ThinkTeam: GDSS Methodology and Technology as a Collaborative Learning Task

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INTRODUCTION

People make decisions all the time. They make decisions alone; they make decisions together with others. Some fields have been focusing on the process of decision making and have attempted to help people make decisions. Psychologists, trainers, and organizational development consultants are aiming to develop decision-making theories and methodologies and train people to use them in business, economics, urban-planning, and more areas of management and personal life. Computer-based decision support systems emerge in various fields. These fields are mainly interested in the actual process: helping people make better decisions. This article is about an indirect use of decision-making methodology: we use it as a learning task.

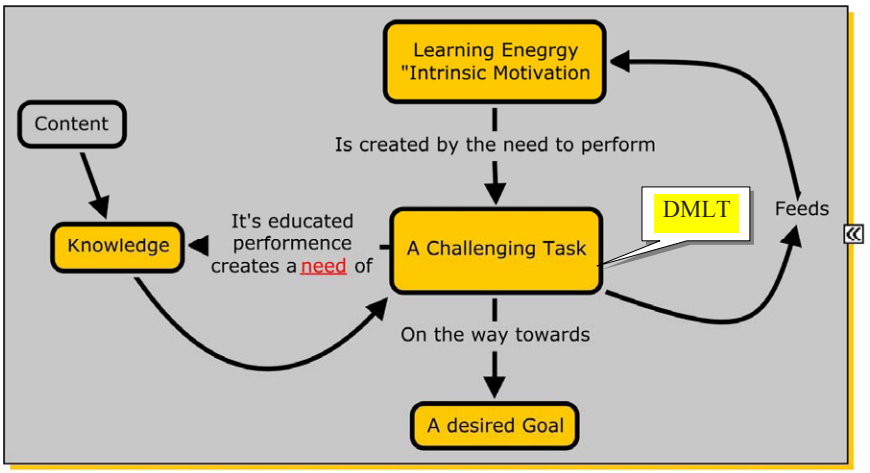
As technology can process large quantities of integrated information while presenting results in a visualize manner, technology was harnessed to aid decision makers in various ways. Decision support systems (DSS) have been used to present decision makers with all possible relevant knowledge so they can take into account as many variables as they can before making an informed decision.

In the field of education, we find that most learning about decision making is aimed at administrative purposes, sometimes including teachers and even students as decision makers.

Because of the elaborative nature of the decision-making process, seeking and organizing as much knowledge as possible to make informed decisions, this article is proposing decision making as a highly potent, engaging learning task for learners of all types and ages. Collaborative decision making is even more engaging as people, working together on a problem, need to evaluate alternatives while reaching a consensus. This article presents a model and a tool for collaborative decision tasks in a learning situation of any curricular or non-curricular content.

Using one of the most popular models of decision making—multi-attribute utility theory (MAUT)—and using a computer-based group decision support system (GDSS) to help learners individually and collaboratively identify, organize, visualize, and evaluate relevant knowledge from any type of content, we present here a some case studies and examples of the use of decision making in learning within educational systems.

Figure1. Theory of need



BACKGROUND

This background overview describes the evolvement of a GDSS learning model from its initial introduction as a learning task within a specific learning environment, through the practical and theoretical realization of its potential contribution to small group learning.

An Answer to a Specific Need

When commissioned to design a learning game on the "industrial cycle" for a national learning center (1990), one of the required specifications was "four learners per one computer." Seeking an activity that can engage learners in playing the game and carry the content with them when they leave, the only sensible solution was decision making. The rational that had led years later to the development of "Theory of Need" is presented in Figure 1.

Years of inquiry into intrinsic motivation theories, game theories, and collaboration have left me with the conviction that there is no better task to generate need than having to make a decision that is based on a rigorous analysis of alternatives and attributes—or, in other words, MAUT-based decision making. This realization will be supported in the following sections with theoretical analysis of learning tasks' pedagogical potential.

MAUT

When searching for a structured or semi-structured decision-making process, two models came to light as potentially suitable for the methodology of dealing with decision making learning task (DMLT). MAUT, also known according to MindTools (n.d.) as "grid analysis," "decision matrix analysis," and "Pugh matrix analysis" has been selected as simple enough to implement. A more recent model of decision making, similar in its basic principles to MAUT, is analytic hierarchy process (AHP) (Saaty, 1977), which requires a more rigorous criteria weighing analysis that is not necessarily needed for the role of decision making in the learning process.

When learners are presented with or design a decision-making task, and the decision-making process follows a MAUT methodology, the learners need to access knowledge that will help them identify potential alternatives, build a criteria profile by which the alternatives are evaluated, assign weight to each criterion, and evaluate alternatives one by one based on that profile. The need for knowledge is authentic and learning happens indirectly, while making the decision.

Learning Tasks Pedagogical Potential (Why DMLT is a Highly Potent Learning Task)

To support the value of group decision making as a learning task, here is a look at McGrath (1984) Group Task Circumplex (see Figure 2).

We can see that decision-making tasks fall within the left side of the circumflex, dealing with situations that require intellectual analysis, creativity, and judgment, while having the group involved in situations that facilitate and encourage negotiation, collaboration and conflict resolution.

Figure 2. McGrath's (1984) group task circumplex