Materials Review

Bung, Klaus. *Ansätze zu einer Theorie des programmierten Sprachunterrichts (Toward a Theory of Programmed Language Instruction)* Heidelberg, Germany: Julius Groos Verlag, 1972. 113 pp DM 16.

This volume is the second in a series by Klaus Bung designed to lay the groundwork for a systematic approach to language instruction. In the first volume, *Problems of Task Analysis in the Production of Language Programs,* 1970, (reviewed in *NALLD Journal,* Vol. 7 No. 1) Bung discusses interrelationships among twenty-five language skills that affect the programming of language instruction. Volume two contains additional theoretical formulations as well as specific procedures for programming. An understanding of volume one is helpful for reading volume two, since the second volume presupposes some familiarity with the first.

Throughout volume two it is emphasized that programmed instruction involves systematic, explicit planning that can facilitate exact analyses of the teaching and learning processes. Because of this planning, it is possible to view teaching and learning objectively; moreover, teaching procedures and outcomes are usually replicable and testable. In addition, variables of the learning situation may be controlled. These possibilities do not exist in most nonprogrammed instructional settings.

According to Bung, the theory of programmed instruction encompasses four principle areas: descriptive grammar, pedagogical grammar, program production and adaptation, and program implementation. Bung indicates that while there is currently no well-defined theory of descriptive grammar, the work of Chomsky and his followers in the area of transformational grammar should soon lead to the development of such a theory.

Pedagogical grammar is defined as all of the problems that are involved in the use of a target language. In the programming of language instruction this collection is divided into main problems and constituent problems. A main problem, for example, might refer to writing the target language when it is heard but not seen. Auditory comprehension, sound-symbol association, and spelling would be constituent problems in this case. In programmed instruction it is important to arrange the constituent problems individually and in groups

in such a way that the learner can follow a step by step progression in solving the problems. In Bung's work this progression is built up in branches which are called "binary flow diagrams". These are adaptations of mathematical algorithms.

In program production and adaptation, binary flow diagrams are means of working with individual aspects of language and are dependent upon the native and target languages concerned. The greater the differences between the two languages, the more necessary are the flow diagrams to help the learner overcome problems of interference. In situations where there is minimal or no interference, a specific strategy like the binary flow diagram may not be needed. The task of the programmer thus is to identify similarities and differences between native and target languages so that the smoothest possible learning paths may be provided. In this analysis transformational grammar including the identification of deep structures and kernel sentences becomes most important, for only after a systematic analysis of native and target languages has been undertaken, can the branches or flow diagrams be constructed.

The result of a series of binary flow diagrams that center on a particular language concept, or main problem, is what Bung calls the *D* diagram. In the process of task analysis and refinement, the D diagram therefore evolves from binary flow diagrams. It may be thought of as the best instructional strategy that can be developed. It is a kind of ideal that the programmer works toward constantly.

Essential to program production is the possibility of adaptation to a number of variables. Significant variables for adaptation are learning goals such as specific language skills to be emphasized to the exclusion of others, learning methods, learning time for various program parts, kinds of learners, and the teacher's qualifications and role in the program.

The vehicles for adaptation are special symbols and codes for branching. Those proposed by Bung are discussed in considerable detail. His clear, concise explanations would appear to make this system workable for a variety of language programs.

In conjunction with program implementation, the variables mentioned above are considered briefly. Regarding the teacher, it is essential according to Bung to keep in mind that he should complement the program and not dominate it. The teacher and the program should be partners. This is crucial since the best constructed program can be a failure if the teacher's role is not clearly defined, or if the teacher does not "cooperate" with the program.

The three basic functions of the teacher in programmed instruction listed by Bung are interaction, parallel instruction, and takeover. Teacher interaction may be needed, for example, if the learner

does not recognize differences in sound discrimination between his own and the target language. Parallel instruction might be advisable in situations where language cannot be programmed economically, as in the case of certain idiomatic expressions for example. Teacher take-over would be needed for follow-up with face-to-face communication of material practiced with a machine.

In this volume the possibility of *total* programming of foreign language instruction is considered. Bung suggests that it is possible but has some disadvantages. For instance, it is not always economical to develop and implement a program for all aspects of language learning. Also, although most intellectual demands of students may be taken into account in programming, emotional ones cannot. As far as motivation is concerned, the program can provide some; nevertheless, the personal motivation supplied by the teacher would appear to be necessary.

In summary, this volume is the second in a series of valuable contributions to the area of programming foreign language instruction. Those in the teaching profession interested in programming language instruction should definitely consider Klaus Bung's work indispensable reading, since it contains important theoretical formulations as well as practical implications for this rapidly developing field.

Additional volumes which are to include further developments and refinements are in the planning stages.

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