#### DOCUMENT RESUME

ED 289 467 IR 012 933

AUTHOR Abeasi, Kwasi; Reigeluth, Charles M.

TITLE Group Discussion as an Effective Method of

Instruction. IDD&E Working Paper No. 20. Syracuse Univ., N.Y. School of Education.

INSTITUTION Syracuse
PUB DATE Aug 85
NOTE 19p.

PUB TYPE Guides - Classroom Use - Guides (For Teachers) (052)

-- Information Analyses (070) -- Viewpoints (120)

EDRS PRICE MF01/PC01 Plus Postage.

DESCRIPTORS \*Group Discussion; Guidelines; Higher Education:

\*Instructional Design; \*Instructional Effectiveness;

Models; \*Teaching Methods

#### ABSTRACT

Advantages and disadvantages of group discussion as a method of instruction are reviewed in this paper and criteria are suggested for determining when group discussion is or is not an appropriate instructional method. The guidelines provided take into consideration the characteristics of the students, the teacher, the group as a whole, and the subject matter, as well as time and financial resources. Three forms of group discussion are then described: (1) the general model, in which the instructor divides the class into groups, selects the topic to be studied, provides guidance for research, and supervises the actual discussion; (2) the moderator model, in which one of the students rather than the instructor acts as leader; and (3) the non-moderator model, in which there is no designated leader, but a student is selected as a recorder. Recommendations for the introduction, presentation, and summary sections of the discussion are included for each model. Nineteen references are provided as well as a list of other publications in this series of working papers. (MES)

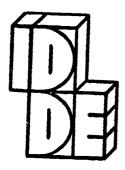


E RO12933

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)

This document has been reproduced as received from the perso, or organization originating it.

- Minor changes have been made to improve reproduction quality
- Points of view or opinions stated in this document do not necessarily represent official OERI position or policy



# INSTRUCTIONAL DESIGN, DEVELOPMENT, AND EVALUATION

# **WORKING PAPERS**

GROUP DISCUSSION AS AN EFFECTIVE METHOD OF INSTRUCTION

by

Kwasi Abeasi Charles M. Reigeluth

IDDAE Working Paper No. 20 August 1985

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Charles Reigeluth

TO THE EDUCATIONAL RESOUR. "S INFORMATION CENTER (ERIC)"

SCHOOL CF EDUCATION, SYRACUSE UNIVERSITY

This report is a working paper intended for prepublication distribution. The reader's comments are solicited and should be conveyed directly to the author(s).

IDDSE Working Papers are available at cost from the Instructional Design, Development and Evaluation Program at Syracuse University.

If you would like to subscribe regularly to the IDDAE Working Papers at cost, please notify the editor.

IDDGE Working Papers
Instructional Design, Development & Evaluation Program
Division of Educational Development, Counseling and Administrative Studies
School of Education
Syracuse University

Charles M. Reigeluth, Editor Mary Flynn, Production Editor 530 Huntington Hall Syracuse University Syracuse, NY 13210



#### Abstract

This paper cutlines group discussion as a method of instruction and prescribes how it can be used effectively. The advantages and disadvantages of the group discussion method of instruction are identified and these are used to make recommendations as to when to use and when not to use this approach.

A criterion for use of the group discussion method is established and the four main types of group discussion are presented as the general model, the student-centered model, the moderator model and the non-moderator model. Each type is outlined in a simple format giving the introduction, the presentation and the conclusion. Used properly, it has been found to be a very efficient method for particular situations and conditions which have been identified in the paper.



The EDeP or Extended Development Procedure (Reigeluth, Doughty, Sari, Powell, Frey, Sweeney & Berliner, 1982) is an instructional design methodology which gives a broad range of instructional design prescriptions to be used as a supplement in the Interservice Procedure for Instructional Systems Development (IPISD). It prescribes sequencing content, selection of instructional strategies and the selection and use of various approaches such as individual resources, tutoring, lecture, group discussion, group activities and group projects.

The selection of the approach from a number of alternatives (as shown in Figure 1) depends on the type of source of instruction to be used as well as the type of receiver or audience.

The lecture has been described as the second oldest form of instruction known to man and it is said that it was invented the day after he learned to talk. Group discussion on the other hand may be said to be the oldest form of instruction known to man, for once he learned to talk, man started to talk to and be talked to by others and thus discussion was invented. Though discussion has been around longer than all the other forms of instruction, it is not used as much as some of the other approaches because it requires a lot of preparation on the part of both the teacher and the students, the setup of some ground rules, and the presence of participants preferably with similar backgrounds.

Group discussion is sometimes put under the general umbrella for "student-centered teaching." Theoretical and practical discussions concern the educational implications of the individuals relationship with authority.

# Advantages of Group Discussion

Group discussion can be a highly effective method of instruction. Properly conducted, discussions may elicit reflective thinking or creative problem-solving (Bloom, 1953). In addition, discussions may be useful for increasing students' awareness of the variables involved in complex matters, for analyzing and reflecting on situations and for fostering motivation (McKeachie, 1970; 1978; Hoover, 1980). Discussion allows the teacher to act as a consultant to the class or group and therefore talks much less than might be expected. It also creates a relaxed atmosphere conducive to the development of personal meaning and originality which is not possible under the threatening aspects of the learning situation, especially through the rejection of implicit hostility, adverse criticism and knowingness.

It also provides a more economic use of classroom "speaking time" (Williams, 1983) and encourages all students to participate in the learning process. It creates a lively and stimulating atmosphere for learning.



# Disadvantages of Group Discussion

As the saying goes, there's two sides to every coin. So is there, for anything which has a use, disadvantages as well as advantages. One of the most obvious disadvantages of group discussion is that because it is a dynamic interaction between an instructor and students, class activities seldom progress in the order planned. Also, because of the unpredictability of a discussion, teachers risk the possibilities that the exchange may wander into irrelevant domains, areas outside the field of study or worst of all, go so far out of control that essential material is not covered and objectives are not reached. It is therefore imperative that it is planned and implemented very carefully (Yelon and Cooper, 1984).

There is also the fact that group discussion as a method of instruction, is very expensive and requires a lot of preparation on the part of the instructor or teacher. Another possible disadvantage is the fact that group discussion could be dominated usually by the group's leader or chairman if not properly organized. It also may sometimes degenerate into chaos if not properly handled.

Finally, discussions are hard to conduct and hard to learn how to conduct. The skills of questioning needed in conducting discussion are complex and a high level of organizing ability is required for an effective use of the group discussion method. Also the group has to be homogeneous in verbal and/or analytical skills (Kennedy, 1982; Goldschmid and Goldschmid, 1976; D'Arcy, 1980).

#### Criteria for Use

Each of the eight modes of instruction has its own special area of usefulness or application. In prescribing the group discussion method as the method of choice for any particular instance, it should be noted that it requires special management guidelines and the setting up of some ground rules. The participation of the students implies automatic practice and therefore better chances of listener reception and retention.

The group discussion method is ideal for certain types of material to be taught and for certain situations; but as can be expected, it is also unsuitable for other situations or occasions. Some of the appropriate situations are outlined below:

When the group is homogeneous - Group selection is a critical activity in using the group discussion method of instruction. The method is most effective when used for small groups who share certain characteristics, such as a common level of verbal and/or analytical skills or when the group agrees on general terms used within the discipline in which discussion is encouraged. (Kennedy, 1982)



When there is a need to arouse interest - in a subject or topic. Often students have an idea of a particular subject or topic but their knowledge is fragmented or of some specific aspect. In this case they could be bored by a formal lecture. Instead the teacher may direct them to some assigned readings after which the discussion method could be used effectively to ensure identification and retention of the main issues. Since the students are already familiar with the subject or some aspect of it, discussion will induce individual research and participation which will in turn ensure maximum retention and meaningful understanding.

When there are insufficient resources to use more effective methods - Most effective methods of instruction like individualized instruction are expensive both to acquire and to operate. Since money is always a problem for most programs, it becomes necessary to adopt less costly methods for particular situations. Even though group discussion is by no means the cheapest mode of instruction (lecture method being the cheapest), it is definitely one of the not-too-expensive methods, especially if it is handled by an experienced group leader.

When there is a lack of a qualified teacher knowledgeable in the particular area or subject - Often when a topic or subject is new, there is a shortage of teachers with adequate knowledge to teach by the lecture method. In that situation, it is usually advisable to adopt the discussion method in which students are guided to research the subject from various sources and then brought together in small groups to discuss the topic or subject and arrive at some consensus (Gall & Gall, 1976).

When students are mature and highly self-motivated - For very mature students who can be easily guided to conduct their own research effectively, it is sometimes more motivating to use the group discussion approach which will enable them to participate fully in the teaching/learning process. It also allows them to use their creativity and innovation.

When information changes rapidly or frequently - In situations where information changes rapidly and has to be regularly updated, it is quite effective to have students search various journals for current material on a particular topic and then use the group discussion method to extract the relevant conclusions for the benefit of the group. The lecture could be used in such a situation but the group discussion method allows more people to be involved in the scanning of journals and therefore access to more sources. This is active processing of information.

When information is scattered among different sources - For situations where information is not developed enough for text books to be written, it is often the practice for



articles from journals to be used as source material. In such cases, the group discussion method is a very effective way of getting maximum scanning of journals and the extraction of relevant articles on the subject. Again, the lecture method could be used for this situation but the group discussion method generates participation by more people.

When long term retention is necessary - When long term retention is necessary, then it is important for the student to have sufficient opportunity for practice and immediate feedback. In such cases, methods such as the lecture are not very useful. The group discussion method could prove useful in such situations since the participation of the students in processing the assigned or prerequsite readings and discussing the main points tends to create better retention in the students.

when active listener participation is required - One of the benefits of the group discussion method is the fact that it forces active individual participation and enhances reflective thinking and individual development when done properly. When individual/listener participation is therefore important, then this is one of the most effective methods of inscruction.

When listeners are above average in intelligence - As the general level of education of the audience increases, the use of the group discussion method becomes even more appropriate and effective. This is because the student's attitude towards the traditional teacher-student relationship tends to be hostile. The student at this stage, wants to be able to use his creativity in the learning process. The student wants to show his knowledge (Gall & Gall, 1976).

There are also specific instances and conditions under which the group discussion method should not be used as a method of instruction. The literature indicates several such situations among which are the following:

When there is a big difference in the background and level of intelligence of the students - When there is a large difference in certain characteristics of the group members such as a large variation in the levels of verbal and/or analytical skills of the individual students, then the group discussion method should not be used because there's bound to be domination by those with higher verbal and analytical skills.

When there is very little time - The discussion method of instruction requires vast amounts of time both on the part of the instructor and on the part of the students. The teacher needs a lot of time for planning and organizing it while the students need a lot of time to read preparatory



material and research the particular topic or subject to be taught. If, therefore, time is limited then this approach should not be used. Instead, the lecture method would be a better approach.

When subject matter is highly abstract or complex - Sometimes the subject matter is abstract or very complex and needs very careful research and handling. In such cases, group discussion may not be the best way to go about it.

When the group is not homogeneous - This situation is similar to that of difference in levels of intelligence. In each case, the group discussion approach is not the appropriate method of instruction to use. This is because the more intelligent or knowledgeable learners tend to dominate the discussion.

When there are insufficient resources - As has already been mentioned, the group discussion method is certainly not the cheapest method of instruction in terms of time, as well as money for preparation. A lot of organizing and preparation of the students as well as the format and the materials to be used are required. These tend to make the method a little more expensive than other methods. When there are insufficient resources therefore, group discussion is certainly not the best method of instruction to use.

# Preparatory Steps Necessary for Effective Use of Group Discussion

In order to use the group-discussion method as an effective method of instruction, there are some preparatory steps that need to be taken. These are mainly decision-making steps concerning the group size, group membership, meeting schedules, discussion topics and starting of group sessions.

To ensure that each member or student gets enough time and opportunity to make his/her contribution, it is important that the group size is chosen such that the number of students is neither too large (which could cause excessive limitation on time) nor too small. As a rule of thumb or quick and dirty rule, a group size of 6 or 8 members is ideal (Reigeluth, Doughty, Sari, Powell, Frey & Sweeney, 1982). Students with similar backgrounds should be placed together - this has been elaborated upon under Criteria for Use.

The schedule of meeting times should also be determined beforehand. In general, groups should meet for 1 or 2 hour sessions. If it is necessary to spend more time for the discussions, then sessions of 1 hour or 1 1/2 hours with short breaks (15 minutes) in-between should be used.

There are also a few other important steps to be taken care of before the group sessions begin. The first is the assignment of readings or other appropriate activity to be undertaken by group members. If students are unfamiliar with each other, have



an ice-breaker session.

It is also important, at this stage, to set the necessary ground rules including goals and objectives as well as the problems.

# THE GROUP DISCUSSION METHOD

The group discussion has been likened to the T-Group model used by psychologists and to the conference or "buzz group" method used by communication specialists. Bridges (1979) defines group discussion as the organization of individuals for putting forward more than one point of view upon a subject, the participants being disposed to examine and be responsive to the different points of view put forward and with the intention of developing their knowledge, understanding and/or judgment on the matter under discussion.

Gall (Gall & Gall, 1976) distinguishes between four different types of discussion based on the instructional objectives: subject-matter mastery discussion, issue-oriented discussion, moral development discussion and problem-solving discussions. This categorization, though more popular, is not appropriate for our purposes (Dillon, 1984). For the purposes of differentiating between these differences however, we may categorize the types of discussions as the general model, the model.

# The General Model

The simplest form of group discussion is the general type in which the teacher or instructor divides the class into groups, selects the topic or subject to be studied, provides guidance for the research into material and then supervises the actual discussion of the topic.

In general, discussion should be preceded by thorough preparation on the part of both the teacher and the student. This should include three important parts: the introduction, the body and a summary and conclusion (Yelon & Cooper, 1984).

# Introduction

The introduction of a group discussion also includes three segments: a review or summary, an introduction to the particular topic, and questions to be discussed. The introductory remarks usually provide a justification for the study of the particular topic or subject and a background and context for questions to be asked.

The introduction should gain the attention of the audience and generate interest in the subject matter or topic. It should indicate the objectives, of the discussion, how they relate to the individual's situation and why the group discussion method



has been chosen over other alternative methods. It should advise participants of what is expected of them and how participation is going to be important. These remarks could further serve to gain and focus the audience's attention while they present the general ideas or facts to be discussed at a broad level. The audience should then be divided into groups following special guidelines, to ensure homogeneity of group, level of education, etc.

The teacher should also generate some general questions for the participants or students to consider or focus on during the discussions. This will give some direction to the discussions to follow and also give a common starting point from which the various individuals can take off in their contributions to the discussion. The introduction should also set a good climate for the discussions. Most experts recommend a permissive climate as the best one. Sensitivity to all opinions and cultural values should be encouraged.

# Presentation

we now move to the body of the discussions, and spell out the general direction the discussions should follow. Each student should be encouraged to present his or her contributions in the simpliest possible terms and elaborate on them as the discussions proceed in order to introduce more specific or complex situations (Reigeluth, 1979).

The body, for the teacher, should also entail reacting appropriately to contributions or responses from students. The instructor should encourage students to contribute towards the discussion and guide them so that they stay on track. The teacher can also keep the discussion focussed with his reactions to students' contributions.

# Summary and Conclusion

The teacher listens to all the contributions and as the last or final step of the discussion summarizes the major points advanced during the discussions and identifies any concensus reached. Occasionally during the portion of the discussion procedure, the teacher may cycle back to the original introduction or question and indicate whether or not they have been adequately answered from the presentations. The teacher may discussions, and should identify strengths and weaknesses of the group session for the future use of the group.

# Variations of the General Model: Group Discussion with Moderator

The group discussion with moderator, as the name implies, is simply a normal group discussion with one of the participants or students as the moderator or leader instead of the teacher. As might be expected this model requires the selection and training of a moderator from among the members of the group.



# Introduction

The introduction for this type of group discussion follows the same pattern as that for the general model with very slight modifications. The introductory remarks should provide justification for the particular topic or subject chosen with a little background information. The introduction should attempt to gain the attention of the audience and generate interest in the subject, and specify group sizes and method used for their selection. Sometimes group members need to be involved in the selection of the topic or subject matter. If this is the case, it should be so stated and members allowed to select subject or topic for discussion (Reigeluth et al., 1983).

The teacher should then provide guidelines for selection of moderators and allow the groups to select their moderators. Once this is done, the teacher should then organize a short training session for the moderators, providing procedural guidelines for conducting sessions, provide suggestions for reading matter and other media and also remind moderators not to take control of discussions and finally provide goals and objects for the groups.

### Presentation

In the body of the discussion, otherwise known as the presentation, the selected moderator should introduce the topic for discussion, set the ground rules for participation and encourage every member to participate fully in order to benefit from the session. The moderator should define the problem, if appropriate, and use his facilitative skills and problem-solving strategies to guide the group without dominating it (Flynn, 1972).

The moderator may kick off the discussion with some remarks of his own on the chosen topic and pose some leading questions which will get the discussions started. He may also invite some particular members by name, to give their views to start the discussion off, providing feedback to their responses, clarifying them if they are inaccurate or if the members are not clear about the subject (Thompson, 1974). Inappropriate contributions should be politely pointed out without creating negative effect.

#### Summary

The summary of a group discussion with a moderator can be handled in two ways. Either the moderator sums up the discussions with a run through the various consensus reached or he can invite each member of the group to make his or her summative comments after which he can synthesize all of the comments into major consensus.



# Variations of the General Model: Group Discussion Without a Moderator

The group discussion without a moderator is also another variation which is slightly different from the general model. In this type, even though there is no moderator, usually one of the group members is selected as a recorder or secretary to record the various consensus reached by the group. In such cases usually, the natural leadership emerges from the group.

# Introduction

With this model of group discussion, the teacher needs to ensure that group se ection is done very carefully to consist of mature, motivated students capable of organizing their affairs themselves. Since the group is really without a de jure leader, it is even more important for the teacher to draw clear and specific ground rules for the group. Procedural guidelines should be given in clear unambiguous terms. Introduction of the topic or subject for discussion together with some leading questions is usually a good approach in such cases.

The group then is encouraged to select a reworder or secretary who will keep a record of the main points or contributions and the consensus arrived at if any.

# Presentation

The presentation for the group discussion without a moderator is different from that with a moderator. In this case, it is usually more effective for the group to agree to go round in a particular order to hear the views and/or comments of each member in turn with regard to each particular issue. Once a consensus is reached on particular issue or viewpoint, it is noted down by the recorder or secretary.

#### Summary

Once the topic or subject has been thoroughly discussed by the group, the group may agree to go a final round for each member to present his or her concluding remarks or comments. The recorder then recapitulates for the entire group the major points noted down and the various consensus arrived at. These are given a final review by the group and then presented as the report for the group.

### Conclusion

Group discussion is one of the methods of instruction which actively involves the learner in the process. It certainly has several advantages, notable among which are the fact that it increases internalization and retention of information, usually provides cohesiveness of members in the group (except for highly controversial topics), increases the rate of learning and retention, reduces the fear of failure, and provides



educationally effective training in interpersonal relations (Flynn, 1972). It also encourages cooperation, community and participative decision-making (Flynn, 1972). However, it must be noted that group discussion is very time-consuming especially if the group is very heterogeneus. It may not always be necessary or feasible, but if it can be utilized it is a very exciting and stimulating method of instruction to use because it pools together the abilities, knowledge and experience of all members of the group, to reach a common goal.



# References

- Carpening, D.K. All right class, let's discuss it, G/C/T 35, 27-9 November/December 1984
- Dillon, J.T. Research on Questioning and Discussion Educational Readership, 1984, 42:50-6 N
- Flynn, E.W. & LaFaso, J.F. Group discussion as learning process: A sourcebook. Paulist Press. New York: 1972
- Gagne, R.M. & Briggs, L.J. Principles of Instructional Design (2nd edition), New York: Holt, Reinhart and Winston, 1979
- Gafney, L. Fractical Guide to Discussion, <u>Indiana School</u>
  <u>Bulletin</u>, 1975, 35:65-6 D
- Gall, M.D. & Gall, J.P. "The Discussion Method" in The Psychology of Teaching Methods: 75th Yearbook of The National Society for the Study of Education. Editor: M.L. Gage. Chicago: Chicago University Press, 1976, pp. 166-215.
- Hart, G. Preparing students for small group work in the Classroom. Education, 1975, 95:351-3 Summer
- Hill, W.F. Learning Through Discussion (2nd Edition) Beverly Hills, California, Sage 1977.
- Johnson, M.C. <u>Discussion Dynamics</u>, Rowley, Massachusetts: Newbury, 1979.
- Lander, G. Learning by Discussing, Times Educational Supplement, 1983, 3472:22 January 14.
- Marriott, Stuart, Student-Centered Teaching, Adult Education.
- McKeachie, Wilbert J. Teaching Tips: A guidebook for the Beginning College Teacher, 5th Edition, Ann Arbor, Michigan: Seorge Wahr Publishing Company, 1965, pp. 36-37.
- Purvis, K. The teacher as moderator: A technique for interactional learning. ELT Journal, 1963, J37:221-8.
- Retgeluth, C.M. In Search of a Better Way to Organize Instruction: The Elaboration Theory, <u>Journal of Instructional</u> <u>Development</u>, 1979, hpl. 2 (3), 8-14.
- Reigeluth, C.M., Doughty, P.D., Sari, I.F., Powell, C.J., Pr.y. L., and Sweeney, J. Extended Development Procedure (EDep): User's Manual. Final Report submitted to the U.S. Army Training and Doctrine Command (TRADOC), 1982.
- Smallegan, M.J. Teaching Through Groups. Journal of Nursing Education, 1982, 21:23-31 January.



- Weaver, R.L. The small group in large classes, <u>Education Forum</u>, 1983, Fall 48:65-73.
- Williams, Dick. Using the Discussion group technique in the ESL conversation class. ERIC Report.
- Yelon, S.L. and Cooper, C.K. Discussion: A naturalistic study of a teaching method, Instructional Science, 1984, 13:213-4.



#### PREVIOUS WORKING PAPERS

The following is a list of IDD&E Working Papers that have been published. With the exception of the \* titles, these Working Papers are available at 50c each plus postage.

- \*1. Meaningfulness and Instruction: Relating What is Being Learned to What a Student Knows by Charles M. Reigeluth, March 1980 (34 pp.)
- \*2. Relating What is to be Learned to What is Known: Subsumptive Sequencing, Coordination, and Cognitive Strategies Activation by Faith S. Stein, Jody K. Witham and Charles M. Reigeluth, April 1980 (44 pp.)
- \*3. Toward a Common Knowledge Base: The Evolution of Instructional Science by Charles M. Reigeluth, August 1980 (44 pp.)
- \*4. Using Videodiscs in Instruction: Realizing Their Potential Through Instructional Design by Charles M. Reignluth and Joanne Garfield. September 1980 (41 pp.)
- \*5. The Use of Sequence and Synthesis for Teaching Concepts by Linda Frey and Charles M. Reigeluth, December 1981 (16 pp.)
- \*6. A Comparison of Three Instructional Presentation Formats by Bonnie Keller and Charles M. Reigeluth, January 1982 (30 pp.)
- \*7. Type and Position of Adjunct Questions: Their Effects on Memory and Application by Afnan N. Darwazeh and Charles M. Reigeluth, February 1982 (18 pp.)
- \*8. The Effects of Sequence and Synthesis on Concept Learning Using a Parts-Conceptual Structure by C. Herbert Carson and Charles M. Reigeluth, February 1983 (23 pp.)
- \*9. The Effects of Analogies on Student Motivation and Performance in an Eighth Grade Science Context by Ruth V. Curtis and Charles M. Reigeluth, March 1983 (31 pp.)
- \*10. Use of the ARCS Model of Motivation in Teacher Training by John M. Keller, March 1983 (9 pp.)
- 11. The Effect of Three Different Kinds of Feedback: Hint, Correct Answer. and Right/Wrong by Betty Feng and Charles M. Reigeluth, April 1983 (19 pp.)
- 12. Effects of Four Instructional Sequences on Application and Transfer by Chun-I Chao, Luz Ruiz and Charles M. Reigeluth, May 1983 (23 pp.)
- 13. The Effects of Format of Synthesizer on Conceptual Learning by Lois McLean. N. Kei Yeh and Charles M. Reigeluth, June 1983 (23 pp.)
- 14. Current Trends in Task Analysis: The Integration of Task Analysis and Instructional Design by Charles M. Reigeluth, July 1983 (20 pp.)
- 15. Motivation Design by John M. Keller, August 1983 (12 pp.)
- 16. Restructuring: The Key to a Better Educational System for an Information Society by Charles M. Reigeluth September 1983 (22 pp.)
- 17. Teaching Common Errors in Applying a Procedure by Fredy E. Bentti, Anthony R. Golden and Charles M. Reigeluth, October 1983 (17 pp.)



- 18. Teaching Common Errors in Applying a Procedure by Alberto O. Garduno, Stephen Marcone and Charles M. Reigeluth, November 1984 (22 pp.)
- 19. The Effect of Principle-Procedure and Procedure-Principle Sequencing on Learning Outcomes by Muriel Lim-Quek, Indaryati Motik and Charles M. Reigeluth, July 1985 (21 pp.)



# SOURCE

	<u>Hu</u>	nan .	Non-Human	
	<u>Professional</u>	Non-professional	Instructional	Non-instructional
One	Professional Tutoring	Peer Tutoring	Individualized Resources	Individual Projects
Many	Lecture	Group Discussion	Group Activities	Group Projects

FIGURE 1: Alternative approaches of instruction based on source and receiver characteristics.

