

Comparison of educational decisions made intuitively and with a decision support system

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The literature describes excessive dependence on intuitive thinking in formulation of decisions at all levels of the educational system.

This paper presents a comparison of the effectiveness of educational decisions taken by means of a holistic-intuitive procedure and a computerized decision support system (DSS) that promote systematic and accurate judgment. Two groups of teachers were asked to resolve an educational problem, first using the holistic procedure and a second time with the DSS program. Each group was given an identical dilemma but at different levels of complexity. One group was offered a limited number of alternatives for resolving the dilemma as well as a limited number of criteria for comparing the effectiveness of the various alternatives. The other group was presented with a larger number of solution alternatives as well as a larger number of criteria.

The findings confirm the hypotheses. The intuitive and computerized methods elicit similar results when the question to be resolved is simple. However, in dilemmas involving complex reasoning, the two procedures yield different solutions. The study sheds light on the cognitive processes that define each decision-making approach. The findings help in determination of optimal decision-making procedures for different types of educational situations.

Keywords: Intuitive decision making; DSS

1. General background

The dynamics of school life require that the educational staff must cope at times with complex dilemmas. Some are decided intuitively and others through a systematic procedure of one sort or another. In the literature, one encounters criticism of decisions based on a unilateral approach, be it intuitive or systematic, for not considering the qualities of the other.

Intuitive decisions have the advantages of rapid response, comprehensiveness and creativity, freedom from obligatory resolution procedures, and flexibility in response to unconventional situations [1, 2]. Because such decisions tap into information residing in subconscious memory, they contribute greatly to solving information-intensive problems [3]. Furthermore, there are instances in which a delayed response renders it irrelevant; the immediacy of intuitive decisions contributes to their significance [4].

The advantages of intuitive judgment, however, are tempered by evidence of errors in intuitive judgment [5, 6]. Difficulties in using intuitive decisions arise in complex situations [7] where large masses of information are simplified and delimited by heuristic thinking. At times decision makers simply ignore some of the data [8, 9]. The process exposes decision makers to the influence of non-cognitive factors that include biases, empathy and emotions, thus impairing their capacity to reach a balanced conclusion that takes all aspects of the problem into account [10-12].

The literature deals extensively with reports of errors in educational decisions that are taken intuitively. This problem results in faulty assessment of achievement and in erroneous estimation of the

potential of students. As a result, students receive inappropriate advice for the continuation of their development [13].

Auxiliary procedures have been designed to promote the formulation of balanced decisions. One such program is the Decision Support System (DSS). A computer-based system used to support managerial decision making [14], the DSS serves as a guide to structured and hierarchical decision making and assists in reaching complex decisions [15]. The DSS contributes to high internal consistency between the principles guiding decision makers and the decisions made in practice [2, 16]. A comparison of therapeutic decisions concerning exceptional children formulated with and without the assistance of DSS shows that those who were assisted by the computer used more professional considerations [17]. Its effectiveness has also been proved in educational decision making [18]. The inclusion of a broad range of considerations in educational decisions tempers extreme emotional responses and contributes to the formulation of moderate decisions. In contrast to its mechanistic, alienated stereotype, computer-assisted decisions seem to enhance the process of systematic deliberation when dealing with complex educational situations and to maximize immunity to undesirable biases [19].

2. The study

2.1 Hypotheses

In simple dilemmas, with few alternatives and few criteria for comparison, no significant difference will be found between educational decisions formulated intuitively and with DSS assistance.

In complex dilemmas, a significant difference will be found between the decisions made using the two procedures.

2.2 Participants and procedure

Three hundred and twenty junior and senior high school teachers were asked to make a decision with respect to integration of regular students and those with special needs in the same educational framework. Some teachers were offered a limited number of alternatives for solving the dilemma and a small number of criteria for comparing the efficacy of the various alternatives. Some were given a larger number of alternatives and criteria. Each teacher analyzed the dilemma twice, once using the intuitive procedure and a second time utilizing the DSS.

In the more extensive model, participants were originally given four possible answers. Two of the solutions advocated varying levels of support for integration, and the other two presented different degrees of opposition to integration. In order to have a uniform measurable scale on which to compare the complex decision making situation with four decision alternatives, and the simpler one with only two alternatives, the four decisions in the complex situation were combined into two main categories, each including the two decisions that favored the same general educational approach. These categories corresponded to the alternatives in the models with only two decision options.

A 2x2x2 MANOVA was performed to test whether educational decisions are influenced by:

1. procedure (intuitive or computerized),
2. number of alternatives offered to participants (two or four)
3. number of criteria (three or seven).

2.3 Findings

Key:

1 = support for integration of pupils with regular and special educational needs in the same classes.

2 = support for different frameworks for pupils with regular and special needs.

Intuitive decisions

Two alternatives and three criteria	Mean = 1.81, S.d. = .39
Two alternatives and seven criteria	Mean = 1.79, S.d. = .41
Four alternatives and three criteria	Mean = 1.25, S.d. = .44
Four alternatives and seven criteria	Mean = 1.16, S.d. = .37

DSS-assisted decisions

Two alternatives and three criteria	Mean = 1.83, S.d. = .38
Two alternatives and seven criteria	Mean = 1.50, S.d. = .50
Four alternatives and three criteria	Mean = 1.49, S.d. = .50
Four alternatives and seven criteria	Mean = 1.58, S.d. = .50

1. When the dilemma was complex, a significant difference was detected between the decisions taken intuitively and systematically. No such difference was found in the case of the simple problem.
2. A significant interaction was found between procedure, number of alternatives and number of criteria: $F(1,610)=2.19, p<.01^{**}$
3. A significant interaction was revealed between procedure and number of alternatives, $F(1,610)=8.53, p<.001^{***}$, and between number of alternatives and number of criteria, $F(1,610)=1.25, p<.05^*$. No significant interaction was found between procedure and number of criteria.

3. Main implications

- 1 For simple dilemmas, it is possible to reach accurate educational decisions intuitively, without resorting to external support systems.
2. In coping with complex problems, the decision-maker is exposed to distracting influences. A decision support system aids in consolidation of balanced decisions, though it does not constitute a substitute for human judgment.

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