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individualised instruction: bandwagon or watershed*

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"The term 'individualisation', used in America and Sweden to describe the new freedom, contains another trap. To be totally free, it seems, not only should we refuse to walk in step; we ought to walk alone. But a boy working in solitary style in his carrel reminds one disturbingly of a battery hen, and elaborate learning consoles made up from screens, dial access, wireless communication, and so on, still cast the learner as anchorite. Such solitary austerities may work with adult learners; they are not likely to appeal for long to boys. Individualisation needs to be qualified." (L C Taylor, Resources for Learning (1972), p 195.)

TRANSATLANTIC STIRRINGS

The term "individualising" has been described as "an educational rallying cry of the 1970s".[1] It appeared in the 1950s in relation to reading programmes, and of 16 articles published in the USA in 1958 on "individual instruction", 12 were in that special field.[2] But interest in wider applications of the concept grew rapidly, and of 30 articles published in 1962 nearly half were outside the area of reading. In that year, the National Society for the Study of Education published **Individualising Instruction.** Henceforward this became a dominant theme in education. The **Education Index** for 1973-4 lists 112 articles on the topic, of which 72 are general in character, and the remainder concerned with the application of the concept of individualising to various subjects. Some aspects of the American approach, such as team teaching and resources for learning, attracted interest in Britain. British Primary Schools, with their "integrated day" or "informal education", gave a new slant to the search for ways to individualise instruction and have been held up in the USA as models for elementary schools.[3]

Recently, South African journals have had articles on individualising the teaching of mathematics, computer-aided instruction in high schools, and open-plan buildings. An editorial in the **Transvaal Educational News** was headed "Individualisation or Uniformity" and in the same issue Dr F A J van Rensburg took a critical look at individualised methods of teaching mathematics in some English primary schools he visited. One writer has described South African new Junior Secondary Schools as "an attempt to personalise, humanise and individualise education".[4] Before the attempt is made, an essential preliminary is to find out what we mean by individualised instruction, to collect information on its methods and results, to decide whether we want to individualise, and to note possible drawbacks. This paper is offered by a geographer as a sketch map of what may be to some of you an educational Terra Incognita, where some travellers say there are quicksands, ravines, cul-de-sacs and mirages.

WHAT IS INDIVIDUALISED INSTRUCTION?

Professor Oettinger of Harvard University has called the term "individualised instruction", "a flag . . . used with great abandon and little definition".[5] On closer inspection, however, it is clear that the animated flag wavers, united in their distaste for formal class teaching, are representative of the whole spectrum of educational opinion and include some very strange bedfellows. Behaviourist professors of computer technology stand shoulder to shoulder with existentialist "caretakers" of "schools without walls". Ivan Illich ("learning webs for individuals"), Lady Plowden ("we welcome the trend towards individual learning") and Professor R S Peters ("respect for persons"), wave the same flag. Behind them are earlier generations of "individualisers": Madame Montessori ("reverence for the individuality of the pupil"), Percy Nunn ("the uniqueness of the individual"), A S Neill ("let the child be himself") and E G A Holmes ("education as self-realisation"). There is even an official placard from the Board of Education: "the characteristic

* Paper read at the Mathematics Association of South Africa Conference, 19th July, 1975.

note of recent educational doctrine or practice has been the insistence on the importance of the individual as distinct from the class" (**Suggestions for Teachers,** 1927). Meanwhile, the enemy, the didactic class teachers and their systematising headmasters, are protesting that they also follow the "individualising" flag — were not the very mottos of the reformists taken in with their alma mater's milk, in those dimly recalled lectures on the principles of education? Is it really a war, or a case of theory not guiding practice, or merely a misunderstanding about words and intentions? After all, did those fountain heads of pedagogical wisdom, the departments and colleges of education, **practise** individualising on their own part?

Beneath their flag, then, the "individualisers" may hide some conceptual confusion. They are united on two important points, (a) that teaching should adapt to the characteristics of individuals, and (b) that we should begin to move away from, or discard altogether, the "lock step" of class teaching. Beyond this, however, they divide themselves, by their own statements, into two camps:

Type A: "Structured" Individualised Instruction.

Here the common metaphor is that "each learner is on his own track", with a personalised curriculum **designed** for him. Its chief features are:

> a continuous progress curriculum, which permits pupils to progress at their own rates, in keeping with their abilities and motivation;
>
> the curriculum is organised around individual learning units, carefully designed to meet prescribed and stated behavioural objectives;
>
> the tasks are programmed, with linear progression or lateral branching;
>
> there are performance criteria which establish whether the unit has been adequately learned.

Oettinger calls this approach "mass production to narrow specifications with rigid quantity control. Each pupil is free to go more or less rapidly exactly where he is told to go".[6]

Variations on this approach are "the teacher as doctor", when the teacher makes specific recommendations and assignments for each pupil, and the "client-centred school" where, in a world far removed from any school I have yet visited, "a student desiring beneficial learning experience seeks a teacher". According to Wolfson, the "teacher-as-doctor" is the most popular interpretation of individualised instruction in the USA.[7]

Type B: Open-ended Individualised Instruction

We now leave the white-coated social engineers for the other end of the rainbow. The language takes on an ethereal quality. "The chief object of individualisation", intones the National Society for the Study of Education Yearbook, "is the release of potential in the individual". A high school principal speaks of developing a climate for self-fulfilment "which encourages each individual to become his own true self".[8] These phrases may be comforting but they provide little guidance on direction for the teacher. Freedom of choice, diversity and openness are the keywords. The teacher is free to choose his methods, guided only by experimentation and a cautious pragmatism. Pupils are placed on an escalator which begins with the selection of objectives and methods by the teacher, and ends, hopefully, with the pupil setting his own objectives of learning and choosing his own methods, perhaps with the advice of the teacher/consultant. Wolfson provides a closely reasoned case against Type A, Individualised Instruction (Structured) and argues the case for the learner to be self-directive and active.[9] The most down-to-earth guides to the Type B (Open-ended), approach are two books by British headmasters, L C Taylor's **Resources for Learning** (1972), and A W Rowe's **The Education of the Average Child** (1959).

The implicit contradictions between Types A and B have been noted by some individualisers, who have hastened to insist that theirs is the **true** one. "Individualising cer-

tainly does not mean that teachers must teach each pupil separately, that is tutor each pupil personally or through a teaching machine . . . teachers who used programmed or packaged . . . materials . . . must carefully introduce opportunities for peer teaching." Emmerij would like to group projects, group discussions, and abandon the word "individualised" to the behaviourists, and set off a new hare, "independent learning", but he uses the noun "individual" in his definition of this: "a flexible framework containing some carefully controlled elements and providing a variety of learning opportunities for different individuals."

THE METHODS OF INDIVIDUALISED INSTRUCTION

The survey which follows looks at the various methods of individualised instruction from the view point of their possible introduction in South African schools. Therefore, it distinguishes between those which are within the reach of the individual teacher or subject department, and those which would require high level decisions by the school or provincial education department before they could be introduced. My own viewpoint is that any new methods introduced should not necessarily replace class teaching but could possibly be used alongside class teaching, the actual mix to be decided by the teacher.

METHODS WHICH COULD BE EMPLOYED BY SUBJECT DEPARTMENTS

The Educational Contract, Job Card or Assignment Approach

Under the name of the Dalton Plan this approach has been in use since the 1920s. Work in the subject is divided into contract tasks which the pupil is expected to complete in a set time. The assignment declares the purpose of the work, the problems he would learn to solve, and the skills he would acquire. Work cards set out his activities step by step and provide, if necessary, for tutorial consultation: "After you have finished the required problems come to me and I will explain the next (mathematical) rule before you go on". The daily inspection of assignment cards by the form master permits a check on progress. The pupil has responsibility for his own learning and in a school organised on these principles, with subject laboratories, it is left to him to decide the order, time and place for completing his contracts. The approach is very flexible and some schools work on a modified Dalton Plan with some whole class lessons. A W Rowe's **The Education of the Average Child** is an invaluable account of organising a secondary school on "job card" lines. Its stated aim is "individual tuition".[11]

Team Teaching and grouping variations

A team-teaching approach by a subject department makes it possible to provide a variety of pupil groups as well as the conventional class, but it must be admitted that the straight-jacket of the school timetable may make this out of the question.

The options opened by team-teaching are:

(i) **large group instruction** for lectures, films, broadcasts, teacher or pupil panels, testing and "shared teaching" (two or more teachers combine to take a lesson);

(ii) **small group instruction** for six to 15 pupils, for discussions, seminars, structured investigations, projects, demonstrations;

(iii) **tutorials** for one to five pupils, to discuss assignment points of difficulty;

(iv) **independent study** for work with assignments, job cards, learning activity packages;

(v) **laboratory activities,** with maximum numbers depending on subject, facilities and maturity; and

(vi) **class instruction.**

The claim is that, with the variety of groupings listed above, schools are able to cater for individual learning better than with class teaching alone. In (iv) the pupil has an opportunity to work at his own pace, while in (ii) and (iii) he has more chance to express himself, learn from his fellows and establish a personal relationship with the teacher than in a whole class situation. In his **Individualising Educational Systems,**

Bishop suggests that the best division of time in a secondary school is: 15/20 per cent large group instruction; 30/35 per cent small group instruction; 15/20 per cent laboratory activities; and 25/35 per cent independent study. Others want to increase the proportion of time spent in small group instruction and independent study. My own view is that all six groupings listed above have a contribution to make, and that the first task is for the various subject departments to decide which organisation best suits their purposes.

Resource-based Learning

Here we are concerned with a variety of materials for individual study, ranging from tapes and programmed learning books to multi-media packages. Description of kits and materials are readily available in the journal reviews and Taylor's **Resources for Learning** gives a broad survey of their possible uses for teaching. I will confine myself to some general points on choice of materials. An obvious distinction is between materials designed for Individualised Instruction Type A (Structured), with exercises leading step by step to the achievement of specific behavioural objectives, and materials which are more open-ended in intention and thus appropriate for Individualised instruction Type B. Another division, and one in which the class teacher is more likely to be interested, is that between (i) packs published by commercial firms or designed by institutions for use in schools; and (ii) packs prepared by teachers for use in their own schools.

The 1 Math course of the University of Maine shows the potential of the first group. It is designed to ensure that students fresh from school are competent to begin more advanced courses. A diagnostic test indicates which modules (or sections) of the 1 Math course the student should take to bring him up to standard. There is a learning packet for each module, containing a statement of objectives in behavioural terms; a list of activities to achieve these objectives; learning materials such as textbooks, programmed books, film strips and tapes; a videotape lecture which he views before beginning work; notes of the lecture; and pre-test, inter-module tests and end-test exercises, all with answers.[12] The Swedish IMU (Individualised Maths Instruction) is on similar principles, but is set out in workbooks of a programmed learning type.[13] Project Plan (Programme for Learning in accordance with Needs) is an interesting example of institutional help in the development of school learning materials. The American Institute of Research tests "teaching learning units" (TLUs) representing a module of two weeks assignment in a subject. The student's progress is monitored by computer.[14] In England, some Schools' Council Projects have developed learning packs which are less structured than their American counterparts. American and British packs and programmed learning texts in a number of subjects are available from commercial publishers and offer an opportunity for teachers to experiment with individualised instruction. A word of warning: read the reviews in your specialised journals before purchasing.

Some writers think that packs prepared by teachers for use in their own schools are the most valuable ones for really individualising instruction. Taylor, who directed the UK Resources for Learning Project, is less sanguine. "I cannot believe a package system — as distinct from occasional pieces of work in particular subjects — will develop from, little less be sustained by, willing but burdened shoolmasters in their spare time . . . for a school to produce its own self instructional material requires rare and sustained heroism". He sees a possible solution in co-operation between schools, with a role perhaps for schools and departments and colleges of education.[15]

METHODS WHICH WILL REQUIRE HIGH LEVEL DECISIONS BEFORE THEY CAN BE INTRODUCED

Flexible Scheduling

The conventional timetable with its periods of fixed length and its Mad Hatter's Tea-party movement of pupils or teachers every 35 minutes at the bidding of a bell, has been called the graveyard of educational

change. Attempts have been made to get over its cramping effects by dividing the school day into modules of, say 20 minutes in length, which are used singly or in any combination to draw up a varied programme of small, medium and large group activities, laboratory periods and time for independent study. Because of the complexity of the task a computer is used.[16]

Non-graded instruction

Some American individualisers want to abandon the grouping of pupils in grades, or age-specific classes, and substitute achievement groups. Pupils could then be grouped in subject "phases", ranging from Phase 1 (very elmentary) to Phase 5 (advanced). Other possibilities at the primary level are to group pupils in teams composed of, for example, five- to seven-year-olds, and with four teachers to each team of 120 pupils; and to group children according to their psychological characteristics in relation to learning.[17]

Changes in Building Plan and Use

In Britain, new school buildings are breaking away from the traditional plan of box-shaped classrooms connnected by an outside corridor. Individualised learning is provided for in primary schools with such new features as shared working areas, home bases, corridor niches, noise insulated spaces, study alcoves, vast open spaces and central resource rooms. In some secondary schools the policy is "to see that nothing remains fixed except the outer walls. Shelving, furniture and inside walls are all movable". American schools have additional features: study carrels, equipped with audio-visual aids, seminar rooms with seating for up to 16 pupils, fully equipped learning evaluation rooms, and pseudopodial learning centres (centres which can shrink or spread according to demand). I was intrigued, however, by the "formal study room", for pupils who "cannot at the moment assume responsibility for their learning", ominously under the direction of "a teacher successful for controlling students". Evidently even individualised learning has its casualties, both pupils and staff.[18]

Computer-assisted Instruction (CAI)

The potential role of the computer in schools hinges upon two related issues: (a) what distinct contributions will they be able to make to instruction? and (b) how expensive will their use be? It is generally agreed that computers could contribute to practice in skills and drills, e.g. in mathematics and languages, and to administrative tasks such as recording and analysing educational data. What is still at issue, however, is whether we know enough about learning and teaching to programme the computer to teach higher order intellectual skills. We are still a long way off the time when, as Professor Patrick Suppes said, "millions of school children will have access to . . . the personal services of a tutor as well informed as Aristotle". Bishop includes CAI in his scheme for individualised learning, but admits its cost is prohibitive at present. A management consulting firm calculated that it would cost 24 billion dollars per year to provide one hour per day of CAI for 75 per cent of American pupils (those in metropolitan areas). The current cost of maintaining the school system, including salaries, was 38 billion dollars at that time. Clearly, for the time we cannot count on CAI as an integral part of any system of individualised education in South Africa, even in metropolitan areas, although some school linkages are now taking place.[20]

WHY INDIVIDUALISED INSTRUCTION?

In this section the main reasons put forward for a move away from class teaching to individualised instruction are critically reviewed.

We need to break away from the lockstep of class teaching, in order to cater adequately for individual differences in ability, motivation, interest and rate of learning. It seems undeniable that these differences do exist, but it does not necessarily follow that they are best coped with by individualising instruction. It will be a matter for careful empirical investigation before we are able to establish whether one system is more efficient that the other. Until these

investigations have been made, the claims of the individualisers have no more weight logically than those of the exponents of class teaching. Husen writes: "According to studies based on Carroll's theoretical model of classroom learning, the individualisation of both time and methodology . . . can greatly reduce the spread of final performances and at the same time considerably raise the average", but he does not cite references.[21] In view of the large number of variables — subjects, age, ability and experiental differences between children, teaching styles, extrinsic factors, to name a few — the problems of research design seem formidable for a comparison of the two approaches. Until much more evidence is available, there does not seem to be a strong case to individualise on this argument alone.

Learning takes place individually, and therefore the curriculum should be organised round the individual pupil. With a teacher-pupil ratio of 25, this implies that the primary teacher has some 25 clients and the secondary specialist some 150 or so clients to cater for **individually** in terms of (a) objectives, (b) content, (c) methods, (d) evaluation (these are the accepted components of curriculum). The teacher must surely be hoping that individual pupils are not as different as the individualisers claim!

We must try to provide a supporting environment which will encourage individual pupils to take responsibility for their own learning. This seems a sound argument to introduce some individualised components in education.

Individualised instruction is a better preparation than class teaching for "recurrent education" (lifelong education). Again this seems to be a cogent argument.

Individualising instruction mitigates contemporary problems of adolescent motivation and behaviour. This may well be so, but it should be a matter for empirical investigation. Some critics regard this as the latent function of individualisation: "the pupil has to study alone . . . the more he succeeds with such a programme, the more he behaves in a quiet, docile, subordinate manner".[22] This seems rather unfair. In my experience it is certainly not true of Individualised Instruction, Type B (Open-ended).

It is more efficient than class teaching in an "unstreamed" comprehensive secondary school, with its wide range of ability. It is certainly true that in Britain and Sweden the development of comprehensive education in a climate when "streaming" was increasingly suspect, resulted in the adoption of a number of individualised methods, e.g. team teaching, job cards and work sheets, small group discussions.[23]

It will help to put more educational emphasis on individuality and initiative and less emphasis on conformity. This certainly seems true in the case of open-ended individualised instruction (Type B).

DRAWBACKS

A number of objections to individualised instruction may have occurred to you already. This section looks briefly at some of the more obvious ones under three heads:

PRACTICAL

Will teachers be able to guide, monitor and record the progress of all their pupils, each working at their own rate?

Will teachers be able to construct or obtain sufficient well designed learning packets?

Will teachers be able to correct all the work done?

Will pupils become bored with independent study, and regard learning packages with the same lack of enthusiasm which they now show for school textbooks and worksheets?

HOW PERSONAL IS INDIVIDUALISED INSTRUCTION?

As Silberman points out, "the ultimate irony is that IPI (Individually Prescribed Instruction) forces students into a passive, almost docile role under the name of individualisation".[24] Type A (Structured Individualised Instruction) is especially open to this criticism. Learning in a social setting, whether small group or conventional class, must also be provided.

HOW VALUABLE IS THE WORLD THE PUPILS WILL LOSE, IF CLASS TEACHING IS ABANDONED?

Above I have suggested that a comparison of the relative efficiency of the two teaching modes must wait upon empirical research. In the meanwhile, we have a host of subjective impressions:

> I have been in classrooms where the pill of exposition has been sweetened with lucidity and wit, and where humour, timing, good preparation and an easy relationship with pupils have combined to move them from the stage of dawning understanding to a completion of the prescribed activities with zest and competence;
>
> I have also seen dull class lessons where nothing has been learned;
>
> reports from the individualised front show the same range from excellence to inadequacy.

Perhaps it is better to think of teaching as an art, not a skill. Competent performances may result from following a number of teaching models. In their scholarly survey of teaching techniques, Stones and Morris conclude: "the most significant conclusion that can be drawn from efforts to use teachers as a basis for information about teaching is that effective instruction can be produced by a variety of combinations of characteristics and conditions rather than by one unique condition".[25]

RESULTS

Evidence is now beginning to come in on the outcome of some of the pioneer attempts to individualise instruction, and the **Education Index** lists several evaluation papers annually. It is still too early to give a general verdict. Bishop cites four studies which showed no significant differences in efficiency between class teaching and team teaching, and three studies which found the latter method more effective. A study of four years of flexible modular scheduling found the overall achievement of pupils unchanged, but noted that individualised instruction tended to provide more very high and very low grades. Those who did badly before, tended to do even worse under the new system, and demonstrably wasted their independent study time. Ninety-three per cent of students preferred modular to traditional scheduling, but there was a feeling that class scheduling should be increased for first years, and independent study time reduced.[26]

As well as research papers, we have had the ad hoc reports of visitors to the schools and teachers connected with them. Individualised instruction in American schools is the subject of more than a hundred articles a year. Many of these contain detailed accounts of how work is organised in subject. Mathematics, Science and English are especially well represented. A report on "Individualised Learning in an open Geography classroom" concludes: "In general, the approcah worked exceedingly well. The students did accept considerable responsibility for their own learning, which was a major aim of the instructor, and most demonstrated considerable growth in ability to research a topic . . . The author would undertake such a programme again, and believes that teachers as well as students can benefit from individualised programmes".[27]

Insofar as Britain is concerned, the impact of individualised instruction on the primary school — the integrated day, "open" and "informal" schooling — is well known and the literature immense. I would like to draw the attention of primary teachers to three recent publications, all containing considered assessments by educationalists from outside Britain: the 23 booklets of the series **British Primary School Today,** published by Macmillan in 1971; G W Bassett, **Innovation in Primary Education** (Wiley, 1972); and a participant-observer study by four American teachers who worked in three schools and made shorter visists to 13 other schools.[28] These show how difficult it is to get a rounded picture by reading impressionistic accounts, favourable or otherwise. A survey by the inspectorate of the teaching of geography in primary schools found only four per

cent using a class teaching method predominantly but 81 per cent using it occasionally in connection with group and individual work. Group work predominated.[29] In secondary schools the position is less clear cut. Team teaching and integrated studies using group and individual projects are common outside the selective secondary school area. Comprehensive schools provide many options in an attempt to cater for individual interests among older pupils. In a recent survey two-thirds of the schools had a core of required subjects and a range of options.[30] Work sheets are ubiquitous, but there seems to be little use of the carefully designed learning packages produced by the exponents of Individualised Instruction Type A (Structured), except possibly in the field of science. Countesthorpe College, Leicestershire, catering for the senior secondary range, is representative of a radical approach to schooling, which obviously owes a lot to the individualising movement. Pupils are organised in teams, about 120 pupils to five teachers, and the teams are subdivided into tutor groups. Teachers organise the core curriculum (English, Mathematics, Social Studies) for their team, and this takes up about half of the time. Pupils also choose courses from a range of electives, with the advice of their tutor. An article in the **Times Educational Supplement,** 23 May, 1975, gives a favourable account of standards, attitudes and staff opinions. Staff-pupil relationships are of special interest: "It is impossible to spend five minutes in the school without seeing examples of the exceptional warmth and trust noted by HM inspectors". It would seem that we have here a good example of successful Individualised Instruction Type B (Unstructured), with the accent on learning in a **social** rather than a solitary setting.

CONCLUSION

You may have sensed that there is an ambivalence in my own attitude to individualised instruction. I endorse many of the goals of the individualisers, but am not convinced that their attainment will necessarily be brought closer by an exclusive use of their methods. Like L C Taylor, I favour a blending of individualised approaches in a pragmatic way. Individualised Instruction Type A (Structured) has its place, but it needs the complementary open-endedness of Type B alongside. We have not had time to consider the important point that individualised instruction may have a different role to play in the various school subjects and age groups. The basic question is, do you want to individualise your own teaching area? My answer is, yes, experimentally, to a limited extent (Education) and within the structure of an academic discipline (Geography). What is yours?

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