tends to reduce "out of the box" creative thinking, assessment, and support that can be facilitated by consciously moving to "green zone" processes and alternatives.

Explanation of Rubric Factors and Levels

The *Judgment and Decision Making Rubric* (Table 4) represents how typical attitudes and skills can be identified and assessed as five "levels" of quality. At each level, the composite of the five statements (one for each of the five factors of a. Information Sampling, b. Mental Representation, c. Social Context, d. Use of Resources, and e. Assessment) provides a sampling of behaviors, attitudes, and performances related to the focus of attention and the way judgments are typically handled at that level.

The judging and deciding model in this article is intended to support substantive decisions such as whether and how to improve nutrition, mental health, or relationships; make a large purchase; start a business; change jobs; manage a large project; or implement a quality change such as applying the Process Education model.

Judgments are the focus of the five quality levels in the *Judgment and Decision Making Rubric* because decisions, the step before action in the *DADA Loop Methodology*, can be improved only if the judging process is sound. A combination of the judgment descriptions (statements for factors "a" through "e" at each level) support assessment of the level/quality of both judging and deciding dimensions. (Table 1 provides separate sets of criteria for the two processes as a guide to what might be assessed.) The following are the quality levels with Level 5 being the most complex.

1. Intuitive Decision Maker
2. Bias-Reducing Decider
3. Empowered Decision Maker
4. Effective Facilitator of Decision Processes
5. Integrator of Collective Wisdom

Judging and deciding that shows Level-1 quality, labeled "intuitive," tends to be made on the basis of immediately available information that is assumed to be accurate for the decision. In many situations one is asked or expected to decide immediately, which results in increased influence of multiple types of bias on thinking, emotions, and behavior (Table 2).

The second level, "bias-reducing," describes judgments made with more caution about accounting for biases from groupthink, cognitive biases, role expectations, and situational pressures. Quality limitations at Level 2 include lack of criteria and standards or reliance on external guidance from supervisors or mentors—however, Level 2 includes positive steps of growth related to awareness of biasing influences that could lead to poor quality or errors. Level 2 represents the typical challenges needing to be met by applied learners such as interns. At Level 3, the judgments are "empowered" as indicated by independent performance with effective assessment and reflection practices.

Levels Four and Five suggest ways that judgment and decision processes themselves can be creatively applied, e.g., use of organizational social media and ecological leadership strategies for communication with and involvement of more stakeholders. At the highest level the decisions, even those that are the responsibility of executive leadership, will readily be interpreted by followers as

Table 4 Judgment and Decision Making Rubric

(Levels 4 and 5 in this rubric are intended for application beyond an individual perspective.)

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5. **Integrator of Collective Wisdom** *(Actively "mining" insights from cycles of assessment and evaluation to institute improved process knowledge in support of long-term outcomes.)*

   a. Uses a knowledge creation cycle for gathering of information and insights from a wide array of stakeholders using a well-designed data gathering and sharing system.

   b. Articulates decision alternatives that take into account results of open communication with critics.

   c. Uses social networking and transparent, democratic methods to assure that inputs have been received from concerned stakeholders—even when leaders must make the final decision.

   d. Makes available administrative support and all necessary resources for the decision process as well as implementation.

   e. Evaluates the quality of performance of support systems as well as the decision process and implementation.

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4. **Effective Facilitator of Decision Processes** *(Improvement of application of a decision making methodology with emphasis on analysis of data and of ways to more efficiently and validly incorporate data into decision processes.)*

   a. Identifies the strongest data analysis and sharing tools available to enhance quality of the information base.

   b. Articulates decision alternatives so features or elements can be compared and contrasted for value and validity.

   c. Predicts sources of social bias and takes specific measures to observe and analyze how these are influencing a decision process.

   d. Clarifies the nature and level or amount of resources available for each decision.

   e. Includes external assessors to validate the quality of a decision making process.

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3. **Empowered Decision Maker** *(Goal-oriented movement based on sound awareness and understanding.)*

   a. Consistently samples a full range of knowledge that is based on scientific and professional standards of scholarship.

   b. Mentally represents the decision in a flexible manner that is more abstract than a simple action.

   c. Adopts team or group strategies to assure that skepticism plays a role in the assessment of judgments and steps in making a decision.

   d. Identifies personal, team, material, and expert/supervisory resources needed for full implementation of a decision.

   e. Makes real-time changes to the decision process that will reduce bias and increase quality of the decision in terms of value beyond the immediate decision.

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2. **Bias-Reducing Decider** *(Application of research on cognitive and affective sources of bias to improve judgments preliminary to decisions.)*

   a. Samples some relevant knowledge but without a clear set of standards for completeness of exploration of knowledge sources.

   b. Represents situations accurately and beyond immediate personal impressions.

   c. With guidance, recognizes influences on decision making from groupthink, power differences, and social roles.

   d. Tends to underestimate the significance of key resources and expertise for implementing a decision.

   e. If guided, can use procedures or standards external to personal opinion that are available for the assessment of steps in a decision.

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1. **Intuitive Decision Maker** *(Using only available information and personal perceptions to make important decisions.)*

   a. Samples information from immediately available sources that are assumed to be representative and valuable for anchoring judgment.

   b. Relies on immediate perceptions for representation of the situation at hand.

   c. Assumes, without reflection, that social influences have not distorted the steps used to decide.

   d. Avoids or is unaware that others may be available to facilitate improvements in how decisions are made.

   e. Describes personal reactions as "evidence" that a "good" decision has been made.

(Factors: (a) Information Sampling, (b) Mental Representation, (c) Social Context, (d) Use of Resources, (e) Assessment)

wise, equitable, and reflecting long-term well-being of everyone in the organization. Wise leaders recognize the value of transparent and substantive collaboration across all parts of the organization; individuals then are able to validly assess their own judging and deciding as valued participants.

When decisions of others, e.g., managers or leaders, are perceived as or known to be flawed, individuals are likely to change the focus of their decisions to consideration of strategic alternatives for influencing the direction of the leaders or opting out, e.g., focusing on what can be controlled or seeking employment elsewhere. By changing the perspective of Levels 4 and 5 to a group or organization perspective, the rubric "message" is that individual quality can proceed only so far before the contextual factors override the control of individuals.

Case Studies

General Examples

Qualities of judging and deciding performance are modeled in the five levels of the holistic *Judgment and Decision Making Rubric*. Individuals are prone to inclusion of biases, sometimes to an extreme extent as explained by Zimbardo (2008). Among the biases is the human tendency to assume that perceived patterns almost always have real meaning and therefore can be explained. A widely reported example is the selling, by many employees, of their mutual fund stocks within 403(k) retirement portfolios when the market fell sharply at the beginning of the recent "great recession." Although anxiety arousing, even extreme variations in business cycles and markets in relatively stable countries follow a pattern of "regression to the mean" which means periods when prices have fallen are opportunities to invest rather than divest. Even experts cannot outguess broad patterns of change for which there is no definite causal explanation. Multiple sources of bias (Table 2) come into play when situations or social factors are powerful enough to reduce awareness of how judgment is being affected. If reasoning seems ineffectual, individuals respond emotionally. The methodology and rubric tools in this article are intended as resources to put emotionality into a proper role—important decisions always involve passion for a certain type of outcome.

Poole and Lamb (1998) illustrate the challenges involved in judgments about whether child sexual abuse has occurred. Many errors have resulted from reliance on various "syndromes" thought to be relevant, but both scientific research and courts have rejected the "evidence" collected in this way. Poole and Lamb counsel that it is possible to improve clinical judgments

and related decisions, e.g., about whether a child has been sexually abused, by attending to base rates known from research, being skeptical about hypotheses, maintaining records to aid memory, and following protocols that direct attention to important questions and criteria.

The *DADA Loop Methodology* and the *Judgment and Decision Making Rubric* tools, if used in a quality manner as suggested by the criteria in Table 1, could guide clinical professionals to improve their discernment and analysis in support of the holistic quality of their professional judgments over time. Educators and learners could benefit in similar ways. Learners will respond more accurately and more creatively if presented with challenges that reduce, to a manageable degree, needs to select knowledge, manage social interactions, and assess progress. Activities and learning environments can be designed for the developmental or complexity level most relevant by using PE principles and processes. The methodology and rubric are expected to add to the quality of educational decisions and curriculum materials by adding a new dimension for assessment and evaluation efforts.

Education Examples

The following cases feature educational scenarios that illustrate quality levels for judgment and decision making. PE educators have the benefit of an integrated system of theory and practice but, like other professionals and people-in-general, they cannot always discern an effective objective for a context or the nature of influences on such decisions. An insight to keep in mind about the processes of judging and deciding is that individual growth is very likely to be prominent in the first three quality levels in the *Judgment and Decision Making Rubric*. Levels 4 and 5 represent conditions in which ecological leadership and organizational collaboration become essential; individuals still must perform with advanced judging and decision skills but the needs and success of an organization require creative strategies that integrate individual strengths and sources of operational information, e.g., as described in Davenport and Manville (2012).

> **Case 1:** An educator considering a first implementation of Process Education.

Faculty member "A" has attended a PE teaching institute, with support from his dean, and is trying to decide how to get started. His clearly presented lectures with lively question/answer sessions have resulted in stellar student evaluations so it is important to avoid any regression in this respect. Some peers have also taken an interest in Process Education but

plan to wait until they feel clearer about how to make changes. He calls the teaching institute facilitator who suggests that he contact an experienced PE mentor to help with deciding how to move from his successful but traditional approach to a more active-learning delivery of the introductory course he would like to start with. After a couple of phone sessions with his mentor he decides to address the challenge by designing three activities that involve key learning skills for majors in his discipline. His mentor makes suggestions about modules and methodologies to use as a guide and provides assessment of drafts until the three new activities are ready for use in the upcoming term.

Faculty member "A" exhibits Level 3 decision skills (Empowered Decision Maker) by gathering a realistic amount of knowledge that supports his decision to design and use three process activities in place of presently very successful traditional presentations. Although social support from peers is relatively limited they are interested in PE, and the initial changes do not require external authorization or support. Use of mentoring provides a social and motivational resource to help with resolving uncertainties, and adds substantial assessment feedback as well as information to share with peers. Recognizing that student evaluation data is a concern, he keeps his dean informed of his progress and also takes time to orient his students about the changes and why they are important for college success even though they add some ambiguity to the learning process in contrast to what is typical in most courses at the institution.

Case 2: A department chair collaborating with colleagues to develop a new major.

An opportunity arises for creating a new program based on Process Education principles. The chair knows that several members of the department are not on board with this plan because they believe more traditional methods will be much easier to get approved and will be better accepted by marketing and enrollment. The dean has publicly expressed interest in the active learning that will be increased by methods recommended by process educators. To avoid a long series of discussions, the chair decides to create a proposal in which he describes the overall plan and some of the types of activities he believes will produce the outcomes needed in the new major. Department faculty members are divided about the plan; however, the majority approve going ahead and agree to take on some of the work as recommended by the chair.

The department chair appears to exhibit Level 1 decision skills (Intuitive Decision Maker) because he assumes that he has enough information and authority to proceed: the dean wishes the department to produce a new, active learning major. His model represents Process Education methods except that buy-in is limited by his decision to move forward first with his own version. His department faculty colleagues are somewhat relieved that he has taken responsibility for the initial planning but there may be serious issues with their cooperation as challenges emerge. Use of the "appreciative inquiry" approach (Davis, 2007) is a resource for facilitation of faculty buy-in and involvement that could potentially reduce groupthink, increase social support for a new major that truly reflects department strengths and resources, and make it natural to assess progress with the development and quality of the initial implementation.

Case 3: A college working on a new strategic plan

The VPAA (Vice President for Academic Affairs) is charged with creating an improved strategic plan for a college that appears to be losing its focus. Although enrollment has been stable, this outcome has been achieved by offering several new degrees that draw some new student populations but also tend to draw away students from the more established programs. In addition to presenting institutional data, the VPAA facilitates the initial meetings by using the appreciative inquiry approach (Davis, 2007).

To facilitate articulation of the main issues, the VPAA starts with the last phase, Assessment, of the *DADA Loop Methodology* because (a) strengths and areas of improvement of current programs and operations need to be collaboratively identified, and (b) the quality of collaboration skills needs to be assessed using criteria that define success of teamwork and critical thinking skills. The next step is to use the methodology to increase discernment of assumptions and sources of bias that will influence what alternatives are formulated, e.g., personal consequences for contracts of some faculty. After working through an initial stage of planning, the holistic *Judgment and Decision Making Rubric* is used to assess how well and how consistently the teams are meeting quality standards.

The VPAA appears to meet Level 4, Effective Facilitator of Decision Processes, by focusing on application of the decision making methodology with assessment support from the holistic rubric. An insight is that effectiveness with this facilitation approach for one significant unit of the institution may create a foundation for future improvements with ecological

leadership that require both individual and group inputs and actions in concert to achieve integration based on collective wisdom (Level 5). Davenport and Manville (2012) provide several clear examples.

Conclusions

The processes of judging and deciding are especially susceptible to biases and influences that remain outside conscious awareness. Even individuals who have explored these influences and understand them tend to exhibit the effects of biased thinking and feeling in real situations. Extensive research shows that most people are more sensitive to risks of loss than they are to equal probabilities presented in terms of benefits that could occur. This sense of risk is an important factor for educators who are passionate about trying new methods. Change often stimulates resistance from peers and students as well as from administrators, e.g., if evaluation ratings go down. The tools presented in this article can assist with assessment of risks as well as quality of judging and deciding. The *DADA Loop Methodology* is designed to encourage exploration of knowledge about decision alternatives as well as careful assessment of each judgment which is likely to help users move from quicker, intuitive judging and deciding to slower and more thoughtful progress when making any important decision.

The holistic *Judgment and Decision Making Rubric* is based on the main factors gleaned from the review of the multiple kinds of research done in this domain. Janis and Mann (1977) and Kahneman (2011) were seminal resources. Among the insights from this research is that quality of judging and deciding must be framed in terms of social, organizational, and community norms and influences that are often beyond the control of individuals. Increasingly, researchers and professionals are addressing these "communitarian" aspects, e.g., clinical professionals often need peer and consultative support not only for specific decisions but for assessing how each decision is influenced by personal, legal, and social mores or perceptions. Because there are many sources of bias, it is essential to use others as experts or support resources. This insight informs the design of the rubric to reflect growth from an individual decider's perspective for the first three levels and then, at Levels 4 and 5, to assume that higher-quality individual skills are typically used in group or organization contexts, e.g., for strategic planning or project collaboration.

The theory and tools presented will assist process educators, at all levels of experience, to improve their judging and deciding performance quality in ways that exceed intuitive decision making for substantive problems. It is important to increase self-efficacy (performance expectancies) when assessing sources of influence and to increase growth in quality of judging and deciding in all life and professional domains. The background and tools in this article are based on the assumption that judging and deciding are meta-process that are operational when applying any methodology and for effective assessment and evaluation. The Process Education system can be significantly improved by incorporating the judging and deciding processes because these are essential performance features of all educational processes.

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