LETTERS TO THE EDITOR

TOPIC: “The Bridge Between the Learning Research Laboratory and the Classroom.”

Educational Psychologist, 1973, 10, 105-132.

Dear Frank,

Overall I believe the symposium you published recently in the Educational Psychologist was excellent. Although, as Bob Glaser pointed out in his sound reaction, very little was said about the problem of individual differences, few could possibly disagree with the call by various symposium contributors for (1) more research on the analysis of task competencies, (2) a performance test theory, and (3) a significant theory of knowledge acquisition.

I cannot help but get the feeling in some cases, however, of deja vu. In particular, I believe that (1) significant progress has already been made in analyzing task competencies—indeed, in devising systematic methods for generating such analyses, (2) a valid performance test theory, with empirical support, already exists, and (3) the foundations for a comprehensive theory of knowledge acquisition have already been proposed and partly tested. Indeed, I have had a personal hand in much of this work. Rather than attempt the impossible task of justifying these assertions here, I would just mention that the basic theory is detailed in my recent book (1973a) and that educational implications have been described in a variety of articles (e.g., Scandera, 1973; Ehrenpreis & Scandera, in press; Scandera, 1972, 1973b). Scandera (1973c) extends and pulls together much of the most directly relevant material. For an independently conceived and generally compatible view, see Pask (1972, 1973).

More important, although I have nothing but the highest respect for all of the contributors, I do feel that certain remarks were potentially misleading and should be clarified. There is no question that instructional psychology is still an emerging field but I believe that it is incorrect to imply that (certain) current research in the near future will (for the first time) make it possible for us to “make design drawings of the cognitive structures one wants a student to acquire” (Groen, p. 117). In the pragmatic, extensional sense of task analysis, we have been doing this for years (Gagne, 1962). Furthermore, the distinction between tasks and knowledge (rules, cognitive structures) has played an important role in educational psychology research for at least a decade. To complete the argument, one needs only to point out that precisely what is being proposed has already been done. Cognitive structures underlying various content areas have been identified (e.g., Klix & Sydow, 1968) and methods for devising same have been verified (e.g., Scandera, Durnin, & Wulbeck, 1972). Even commercially available texts utilizing some of these ideas are already available or in preparation (e.g., see MERG, 1974; above educational references).

Second, the purported fundamental distinction between general propositional knowledge and specific algorithmic knowledge (p. 120) does not exist. It is sometimes convenient and appropriate to distinguish between situations where knowledge of interest is discrete and where it is stored in relation to other information. (In the latter case, the knowledge [rules = labeled directed graphs] of concern is embedded in larger networks [labeled directed graphs].) But this distinction has nothing to do with whether the knowledge is algorithmic or propositional. As a simple example, notice that while “is a triangle” is a proposition, one can only find out whether in fact a person knows the idea by presenting triangles and non-triangles and seeing if he or she can distinguish between the two. The latter involves algorithmic knowledge. In addition, propositional knowledge is not by nature general and algorithmic knowledge, specific. Algorithmic knowledge exists which is highly general (e.g., Scandera, 1973a) and the above is clearly an instance of specific propositional knowledge. As I noted in “On Higher Order Rules” (which oddly enough appeared in the same issue of the Educational Psychologist as the symposium papers), knowledge itself is neither propositional nor algorithmic. All knowledge can be represented in terms of labeled directed graphs (Scandera, 1973a). Whether it is considered to be propositional or algorithmic depends on the use to which it is put. The (same) knowledge is termed propositional when it is being acted upon; when it is doing the acting, it is called algorithmic.

REFERENCES


Sincerely,

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