



PEDAGOGY - THE "SCIENCE" AND "ART" OF TEACHING
ANNOTATION

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The teacher and the learner. In the act of teaching there are two parties (the teacher and the taught) who work together in some program (the subject matter) designed to modify the learners' experience and understanding in some way. It is necessary to begin, therefore, with observations about the learner, the teacher, and the subject matter and then to consider the significance of group life and the school. It will then be possible to consider the factors and theories involved in modifying a person's experience and understanding. They include theories of learning in education, of school and class organization, and of instructional media.

Key words: class organization, capable of learning, sensorimotor coordination, human culture, formal structure;

A child enters school with little if any attainment in written expression and leaves it capable of learning much from human culture. It was thought originally that such progress was just a matter of learning, memorizing, associating, and practicing. The work of psychologists has revealed, however, that the growth of the pupil's intellectual powers must include a large element of development through different phases, beginning with simple sensorimotor coordination; going on to the beginnings of symbolizing, helped by the growth of language and play; and then on to logical thought, provided the material is concrete; and, finally, in midadolescence, on to the power to examine problems comprehensively, to grasp their formal structure, and to evoke explanation. Regarding emotional experience, the child progresses from direct, immediate, uninhibited reactions to more complex, less direct, and more circumspect responses. The physical growth of the child is so obvious as to need no comment. Any attempt to educate the child intellectually and emotionally and for action must take account of those characteristics. Education must pace development, not follow it and not ignore it. The components in the child's overall educational growth are physical and mental maturation, experience, formal teaching through language, and an urge in the learner to resolve discrepancies, anomalies, and dissonances in experience.





What is required of teachers is that they enjoy and be capable of sharing with children work programs designed to modify their experience and understanding. That means making relevant experience available to the student at the right time. The teacher must be mature, have humour with a sense of status, be firm yet unruffled, and be sympathetic but not overpersonal. With large classes, the teacher becomes a leader of a group, providing stimulating learning situations.

The subject matter taught also has a marked influence on the total teaching situation. It may be conveniently divided into the broad headings of languages, humanities, sciences, mathematics, and arts. Although each group of subjects has something in common with others in terms of the demands it makes on the thinker, each area has also something quite specific in its mode of development. Languages call for verbal learning and production based on oral work, particularly during the early phases. The humanities call for an understanding of cause-effect relations of immediate and remote connections between persons and institutions and between human beings and their environment. The sciences call for induction from experience, though deductive processes are required when the laws of science are formalized into mathematical terms. The humanities and sciences both depend on the ability of the learner to hypothesize. Mathematics calls for the ability to abstract, symbolize, and deduce. An interest in the formal and structural properties of the acts of counting and measuring is fundamental. Arts and literature call for a fairly free opportunity to explore and create.

A large part of the teacher's role is as a group leader, and the group life of the school and the classroom must influence the teaching situation.

Group life shows itself in the dynamic structure of the class—including its manner of reaching group decisions, the hierarchy of its members, the existence of cliques and of isolated individuals—and in its morale and overall response to the school and the rest of the staff. Individual pupils also conduct themselves under the influence of the groups to which they belong. Their achievements and attitudes are subject to evaluation by the group, leading to support or ostracism, and they set their standards according to those influences.

In many schools, the range of ages in any class is about one year, and the narrow range makes for some uniformity of subject-matter coverage. But in rural one- and two-teacher schools, groups of children may be heterogeneous by age and ability, and the mode of teaching has to cope with a number of smaller subunits moving along at different rates. The teacher's problem is to coordinate





the work of those small, dissimilar groups in such a way that all get attention. Creative free activity has to be practiced by one group while another has more formal instruction from the teacher.

The effect of “streaming,” or “tracking”—that is, selecting homogeneous groups by both age and intellectual ability—has promoted much inquiry. The practice evokes extreme opinions, ardent support, and vociferous condemnation. The case for uniformity is that putting pupils with their intellectual peers makes teaching more effective and learning more acceptable. The case against it draws attention to its bad effects on the morale of those children in the lower streams. That view supports the heterogeneous class on the grounds that the strongest are not overforced and the weakest gain from sharing with their abler fellows. Experimental evidence on the problem is diverse.

The school community is housed in a physical complex, and the conditions of classrooms, assembly places, and play areas and the existence (or nonexistence) of libraries, laboratories, arts-and-crafts rooms, and workshops all play their part in the effectiveness of the teaching-learning situation. Severe restrictions may be caused by the absence of library and laboratory services.

The social forces immediately outside the school community also influence the teaching situation. They emanate from home, neighbourhood, and wider social groupings. Teaching is a compact among several groups, including teachers, students, and parents, in the first place, with youth organizations and civic and sometimes religious groups playing a secondary role. The overall neighbourhood youth subculture also sets standards and attitudes that teachers must take into account in their work.

General objectives of teaching. The classification of the general objectives of teaching in terms of school subject matter is not sufficient to explain the ultimate ends of education. They include, essentially, the promotion of a well-integrated person capable of taking a responsible, active role in society. With such a purpose in mind, one may achieve more insight by choosing a psychological analysis of the objectives into the attainment of intellectual abilities and social insights (cognition), the learning of practical active skills (psychomotor learning), and the development of emotions, attitudes, and values (affective learning).

Cognitive growth begins at the level of the infant school, with the acquisition of early language and numerical capabilities, and continues increasingly to dominate education to the secondary and higher levels. But the





learner is more than an enlarging reservoir of information. With that acquisition goes a growing power to generalize, abstract, infer, interpret, explain, apply, and create. Cognitive training produces a thinker-observer aware of the modes of thought and judgment making up human intellectual activity. In the final stages, the teacher aims at a thinker, critic, organizer, and creator.

In the development of psychomotor learning, the teacher is concerned with the promotion of coordinated skills and their creative use. Instruction begins with the acts of handwriting and plastic art play, characteristic of earlier years of schooling. It includes painting, games, workshop skills, and practical science. It has a high prestige value among the pupils themselves and the wider community.

The permeation of emotional learning throughout the whole educative process is not always obvious, in part because very often it is brought about incidentally.

Teachers may be self-conscious and self-critical about the deliberate inculcation of emotional responses, which will provide the energy and a mainspring of social life. The acquisition and application of values and attitudes are most marked by the time of adolescence and dominate the general life of the young individual. Theoretical, aesthetic, social, economic, political, ethical, and sometimes religious values pervade the school curriculum. Literature, art, the humanities, and sometimes religious teaching are all directly involved, and the teaching of science and mathematics can bring about a positive attitude toward cognitive and theoretical values. An individual's emotional structure is the pattern of personal values and attitudes. Under the influence of instruction and experience, that structure shows three kinds of change. First, pupils learn to select those situations and problems to which they will make appropriate emotional responses. Second, in general, an increasing range of situations includes happenings more remote from the learner. At first, emotions are aroused by situations directly affecting the child. As children become more mature, they are increasingly involved in affairs and causes far removed from their own personal lives. Third, their repertoire of emotional responses gradually becomes less immediate, expressive, and linked with physical activity.

The general design of instruction. The scientific analysis of educative processes has led to a more detailed examination of the total act of teaching, which is intended to make the teacher more aware of all that is involved in a piece of instruction.





Foreknowledge about students and objectives. The complete act of teaching involves more than the presentation and development of lesson material. Before they embark on a fresh stage of instruction, teachers must be reasonably clear about two things: (1) the capabilities, achievements, strengths and weaknesses, background, and interests of their learners; and (2) the short- and long-term objectives they hope to achieve in a lesson and series of lessons. Those curricular strategies will have to be put into effect in the light of what is known about the students and will result in the actual tactics of the teaching-learning situation.

Educational psychologists give much attention to diagnosing preinstructional achievements, particularly in the basic subjects of language and number, and to measuring intellectual ability in the form of reasoning power. There has been special emphasis on the idea of the student's readiness at various ages to grasp concepts of concrete and formal thought. Numerous agencies produce test material for those purposes, and in many countries the idea has been widely applied to selection for entry to secondary and higher schools; one of the purposes of so-called leaving examinations is to grade students as to their suitability for further stages of education. Teachers themselves, however, can provide the most sensitive diagnoses and analyses of preinstructional capacity, and the existence of so much published material in no way diminishes the effectiveness of their responsibility.

The teaching-learning situation. In the actual instruction, a single lesson is usually a part of a longer sequence covering months or more. Each lesson, however, stands to some extent as a self-contained unit within a sequence. In addition, each lesson itself is a complex of smaller teaching-learning-thinking elements. The progress of a lesson may consist of a cycle of smaller units of shorter duration, each consisting of instruction by the teacher and construction by the learner—that is, alternating phases in which first the activity of the teacher and then that of the learner predominates.

The lesson or syllabus proper is thus not to be narrowly conceived of as “chalk and talk” instruction. It is better seen as a succession of periods of varying length of instruction by the teacher and of discovery, construction, and problem solving by the pupil.

Teachers must face the problem of how to maintain curiosity and interest as the chief motivative forces behind the learning. Sustained interest leads students to set themselves realistic standards of achievement. Vital intrinsic motivation may sometimes be supplemented by extrinsic rewards and





standards originating from sources other than the students themselves, such as examinations and outside incentives, but those latter are better regarded as props to support the attention of learners and to augment their interest in the subject matter.

Assessment of results. At the end of the lesson proper or of any other unit or program of instruction, the teacher must assess its results before moving to the next cycle of teaching events. Assuming the occurrence of teaching-learning cycles of instruction-construction activity, it follows that there is a built-in process of frequent assessment during the progress of any period of teaching. The results of the small phases of the learner's problem solving provide at the same time both the assessment of past progress and the readiness for further development.

Progress over longer intervals of learning can be measured by more formal tests or examinations within the school or at local administrative levels. Postinstructional assessment may have several purposes: to discover when classes or year groups have reached some minimum level of competence, to produce a measure of individual differences, or to diagnose individual learning-thinking difficulties. A wide variety of assessment can be used for this purpose, including the analysis of work produced in the course of learning, continuous assessments by the teachers, essay-type examinations, creative tasks, and objective tests. The content of the assessment material may also vary widely, ranging from that which asks for reproduction of learned material to that which evokes application, generalization, and transfer to new problem situations.

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