EXPERIENCE OF A DESIGN EXERCISE, MAKING USE OF THE PROGRAMS: GOAL, BIBLE & GLOSS (developed by ABACUS)

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ABSTRACT

A 6 weeks (2 days a week) design exercise, making use of the above programs, was held the last bimester in the Faculty of Architecture in T.H. - Delft.

This exercise was an experimental one for the students, as well as for the teachers.

We would like to present the conclusions we reached at the end of the exercise (partly based on comments made by the students themselves), regarding the following aspects:

1. Selection of the type of project to be designed (criteria for the selection, like: size, complexity, etc.).
2. Organizational aspects, like: the time table; size of student working groups; internal organization of the groups, etc.
3. Introduction of students to hardware & software.
4. Project development: generating alternatives, improving the selected ones, changing the Standard Data File, etc.
5. Requirements for presentations.

As the exercise had an experimental character, it is clear that a lot should be learned from that experience, both from its positive and negative outcomes.

The paper will try to evaluate on this point for the benefit of

DESCRIPTION OF THE EXERCISE AND INITIAL INTENTIONS

During the Spring bimester, an exercise in Computer Aided Architectural Design was held at the TU-Delft. The design activity of the exercise was to analyse and improve an existing building (not to design a new building from scratch). The computer programs available to the students were: GOAL, BIBLE & GLOSS.

15 students, divided into 3 groups, participated in the exercise and were assisted by 3 tutors. Most of the students had no previous experience with computer use.

The duration of the exercise was 6 weeks, with 14 hours tutorial time per week. Those students who wanted to, could have access to the terminals during additional hours as well.

The peripheral equipment in T.H.-Delft, consists of two graphical terminals (TEK 4052, 4054), one alphanumeric terminal (TI silent 700), one A2 plotter (TEK 4662), one digitizer (TEK 4956) and one hard copy machine (TEK 4631).

The above programs are installed on a remote computer (DEC 20 in Twente), and accessed via telephone lines.

The project which was chosen for the exercise, was a university building, which was also the subject of an All-design project in the previous bimester. Three different designs, done by students of the previous bimester, were chosen as a starting point for the exercise, one for each group.

The building which is planned to be used by several surrounding faculties, is situated at the campus of the Utrecht University (see fig. 1), and consists of: laboratories, lecture rooms and halls, seminar rooms, examination rooms, staff working rooms and a large cafeteria: in total about 12.000 m^2

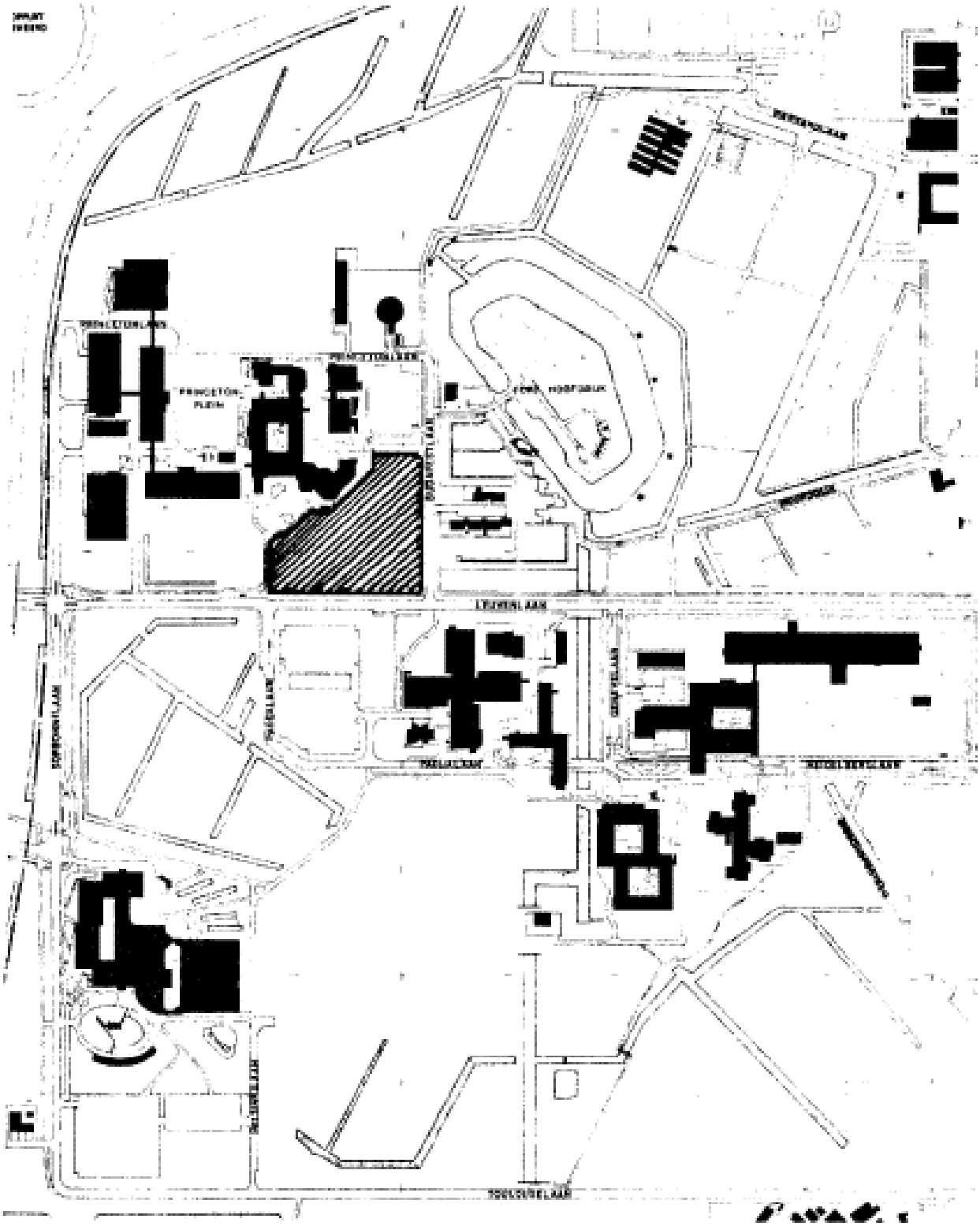

Fig. 1: Plan of the university campus in Utrecht and the site of the new building.

The brief (as prepared by the students on the previous bimester) and the Standard Data File (SDF) required for running the program GOAL, were given to the students at the beginning of the exercise. Only minor changes were introduced by the students to enable the use of the computer programs, and answer some specific demands (e.g. glassbricks as an additional wall type). (See fig. 2).

The original planning of the exercise was as follows (see fig. 3):

1st week: revision of the brief and Standard Data File; lecture on hardware and computer programs to be used, including demonstrations.

2nd week: preparation of the individual files, i.e,: construction file, geometry file, environment file.

3rd-5th week: development of the individual groups designs, using GOAL & BIBLE for the appraisal of the alternatives.
The first 3 hours each week had to be devoted to a report by the students. Each group of students had to tell the others about their progress, what they wanted to accomplish, how they did it, problems they identified related to hard ware and software, what were the results and how they intended to proceed.
The remaining hours, had to be used by the students to work behind the screens assisted by the teachers.

6th week: This last week was devoted to prepare the final presentations, and use the program GLOSS to compare between the various alternatives.

7th week: Final presentation and assessment (at the beginning of the week).

EVALUATION OF THE EXERCISE

The second part of this paper will discuss the evaluation of the exercise as a result of a discussion between students and tutors. As a general remark, students made it clear that the exercise succeeded on the level of operating the programs as such, but failed, to their opinion, on the level of using the programs as real design aids.

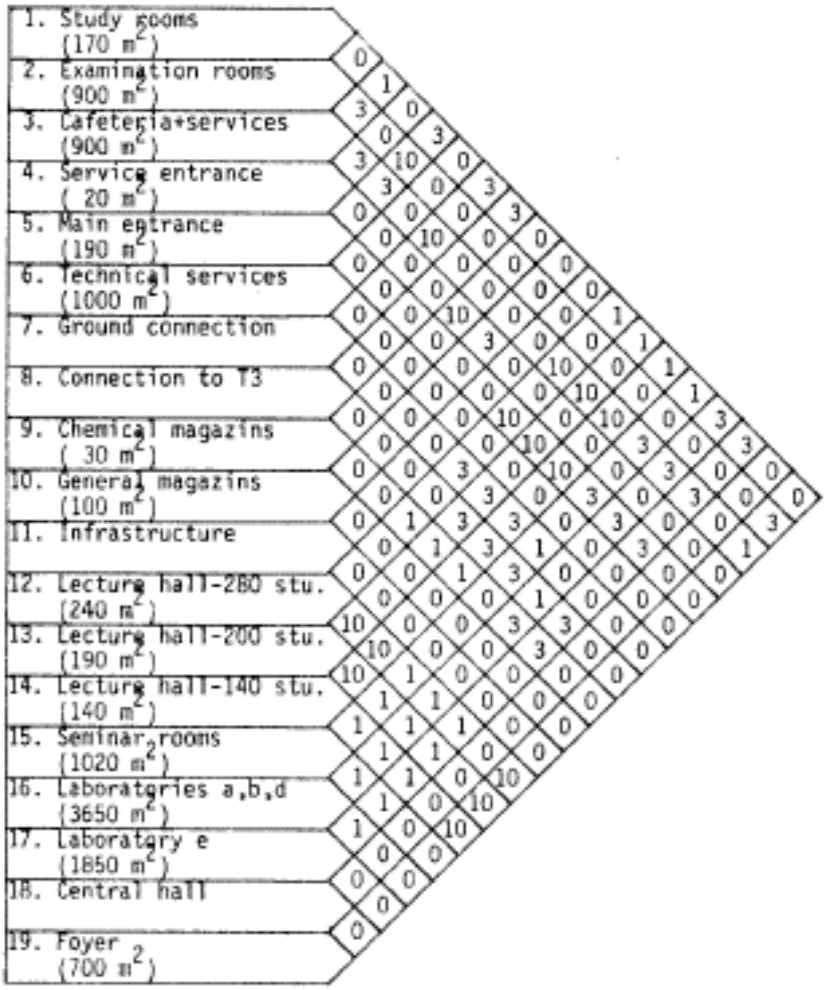

Fig. 2: Matrix of associations between the 19 functional units of the university building.

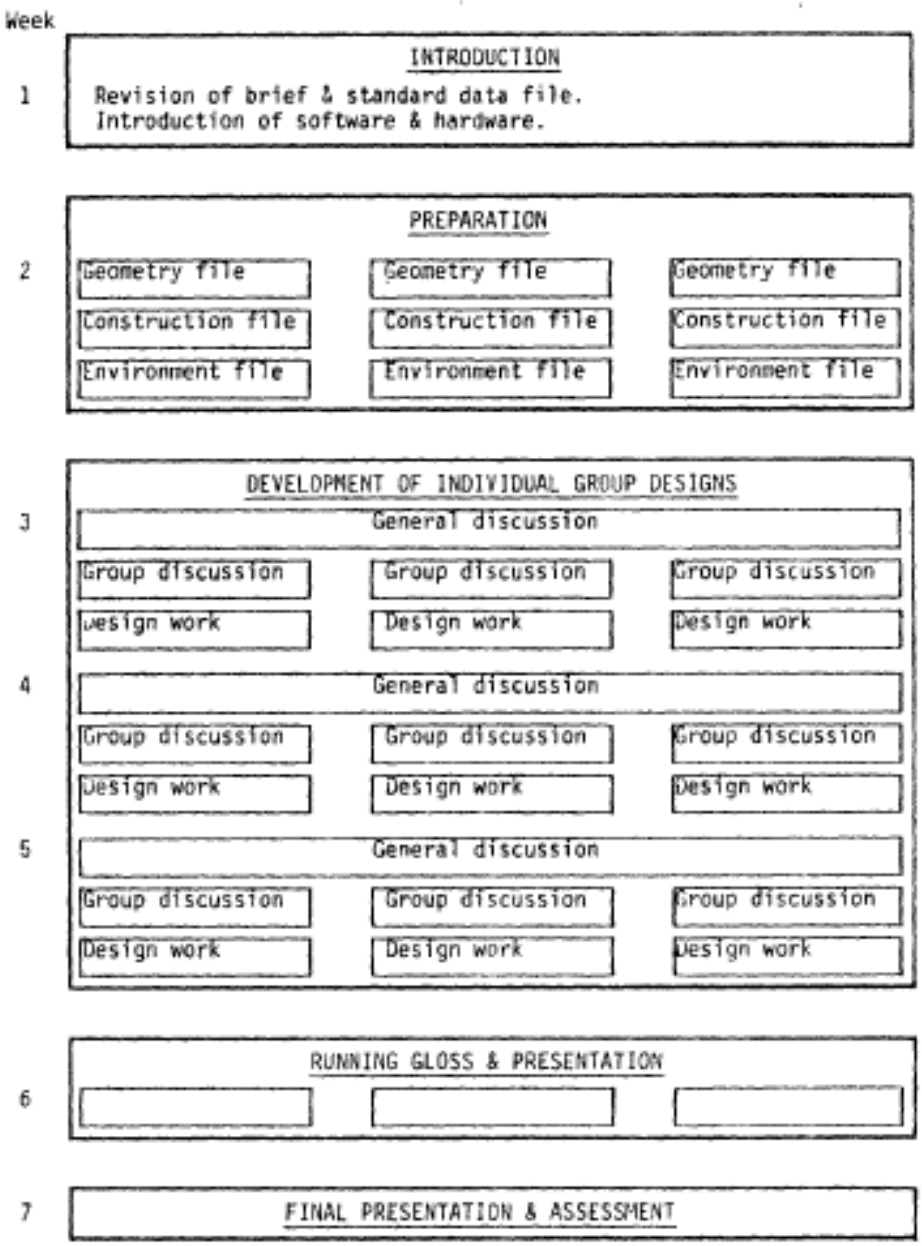

Fig. 3:Scheme showing the intended structure of the exercise.

In other words, there was a strong feeling that the connection between running the programs, and designing with the programs, was missing.
Reasons for that could have been:
1. Selection of the project to be designed.
2. Organizational aspects.
3. Introduction of students to hardware and software.
4. Project development.
5. Requirements for the final presentation.

Each of these aspects, will be discussed now in more details.

1. Selection of the project to be designed.

The project which was chosen for this exercise was inadequate, for several reasons:

- complexity in size;
- complexity of the brief;
- unfamiliarity of the students with this kind of projects;
- the computer programs being inadequate for such complex projects;
- the fact that a complete design was used as a starting point for the exercise, forcing the students to schematize an already detailed design, and losing existing information. This being in contradiction to the usual design process, where in each step one tries to maximize the information. Also, some psychological problems arose because of the fact that the students could not identify themselves with the designs made by others.

Our conclusion was that for a first encounter with such a kind of computer programs, one should choose small projects, with a limited number of activities, having clear relations between them. In our case, the different type of activities and the unclear connections between them, resulted in the fact that the students spent most of their time changing the geometry, shifting spaces from one place to the other, and getting no significant improvements.
The big size of the building also caused a waste of time: to input a new geometry through the digitizer, they had to split each floor into two parts, and since there were about 5 floors, it meant that 10 plans had to be brought up separately to the computer.

2. Organizational aspects.

Post factum it seems that our original schedule for the exercise, was a good one, but it was not maintained.

Instead of devoting one week to the preparation of the Standard Data File, and introduction of the computer programs, two weeks were used for this part. The students themselves suggested that the SDF should be given to them as a data, not allowing them to make any changes in it.

Also the weekly discussions about the progress of each group were not held properly, affecting the final results as will be described later.

The division into three groups of 5 students, was done according to the number of available working stations. We think that a group of 5 students is too large for one station. (Usually, only 2 or 3 students were working). This of course can only be improved if more working stations are available.

3. Introduction of students to hardware and software.

A long time was spent on explaining how the computer programs work and discussing the output, instead of letting the students go over the manuals themselves. Equally, considerable time was spent in explaining how to use the hardware.

The students suggested that a short manual describing how to deal with the hardware (switching on the machines, getting a connection to the main frame, etc.) could be given to them, so as to enable them to work without the tutors.

While we tried to make it easier for them by tutoring them behind the machines, they prefer to get written instructions and learn from their own experience (a most important remark).

4. Project development.

Because we did not oblige the students to make a weekly report about their progress. in spite of the initial planning, they forgot about the design aspect. Instead of deciding on a design strategy, based on the outputs they had, and making changes accordingly, they were sitting behind the screen, using the program merely as a computer game. We are positive now, that a very strict time table should be kept, and that the tutor should stress the point of the close relationship

between the use of the programs and the design decisions. This can be achieved by a regular weekly meeting, where each group of students has to explain what they had accomplished during the week. There has to be a written presentation, explaining the process: what was their goal, how did they operate, what were the results, and what are their conclusions for the next step. Once the student has to explain his work to others, it forces him to think about what he is doing, and this should result in a more clear and logical design process.

5. Requirements for the final presentation.

For the final presentation, the students were requested to show the various alternatives they generated, what was improved in each alternative, and compare them by using GLOSS. They also had to work out at least one scheme as an architectural plan on a scale of 1:100. As was reported by the students, this last demand turned out to be a very difficult one. When they made their geometric changes, they did not take into account some of the main features of the different spaces. Once they had to turn the schemes, used for the computer programs, into real plans, they found out that many details could not be realized, and additional changes were required. Again, we reached the conclusion that such drawings should have been requested all along the process, and not only for the final presentation.

SUMMARY

We have reported here about our experience, which as could be understood was not very successful. It did not result in a design exercise, but in a computer use exercise.
We hope that those intending to teach similar courses will take into account the above remarks and will be able to obtain better results.

However, it should be clear that the use of computer programs as such, can give more insight into the nature of a design problem, but can never function as a decision maker itself. This means that the user of the program still has to interpret the output within a broader context. It is most important to stress this point at the beginning of any CAAD students project.