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ABSTRACT

On the basis of educational experience and educational research, the following two assumptions have been widely accepted: students achieving the best results work differently from those who do less well, and low achieving students may learn something from the way the "good" performers approach the learning task and will thus be able to obtain far better results from their studies. These assumptions are based on subjective impressions gained by teachers and students, and on tentative results from small-scale investigations. Methods promoting a more effective manner of studying are not often the product of premeditation on the part of students. Some methods are discovered by mere chance, others through experiments made by individuals in an effort at getting as much done as possible within the briefest span of time, and others are the result of thorough scientific research. In any case, more efforts need to be directed toward educational research aimed at defining, investigating, and determining those study methods which will prove useful in helping students to learn. (RB)

REPORT FROM THE DANISH INSTITUTE FOR EDUCATIONAL RESEARCH

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THE SCIENTIFIC BASIS OF OUR KNOWLEDGE ABOUT STUDY METHODS

Report
No. 6

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Our present knowledge of Study Methods rests on a very shaky foundation.

It is necessary to concentrate on renewed scientific research.

The intention of this Article is to illustrate the reason for this and to show how it can be done.

THE SCIENTIFIC BASIS OF OUR KNOWLEDGE ABOUT STUDY METHODS

by

STEN C. POULSEN

What are "Study Methods"?
What do we know about them?
On what foundation do we
base this knowledge?
Why is research necessary?
How can it be conducted?
What is the use of it?

This report is a translation of an article appearing in the Danish journal "Uddannelse 69" (Education 69), 1969 vol. 2 pp 354-364.

If you wish to help a person to improve the knowledge and skills he gets from the efforts devoted to a certain area of study, it stands to reason that first of all you must try to isolate some personal factors, which are most likely to influence the amount of learning acquired by him.

Of such factors may be mentioned the interest taken by the student himself in the subject, what he knows about it already, his mental capacity, his working method and finally, certain personality characteristics.

Formerly, the first mentioned three factors were considered of particular interest, whereas it was not realized that the individual student's study methods might be important. On the basis of educational experience and educational research the following two assumptions have, however, been widely accepted today.

1. The students achieving the best results work differently from those, who do not do so well.
2. The latter group may to a wide extent learn something from the way the "good" performers approach the learning task and will thus be able to obtain far better results from their studies.

It is important to bear in mind that it is a question of assumptions only - both based entirely on subjective impressions gained by teachers and students and on uncertain results from small-scale investigations. So far they have only been partially confirmed by research findings.

Confusing Terminology

The literature on study methods available in Denmark displays a certain tendency towards a confusing terminology. Terms such as "study habits", "study techniques" and "study methods" are being used indiscriminately to describe the same thing.

Of these three terms the first one "study habits", is an unfortunate choice for two reasons. For one thing it hints that it is a question of something rigid, a process that does not require any great capacity for thinking. In the Danish language the word "habit" as such moreover tends to have an unfortunate ring of something negative.

The second term, "study techniques", is also unfortunate seeing that the word "techniques" generally is applied as referring to less comprehensive and clearly defined skills. It seems very reasonable to talk of "reading techniques", the "techniques of note taking" etc. but to use the term "study techniques" as a designation for something that ranks above the other two seems rather confusing.

Consequently, it would seem more appropriate if, in the future, an effort was made to use the term study methods, which is not encumbered with the mentioned weak points and which, moreover, offers an important advantage in two respects. For one thing, it is a natural parallel to the term "teaching methods" and secondly, it is the term most commonly used in the English literature.

<u>Definition and Foundation of Knowledge: What are "Study Methods", what do we know about them, and on what foundation do we base this knowledge?</u>

Study methods are <u>procedures</u> which - in given circumstances - may be applied with advantage if economy of time and effort is desired in the pursuit of the goal of one's studies.

The "given circumstances" refers to the overall study situation. As an example may be mentioned a situation where the student sits by himself in his room faced with the task of reading up on a special subject. As another example may be given the situation where the student attends a lecture and must try to get the full meaning of what is said. Finally, as a third example let us look at the group-work situation, where a team of students are to investigate a certain subject matter and prepare a report on their findings. Study methods must always be adapted to the study situation. Though this may seem self-evident, it is mentioned nevertheless, for you may often come up against the mistaken belief that study methods are patent solutions that may be applied without modification in all possible learning situations. This is far from always the case. Study methods yielding good results in one situation may often be less productive of results in other situations.

In short, study methods may be said to comprise a number of procedures believed to render the student's work more effective - but it should be added that these procedures should be adapted to the goal to be reached through these studies, the study situation and the student himself.

It is important to understand that in this definition of study methods there is nothing to indicate whether they increase the degree of independence displayed by the student in his work. This depends entirely on the requirements with which he is faced from the teachers. If a precise rendition of textbook material is requested, it would be lack of effectiveness to teach the student to approach the learning task from the angle of critical evaluation - it would be more adequate to teach him something about efficient recitation techniques.

In other words: If you teach students to work independently without having to rely on their teacher and to learn the material through critical evaluation, this will only make them successful in learning situations, where the teacher is prepared to recognize such an approach as being of value. If not, the independent study methods are more apt to cause trouble with teachers and fellow-students both.

Another fallacy is that study methods are aimed exclusively at teaching the students to work alone and will not teach them to contribute effectively towards group activities. This is not the case, but it should be recognized that the group situation requires the student to approach the task in a special manner.

Limitations

The above definition of "Study Methods" and the mention of some common mistaken beliefs have been held in rather general terms. If we want to form an impression of the specific content of the study methods, we shall have to look at the advice contained in the manuals on study methods.

Here we find suggestions for working methods covering nearly all aspects of the student's working process. Advice is given on the planning of the activities and the distribution of the time spent on the study. There are instructions about data retrieval

at the libraries and about effective techniques to be used in note taking, and possibilities are mentioned of improving your reading capacity. Distinction is made between the slow and careful analytical method used when reading difficult textbook matter and the swift skimming of literature of secondary importance for purposes of orientation. Furthermore, methods are described for learning of key-points and detailed advice is given on how to prepare written reports and also verbal reports. Finally, also there are many sensible recommendations as to how to arrange your physical surroundings in the best possible manner for study purposes. Much information is thus available, which it would probably benefit many students to become acquainted with.

There are, however, some limitations because of which the instructions available so far cannot be considered to cover the situation fully but call for further action in an effort to extend our knowledge on this subject through systematic investigations into the problems of study methods.

One of the mentioned limitations is that on the whole, the instructions cover mainly the Humanities. Students encountering difficulties in the study of science derive no great benefit from the recommended methods.

Another limitation - and one that is more serious - is that we do not know whether the recommended methods can be learned by everybody, or whether they are suited for some students only and not for all of them. In other words: It is not known whether it would serve the purpose to provide lessons in study methods for all students or whether it would only pay to instruct a chosen few in such methods.

The Sources of our Knowledge

To understand the background for the mentioned limitations it will be necessary to have a look at the sources of the advice on effective study methods.

With a view to a study of this question an analysis was made in 1966 of a number of publications from U.S.A., England, Sweden, Denmark and Norway. As a result of this informal in-

vestigation it was found that practically all recommendations were the product of one of the following procedures:

1) Copying of parts of other books on study methods.
2) A description given by the author of subjective experience gained by himself or by persons known to him.
3) Extensive generalization from psychological experiments in animal learning.
4) Extensive generalization from laboratory experiments in human learning.
5) A description of the content of courses in study methods which seem to have produced good results.
6) Results from descriptive investigations into the behaviour of students when studying.
7) Results from controlled experimental studies of the value of old and new advice and instructions relating to study methods.

These procedures are listed so that the last mentioned are believed by the author to be those which provide the most reliable information on study methods - while the first mentioned sources are rather unreliable.

Moreover, it was found that the great majority of recommendations and instructions were the product of the first four categories, while only an extremely small proportion of the content of the instructions could be attributed to an analysis of results derived from studies of the nature covered in the last three categories.

Consequently, it must be concluded that what we know at present about study methods rests on a very shaky foundation. If we wish to know for certain what study methods should be recommended under given circumstances as being the most adequate in given study situations, it will be necessary to institute scientific research of the above mentioned nature.

Why is Research necessary?

Many unsolved problems within the field of study methods may be mentioned but most important are possibly the following three

which, put together, form the basis for all work on study methods:

1) Are there, in fact, any marked difference between the working methods of different students?
2) Is it possible for students working in an inefficient manner to learn the methods applied by the more effective students in their work?
3) Will the learning of such methods applied by others really increase the former students' efficiency?

Many people feel that these three questions may be answered in the affirmative, but so far this has not been completely confirmed by research findings. This does not mean that they may not be right in their assumptions, but it must be realized that it is not known for certain that this is the case. - And such certainty is necessary before far reaching decisions can be made as to the place of study methods in the educational system.

For the solution of the mentioned three problems precise descriptions will be required of the procedure followed by the students in their studies. Failing such descriptions, it is impossible to ascertain whether there are individual differences; there is nothing to prove whether working methods really have been changed as a result of lessons provided in study methods; it is hopeless to diagnose the weak points of a given person's methods. Finally, such descriptions are necessary before lessons in study methods are provided in order to avoid that this will mean an attempt at teaching the students something they already know.

The second problem - whether it is possible to learn how to apply other people's methods - is, in other words, a question of the students' response to lessons in study methods. This might depend to a large extent on the individual student's personality - which is difficult to change.

The third problem - whether the learning of study methods applied by effective students really will increase the efficiency of less effective students - is simply a question of the extent to which and the manner in which effective working methods,

coupled perhaps with devotion of more time to the studies, may counterbalance a higher mental capacity and greater interest, in other words a definition of the limits within which it is possible to teach people to think and to solve problems.

Finally, there are two more questions, which have been left unanswered:

4) How can we develop study methods concerned with activities not covered by the available guides?
5) How can we best plan the teaching of study methods?

More Research necessary

You still come across American student's guides written already at the beginning of this century. In content these old guides resemble the most recent publications on many points. During the past 50 years much work has been done in an effort to gain experience as to the importance of study methods to learning. There is every indication, however, that today it must be admitted that no further headway can be made based exclusively on educational experience. The problems that were unsolved in 1910 have still not been worked out, and the only possibility of getting any further seems to be by intensive educational research.

In this respect the objection may be raised that many reports are already available on research into the problems of study methods and that an analysis of this material might possibly provide the answer to the above questions.

In order to test the validity of this objection the author decided in 1968 to review all reports on research into study methods listed in "Psychological Abstracts" from 1927 to 1967. It was found that the great majority of these reports could be referred to one of the following two categories:

One type of reports covered descriptive investigations aimed at ascertaining how students actually set about learning the material and in which investigations the observations were compared against the scores obtained by the same students, their personality etc.

The second category covered investigations for the purpose of determining whether instruction in study methods helped the students to obtain higher scores.

The results of the descriptive investigations proved untenable because of the following flaws in the research methods:

1) Nearly all investigations comprised questionnaires, to be completed by the students themselves. One of the results of this procedure was that the only information obtained was data relating to the topics covered by the questionnaires. Another was that the information had an uncertain validity.
2) The investigations did not include the amount of time devoted by the students to their studies.
3) The descriptions were confined to the situation at the very time of the investigation or they were based on the students' recollection of their working methods up till the time of the investigation.
4) No direct observations were made of working procedures over any great length of time.

The results of the investigations in the second category unfortunately also turned out to suffer from weak research designs:

1) Very few personal data on the participants were made available. In consequence hereof it was impossible to decide, on completion of the instruction, whether any specific categories of individuals had derived a greater benefit from the lessons than had others.
2) Where control groups were used they had as a rule been matched solely according to differences in mental capacity- and not in reading capacity. This is unfortunate considering that reading capacity is very important when deciding the study methods that can be learned.
3) The content of the instruction and the type of instruction were hardly ever described in sufficient detail.
4) Nothing had been done to find out whether any students while attending classes in study methods had adopted the new methods in their work outside the classroom, and whether any such students derived more benefit from the instruction than did less active participants.

5) The methods intended to show whether the participants had changed their study habits suffered from the same weak spots as did the above mentioned descriptive investigations.
6) In extremely few instances only had any attempt been made to ascertain whether the effect, if any, of the instruction was of a more or less permanent character.
7) Where the long-term effect had been investigated, no check had been made on the time spent by the students on training study methods during their studies, i.e. the investigators did not know whether the students could be compared against one another.

Unsolved Problems

The conclusion arrived at as to the value of the content of the student's guides and of the educational efforts made to introduce better study methods may be extended to apply also to many of the scientific investigations in this field.

It may be difficult to decide the reasons for this, but two important contributing factors may undoubtedly be pointed out. For one thing it was not until 5-10 years ago that it was realized what sources of error might threaten such investigations. Secondly, most of the investigations definitely seem to bear the stamp of being a by-product of previously planned educational programs. Often they began after instruction had already been started, which made it impossible to carry out a number of important experimental variations, and as a result of which, what was known about the students prior to the start of instruction was very incomplete.

Within educational psychology rapid forward strides have been made during the past decade within the field of research methods. This development may be explained by the fact that intensive studies now are being made to an ever increasing extent into the reasons why so many research projects have failed to yield certain results applicable in practice. In other words, the specific sources of error confronting different types of educational

investigations have been studied.

As a result of these analyses it is now possible, with a much greater degree of certainty, to decide how educational research should be planned to ensure definite results applicable in practice.

Better research designs

In the following some important requirements will be set forth pertaining to investigations into problems related to study methods - with an outline also of the new possibilities now available of meeting such requirements.

Failing complete understanding as yet of the circumstances under which wide-reaching conclusions may be drawn from investigations conducted as laboratory experiments bearing no resemblance to everyday life, the requirement first and foremost to be made in respect of research on study methods must be that the investigations be conducted in an atmosphere of reality closely resembling a life situation. The students should not be observed in artificial laboratory situations but at the place where they work: At school, at the university, when together with their peers, and in their study.

As the basis of such research, it is important to demonstrate how students actually work under natural conditions and to determine whether there is any systematic correlation between the student's behaviour while studying and the scores subsequently obtained by him, etc. It is, therefore, of central importance to concentrate mainly on observation and description of the students' working methods but not at first on changing them.

In such investigations the following requirements may be made as to research methods:

1) The description shall comprise the study situations that are normal for the students and must not be confined to brief sessions or to the students' recollections of what happened some time ago.
2) The description shall not only cover the manner in which the subjects are working but also state the amount of time spent by them on different activities.

3) The description shall include direct observation of the work and not be based entirely on questionnaires or interviews.
4) On the other hand the descriptions should not be confined to the behaviour alone, but should also include specific aspects of the individual student's line of thinking.

Before these requirements are met in a satisfactory way no possibility can be claimed to exist of obtaining any definite information on the manner in which students work.

The possibility of meeting the above requirements exists because of three important methodological developments:

1) The preparation of special guide lines for the design and testing of interview forms and establishment of the procedure to be followed by the person conducting a research interview.
2) The revival of the "thinking aloud" method where the subjects of the experiment are taught to verbalize certain chosen aspects of their line of thinking. Here the development of good portable battery tape recorders has been very important.
3) The development of technical material for closed circuit television recordings. This means that the person conducting the investigation need not disturb the subjects by his presence, and that a playback of the video tape will make it possible to study the course of events repeatedly for analization of the material from different points of view.

When you get to the point where you can work out realistic descriptions of the manner in which the students work, it may be desirable to extend the research activities so as also to comprise the effect of the instruction provided in study methods.

If such investigations into the impact of the instruction are to be carried out in a proper scientific manner, the following requirements must be met:

1) Some time prior to the investigation a descriptive study must be carried out into the manner in which the subjects are working.
2) This study must be repeated immediately before introduction of the instruction.
3) The samples and the control group must be fairly equal as regards the distribution of academic marks, I.Q. and reading level.
4) During the course of the actual investigation information must be compiled on: a) the total situation of the experimental and the control group, b) the behaviour of the teacher, and c) any extra activities in which the subjects are engaged apart from their lessons which might be imagined to affect the benefit they gain from these lessons.
5) Immediately upon completion of the instruction the descriptive study should be repeated once more.
6) For some time after completion of the instruction information should regularly be collected to show whether the subjects are trying to apply the new study methods in their daily work and the time devoted by them for this purpose.
7) Finally, the descriptive study should be repeated a last time to determine the long-time effect of the instruction.

A research project of this nature would have to include interviews, questionnaires, sessions in thinking aloud, TV-recordings of the class at work, etc., and the total costs involved would be considerable. There is hardly any doubt, however, that a rapid return of the investment would be possible in the form of a lower percentage of drop-outs and a noticeable reduction in the hours spent on studying for a certain goal.

The above views on the need for scientific investigations may be summed up as follows: It must be admitted that our present knowledge of the problems of study methods rests on a very shaky foundation. The problems to be solved are known and also how they may be solved. The main obstacle to the solution of the

research tasks is the lack of technical aids, including primarily the equipment needed for TV-recordings.

Instruction in Study Methods

When reading the previous chapters you might easily get the impression that apart from scientific investigations all other action should be shelved, and that efforts should be concentrated entirely on arriving at a solution of the fundamental problems. This, however, would be to jump to conclusions.

It has been pointed out that there is no certain proof that it would be of any avail to introduce lessons in study methods. There is hardly any doubt in this respect, and such proof must be produced before arriving at far-reaching expensive decisions on the place to be assigned to study methods within the educational system. A study of available literature puts you under the impression, though, that though we know nothing for certain, nearly all research findings and educational experience within all fields seem to indicate the same thing: that the formerly advanced fundamental questions may all be answered in the affirmative.

Therefore, it would be unfortunate if all efforts were abandoned of teaching the students to employ better study methods. It is important, however, that the teachers who may want to work with study methods should recognize that this is a question of experimental teaching, and that, therefore, they are especially responsible seeing that the results of their teaching may be of decisive influence on the educational opinion as to the value of introducing improved study methods at our schools and academies of learning.

What is the use?

One thing emerges clearly from the educational experience gained so far: Unless systematically exposed to external influence students do not change their mode of working to any great extent. Methods promoting a more effective manner of working are not often the product of premeditation on the part of the students

themselves. Some methods are discovered by a mere chance; others through experiments made by individuals in an effort at getting as much done as possible within the briefest possible span of time - others again are the result of thorough scientific research. The study methods we know today, therefore, frequently represent an effort that is comparable with that preceding other technological and methodological achievements - the most adequate standard of comparison would in this respect be our knowledge of different teaching methods. To reject study methods while claiming them to be nothing but a number of tricks that one would hit upon without being told is, therefore, an irresponsible approach.

Another argument against the efforts made to introduce more appropriate methods, however, deserves more attention.

This argument emphasizes how reprehensible - almost inhuman - it is to seek blindly for efficiency at the cost of other - and perhaps more important - aspects of student activities such as e.g. their interest in and satisfaction with a given assignment. This point of view, however, is based on a misunderstanding on two points:

First, a direct comparison between the student's situation and that prevailing in industrial work is not possible. In a factory it may happen, and has in fact happened that the improvement of the individual worker's efficiency has been of small benefit to himself. <u>This, however, is not directly applicable to students</u>. Here it is the student himself who derives the benefit of a more effective working method. He will have more spare time and get better scores - or he may complete his studies within a shorter period and with better results.

Second, it is a mistake to launch the attack against the efforts made with a view to improving the working procedure rather than against the objective which determines the structuring of the work. If an educational program is aimed at making the students more satisfied with what they are doing, then the instruction in study methods will be planned especially for achievement of this end. If, in another educational program, it is desired that the students shall acquire certain knowledge within the shortest possible period of time, other study methods

will be recommended. In other words: Study methods are means of reaching different educational goals. It would be more reasonable to direct the criticism at those goals rather than at the working methods determined by them.

It is quite understandable that the alert is called, warning against any tendency to strain after effect, and a constant critical evaluation of new contributions within the fields of education and training is important.

It should, however, be realized that such critical attitude to the introduction of effectiveness into education to a certain extent is symptomatic of the affluent society. In developing countries the situation is different. Here the main issue is to ensure the output of an ever increasing number of teachers, and a great interest will, therefore, be taken in educational efforts enabling students to work more independently, i.e. in less need of contact with a teacher. This is one of the points which, in particular, should be born in mind when evaluating the efforts made to develop new and better study methods.

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