

THE ROLE OF THE TEACHER AND STUDENT IN TEACHING EDUCATIONAL TECHNOLOGY

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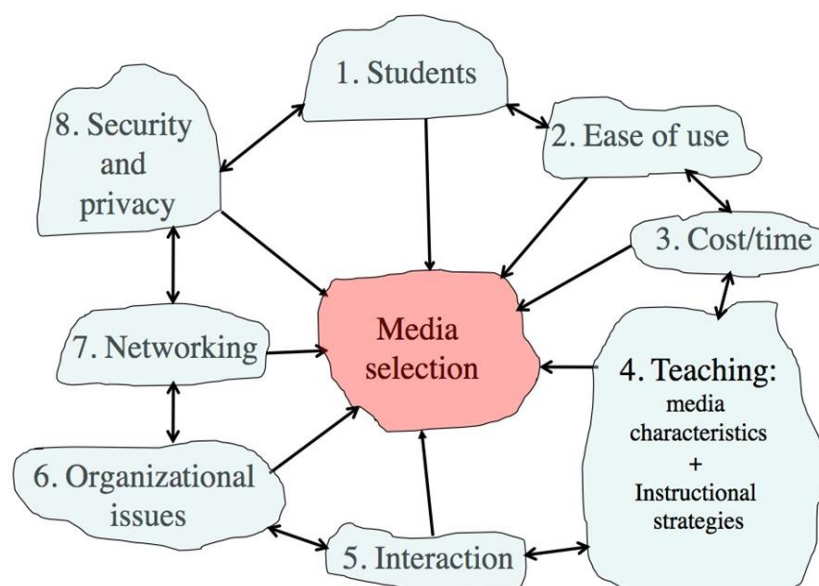
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Abstract. *What is required of teachers is that they enjoy and be capable of sharing with children work programs designed to modify their experience and understanding. That means making relevant experience available to the student at the right time. The teacher must be mature, have humour with a sense of status, be firm yet unruffled, and be sympathetic but not overpersonal. This article discusses the role of the teacher and student in educational process.*

Keywords: *teacher, student, education, technology.*

Pedagogy, study of teaching methods, including the aims of education and the ways in which such goals may be achieved. The field relies heavily on educational psychology, which encompasses scientific theories of learning, and to some extent on the philosophy of education, which considers the aims and value of education from a philosophical perspective.

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.



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 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.

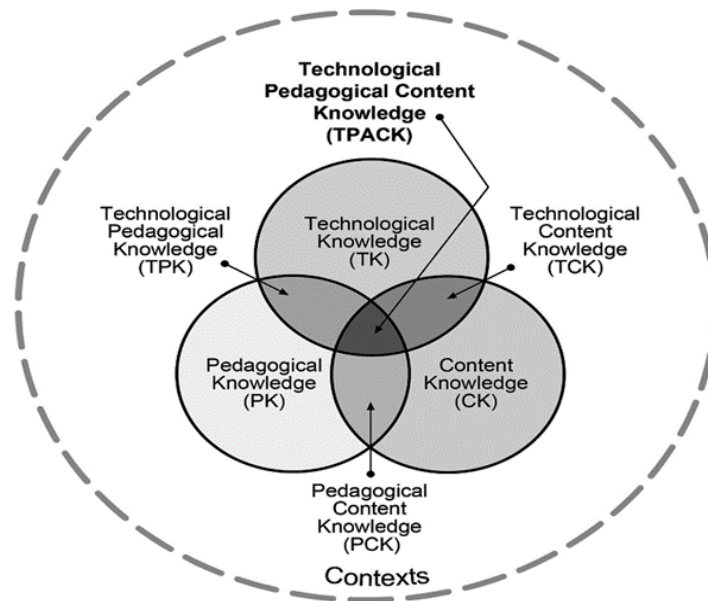
The effect of "streaming," or "tracking"—that is, selecting homogeneous groups by both age and intellectual ability—has promoted much inquiry. The practice evokes extreme opinions, ardent support, and vociferous condemnation. The case for uniformity is that putting pupils with their intellectual peers 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-

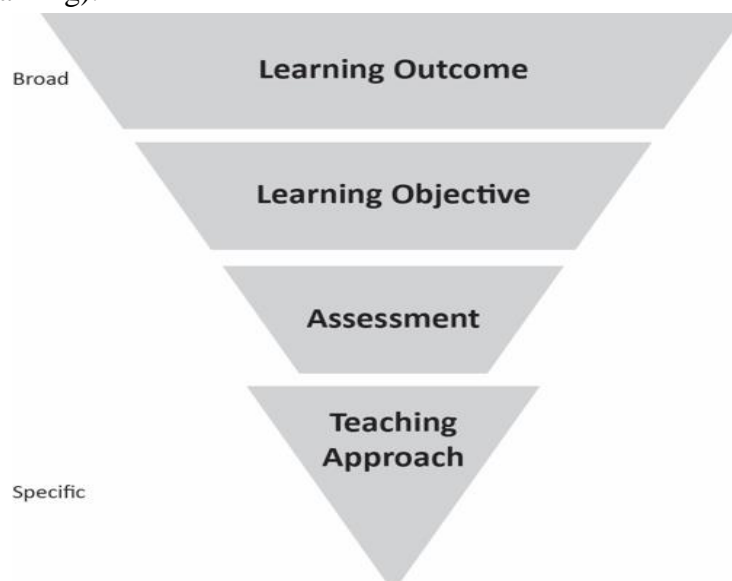
and-crafts rooms, and workshops all play their part in the effectiveness of the teaching-learning situation. Severe restrictions may be caused by the absence of library and laboratory services.

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).



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. Although the student's own curiosity, experience, and observation are important, so is the cyclic activity of teacher and learner. The teacher selects, arranges, and partially predigests the material to be learned, and that is what is meant by guiding the learner's discovery and construction activity. It is a role the teacher cannot abrogate, and, even in curricula revised to give learners greater opportunity to discover for

themselves, there is concealed a large degree of selecting and decision making by the teacher. That is what teaching is about.

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.

The organization of instruction

Educational organization rests to some extent on psychological views about learning, but explicitly it is concerned with the grouping of pupils for educational experience and instruction. Pupils in general are organized by age into what are usually termed grades, classes, or forms. Each school is also usually either comprehensive (containing students pursuing various academic, commercial, and vocational curricula) or based on the so-called dual plan (containing only students pursuing a particular curriculum). In some countries, the dual system is actually tripartite: there may be schools for classical academic study, schools for technical or vocational study, and schools for more generalized, "modern," diversified study. Whether comprehensive or dual-plan, schools frequently have some kind of streaming or multitracking whereby students are grouped according to ability so that there are separate classes for the less able and the more able.

The modern interest in resources for learning has led to the concepts of general-purpose classrooms, open-plan teaching, and team teaching. The idea of general-purpose classrooms starts from the assumption that the school curriculum can be divided into a few large areas of allied intellectual interests, such as the humanities, languages, and sciences. The total resources available for teaching in each of those areas, including teachers, are then made available in one common teaching space, and ordinary classroom and lesson-period divisions disappear, to be replaced by a real mobility between teachers and learners as they make use of the different resources available, including library and laboratory facilities and various educational aids (see below Instructional media). In the infant and primary schools, similar ideas are introduced in the open-plan system. At

both the primary and the secondary levels, however, there is insufficient evidence on the effectiveness of the systems. The attitude and action of teachers remains the strongest factor, and they may still require some privacy for their teaching.

Team teaching represents an attempt to make better use of every teacher's potential in any subject area, to create a flexible learning situation, and to make nonstreaming more effective. For example, the normal class of 30 pupils with an individual subject teacher is replaced by a larger group of pupils and a team of teachers, who pool their efforts. Although the team plan may take several forms, it generally assumes some variety of the following elements: (1) large-group instruction, in which the total complement of some 50 to 150 students in the program is periodically taught by one teacher (either the same teacher or several teachers in rotation) in a lecture hall; (2) small-group instruction, which alternates with large-group instruction so as to allow small numbers of students and a member of the teaching team to discuss, report, and exchange ideas; (3) independent study, whereby students are given individual projects or library work; and (4) team planning sessions, in which, daily or weekly, the teachers plan, coordinate, report on, and evaluate their programs. The presumed benefits of team teaching are that it makes better use of each teacher's individual interests and strengths; that it avoids unnecessary replication, particularly in such basic subjects as native literature, in which ordinarily several classes led by different teachers cover the same ground; and that teaching in front of one's colleagues is a beneficial practice providing some evaluative feedback. Also, it is said that the less able children do not feel so segregated as in ordinary streamed classes; although they may gain little from the large-group sessions and individual projects, they seem to make real progress in the small seminar groups, without becoming overaware of their more limited capabilities. The reasons for that are obscure. In any event, the most obvious advantage of team teaching is its flexibility, in affording a great variety of possible combinations of student groupings and of educational resources. The major problem is that team teaching cannot be used in all subject areas. Although it may be useful in such areas as the humanities and the social sciences, its provision for lecture-size audiences does not aid the teaching of such subjects as mathematics, in which there are too many individual differences in ability. The same is true of arts and other subjects. Furthermore, without expert leadership, seminars are apt to degenerate into scenes of rather woolly discussions.

The grouping of children by ability, though still practiced, remains a problem. Formal tests are used to separate students according to their ability, and many people feel that separations by such means are neither reliable nor socially desirable. Even with regard to separating the intellectually disabled, there is growing opinion that, wherever possible, such children should be given basic instruction in special centres and remedial classes in schools for normal children. Disabled and normal children would thereby share much of their education. Separation of the sexes has also declined in most countries, as the mixing of girls and boys has come to be recognized as healthy and socializing.

With in-person lectures and with audiovisual recordings, teachers are able to set out their material as they think best, but usually the audience reception is weakly passive since there is not much opportunity for a two-way communication of ideas. Furthermore, in lectures, much of the students' energies may be taken up with note writing, which inhibits thinking about the material. Recordings enable one to store lecture material and to use it on occasions when a teacher is not available, but they are rather detached for young learners and seem to evoke better results with older students.

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