

SCIENCE AND MATHEMATICS ACTIVITIES AND RESOURCES FOR TEACHER EDUCATION

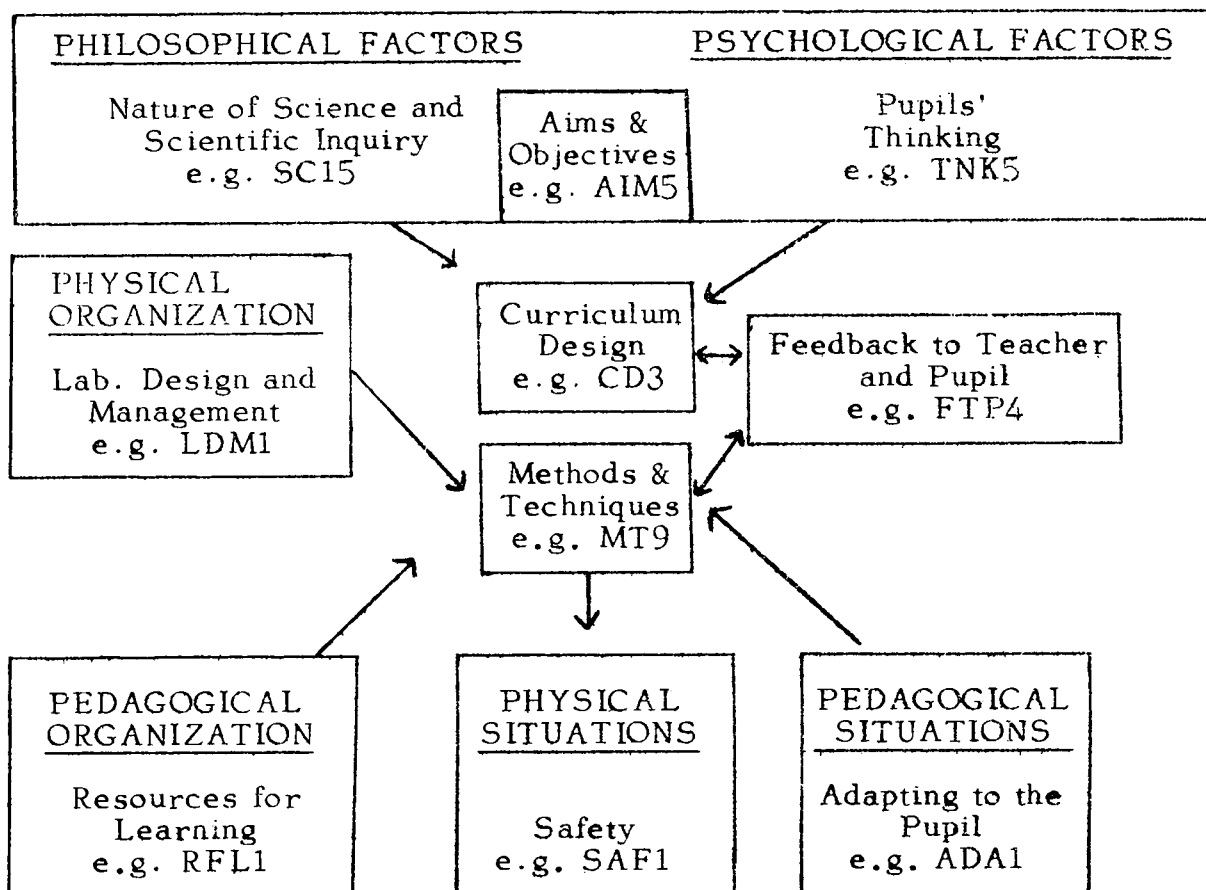
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This project was initiated in 1974, and implemented to the 1975/76 batch of Diploma students.

The objective of this project was not the adaptation of STEP materials, but to provide training through the use of STEP as resource material, and to initiate the production of relevant materials for the science and mathematics methods course.

Fourteen staff members participated in the project which involved approximately 200 students.

On the basis of the 10 "core" lectures in the Science and Mathematics Methods Course, 10 unit themes were selected. These 10 unit themes are diagrammatically presented in their relationships as follows:



The code letters and numbers indicate the corresponding units of STEP materials.

THE IMPLEMENTATION STRATEGY

PHASE I: THE PREPARATION OF UNITS

During this phase students were assigned into groups of 20 according to their subject areas (First Method) to a lecturer who, subject to teaching practice constraints, was also their mentor and supervisor during teaching practice. Each group undertook to prepare one or two of the SMARTE units. Using the STEP materials as the starting point, the lecturer-in-charge would explore the unit intensively and extensively in terms of:

- a) the unit as a learning experience.
- b) the analysis of what has been learned (for teaching purposes) and what other outcomes/activities could be included from the point of relevance to both the subject method and the Malaysian context.
- c) the re-organisation of the unit in terms of an instructional package or module for teacher education purposes.

Twelve contact hours were allocated to this phase, at the end of which a draft unit/s would be prepared by each group.

PHASE II: THE PLENARY SESSIONS

Ten plenary sessions, each of two hour duration were scheduled during this phase when presentation of units were to be made to all students involved in the project. The presentation could include simulated activities, the viewing of films on teaching, and other such devices as are relevant to a given unit theme. The order or sequence of presentation was as follows:-

1. The Nature of Science and Mathematics
2. Aims and objectives
3. Pupil's thinking
4. Teaching Methods and Techniques
5. Resources for learning
6. Adapting to the pupil
7. Feedback to teacher, pupil
8. Curriculum design
9. Safety
10. Laboratory design and management.

Through these plenary sessions all students were exposed in a vicarious manner to all the units which make up the "core" of the course. At each session, each group gave a presentation (with the lecturer's help where necessary) of the experiences and activities of the group in preparing the unit, and the recommendations it has made for improvement of the STEP unit. Each presentation therefore will focus on two major aspects:

- (i) the learning experiences for teacher education inherent in the unit, and
- (ii) The recommendations for reconstructing or modification of the original material in order to widen its scope and relevance.

PHASE III: THE PREPARATION OF INSTRUCTIONAL PACKAGES

After all the plenary sessions, the individual groups again met at separate sessions for another 12-16 hours. The sessions provided opportunity for the students to discuss and reinforce their learning from the plenary sessions, and from the point of view of the project, to produce instructional packages in their respective subject areas, by the application of the principles acquired.

For practical purposes, each group was further subdivided into groups of 3 or 4. Each sub group chose 2 units from the common pool of plenary session units. For the first unit chosen, the focus was on their first method subject while for the 2nd unit, it was their 2nd method subject. At this stage, students worked on their own. Lecturers were expected to stand by whenever students needed to have consultations with them.

THE OUTCOME

The outcome of this project was a set of 10 "core" units prepared jointly by students and lecturers, and several outlines or "packages" for teaching individual subjects - namely, biology, chemistry, mathematics, agricultural science, and physics - which represent the application of the unit principles acquired.

A student evaluation questionnaire was also administered. At the time of writing this is being processed.

The effect of this method of providing pedagogical training is also being assessed through students' performance during the current teaching practice. A few weaknesses have been identified - such as the insufficient exposure or involvement in the "core" units other than the ones in which students helped in the preparation, and the lack of interest or motivation of individual groups during the plenary sessions. These will no doubt be remedied in future projects of a similar nature.

SMARTE thus represents one attempt at utilizing STEP materials in the Faculty of Education. The main motivation, as explained by the chairman of the project, was the production of instructional packages for pre-service (and possibly in-service) teacher education. While STEP is seminar/tutorial oriented, the production of "core" units on the basis of co-operative effort of lecturers and students makes SMARTE more student oriented and in some sense, self instructional.