

A judgement-based model of workplace learning

James A Athanasou
University of Technology, Sydney

The purpose of this paper is to outline a judgement-based model of adult learning. This approach is set out as a Perceptual-Judgemental-Reinforcement approach to social learning under conditions of complexity and where there is no single, clearly identified correct response. The model builds upon the Hager-Halliday thesis of workplace learning and incorporates elements of the image theory of decision-making as the engine for judgements. A power curve is used as a description of cognitive acquisition over time and serves to epitomise the learning process. Seven testable assumptions are derived from the model.

There are many substantive notions of learning that focus on theoretical as well as descriptive aspects. For instance, explanations of learning in a workplace may range from very specific, industrial engineering perspectives of learning (Dar-El 2000) to accounts of

learning as an individual and social process (Illeris 2003). This paper offers a macro-level of analysis for social learning, especially in the context where there is no single, clearly identified, correct response. Its origins lie in a model of workplace learning derived from Hager and Halliday (2002), who first set out a relationship between context, judgement and learning. They saw learning as concerned with judgements that are potentially fallible but also contextually sensitive (Halliday & Hager 2002). Their central theme is a link between judgement and learning: 'making judgements is a central holistic workplace activity that is the expression of practice-based informal learning from work' (cited in Hager 2001, p.352).

These workplace-learning conceptions are directly related to all adult, social learning and were translated into a testable Perceptual-Judgemental-Reinforcement model (Athanasou 2002) that is depicted in Figure 1. This representation emphasises the fact that learning encompasses judgements and is contextually dependent and purposive, but the components and processes in the model described in this paper vary substantially in detail from the original Hager-Halliday conceptions (Hager 2001; Hager & Halliday 2002). In this paper, learning is defined both in its traditional and psychological meanings respectively as "the act or process of acquiring knowledge or skill" and as "the modification of behaviour through interaction with the environment" (Delbridge, Bernard, Blair, Peters & Butler 1995, p.1008).

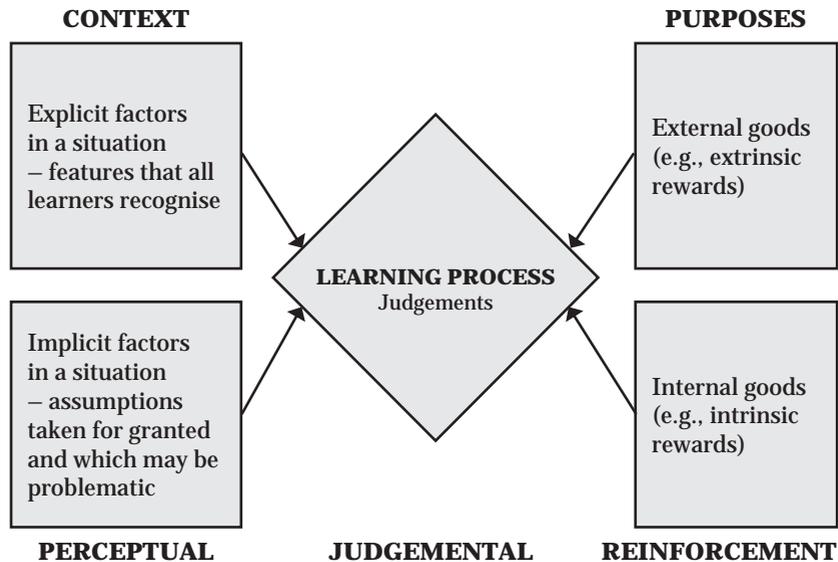


Figure 1: The Hager-Halliday approach expressed as a Perceptual-Judgemental-Reinforcement model of learning (note the model is recursive – after Athanasou 2002)

Coincidentally, the context for learning and purposes for learning depicted in Figure 1 are also embodied in the image theory approach to human decision-making (see Beach & Mitchell 1996). Image theory takes as its starting point the principles held by each person (that is, the self-evident truths). It also recognises that each person has a ranking of goals to achieve. Finally, it is accepted that plans or actions are adopted for the achievement of goals. The image component comes from forecasting or imagining potential outcomes if a plan were to be undertaken as well as when one is monitoring the implementation of a plan of action. A shorthand representation of the ordered components of the image theory structure is set out in Figure 2. The following sections of this paper focus only upon the three major parts of the learning process.

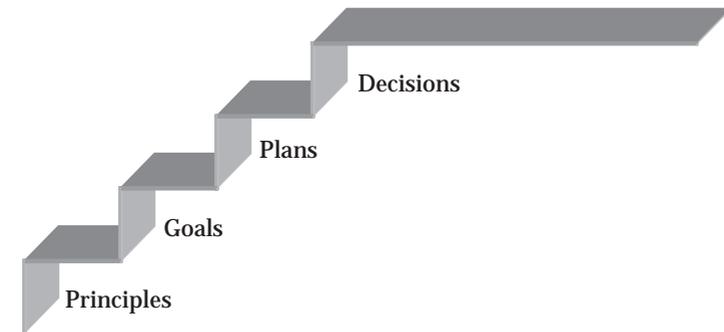


Figure 2: A representation of the hierarchical components of image theory

Perception

The perceptual process is the foundation of learning and occurs within a frame, which is:

... that portion of the decision maker's knowledge that he or she brings to bear on a particular situation in order to endow that situation with meaning ... it involves using information about the present situation to probe memory (Beach & Mitchell 1996, p.6).

It is hypothesised the individual perceives patterns that influence his/her judgements. Specific patterns will increase the probability that a particular judgement will be made, so that over time many judgements come under specific contextual control. This description categorises and explores the contextual antecedents of judgements as implicit and explicit.

If the Halliday and Hager (2002) proposal is correct, then people will respond to both implicit and explicit features of the situation in lawful but idiosyncratic ways. Their hypothesis has lent itself to a focus upon intensive investigation of a few individuals using social judgement analysis (for example, Athanasou 1999, 2003; Athanasou & Cooksey 2001).

Judgement

Two types of decisions and two types of tests are derived from image theory. These are summarised in Table 1. In other words, after having perceived a situation, people make decisions – to adopt or to progress. In making these decisions, they apply two judgement tests in each instance. Firstly, they may screen out options that are clearly not acceptable with their principles, goals or plans and/or choose the option that maximises utility for them or their workplace or organisation.

Table 1: Decisions and decision tests in image theory

Decisions	Decision Tests
Adoption decisions	<ul style="list-style-type: none"> • <i>adoption screening</i> involves discarding options that are not acceptable; • <i>adoption choice</i> involves choosing the most favourable outcome.
Progress decisions	<ul style="list-style-type: none"> • <i>incompatibility</i> is assessed as the weighted sum of the violations of one's principles, goals and plans; • <i>profitability</i> refers to the strategies available as a function of the nature of the choice (e.g. unfamiliar, complex, ambiguous, unstable), the context for a decision (e.g. irreversibility, iterative, significance, constraints) and the decision-maker's own characteristics (e.g. strategy knowledge, motivation, ability).

Secondly, with progress decisions, two tests are also applied but these are quite different in character. These decisions may arise where there is a degree of incompatibility in courses of action. The focus is upon violations, contraventions or some form of interference in one's plans or goals and these are all or none. People may set benchmarks for rejection. These are the levels of incompatibility beyond which they are not prepared to accept an option.

Profitability, on the other hand, represents a collection of strategies. It is based on the nature of the choice, the environment for the choice

and the personal background of the decision-maker (see Beach & Mitchell 1996, p.8). For instance, some choices might be familiar, relatively straightforward, consistent in their features and unchanging over time. The environment in which a decision is made might be one where the decision can be altered easily or one where parts of the decision can be made over time or one where any outcome is acceptable or where there are no social or economic constraints on choice. Finally, there are attributes of the decision-maker, such as their knowledge of different options, their decision-making ability and their willingness to solve the problem. As Beech and Mitchell (1996, p.8) noted, the rationale for decision-making is best visualised in terms of cost-benefit. This recognises that there are pluses and minuses associated with making judgements and sometimes the cost of some decision-making strategies may not be optimal in terms of the benefits that are likely to be produced.

To summarise, a perceptual process has been conceptualised as providing input into the judgement. Next, it was indicated that adoption and progress decisions are moderated by decision tests in which screening, choice, incompatibility and profitability are used as tests. This raises issues of incompatibility and it was noted that there is a trade-off in the cost of a decision and its utility for the person. It is proposed that the set of all these cognitive processes might usefully characterise the complex judgements involved in social learning where there may be more than one potentially correct response. No claim is made that the model depicts knowledge acquisition or skill formation. It merely provides a framework for analysis and description of decision-making across a range of contexts and individuals.

Reinforcement

From the time of Dewey, reinforcement has always been promoted as a formal factor in learning and two types of reinforcement are

considered in this model. The first is straightforward and relies upon the extent to which one's principles, goals and plans are executed satisfactorily. This satisfaction relates to the internal and external goods and feeds into future decisions to make the model recursive. The second type of reinforcement may be in the form of cognitive input or feedforward, as in vicarious learning or modelling. Reinforcement, with perception and judgement, form the foundations of this social learning model but one cannot say that learning has occurred without performance (that is, a change in behaviour over time).

Performance

Observable performance is the essential basis for determining that learning has occurred. Even decision-making, which is one of the most covert aspects of human learning, ultimately has to be expressed in some form (that is, performed) in order for an external observer to say that it has occurred. This performance characterises the change in behaviour that is the essence of the more technical of the two definitions of learning provided by Delbridge *et al.* (1995, p.1008).

The change in behaviour following practice can range from decision-making, choices, preferences, recall, problem-solving, social responses or skilled performances and, as emphasised previously, this change in behaviour has always been the observable hallmark of learning. In the workplace this is seen in complex repetitive actions right through to expert performance or the ability to produce or vary judgements under conditions of uncertainty. It is depicted by the familiar learning curve. Indeed, it is argued that any documentation of learning really needs to be undertaken in terms of the speed, duration, latency, frequency and accuracy of any response.

A mathematical power curve has been used traditionally to represent both cognitive and motor skill acquisition over time. Cognitive learning was emphasised by Hager (2001) and also by Beach and

Mitchell (1996) and involved decision-making, remembering instructions, following sequences and making judgements from the information available. In many situations, there are cases or episodes or experiences where there is instantaneous or essentially one-trial learning (for example, remembering an instance, recalling a syndrome or set of symptoms, observational learning or learning from another's cogent example). In these most highly cognitive cases where manual skills do not impede performance, the learning slope is assumed to be horizontal or near horizontal. In highly manual tasks, speed or accuracy is mainly a function of the number of trials and reduces exponentially. It is beyond the scope of this paper to take into account factors such as forgetting or relearning a task.

Concluding comments

To summarise, the model that has been developed has combined a range of theoretical perspectives. It has synthesised a number of perspectives into a model for the study of individual learning, especially cognitive learning under conditions where there may not be a single, identifiably correct answer (for example, job choice, determination of learning preferences). The focus is clearly on mapping an individual's learning rather than making statements about group performance.

This paper took judgements as its starting point and then set this out as a synthetic model for the study of learning. Image theory was incorporated into the Hager-Halliday framework to form a model that we can now start to evaluate on the basis of empirical evidence. Some testable propositions from the model are:

- there are implicit and explicit factors in the judgement process;
- there are external as well as internal goods affecting learning;
- the decision frame for judgements comprises principles, plans and goals;
- judgements encompass adoption or progress decisions;

- there are adoption, screening, incompatibility or profitability tests in decisions;
- repeated judgements follow a learning curve; and
- repeated judgements result in discrimination of implicit and explicit contexts.

The various facets of the model are not yet complete and future revisions of this framework will add a component of domain-specific expertise. For the time being, it may provide a helpful as well as descriptive framework at a macro-level of analysis for the applied study of individual learning. Some mathematical aspects for the social judgement analysis, the determination of incompatibility and the description of a power curve of cognitive learning over repeated trials are available from the author on request. The aim has been to provide a model with which we can analyse performances as well as modify the rate of learning in a coherent and structured fashion.

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About the author

Dr James Athanasou is Associate Professor in the Faculty of Education at the University of Technology, Sydney. He lectures in the areas of educational measurement, psychology and research. His research focuses on career development and vocational psychology. He is the editor of the *Australian Journal of Career Development*.

Contact details

Faculty of Education, University of Technology, Sydney, PO Box 123, Broadway, NSW 2007
 Email: Jim.Athanasou@uts.edu.au