

FOCUS on education—an interactive computer system for the development and analysis of repertory grids

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(Received 1 June 1977 and in revised form 30 September 1977)

Most teachers and tutors would agree that they achieve their best results when they "start from where the learner is". However, the techniques offered by psychology to help the teacher such as attitude scales, personality tests and questionnaires are less than satisfactory. The Kelly repertory grid is a new tool recently being used more extensively in education to raise the learner's awareness of the learning process, but many users have found the analysis of the grid difficult and unhelpful, and the structure too rigid.

This paper describes two BASIC computer programs to elicit and analyse grids easily and clearly. FOCUS uses a two-way cluster analytic method to re-order the constructs and the elements to highlight similarities and differences in the grid, and displays the focused results together with tree diagrams of the similarities in elements and constructs. PEGASUS is an interactive program which conversationally elicits a grid, processes and offers real-time feedback commentary on the results.

Introduction

One of the basic problems of education is that everyone has a different view of what it is and how it may be achieved. However, most would agree that education includes learning to think, to become sensitive and aware, to be competent, appreciate the world around us, and to live fully.

An important part of education is instruction, which involves following the tradition and convention of doing things in the most successful way. One example of this is the literacy and numeracy which we see as useful accumulated experience of the human race. Instruction is the passing on of a coherent body of knowledge and skills, and to be effective in education must align the teacher's prospective purposes with the learner's retrospective values. In other words, the learner must at least partially suspend his own values and judgment in order to take on those of the teacher with respect to the particular subject area.

Much of what is done in schools, colleges, polytechnics and universities comes into this category, and is in most cases done well and with integrity. Dearden (1967) has noted that we must be on our guard not to think of instruction as being browbeating and hectoring by an offensive teacher. In societies where scientific and technical understanding is not very advanced it is necessary to pass on the knowledge and values of the culture via the teacher, but in our society where knowledge is ever changing, we need to develop flexibility, awareness of the meaning of learning, and the ability of each person

to organize his or her own education and learning in terms of both "content" and "method".

"Content" is currently a controversial area which is especially concerning the Schools Council (1975) but is outside the scope of the present paper. "Method" involves seeing overall patterns and having the ability and expertise to see the relevance of them in different problem-solving situations. Method in learning is always an active process involving both problem identification and problem solving, and education enables one to exercise these competences in an increasing variety and complexity of situations. Learning requires an attitude of mind which may run counter to being taught or effectively instructed, although a proficient learner is able to extract an education from a course of instruction.

Facilitating learning

Facilitating learning is usually done in one of two ways: by organizing the content so that it slips in unobserved, or by enabling the learner to handle less palatable material. A good infant teacher intuitively does this very well, but the problems increase with the age of the learner. The techniques used by the teacher of young children take account of the facts that: it is relatively easy to gain the attention of the infant, and temporarily interest him or her in new things; the content is not over-emphasized but is often less important than the activities and processes of learning; and most important, there is less discrepancy between what the infant thinks and feels and what he or she says. Consequently, to find where the child is and to start from there is a feasible proposition. In the secondary school and in further and higher education the learners—children or students—may have developed in many directions and the adage "start from where the learner is" becomes almost impossible for all but the "born" teacher to do intuitively.

The experienced teacher may be able to make informed guesses which work some of the time for some of the class, but there is a need for a simple technique for encouraging each learner to express his or her understanding of a topic or area in his or her own terms in a form which both the learner and the teacher or tutor can easily understand and use.

Psychological techniques

Psychology has offered the teacher many techniques for discovering where the learner is but very few of these have proved to be of lasting value. Questionnaires, attitude scales, and many observation techniques are intended to do just that. However, they all presuppose that the learner can use the terms offered to him. A questionnaire necessarily asks questions that embody the position of the question asker, and the good conventional personality test, for example, would pride itself in having a high reliability which can be taken as a measure of its resistance to change. Attitude scales, even including the categories in the Affective Domain of Bloom's Taxonomy of Educational Objectives (Bloom, Engelhart, Furst, Hill & Krathworth, 1964) presuppose that the subject thinks and feels about the issue in the terms of the measuring device. Observation techniques such as those devised by Flanders (1960) and Bales (1950) are also designed to help the teachers to understand the teacher-learner situation more clearly, but too often the categories seem inappropriate to their own understanding of events.

Personal constructs and the Kelly Repertory Grid

However, there is a technique in psychology which does allow a person to discover the terms in which he experiences attitudes, thoughts and feelings. This is the Kelly Repertory Grid. George Kelly (1955) developed the theory of personal constructs to explain how similar events could produce quite different behaviour in different people. He suggests that each person has a unique system through which he experiences life. The individual's system of personal constructs is like a pair of spectacles focusing and colouring the world.

In a grid the universe of discourse is represented by a set of elements. Kelly used as his elements people well known to the person, but elements of all kinds are suitable. These elements are then presented in triads and a construct elicited by saying in what way two are alike and why the other differs. For instance, think of three school subjects—Mathematics, English Literature and Art. In what way are two of these similar and different from the other.

Jane says: "Mathematics and English Literature are alike because they are about a body of knowledge and Art is about self expression";

Philip says: "English Literature and Art are alike because they are about life and Mathematics is abstract";

Peter says: "Mathematics and Art are alike because they are about communication by symbols and forms and English Literature is about communication by words";

Mary says: "Mathematics and English Literature are alike because they are useful in life and Art is a waste of time".

Already it is clear that there are different opinions and values. Each of these dimensions is called a construct, and is in fact a personal construct if it is expressed in the person's own terms.

To elicit further constructs another triad of elements may be taken and grouped into a pair and a singleton in a similar way. As each construct is elicited *all* the elements (not just the three in the triad) are assigned to one end or the other. For example, Jane used her construct:

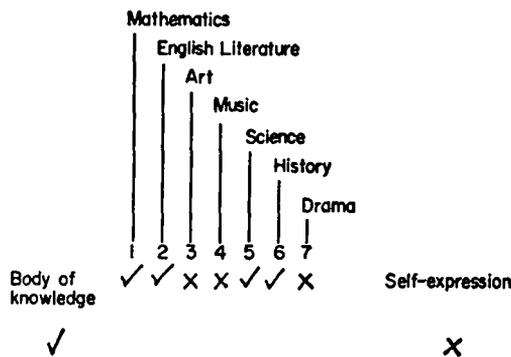


FIG. 1.

You may disagree with her opinion, but you begin to understand how she views these subjects. The following grid is elicited about books read in the last term. In this grid, a

five point rating scale is used to differentiate more sensitively between the ends or poles of the constructs.

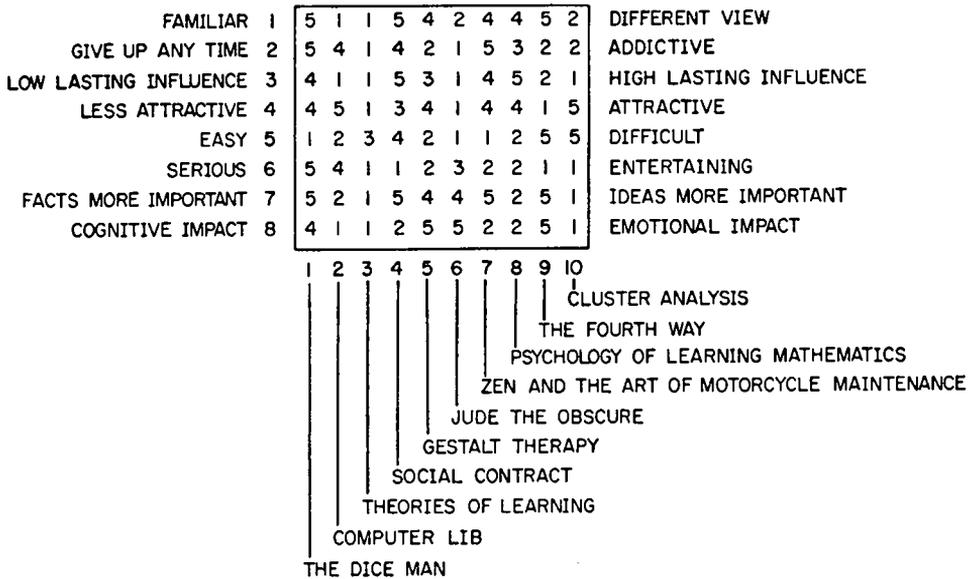


FIG. 2.

Focusing the grid

The FOCUS computer program developed and written by the authors (Thomas & Shaw, 1976) analyses the grid using a two-way cluster analysis to re-order systematically the rows of constructs and columns of elements to produce a FOCUSED grid showing the least variation between adjacent constructs and adjacent elements. This is done with respect to the way in which the constructs order the elements rather than by the verbal labels given to the poles of the construct. This method allows the feedback of the FOCUSED grid to proceed with less mathematical mystification and more insight and understanding. The relationships are highlighted by the tree diagram which shows the highest similarities in the clusters. Appendix 2 shows a sample output from the FOCUS program.

The FOCUS program has been used by people in industry for quality control, management selection and development, appraisal of subordinates, and for the selection of observers in assessment centres. In therapy it has been used with children and adolescents in psychiatric units and hospitals, and in education to investigate the content of children's reading, and the ways student teachers use their teaching practice. It has also been used for the evaluation of courses and in the investigation of magistrates' decision-making.

As an articulator of conversation, the focused grid is a crude but useful tool. It is the beginnings of a psychological reflector which can reflect back to a person a view of himself as seen with his own eyes. However, during the feedback of the results the elicitee may wish to add to his grid as his awareness increases. PEGASUS provides the facility for doing that.

PEGASUS—eliciting personal models

PEGASUS or “Program Elicits a Grid And Sorts Using Similarities” is an interactive computer program for eliciting a person’s model of the world, using a grid structure (Thomas & Shaw, 1977). Figure 3 is a user’s flow diagram of PEGASUS. It does not demonstrate the complete flow of the program but only the interaction, which divides into six sections. The first one is the “Basic Grid” in which explanations are given and the first four constructs are elicited.

Before choosing his elements the user is asked to think about his purpose for eliciting the grid. This is of great importance for the interaction which is to follow, as it sets both the intentionalities and the universe of discourse. The mutual dependencies of the elements on the purpose, the constructs on the elements, and the purpose jointly on the elements and constructs, contributes to the satisfaction and satisfactoriness of the process of elicitation. The user is then asked for six elements which represent his universe of discourse. It is essential that initially elements are of the same type so that meaningful comparisons can be made. As the elicitation proceeds he may add elements at different stages in the process, and for different reasons, but each time he must keep in mind his purpose, and ensure that the list of elements continues to be representative. If during the process of elicitation the purpose is modified, elements of a different type may be added and other elements dropped. Traditionally, the elements that have been used have been people, especially “significant others”, but the authors have used a variety of elements related to a wide variety of purposes. Some of these have been sculptures, significant learning events, audio-visual equipment, graphic art, L.P. records, examination scripts, prospective careers, mathematical concepts and books.

As each construct is elicited, the poles are named and ratings assigned to each of the elements on this dimension. The elements are then grouped according to the ratings given to highlight the patterning and allow the user to revise his ratings or pole names if he wishes. After four constructs the elicitation moves into the second phase where the procedure is less like the traditional grid elicitation and more individual freedom is given. This takes various forms such as the user choosing his own triad, or adding a construct without using a triad; adding or deleting elements; deleting constructs; choosing to see his grid displayed in a focused form; or choosing when to finish. After each input from the user the computer processes, re-orders and feeds back the results of the processing where appropriate. The feedback concerns the matching or similar use of constructs, and the matching or similar use of elements; and gives opportunities to act on the information given at each stage. Very little structure is imposed on the user, and a variety of choice is given wherever possible. Appendix 3 shows a sample output from the PEGASUS program and Fig. 4 is an annotated form of the final result.

The user may choose to finish when he feels that his grid is complete, and see the analysis of the results. Although the FOCUSing and the feedback of results is an important part of the PEGASUS procedure, the elicitation experience is both stimulating and demanding. The computer acts as a cognitive mirror in which the user sees himself through his own eyes, perhaps for the first time. Much of this experience may not be visible in the results, but a greater understanding of oneself and one’s models often develops after the interaction with PEGASUS—the mythological winged horse.

The PEGASUS grid differs from the Kelly Repertory Grid in that it encourages the user to explore the differentiations he can learn to make rather than just elicits those he does habitually make. This is due to the rigorous feedback and the opportunities and

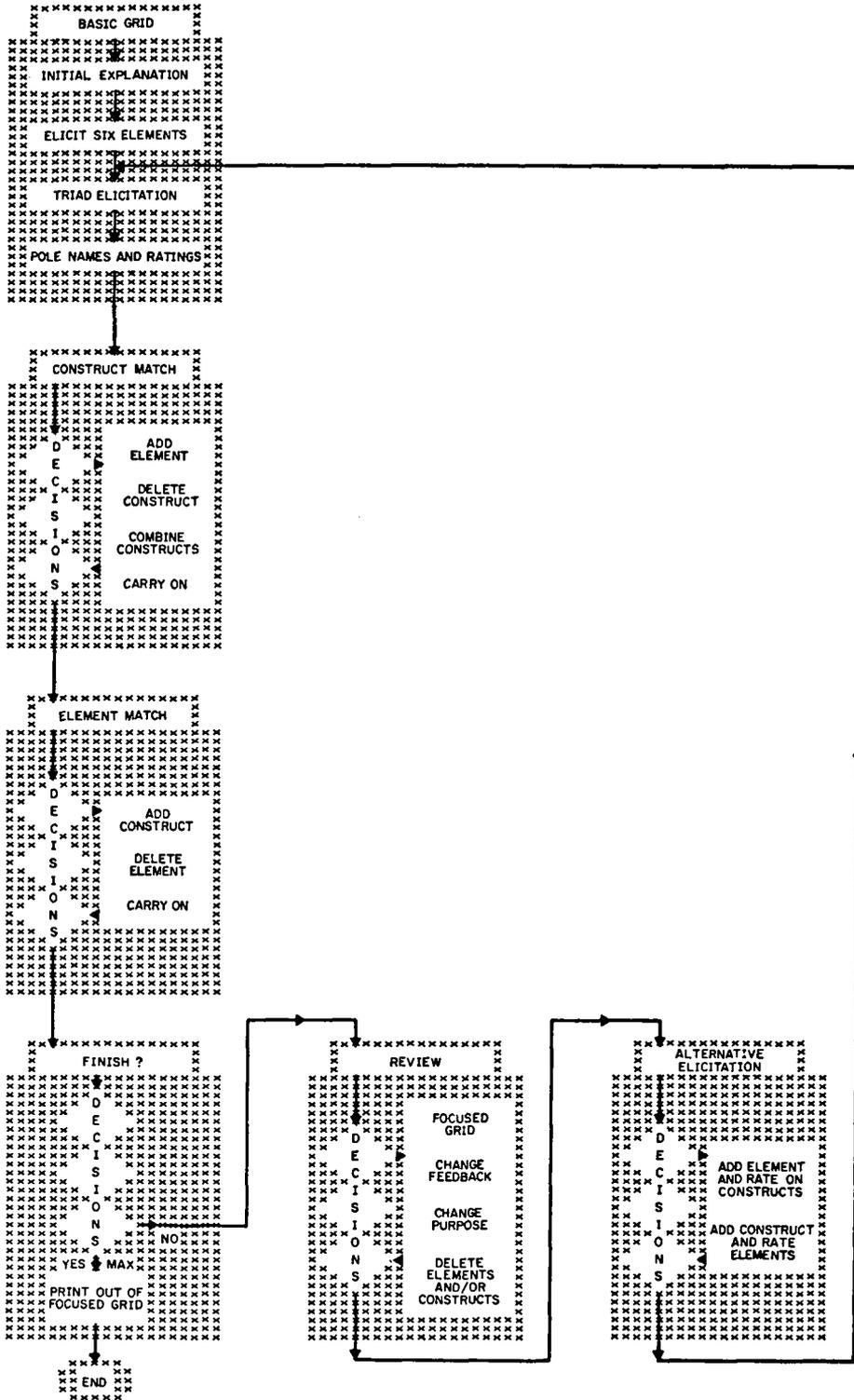


FIG. 3. The PEGASUS flow diagram.

C.S.H.L.

ARTHUR'S FOCUSED GRID WITH ELEMENT AND CONSTRUCT TREES

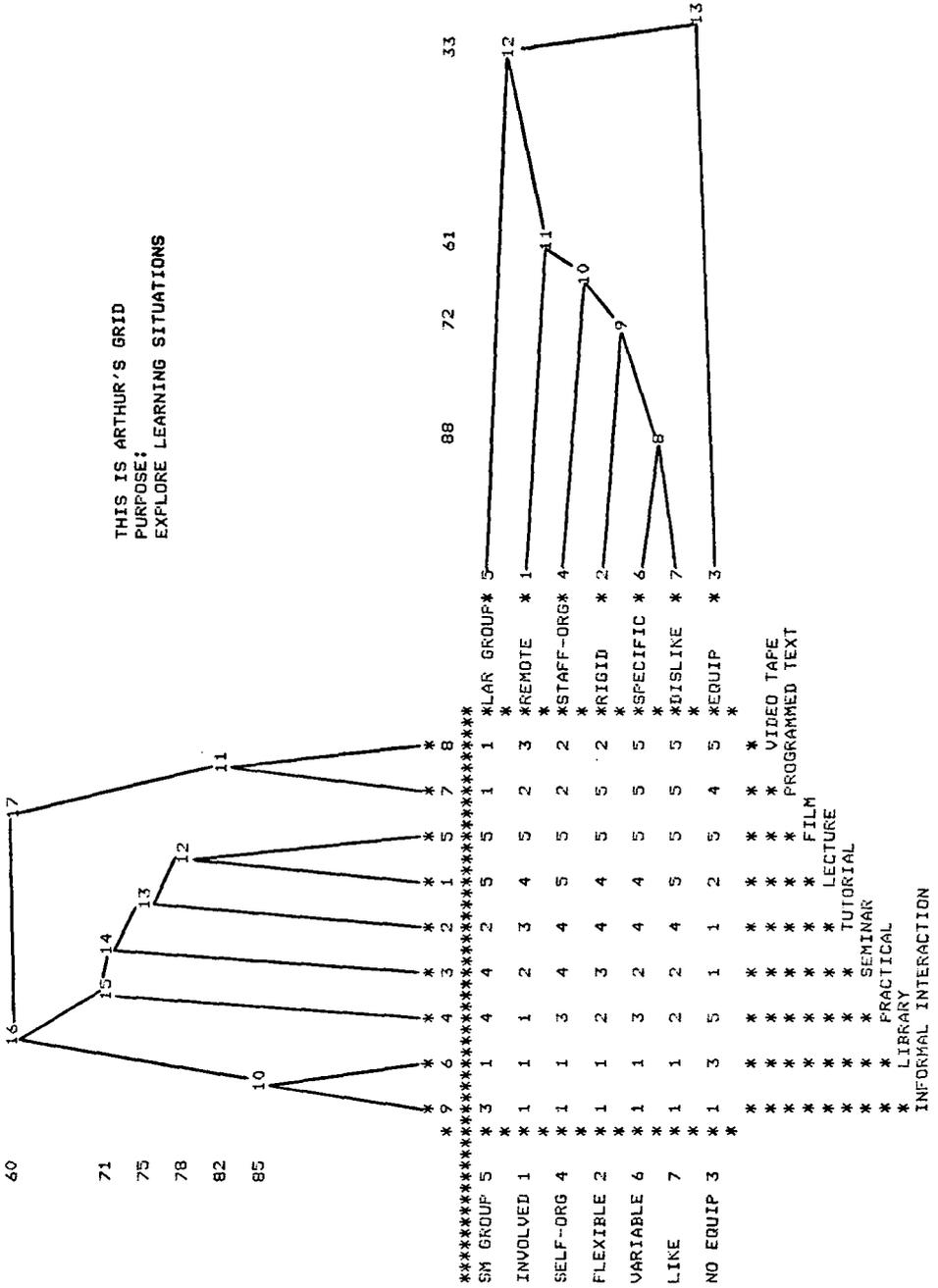


Fig. 4.

encouragement to change which is given. It is felt that learning is exhibited by changes in construing and should be actively encouraged.

Learning-centred grids

Consequently this program can be approached from two points of view: the "grid-centred" approach of the Kelly Repertory Grid; and the "learning-centred" approach of cognitive modelling.

Users familiar with the Kelly Repertory Grid will see the program as a convenient package for eliciting grids and extending their application by using the real-time data processing of the computer to provide feedback during the elicitation, and analysis of the results immediately on completion. Although this facility can provide a powerful aid to anyone who is using grids in a conversational form, this "grid-centred" point of view does not make full use of the potential of this type of program. Kelly has put forward a view of Man as Scientist, modelling reality—people, events and things—to enable him to anticipate and act on the basis of this anticipation. The quality of a person's models, both specific and general, will determine the level of skill, coping, competence and creativity he will be able to achieve. There is a rich potential for deepening understanding and heightening awareness of the world in interactive computer programs like PEGASUS.

Developing psychological tools

The underlying belief is that models of meaning are best elicited using the conversational method. Conversations may take place between two people, in a group of people, or within one person. Conversational heuristics are embodied in context free forms, of which one is the PEGASUS grid in which a conversation within one person is held through the computer. The nature of the heuristic determines the nature of the model of meaning elicited, the mental processes used and the modelling facility which is amplified and brought to bear.

PEGASUS-BANK is an addition to the PEGASUS program. It allows a bank of constructs to be stored in the computer representing an "expert" view of an area of public knowledge. As the processing takes place, continual comparison with the bank gives feedback on how the user's constructs map on to the expert's construing of the same elements. Since the comparison is made in terms of how the construct orders the elements rather than in terms of the verbal labels, it is often found that although a person may have only a vague idea of the expert's terms, he may in fact be using very similar constructs. One example is that of a grid using animals as elements. The biologist had elicited a grid which was stored in the bank, the user had elicited a construct which he called: "horrible creepy crawlies—nice, soft cuddly ones". The computer's feedback response was that "horrible creepy crawlies" was highly matched with the biologist's term "arachnida", and "nice, soft cuddly ones" was being called "warm-blooded mammals". Very often the user is both surprised and enlightened to find the similarity between the patterning in his grid and that of the expert. This technique therefore provides a sound basis for assessment and a useful starting point for training.

The PEGASUS program is constantly used by staff, students and visitors to explore their own problems from the marking of projects to choosing a future career. It has been

used by architecture students construing their favourite buildings, and by a group from the management services section of a large industrial company construing their subordinates for staff development. In each case the individual is encouraged to explore the dimensions of his understanding and increase his awareness of the situation.

These two programs, together with others developed by the authors (see Appendix 1), which enable a person to become aware of his own models, offer him a powerful facility to review and revise the basis of his anticipation. This is the essence of learning. An external observer sees learning as the achievement of certain behavioural objectives, but for the learner himself it is a revision of his cognitive models, that is in the way he perceives and construes events and behaves in the situation. This "learning-centred" approach is recommending PEGASUS to an increasing variety of users in Industry, Education and Psychotherapy. These include teachers and industrial inspectors, artists and managers, maintenance engineers, counsellors, caterers, and Naval Officers. Thus the PEGASUS grid has a wider field of application than the traditional Kelly Repertory Grid.

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Appendix 1: Computer programs

The BASIC computer programs produced by the Centre for the Study of Human Learning are:

FOCUS with versions FOCI
SPACED;

PEGASUS with versions PEGASUS—BANK
PRE-PEGASUS
MIN-PEGASUS;

SOCIOGRIDS;
 ARGUS;
 CORE.

FOCUS is a method of grid analysis which uses a two-way hierarchical cluster analysis technique to re-order systematically the rows of constructs and columns of elements to produce a focused grid showing the least variation between adjacent constructs and adjacent elements. This is done with respect to the way in which the constructs order the elements rather than the verbal labels given to the poles of the construct.

Input specification

Number of grids.

For each grid:

Name or identification.

Number of elements.

Number of constructs.

Range of rating scale.

Matrix of raw grid responses.

Output given.

Raw grid.

Construct matching scores.

List of reversed constructs.

Element matching scores.

Element tree.

Construct tree.

Focused grid.

FOCI is the FOCUS program with Interpretation and suggested use of each part of the output given.

SPACED is a variation of the final printout which blocks the focused grid in order to indicate those elements and constructs which are most alike.

PEGASUS is an interactive program to elicit a repertory grid. Initially six elements are chosen by the user with special attention to the purpose for eliciting the grid. The first four constructs are elicited using fixed triads and thereafter random or chosen triads are offered. Real-time data processing allows feedback about highly matched constructs and elements.

Options offered are:

1. To add an element to split highly matched constructs.
2. To replace two highly matched constructs by one.
3. To add a construct to split highly matched elements.
4. To delete one or more element.
5. To delete one or more construct.
6. To add a construct without using a triad.
7. To add an element.
8. To change the level of feedback commentary.

9. To redefine the purpose for eliciting the grid.
10. To see the grid focused at stages during the run.

When the elicitation is completed a choice of printout of the analysis of the grid is given together with the lists of elements and constructs.

PEGASUS-BANK provides an "expert" grid which the user does not at first see, but against which the elicited constructs are matched. Feedback is given not only on how the user's constructs match each other, but also how they relate to the "expert" constructs. Finally the total grid is focused to show how the two sets of constructs are inter-related.

PRE-PEGASUS allows the user to continue an elicitation started at an earlier date.

MIN-PEGASUS is a straightforward grid elicitation without feedback, but with the opportunity given to add or delete elements and constructs where appropriate.

SOCIOGRIDS analyses a set of repertory grids elicited from a group of people who share a set of elements. It focuses grids singly and in pairs, and produces a set of socionets showing the links within the group. A "mode grid" of the most highly matched constructs is extracted and then focused. Each grid is focused with this mode grid and a measure of overlap of each with the mode, is calculated.

Input specification

- Number of grids.
- Choice of focusing of grids singly.
- Choice of computations of socionets, mode grid, or both.
- Number of constructs in the mode grid.
- Number of elements in each grid.
- Range of rating scale.

For each grid:

- Number of constructs.
- Name of grid.
- Matrix of raw grid responses.

Output given

- Optional full focusing of single grids.

For each pair of grids:

- List of reversed constructs.
- Construct tree.
- Focused grid.
- Gridmix similarity measure.
- Matrix of gridmix similarity measures.
- Lists of socionets showing number of links, current link found, and value of current link.
- Table of grids against constructs, showing average match values for every construct in every grid with any other adjacently focused construct.
- List of mode constructs and the original position of each:
- Full focusing of the mode grid.

For each grid focused with the mode grid:

- List of reversed constructs.
- Construct tree.
- Focused grid.
- Gridmix similarity measure.

This technique is used for investigating the relative positions of the members of a small group, and the content of the sharing of terms and values. It can be used in conjunction with the Delphi technique to promote understanding in the group.

ARGUS elicits a set of grids simultaneously from one person from several roles or points of view. Firstly the elements (roles) are elicited, then three constructs from fixed triads. These construct labels are then used for a new set of ratings to be filled in for each role name in turn, and at each stage another construct which is felt to be important for that role is added. Finally the set of grids all with the same element and construct labels, but with different ratings, are processed on SOCIOGRIDS.

CORE is an interactive program which starts with two repertory grids, each with the same elements and constructs. These would usually be grids done by the same person at different times or by different people using "exchange grids". The two grids are processed by successively determining the element which is seen least similarly and the construct which is used least similarly in both grids. The user is then offered the opportunity to delete the element or construct at each stage, given the extent of the discrepancy. The CORE grids may then be focused in the usual way. This is especially useful to chart change over time, or to evaluate courses or training by examining change in the learner rather than by the conventional method of examining behavioural objectives.

These programs and further details are available from the authors.

Appendix 2

FOCUS OUTPUT

FOCI

A PROGRAM DESIGNED TO ANALYSE AND FOCUS A REPERTORY GRID
WITH INTERPRETATION OF RESULTS. DEC 1976
DEvised AND WRITTEN BY
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LONDON

USUALLY THE COMPUTER RUNS THE FOCUS PROGRAM WITHOUT ANY INTERPRETATION.
THIS PROGRAM (FOCI) GIVES AN INTERPRETATION OF THE OUTPUT FROM
THE FOCUS PROGRAM, BUT DOES NOT ATTEMPT TO EXPLAIN REPERTORY GRIDS
OR THEIR USAGE.
FOCUSING IS A METHOD FOR RE-SORTING THE ELEMENTS AND CONSTRUCTS IN
THE RAW GRID TO PRODUCE A FOCUSED GRID IN WHICH THE ELEMENTS AND
THE CONSTRUCTS ARE ARRANGED SO THAT THE ONES MOST ALIKE ARE NEAREST
TO EACH OTHER. IT CAN BE DONE QUITE EASILY WITH A PENCIL AND PAPER
BUT THE PROGRAM DOES ALL THE CALCULATING AND PRINTING FOR YOU.

IF YOU HAVE ELICITED A GRID WITH PEGASUS RECENTLY YOUR DATA MAY
ALREADY BE ON FILE BUT IF NOT YOU WILL HAVE TO TYPE IT ALL IN

IS YOUR DATA IN PEGASUS?YES
WHAT IS YOUR FILE NAME?BOOKS

CENTRE FOR THE STUDY OF HUMAN LEARNING

MILDRED'S GRID

ELEMENTS	CONSTRUCTS	RATINGS
10	8	1 TO 5

C.S.H.L.

RAW GRID

	* 1	2	3	4	5	6	7	8	9	10

1	* 5	1	1	5	4	2	4	4	5	2
	*									
2	* 5	4	1	4	2	1	5	3	2	2
	*									
3	* 4	1	1	5	3	1	4	5	2	1
	*									
4	* 4	5	1	3	4	1	4	4	1	5
	*									
5	* 1	2	3	4	2	1	1	2	5	5
	*									
6	* 5	4	1	1	2	3	2	2	1	1
	*									
7	* 5	2	1	5	4	4	5	2	5	1
	*									
8	* 4	1	1	2	5	5	2	2	5	1
	*									

THE UNITS OF OUTPUT WHICH YOU WILL NORMALLY GET WITH FOCUS ARE:

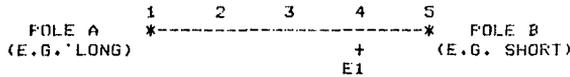
- 1) CONSTRUCT MATCHING SCORES
- 2) TREE FOR CONSTRUCTS
- 3) ELEMENT MATCHING SCORES
- 4) TREE FOR ELEMENTS AND FOCUSED GRID

THE FOLLOWING EXPLANATION RETAINS THIS ORDER BUT THE READER MAY
FIND IT EASIER TO READ QUICKLY THROUGH THE FIRST PART AND THEN
RE-READ "FOCUSING THE CONSTRUCTS" AFTER A MORE DETAILED READING
OF "FOCUSING THE ELEMENTS".

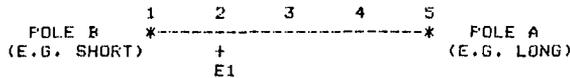
FOCUSING THE CONSTRUCTS

CONSTRUCTS ARE BIPOLAR. THAT MEANS THAT A CONSTRUCT CAN BE THOUGHT OF AS A LINE OR DIMENSION ALONG WHICH EACH ELEMENT HAS A PLACE IN RELATION TO ALL THE OTHER ELEMENTS, AND THE CONSTRUCT CAN BE LOOKED AT EITHER WAY ROUND.

E.G. FOR A FIVE POINT RATING SCALE :



IS THE SAME AS



ELEMENT E1 IS STILL BETWEEN THE MIDDLE OF THE SCALE AND POLE B. WE NEED TO LOOK FOR THE TWO CONSTRUCTS WHICH ARE MOST HIGHLY MATCHED, BUT BECAUSE OF THE BIPOLAR NATURE OF A CONSTRUCT A COMPLETE MISMATCH OR NEGATIVE MATCH IS AS SIGNIFICANT AS A COMPLETE POSITIVE MATCH.

TO ENSURE THAT THE BEST MATCH IS FOUND, ALL THE CONSTRUCTS ARE INCLUDED TWICE, ONCE WITH THE POLES AND THE RATINGS REVERSED, AND THE ACTUAL CHOICE OF ORIGINAL OR REVERSED FORM IS MADE AT THE TIME OF INCORPORATION INTO A CLUSTER.

THE CLUSTERS ARE FORMED BY SUCCESSIVELY CHOOSING THE PAIR OF CONSTRUCTS WHICH ARE MOST HIGHLY MATCHED. IF ONE OF THEM HAS BEEN CHOSEN BEFORE THEN THE NEW ONE IS ADDED INTO THAT GROUP OR CLUSTER NEXT TO THE ONE IT HAS BEEN MATCHED WITH.

TWO MATRICES OF CONSTRUCT MATCHING SCORES ARE PRODUCED FROM THE TWO FORMS OF THE CONSTRUCTS, EACH IS SYMMETRICAL ABOUT ITS LEADING DIAGONAL, SO TO REDUCE PRINTING TIME THE PRINTOUT SHOWS A HALF OF EACH OF THESE MATRICES PUT TOGETHER INTO ONE SQUARE. THE NUMBERS RANGE FROM 100 FOR PERFECT MATCH, 0 FOR NO SIMILARITY, THROUGH TO -100 FOR PERFECT NEGATIVE MATCH.

C.S.H.L.

CONSTRUCT MATCHING SCORES -- MILDRED'S GRID

```

      * 1  2  3  4  5  6  7  8
*****
1  *      40 60 25 5  5  65 35
   *
2  * -10      50 45 5  45 35 -5
   *
3  * -40 -30      35 -5  15 35 15
   *
4  * 5  -15 -5      0  20 0  -10
   *
5  * 15  35 15  30      -10 0  0
   *
6  * 35 -15 5  10  40      20 30
   *
7  * -35 -5 -25 20  30  20      50
   *
8  * -15 25 5  50  20 -10 -40
   *
    
```

CONSTRUCT 4 REVERSED
 CONSTRUCT 5 REVERSED

FOR EXAMPLE IF WE PICK ON CONSTRUCT 1 WHICH IS

POLE 1 --FAMILIAR

POLE 5 --DIFFERENT VIEW

THE LINE OF CONSTRUCT MATCHING SCORES WITH THE HIGHEST MATCH OF THE ORIGINAL OR REVERSED FORMS OF EACH CONSTRUCT IS

2	3	4	5	6	7	8
40	60	25	15	35	65	35

IF YOU LOOK ALONG THIS LINE YOU CAN SEE HOW EACH OF YOUR CONSTRUCTS RELATES TO THIS ONE. IT IS USED

- 40 PER CENT THE SAME AS GIVE UP ANY TIME---ADDICTIVE
- 60 PER CENT THE SAME AS LOW LASTING INFLUENCE---HIGH LASTING INFLUENCE
- 25 PER CENT THE SAME AS LESS ATTRACTIVE---ATTRACTIVE
- 15 PER CENT THE SAME AS DIFFICULT---EASY
- 35 PER CENT THE SAME AS ENTERTAINING---SERIOUS
- 65 PER CENT THE SAME AS FACTS MORE IMPORTANT---IDEAS MORE IMPORTANT
- 35 PER CENT THE SAME AS COGNITIVE IMPACT---EMOTIONAL IMPACT

THE ONE MOST LIKE IT IS C 7 WHICH YOU CALLED
 FACTS MORE IMPORTANT---IDEAS MORE IMPORTANT.

FOCUSING THE ELEMENTS

 THE FOCUSING OF THE ELEMENTS IS A SIMILAR PROCESS TO THAT OF FOCUSING THE CONSTRUCTS BUT MUCH EASIER BECAUSE ELEMENTS ARE NOT BIPOLAR AND SO CANNOT BE MATCHED NEGATIVELY.
 THE HIGHEST MATCH BETWEEN TWO ELEMENTS IS 100 AND THE LOWEST IS 0

THE TWO ELEMENTS THAT MATCH MOST HIGHLY ON ALL THE CONSTRUCTS ARE CHOSEN FIRST, THEN SUCCESSIVELY CLUSTERS ARE BUILT UP BY FINDING THE NEXT HIGHEST MATCH IN THE MATCHING SCORES MATRIX.

C.S.H.L.

ELEMENT MATCHING SCORES -- MILDRED'S GRID

	* 1	2	3	4	5	6	7	8	9	10

1	*	46	15	62	65	46	81	59	46	21
	*									
2	*	46		62	40	50	50	53	62	25
	*									
3	*	15	62		40	43	62	34	50	50
	*									
4	*	62	40	40		59	34	75	71	65
	*									
5	*	65	50	43	59		68	71	75	68
	*									
6	*	46	50	62	34	68		46	43	62
	*									
7	*	81	53	34	75	71	46		78	46
	*									
8	*	59	62	50	71	75	43	78		43
	*									
9	*	46	25	50	65	68	62	46	43	
	*									
10	*	21	68	75	46	50	43	40	56	50
	*									

IF WE NOW LOOK AT ELEMENT 3 FOR EXAMPLE WHICH WAS

THEORIES OF LEARNING

YOU CAN SEE HOW SIMILARLY TO EACH OF THE OTHER ELEMENTS YOU HAVE CONSTRUED IT. IT IS

15 PER CENT SIMILAR TO DICE MAN

62 PER CENT SIMILAR TO COMPUTER LIB

40 PER CENT SIMILAR TO SOCIAL CONTRACT(ARDREY)

43 PER CENT SIMILAR TO GESTALT THERAPY VERBATIM

62 PER CENT SIMILAR TO JUDE THE OBSCURE

34 PER CENT SIMILAR TO ZEN & THE ART OF M'CYCLE MAINT'CE

50 PER CENT SIMILAR TO PSYCH OF LEARNING MATHEMATICS

50 PER CENT SIMILAR TO THE FOURTH WAY

75 PER CENT SIMILAR TO CLUSTER ANALYSIS

DON'T FORGET THAT THIS IS ONLY WITH RESPECT TO THE CONSTRUCTS YOU USED IN THIS GRID. IF YOU USED MORE CONSTRUCTS OR DIFFERENT CONSTRUCTS THESE VALUES COULD VARY.

YOUR CONSTRUCTS ARE:

ATTRACTIVE	LESS ATTRACTIVE
COGNITIVE IMPACT	EMOTIONAL IMPACT
FACTS MORE IMPORTANT	IDEAS MORE IMPORTANT
FAMILIAR	DIFFERENT VIEW
LOW LASTING INFLUENCE	HIGH LASTING INFLUENCE
GIVE UP ANY TIME	ADDICTIVE
SERIOUS	ENTERTAINING
DIFFICULT	EASY

FOR THE PURPOSE OF DISPLAYING YOUR GRID IN A LIMITED SPACE,
PLEASE TYPE IN AN ABBREVIATION FOR EACH POLE NAME
IN NO MORE THAN NINE CHARACTERS.

FAMILIAR	*****
DIFFERENT VIEW	?FAMILIAR
GIVE UP ANY TIME	?DIFFERENT
ADDICTIVE	?GIVE UP
LOW LASTING INFLUENCE	?ADDICTIVE
HIGH LASTING INFLUENCE	?LESS INFL
ATTRACTIVE	?MORE INFL
LESS ATTRACTIVE	?ATTRACTIVE
DIFFICULT	?LESS ATTR
EASY	?DIFFICULT
SERIOUS	?EASY
ENTERTAINING	?SERIOUS
FACTS MORE IMPORTANT	?ENTERTAIN
IDEAS MORE IMPORTANT	?FACTS
COGNITIVE IMPACT	?IDEAS
EMOTIONAL IMPACT	?COGN IMP
	?EMOT IMP

C.S.H.L.

MILDRED'S FOCUSED GRID WITH ELEMENT AND CONSTRUCT TREES

62	19	18
65		17
68	16	15
75	14	13
78		12
81		11

```

* * * * *
* 2 10 3 6 5 8 7 1 4 9
*****
ATTRACTIVE 4 * 1 1 5 5 2 2 2 2 3 5 *LESS ATTR* 4
*
COGN IMP 8 * 1 1 1 5 5 2 2 4 2 5 *EMOT IMP* 8
*
FACTS 7 * 2 1 1 4 4 2 5 5 5 *IDEAS * 7
*
FAMILIAR 1 * 1 2 1 2 4 4 4 5 5 *DIFFERENT* 1
*
LESS INFL 3 * 1 1 1 1 3 5 4 4 5 2 *MORE INFL* 3
*
GIVE UP 2 * 4 2 1 1 2 3 5 5 4 2 *ADDICTIVE* 2
*
SERIOUS 6 * 4 1 1 3 2 2 2 5 1 1 *CERTAIN* 6
*
DIFFICULT 5 * 4 1 3 5 4 4 5 5 2 1 *EASY * 5
*
* * * * * THE FOURTH WAY
* * * * * SOCIAL CONTRACT (ARDREY)
* * * * * DICE MAN
* * * * * ZEN & THE ART OF M'CYCLE MAINT'CE
* * * * * PSYCH OF LEARNING MATHEMATICS
* * * * * GESTALT THERAPY VERBATIM
* * * * * JUDE THE OBSCURE
* * * * * THEORIES OF LEARNING
* * * * * CLUSTER ANALYSIS
* * * * * COMPUTER LIB

```

65 50 40

13

12

9

10

11

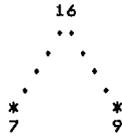
14

15

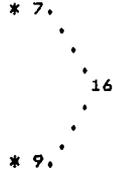
THIS IS MILDRED S URTD
PURPOSE:
TO THINK ABOUT BOOKS

CLUSTERS ARE FORMED BY JOINING TWO NUMBERS TO THE NEW CLUSTER NUMBER.
E.G. JOIN 7 AND 9 INTO CLUSTER 16 WOULD MEAN

ELEMENT TREE



CONSTRUCT TREE



TO JOIN UP THE CONSTRUCT TREE

- JOIN 7 AND 1 INTO CLUSTER 9
- JOIN 9 AND 3 INTO CLUSTER 10
- JOIN 10 AND 2 INTO CLUSTER 11
- JOIN 8 AND 11 INTO CLUSTER 12
- JOIN 4 AND 12 INTO CLUSTER 13
- JOIN 13 AND 6 INTO CLUSTER 14
- JOIN 14 AND 5 INTO CLUSTER 15

TO JOIN UP THE ELEMENT TREE

- JOIN 7 AND 1 INTO CLUSTER 11
- JOIN 8 AND 11 INTO CLUSTER 12
- JOIN 5 AND 12 INTO CLUSTER 13
- JOIN 10 AND 3 INTO CLUSTER 14
- JOIN 6 AND 13 INTO CLUSTER 15
- JOIN 2 AND 14 INTO CLUSTER 16
- JOIN 4 AND 9 INTO CLUSTER 17
- JOIN 15 AND 17 INTO CLUSTER 18
- JOIN 16 AND 18 INTO CLUSTER 19

FOR AN EXPLANATION OF OTHER PROGRAMS ASK FOR A COPY OF
'NOTES ON THE COMPUTER PROGRAMS'.
THIS MAY BE OBTAINED FROM THE CENTRE FOR THE STUDY OF HUMAN LEARNING
(ADDRESS ABOVE) TOGETHER WITH THE LIST OF PUBLICATIONS.
THE MAIN ONES ARE:-

FOCUS -- THE GRID ANALYSIS PROGRAM;

PEGASUS -- AN INTERACTIVE PROGRAM TO ELICIT A GRID WITH
***** REAL-TIME FEEDBACK;

SOCIO-GRIDS -- A PROGRAM FOR EXPLORING COMMONALITY OF CONSTRUCTING
***** IN A SMALL GROUP;

ARGUS -- AN INTERACTIVE PROGRAM FOR COUNSELLING AND THERAPY;

CORE -- AN INTERACTIVE PROGRAM TO FIND THE CORE COMMONALITY
***** BETWEEN TWO GRIDS.

CENTRE FOR THE STUDY OF HUMAN LEARNING, COPYRIGHT 1976

Appendix 3

PEGASUS OUTPUT

PEGASUS

PROGRAM ELICITS GRID AND SORTS USING SIMILARITIES
MAY1976. UPDATED VERSION OF DEMON 1968
DEvised AND WRITTEN BY
LAURIE F. THOMAS AND MILDRED L.G. SHAW
CENTRE FOR THE STUDY OF HUMAN LEARNING
BRUNEL UNIVERSITY
UXBRIDGE
LONDON

THIS IS A PROGRAM TO ELICIT A KELLY REPERTORY GRID.
PLEASE READ CAREFULLY EVERYTHING THAT IS PRINTED, AND
MAKE SURE YOU UNDERSTAND WHAT YOU HAVE TO DO.
A REPERTORY GRID IS A TECHNIQUE DEVISED BY KELLY TO
HELP YOU EXPLORE THE DIMENSIONS OF YOUR THINKING.
YOU MUST DECIDE ON A PURPOSE FOR DOING THE GRID AND
KEEP THIS IN MIND WHEN YOU CHOOSE THE ELEMENTS--THE
THINGS YOU ARE GOING TO THINK ABOUT DURING THE PROGRAM.
THESE ELEMENTS WILL THEN BE USED TO ELICIT CONSTRUCTS.
YOU ARE LIMITED TO 25 LETTERS AND SPACES FOR YOUR ELEMENT
AND CONSTRUCT NAMES.
IF YOU MAKE A TYPING ERROR PRESS THE DELETE KEY AS MANY
TIMES AS YOU WANT TO ERASE A CHARACTER, THEN CARRY ON.
THROUGHOUT THIS PROGRAM THE QUESTION WILL BE ASKED --
DO YOU NEED HELP? EACH TIME JUST TYPE YES IF YOU DO AND
PRESS THE RETURN KEY
BEFORE YOU START THIS GRID, WHAT IS YOUR NAME
?ARTHUR
TYPE IN ON ONE LINE YOUR PURPOSE FOR DOING THIS GRID
?EXPLORING LEARNING SITUATIONS

NAME SIX ELEMENTS

YOU MUST CHOOSE A SET OF ELEMENTS KEEPING IN MIND WHY YOU WANT TO DO THIS GRID. THEY COULD BE PEOPLE,EVENTS, PIECES OF MUSIC, PICTURES, BOOKS OR WHAT YOU WANT BUT WHATEVER YOU CHOOSE THEY MUST BE OF THE SAME TYPE AND EACH MUST BE WELL KNOWN TO YOU. TRY TO CHOOSE SPECIFIC THINGS. NOW TYPE EACH ONE AFTER EACH QUESTION MARK. DO NOT FORGET TO PRESS THE RETURN KEY AFTER EACH.

- ELEMENT 1 ?LECTURE
- ELEMENT 2 ?TUTORIAL
- ELEMENT 3 ?SEMINAR
- ELEMENT 4 ?PRACTICAL
- ELEMENT 5 ?FILM
- ELEMENT 6 ?LIBRARY

ELICITATION OF CONSTRUCT 1

- TRIAD
- 1 LECTURE
 - 2 TUTORIAL
 - 3 SEMINAR

NAME THE PAIR

CAN YOU CHOOSE TWO OF THIS TRIAD OF ELEMENTS WHICH ARE IN SOME WAY ALIKE AND DIFFERENT FROM THE OTHER ONE ? TYPE IN THE NUMBERS OF THE PAIR ONE AFTER EACH QUESTION MARK. DONT FORGET TO PRESS THE RETURN KEY AFTER EACH.

?2

?3

NAME THE POLES OF YOUR CONSTRUCT

NOW I WANT YOU TO THINK ABOUT WHAT YOU HAVE IN MIND WHEN YOU SEPARATE THE PAIR FROM THE OTHER ONE.HOW CAN YOU DESCRIBE THE TWO ENDS OR POLES OF THE SCALE WHICH DISCRIMINATE TUTORIAL AND SEMINAR FROM LECTURE JUST TYPE ONE OR TWO WORDS FOR EACH POLE TO REMIND YOU WHAT YOU ARE THINKING OR FEELING WHEN YOU USE THIS CONSTRUCT.

LEFT POLE (RATED 1) --?INVOLVEMENT
 RIGHT POLE (RATED 5)--?REMOTENESS

TYPE IN THE RATINGS
 NOW IF TUTORIAL AND SEMINAR ARE
 ASSIGNED THE VALUE 1 AND LECTURE IS
 ASSIGNED THE VALUE 5

PLEASE ASSIGN TO EACH OF THE OTHER ELEMENTS IN TURN A PROVISIONAL VALUE FROM 1 TO 5 ACCORDING TO HOW YOU FEEL ABOUT THEM. AS BEFORE WAIT FOR EACH QUESTION MARK,DONT FORGET RETURN

- 2 TUTORIAL 1
- 3 SEMINAR 1
- 1 LECTURE 5
- 4 PRACTICAL ?1
- 5 FILM ?5
- 6 LIBRARY ?1

POLE 1 --INVOLVEMENT

2 TUTORIAL 1
 3 SEMINAR 1
 4 PRACTICAL 1
 6 LIBRARY 1

1 LECTURE 5
 5 FILM 5

POLE 5 --REMOVEDNESS

DO YOU WANT TO CHANGE ANY OF THESE VALUES?YES
 IF YOU HAVE CHANGED YOUR MIND ABOUT ANY OF THESE VALUES
 INCLUDING THE ELEMENTS YOU HAD IN THE TRIAD,
 TYPE IN HOW MANY YOU WANT TO ALTER WHEN YOU ARE ASKED.
 THEN TYPE THE NUMBER OF THE FIRST ELEMENT AND PRESS THE RETURN KEY.
 ON THE NEXT LINE TYPE IN THE VALUE YOU WANT IT TO HAVE,
 AND CONTINUE UNTIL YOU HAVE DONE THEM ALL.
 DONT FORGET RETURN AT THE END OF EACH LINE.

HOW MANY?2
 ELEMENT NUMBER?2
 NEW RATING FOR ELEMENT 2 ?2
 ELEMENT NUMBER?1
 NEW RATING FOR ELEMENT 1 ?4

POLE 1 --INVOLVEMENT

3 SEMINAR 1
 4 PRACTICAL 1
 6 LIBRARY 1

2 TUTORIAL 2

1 LECTURE 4

5 FILM 5

POLE 5 --REMOVEDNESS

DO YOU WANT TO CHANGE ANY OF THESE VALUES?YES
 IF YOU HAVE CHANGED YOUR MIND ABOUT ANY OF THESE VALUES
 INCLUDING THE ELEMENTS YOU HAD IN THE TRIAD,
 TYPE IN HOW MANY YOU WANT TO ALTER WHEN YOU ARE ASKED.
 THEN TYPE THE NUMBER OF THE FIRST ELEMENT AND PRESS THE RETURN KEY.
 ON THE NEXT LINE TYPE IN THE VALUE YOU WANT IT TO HAVE,
 AND CONTINUE UNTIL YOU HAVE DONE THEM ALL.
 DONT FORGET RETURN AT THE END OF EACH LINE.

HOW MANY?2
 ELEMENT NUMBER?2
 NEW RATING FOR ELEMENT 2 ?3
 ELEMENT NUMBER?3
 NEW RATING FOR ELEMENT 3 ?2

POLE 1 --INVOLVEMENT

4 PRACTICAL 1
 6 LIBRARY 1

3 SEMINAR 2

2 TUTORIAL 3

1 LECTURE 4

5 FILM 5

POLE 5 --REMOVEDNESS

DO YOU WANT TO CHANGE ANY OF THESE VALUES?NO
 DO YOU WANT TO CHANGE THE POLE NAMES?NO

NOW YOU HAVE GOT ONE CONSTRUCT YOU KNOW WHAT TO DO.
 A CONSTRUCT CAN BE THOUGHT OF AS A LINE ALONG WHICH
 EACH OF YOUR ELEMENTS HAS A PLACE IN RELATION TO ALL THE
 OTHER ELEMENTS.

PLEASE DO NOT USE CONSTRUCTS WHICH DO NOT APPLY TO ALL
 YOUR ELEMENTS, AN EXAMPLE OF THIS IS:
 REDHEAD---BLOND ,AS IT IS IMPOSSIBLE TO RATE A PERSON
 WITH BLACK HAIR ON THIS CONSTRUCT.
 ONE POLE MUST BE IN SOME SENSE WHAT THE OTHER IS NOT,
 AND THEY MUST DIVIDE YOUR ELEMENTS INTO TWO APPROXIMATELY
 EQUAL GROUPS, SO PLEASE TRY TO AVOID CONSTRUCTS
 WHERE NEARLY ALL THE ELEMENTS ARE AT ONE END. AN EXAMPLE MIGHT BE
 A GREEN-EYED MONSTER---NOT A GREEN-EYED MONSTER

ELICITATION OF CONSTRUCT 2

TRIAD
 4 PRACTICAL
 5 FILM
 6 LIBRARY

NAME THE PAIR
 CAN YOU CHOOSE TWO OF THIS TRIAD OF ELEMENTS WHICH ARE IN
 SOME WAY ALIKE AND DIFFERENT FROM THE OTHER ONE ?
 TYPE IN THE NUMBERS OF THE PAIR ONE AFTER EACH QUESTION
 MARK. DONT FORGET TO PRESS THE RETURN KEY AFTER EACH.

?4

?6

NAME THE POLES OF YOUR CONSTRUCT
 DO YOU NEED HELP?NO

LEFT POLE (RATED 1) --?FLEXIBLE
 RIGHT POLE (RATED 5)--?RIGID

TYPE IN THE RATINGS
 DO YOU NEED HELP?NO

4 PRACTICAL	1
6 LIBRARY	1
5 FILM	5
1 LECTURE	?4
2 TUTORIAL	?4
3 SEMINAR	?3

POLE 1 --FLEXIBLE

4 PRACTICAL	1
6 LIBRARY	1

3 SEMINAR	3
-----------	---

1 LECTURE	4
2 TUTORIAL	4

5 FILM	5
--------	---

POLE 5 --RIGID

DO YOU WANT TO CHANGE ANY OF THESE VALUES?YES
DO YOU NEED HELP?NO

HOW MANY?1
ELEMENT NUMBER?4
NEW RATING FOR ELEMENT 4 ?2

POLE 1 --FLEXIBLE

6 LIBRARY	1
4 PRACTICAL	2
3 SEMINAR	3
1 LECTURE	4
2 TUTORIAL	4
5 FILM	5

POLE 5 --RIGID

DO YOU WANT TO CHANGE ANY OF THESE VALUES?NO
DO YOU WANT TO CHANGE THE POLE NAMES?NO
THE TWO CONSTRUCTS YOU CALLED
1 INVOLVEMENT--REMOTENESS
2 FLEXIBLE--RIGID
ARE MATCHED AT THE 75 PERCENT LEVEL.
THIS MEANS THAT MOST OF THE TIME YOU ARE SAYING
INVOLVEMENT YOU ARE ALSO SAYING
FLEXIBLE
AND MOST OF THE TIME YOU ARE SAYING
REMOTENESS YOU ARE ALSO SAYING
RIGID
THINK OF ANOTHER ELEMENT WHICH IS EITHER
INVOLVEMENT AND RIGID
OR FLEXIBLE AND REMOTENESS
IF YOU REALLY CANNOT DO THIS THEN JUST PRESS RETURN AFTER THE
FIRST QUESTION MARK, BUT PLEASE TRY. THEN YOU MUST GIVE
THIS ELEMENT A RATING VALUE ON EACH CONSTRUCT IN TURN.
TYPE A VALUE FROM 1 TO 5 AFTER EACH QUESTION MARK.

WHAT IS YOUR ELEMENT?PROGRAMMED TEXT
RATINGS :
INVOLVEMENT--REMOTENESS?2
FLEXIBLE--RIGID?5

ELICITATION OF CONSTRUCT 3
TRIAD
1 LECTURE
3 SEMINAR
5 FILM

NAME THE PAIR
DO YOU NEED HELP?NO

?LECTURE
PLEASE TYPE A NUMBER BETWEEN 1 AND 7
?1

?3

NAME THE POLES OF YOUR CONSTRUCT
DO YOU NEED HELP?NO

LEFT POLE (RATED 1) --?NO EQUIPMENT
RIGHT POLE (RATED 5)--?EQUIPMENT

TYPE IN THE RATINGS
DO YOU NEED HELP?NO

1 LECTURE	1	
3 SEMINAR	1	
5 FILM	5	
2 TUTORIAL	?1	
4 PRACTICAL	?5	
6 LIBRARY	?2	
7 PROGRAMMED TEXT		?4

POLE 1 --NO EQUIPMENT

1 LECTURE	1	
2 TUTORIAL	1	
3 SEMINAR	1	
6 LIBRARY	2	
7 PROGRAMMED TEXT		4
4 PRACTICAL	5	
5 FILM	5	

POLE 5 --EQUIPMENT

DO YOU WANT TO CHANGE ANY OF THESE VALUES?YES
DO YOU NEED HELP?NO

HOW MANY?2
ELEMENT NUMBER?1
NEW RATING FOR ELEMENT 1 ?2
ELEMENT NUMBER?6
NEW RATING FOR ELEMENT 6 ?3

POLE 1 --NO EQUIPMENT

2 TUTORIAL	1	
3 SEMINAR	1	
1 LECTURE	2	
6 LIBRARY	3	
7 PROGRAMMED TEXT		4
4 PRACTICAL	5	
5 FILM	5	

POLE 5 --EQUIPMENT

DO YOU WANT TO CHANGE ANY OF THESE VALUES?NO THANK YOU
DO YOU WANT TO CHANGE THE POLE NAMES?NO THANK YOU

ELICITATION OF CONSTRUCT 4
 TRIAD
 2 TUTORIAL
 4 PRACTICAL
 6 LIBRARY

NAME THE PAIR
 DO YOU NEED HELP?NO

?2

?4

NAME THE POLES OF YOUR CONSTRUCT
 DO YOU NEED HELP?NO

LEFT POLE (RATED 1) --?STAFF-ORGANISED
 RIGHT POLE (RATED 5) --?SELF-ORGANISED

TYPE IN THE RATINGS
 DO YOU NEED HELP?NO

2 TUTORIAL	1	
4 PRACTICAL	1	
6 LIBRARY	5	
1 LECTURE	?1	
3 SEMINAR	?2	
5 FILM	?1	
7 PROGRAMMED TEXT		?3

POLE 1 --STAFF-ORGANISED

1 LECTURE	1	
2 TUTORIAL	1	
4 PRACTICAL	1	
5 FILM	1	
3 SEMINAR	2	
7 PROGRAMMED TEXT		3

6 LIBRARY	5	
-----------	---	--

POLE 5 --SELF-ORGANISED

DO YOU WANT TO CHANGE ANY OF THESE VALUES?YES
 DO YOU NEED HELP?NO

HOW MANY?3
 ELEMENT NUMBER?2
 NEW RATING FOR ELEMENT 2 ?2
 ELEMENT NUMBER?4
 NEW RATING FOR ELEMENT 4 ?3
 ELEMENT NUMBER?7
 NEW RATING FOR ELEMENT 7 ?4

POLE 1 --STAFF-ORGANISED

1 LECTURE	1	
5 FILM	1	
2 TUTORIAL	2	
3 SEMINAR	2	
4 PRACTICAL	3	
7 PROGRAMMED TEXT		4
6 LIBRARY	5	

POLE 5 --SELF-ORGANISED

DO YOU WANT TO CHANGE ANY OF THESE VALUES?NO
 DO YOU WANT TO CHANGE THE POLE NAMES?NO
 THE TWO ELEMENTS 2 TUTORIAL AND 3 SEMINAR
 ARE MATCHED AT THE 87 PERCENT LEVEL
 THIS MEANS THAT SO FAR YOU HAVE NOT DISTINGUISHED
 BETWEEN TUTORIAL AND SEMINAR
 DO YOU WANT TO SPLIT THESE
 ANSWER YES OR NO?YES
 TO SPLIT THESE DO YOU NEED HELP?YES

THINK OF A CONSTRUCT WHICH SEPARATES THESE
 TWO ELEMENTS, AND THEN KEEPING THIS IN MIND
 PLEASE ASSIGN TO EACH OF THE OTHER ELEMENTS IN TURN A PROVISIONAL
 VALUE FROM 1 TO 5 ACCORDING TO HOW YOU FEEL ABOUT THEM.
 AS BEFORE WAIT FOR EACH QUESTION MARK,DONT FORGET RETURN

NAME THE POLES OF YOUR CONSTRUCT
 LEFT POLE (RATED 1) --?SMALL GROUP
 RIGHT POLE (RATED 5)--?LARGE GROUP

TYPE IN THE RATINGS

2 TUTORIAL	1	
3 SEMINAR	5	
1 LECTURE	?5	
4 PRACTICAL	?4	
5 FILM	?5	
6 LIBRARY	?1	
7 PROGRAMMED TEXT		?1

POLE 1 --SMALL GROUP

2 TUTORIAL	1	
6 LIBRARY	1	
7 PROGRAMMED TEXT		1

4 PRACTICAL	4	
-------------	---	--

1 LECTURE	5	
3 SEMINAR	5	
5 FILM	5	

POLE 5 --LARGE GROUP

DO YOU WANT TO CHANGE ANY OF THESE VALUES?YES
HELP?NO

HOW MANY?2
ELEMENT NUMBER?2
NEW RATING FOR ELEMENT 2 ?2
ELEMENT NUMBER?3
NEW RATING FOR ELEMENT 3 ?3

POLE 1 --SMALL GROUP

6 LIBRARY	1	
7 PROGRAMMED TEXT		1
2 TUTORIAL	2	
3 SEMINAR	3	
4 PRACTICAL	4	
1 LECTURE	5	
5 FILM	5	

POLE 5 --LARGE GROUP

DO YOU WANT TO CHANGE ANY OF THESE VALUES?YES
HELP?NO

HOW MANY?1
ELEMENT NUMBER?3
NEW RATING FOR ELEMENT 3 ?4

POLE 1 --SMALL GROUP

6 LIBRARY	1	
7 PROGRAMMED TEXT		1
2 TUTORIAL	2	
3 SEMINAR	4	
4 PRACTICAL	4	
1 LECTURE	5	
5 FILM	5	

POLE 5 --LARGE GROUP

DO YOU WANT TO CHANGE ANY OF THESE VALUES?NO
DO YOU WANT TO CHANGE THE POLE NAMES?NO
DO YOU WANT TO FINISH NOW?NO
DO YOU WANT A PRINTOUT OF THE FOCUSED GRID SO FAR?YES

```

      * 5 1 2 3 4 6 7
*****
5 * 5 5 2 4 4 1 1

4 * 5 5 4 4 3 1 2

1 * 5 4 3 2 1 1 2

2 * 5 4 4 3 2 1 5

3 * 1 4 5 5 1 3 2

      * * * * *
      * * * * * PROGRAMMED TEXT
      * * * * * LIBRARY
      * * * * * PRACTICAL
      * * * * * SEMINAR
      * * * * * TUTORIAL
      * * * * * LECTURE
      * * * * * FILM
    
```

LIST OF CONSTRUCTS

```

SMALL GROUP                * 5  LARGE GROUP
SELF-ORGANISED           * 4  STAFF-ORGANISED
INVOLVEMENT               * 1  REMOTENESS
FLEXIBLE                  * 2  RIGID
EQUIPMENT                 * 3  NO EQUIPMENT
    
```

THIS IS ARTHUR'S GRID
 PURPOSE:
 EXPLORING LEARNING SITUATIONS

IS YOUR REASON FOR DOING THIS GRID STILL
 EXPLORING LEARNING SITUATIONS
 ANSWER YES OR NO?YES
 YOU HAVE NOW GOT 5 CONSTRUCTS AND 7 ELEMENTS
 AND YOU MUST DECIDE WHETHER THEY ARE THE IMPORTANT
 ONES FOR YOU IN THE PURPOSE YOU HAD FOR DOING THIS
 GRID WHICH YOU SAID WAS
 EXPLORING LEARNING SITUATIONS

IF YOU FEEL THAT ONE OR MORE OF YOUR CONSTRUCTS OR ELEMENTS
 DOES NOT BELONG WITH THE OTHERS YOU MAY DELETE THEM

HERE IS A LIST OF YOUR ELEMENTS

- 1 LECTURE
- 2 TUTORIAL
- 3 SEMINAR
- 4 PRACTICAL
- 5 FILM
- 6 LIBRARY
- 7 PROGRAMMED TEXT

DO YOU WANT TO DELETE AN ELEMENT ?NO

HERE IS A LIST OF YOUR CONSTRUCTS

- 1 INVOLVEMENT--REMOTENESS
- 2 FLEXIBLE--RIGID
- 3 EQUIPMENT--NO EQUIPMENT
- 4 SELF-ORGANISED--STAFF-ORGANISED
- 5 SMALL GROUP--LARGE GROUP

DO YOU WANT TO DELETE A CONSTRUCT ?NO

YOU HAVE ONE OF THREE CHOICES. YOU MAY

- 1)ELICIT A CONSTRUCT FROM A TRIAD
 - 2)ADD ANOTHER ELEMENT
 - 3)ADD ANOTHER CONSTRUCT
- WHAT IS THE NUMBER OF THE CHOICE YOU HAVE MADE
?1

ELICITATION OF CONSTRUCT 6

TRIAD

WOULD YOU LIKE TO CHOOSE YOUR OWN TRIAD

ANSWER YES OR NO?YES

- 1 LECTURE
- 2 TUTORIAL
- 3 SEMINAR
- 4 PRACTICAL
- 5 FILM
- 6 LIBRARY
- 7 PROGRAMMED TEXT

TYPE IN THE NUMBERS OF THE ELEMENTS ONE AFTER EACH QUESTION MARK

?5

5 FILM

?7

7 PROGRAMMED TEXT

?6

6 LIBRARY

NAME THE PAIR

HELP?NO

?2

2 IS NOT ONE OF YOUR TRIAD PLEASE RETYPE IT

?5

?7

NAME THE POLES OF YOUR CONSTRUCT

HELP?NO

LEFT POLE (RATED 1) --?SPECIFIC CONTENT
RIGHT POLE (RATED 5)--?VARIABLE CONTENT

TYPE IN THE RATINGS

HELP?NO

5 FILM	1	
7 PROGRAMMED TEXT		1
6 LIBRARY	5	
1 LECTURE	?2	
2 TUTORIAL	?2	
3 SEMINAR	?3	
4 PRACTICAL	?2	

POLE 1 --SPECIFIC CONTENT

5	FILM	1	
7	PROGRAMMED TEXT		1
1	LECTURE	2	
2	TUTORIAL	2	
4	PRACTICAL	2	
3	SEMINAR	3	
6	LIBRARY	5	

POLE 5 --VARIABLE CONTENT

DO YOU WANT TO CHANGE ANY OF THESE VALUES?YES
HELP?NO

HOW MANY?2
ELEMENT NUMBER?4
NEW RATING FOR ELEMENT 4 ?3
ELEMENT NUMBER?3
NEW RATING FOR ELEMENT 3 ?4

POLE 1 --SPECIFIC CONTENT

5	FILM	1	
7	PROGRAMMED TEXT		1
1	LECTURE	2	
2	TUTORIAL	2	
4	PRACTICAL	3	
3	SEMINAR	4	
6	LIBRARY	5	

POLE 5 --VARIABLE CONTENT

DO YOU WANT TO CHANGE ANY OF THESE VALUES?NO
DO YOU WANT TO CHANGE THE POLE NAMES?NO
THE TWO CONSTRUCTS YOU CALLED
2 FLEXIBLE--RIGID
6 VARIABLE CONTENT--SPECIFIC CONTENT
ARE MATCHED AT THE 85 PERCENT LEVEL
THIS MEANS THAT MOST OF THE TIME YOU ARE SAYING
FLEXIBLE YOU ARE ALSO SAYING
VARIABLE CONTENT
AND MOST OF THE TIME YOU ARE SAYING
RIGID YOU ARE ALSO SAYING
SPECIFIC CONTENT
THINK OF ANOTHER ELEMENT WHICH IS EITHER
FLEXIBLE AND SPECIFIC CONTENT
OR VARIABLE CONTENT AND RIGID
IF YOU REALLY CANNOT DO THIS THEN JUST PRESS RETURN AFTER THE
FIRST QUESTION MARK, BUT PLEASE TRY. THEN YOU MUST GIVE
THIS ELEMENT A RATING VALUE ON EACH CONSTRUCT IN TURN
TYPE A VALUE FROM 1 TO 5 AFTER EACH QUESTION MARK.

WHAT IS YOUR ELEMENT?VIDEO TAPE
 RATINGS :
 INVOLVEMENT--REMOTENESS?3
 FLEXIBLE--RIGID?2
 EQUIPMENT--NO EQUIPMENT?1
 SELF-ORGANISED--STAFF-ORGANISED?2
 SMALL GROUP--LARGE GROUP?1
 VARIABLE CONTENT--SPECIFIC CONTENT?5
 DO YOU WANT TO FINISH NOW?NO
 DO YOU WANT A PRINTOUT OF THE FOCUSED GRID SO FAR?NO
 ARE YOU HAPPY WITH THE AMOUNT OF FEEDBACK COMMENTARY
 IS IT : 1)OKAY 2)TOO MUCH 3)TOO LITTLE
 TYPE IN 1,2 OR 3
 ?1
 YOU HAVE ONE OF THREE CHOICES. YOU MAY
 1)ELICIT A CONSTRUCT FROM A TRIAD
 2)ADD ANOTHER ELEMENT
 3)ADD ANOTHER CONSTRUCT
 WHAT IS THE NUMBER OF THE CHOICE YOU HAVE MADE
 ?2
 WHAT IS YOUR ELEMENT?INFORMAL INTERACTION
 RATINGS :
 INVOLVEMENT--REMOTENESS?1
 FLEXIBLE--RIGID?1
 EQUIPMENT--NO EQUIPMENT?5
 SELF-ORGANISED--STAFF-ORGANISED?1
 SMALL GROUP--LARGE GROUP?3
 VARIABLE CONTENT--SPECIFIC CONTENT?1

ELICITATION OF CONSTRUCT 7
 TRIAD
 WOULD YOU LIKE TO CHOOSE YOUR OWN TRIAD
 ANSWER YES OR NO?NO
 2 TUTORIAL
 6 LIBRARY
 8 VIDEO TAPE

NAME THE PAIR
 HELP?NO

?2

?8

NAME THE POLES OF YOUR CONSTRUCT
 HELP?NO

LEFT POLE (RATED 1) --?DISLIKE
 RIGHT POLE (RATED 5)--?LIKE

TYPE IN THE RATINGS
 HELP?NO

2 TUTORIAL	1	
8 VIDEO TAPE	1	
6 LIBRARY	5	
1 LECTURE	?1	
3 SEMINAR	?4	
4 PRACTICAL	?4	
5 FILM	?1	
7 PROGRAMMED TEXT		?1
9 INFORMAL INTERACTION		?5

POLE 1 --DISLIKE

1 LECTURE 1
 2 TUTORIAL 1
 5 FILM 1
 7 PROGRAMMED TEXT 1
 8 VIDEO TAPE 1

3 SEMINAR 4
 4 PRACTICAL 4
 6 LIBRARY 5
 9 INFORMAL INTERACTION 5

POLE 5 --LIKE

DO YOU WANT TO CHANGE ANY OF THESE VALUES?YES
 HELP?NO

HOW MANY?1
 ELEMENT NUMBER?2
 NEW RATING FOR ELEMENT 2 ?2

POLE 1 --DISLIKE

1 LECTURE 1
 5 FILM 1
 7 PROGRAMMED TEXT 1
 8 VIDEO TAPE 1
 2 TUTORIAL 2

3 SEMINAR 4
 4 PRACTICAL 4
 6 LIBRARY 5
 9 INFORMAL INTERACTION 5

POLE 5 --LIKE

DO YOU WANT TO CHANGE ANY OF THESE VALUES?NO
 DO YOU WANT TO CHANGE THE POLE NAMES?NO
 THE TWO CONSTRUCTS YOU CALLED
 6 VARIABLE CONTENT--SPECIFIC CONTENT
 7 LIKE--DISLIKE
 ARE MATCHED AT THE 88 PERCENT LEVEL
 THIS MEANS THAT MOST OF THE TIME YOU ARE SAYING
 VARIABLE CONTENT YOU ARE ALSO SAYING
 LIKE
 AND MOST OF THE TIME YOU ARE SAYING
 SPECIFIC CONTENT YOU ARE ALSO SAYING
 DISLIKE

THINK OF ANOTHER ELEMENT WHICH IS EITHER
 VARIABLE CONTENT AND DISLIKE
 OR LIKE AND SPECIFIC CONTENT
 IF YOU REALLY CANNOT DO THIS THEN JUST PRESS RETURN AFTER THE
 FIRST QUESTION MARK, BUT PLEASE TRY. THEN YOU MUST GIVE
 THIS ELEMENT A RATING VALUE ON EACH CONSTRUCT IN TURN.
 TYPE A VALUE FROM 1 TO 5 AFTER EACH QUESTION MARK.

WHAT IS YOUR ELEMENT?
 WOULD YOU LIKE TO:
 1)DELETE A CONSTRUCT
 2)REPLACE THE TWO CONSTRUCTS BY ONE
 3)JUST CARRY ON
 WHAT IS THE NUMBER OF THE CHOICE YOU HAVE MADE
 ?3
 DO YOU WANT TO FINISH NOW?YES
 DO YOU WANT:
 1) A COMPLETE PRINTOUT OF THE ANALYSIS OF YOUR GRID
 2) ONLY THE RESULTS OF THE ANALYSIS
 WHAT IS THE NUMBER OF YOUR CHOICE
 ?2

GRID COMPLETE

CONSTRUCT 3 REVERSED

TREE FOR CONSTRUCTS

	88	72	61	33
* 5				12
* 1				
* 4			11	
* 2			10	
* 6		9		
* 7	8			
* 3				13

TREE FOR ELEMENTS

60	16	17
71	15 14	
75		13
78		12
82		11
85	10	

