PROJECT SOLO: A STATEMENT OF POSITION REGARDING CAI AND CREATIVITY

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The Department of Computer Science at the University fo Pittsburgh and the Pittsburgh public school system are engaged in an exploration of the role of computers in the scholarly aspects of secondary school education. Sponsored by the National Science Foundation, the project is researching and testing the potential of computers for the range of subjects found in large urban school systems.

Primary emphasis is being placed on the importance of each student as a creative person who can learn to use the computer as an exploratory tool. This is in contrast to a programmed learning type of CAI which guides the student in pre-determined patterns. It is hypothesized that the long range value of computing systems in education lies in their ability to provide the individual student with a sophisticated tool that will allow him to explore, make mistakes, and under the guidance of his teacher find his own unique path to 'discovery.'

The second premise of the project is that well-tested curriculum materials which document such use of computing systems are essential, and that the preparation of these materials must be guided by practicing classroom teachers. Preliminary work with a group of Pittsburgh teachers has shown, in fact, that given the proper facilities and consultative personnel, these teachers contribute not only the practical know-how of their educational expertise, but also some very imaginative approaches to curriculum module preparation. The experience gained in a contemporary urban school system of Pittsburgh's size should prove valuable to other school systems, and conscious attention is being given to documentation and evaluation.

Some elaboration on the project name and its implications may be of interest to other workers in CAI. The word SOLO is derived from the "dual-solo" learning scheme employed in practical flight instruction. The usual flight training sequence starts with a 'student-with-instructor' (dual) phase, where there is initially much information presented by the instructor (lecture-demonstration), with guided repetition by the student. The emphasis gradually shifts to the student, however, with the instructor principally observing and correcting as the student finds his own way of comprehending and using the new ideas. But as long as the instructor is present, even though he may say or do practically nothing, there is a real dependence by the student on the instructor, simply because of his availability. The moment of truth only

Project Solo Diagram

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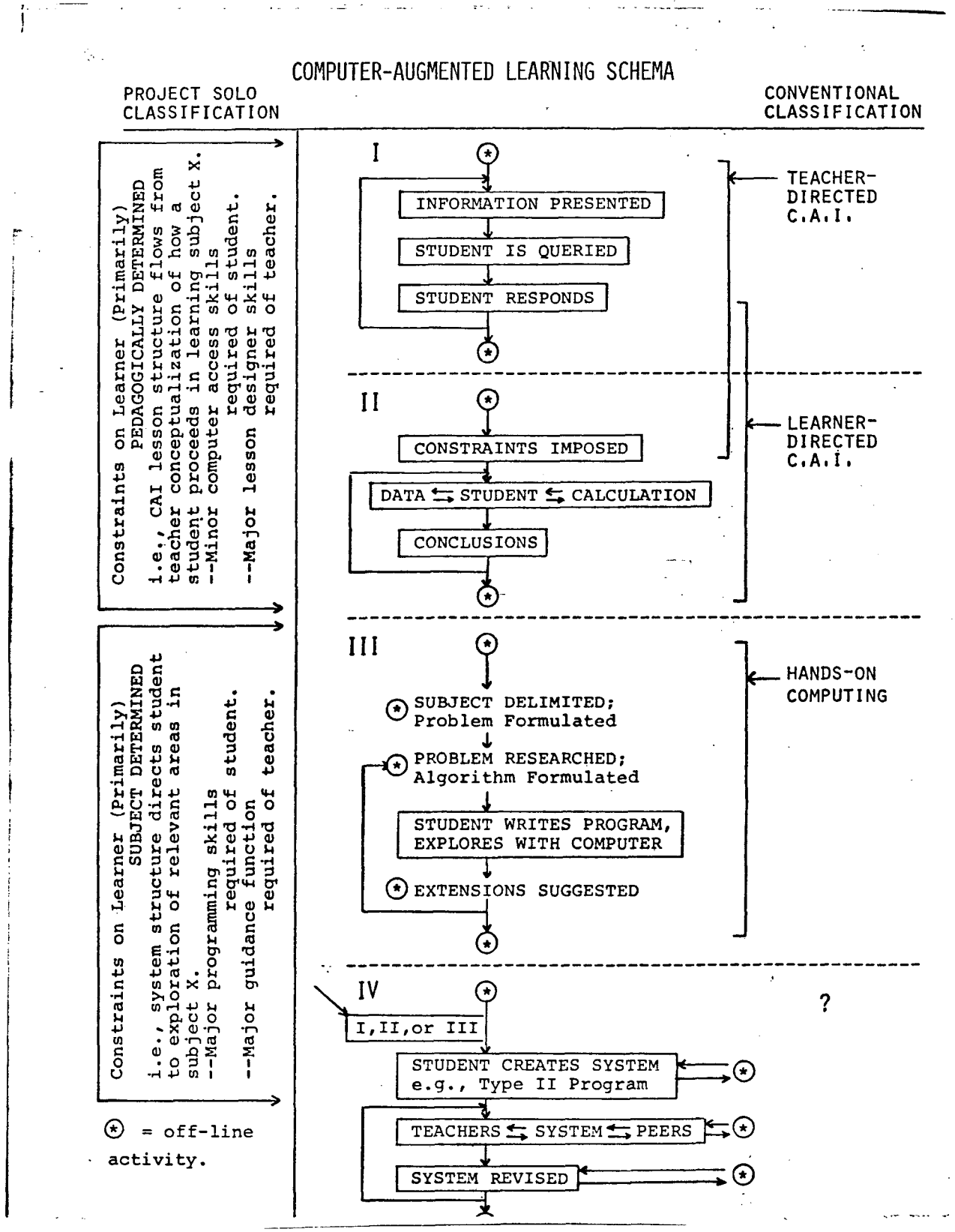

occurs at SOLO time, when the student must assume the responsibility for making all decisions. There is a radically different type of learning that takes place at this point, and when teacher and student get back together for more dual time, the student is a very different person from the learning point of view. There has been a notable increment in his receptivity and ability to absorb.

It is important to notice that SOLO implies more than "student alone." It means that the student must make his way on his own, but within a highly structured, well-prepared environment. In the flying analogy, this environment includes the aircraft itself with all its systems and their history of revision, the airport facilities and air space, and an elaborate system of air traffic control. Let us call this structure the "solo environment."

If we now transfer our thinking to the classroom setting for the more usual academic subjects, we see a great deal of "dual" type instruction, with "solo" work being limited to assignments that are done with something less than genuine excitement. The principal hypothesis of the present program is that this solo mode is a critical need in next-generation education, but that it only makes sense if coupled with the proper complete solo environment. It is precisely in this role that we see the computer performing a critical function, provided that this computer be coupled with a complete set of auxiliary factors, ranging from support documentation to skilled personnel.

Viewed from this perspective, "Socratic" mode CAI is seen as a new way for implementing the dual or guided mode of learning. This throws new light on its role in the school, and makes clear the partial nature of its potential in the total educational scheme. Conversely, by labeling hands-on computing, modeling or information retrieval a solo experience, we have clarified its partial role in the total picture. Finally, it should be noted that it is the confidence exhibited by sending our model flight student out in a real airplane where he exercises real control that welds the student-instructor relationship. Similarly, the action of making a sophisticated computer system available to a student in such a manner that he runs the show (which is really not true in conventional CAI systems) will speak volumes in establishing the teacher-student relationship. The ability to establish such an environment of mutual respect is certainly one of the more subtle, but quite exciting potentials of computing systems within the total educational picture.