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## THE «HABITUS-PROJECT», A COURSE IN JOB-ORIENTATION

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### SUMMARY

Job orientation for mechanical engineers is the objective of the "Habitusproject" which is a new course in the first year curriculum. Orientation helps students to select suitable courses of study for their future careers. The students work in groups in order to gather information about job opportunities in industry.

Evaluating the course showed that the main objectives are being achieved and the students became aware of the various job options available and they learnt more about working in groups. At the end of the course, most students were able to define their preference for a future job.

Evaluation of the input, procedure and output of the project leads to valuable insights for the staff.

The project's procedure, inputs and outputs were evaluated in order to give the staff a better understanding of the way that it should be organised.

### INTRODUCTION

In 1982, a new system of higher education started in the Netherlands. The curricula of the old system comprised five years, but under the new situation, curricula have to be condensed into four years. The basic curriculum for the first year should be seen as a preparation for the next three years of the study course, but one of the things that was missing from the old curriculum was a systematic approach to the preparation for future careers in mechanical engineering. The Faculty Board of Mechanical Engineering decided to introduce a specific course into the first year in order to prepare students for their future careers. It is called "The Habitus Project". It aims to create an attitude towards reality by encouraging students to observe the behaviour of mechanical engineers in practice. In this way the students will gain insight into opportunities of a career in mechanical engineering. The new course was developed in cooperation with staff of the Faculty of Philosophy and Social Sciences and the study group consisted of the authors and three students.

### THE OBJECTIVES OF THE COURSE

In the first place, the study group defined objectives, especially the main objective: "to give students insight into the diversity of mechanical engineering work". More specific objectives were, that students at the end of the course should be able to:

- describe the different professional options of mechanical engineering work,
- explain the relationship between these options,
- decide their own particular interests.

The following indirect objectives that relate to the general professional practice were defined too:

- to work with incomplete information,
- to generate solutions to problems creatively, using the information collected,
- to decide the most important skills in group cooperation.

Then, the course was designed to meet these objectives.

### THE STRUCTURE OF THE COURSE

Because an active search for information by the students is an important part of the course, groups of about 15 students are informed about the different job options available to mechanical engineers in specific branches of

industry. Also, the relationships between these different job options have to be studied. Within these groups, subgroups will focus their attention on one or more of the job options on mechanical engineering. The information that is collected by the subgroups will be discussed in the larger group. After its analysis and organisation the information collected is arranged for poster presentation.

The branches of industry are defined by the teaching staff, so that companies can be invited to participate in the course by allowing their mechanical engineers to be interviewed by the students about the nature of their work and by allowing the students making visits to these companies. Giving an insight to the students of the diversity of jobs available to mechanical engineers helps them plan their own future careers. This is done by looking at the object of their jobs; for instance, transport systems or the design of engines. Each group is assigned to a different branch of industry in order to help them to find out its activities regarding mechanical engineering. A second way of looking at the profession is to focus on the following aspects of the work: (1) fundamental (knowledge needed to understand operations and obtain information), (2) design and development, (3) production, (4) marketing (commercial), (5) services/maintenance, (6) project engineering and (7) training (in educational institutions and industry). General descriptions of these aspects are given to the groups in order to guide them when searching the relevant engineers in industry. Not only do the groups have to prepare specific job descriptions for these engineers, but they have to indicate interrelationships too; i.e.: how does a production engineer cooperate with a commercial colleague. The groups have to complete the course in about eight meetings of 3½ hours in the third trimester of the academic year, because the student will need to have some technical background knowledge. The groups are supervised by student-assistants who are older and have received appropriate training from the teaching staff regarding groupwork. These student-assistants are supported by the teaching staff during the course.

### THE ASSESSMENT

The work of each group is assessed from three main points of view: (1) group functioning is judged by the student assistant, (2) the posters presented by the groups are marked by two independent judges (if possible one from industry) according to their content and lay out and (3) all students take part in an individual written examination when they are asked questions about job options, job relationships and working together in a group. The assessment is a combination of group- and individual work.

#### EVALUATION OF THE COURSE

After the first year of the course, the staff wanted more information before deciding what changes in the course were necessary. Therefore, an evaluation plan has been incorporated into the course. The staff had to specify the course objectives, the educational process and the assessment of students. Questionnaires, log-books, meetings with the group leaders, group interviews, examinations and reviews of the poster presentations are useful for gathering data for input-, process- and product-evaluation.

The main questions for input evaluation concern the availability of resources and suitability of the objectives. Resources in this case are the amount of time that students can spend on the course, actually, it was not very different from the time planned (32 hours). Also the branch of industry investigated by each group was evaluated. Answers by students to the questionnaires and information from the group-leaders made it clear that some branches of industry offered few job options in mechanical engineering. This suggested a need to change or exclude certain branches.

In the questionnaire, students were also asked about the relationship between the course and the objectives. Answers indicated that the course did aim at the main objectives (based on the global goal of orientation) and the indirect objective of working together in groups. However, the indirect objective of working with incomplete information was not recognized as such by the students. From log-books, group interviews and staff meetings with group-leaders, information was gathered about the process of working and learning in the groups. In the first two of the weekly meetings, the students needed a lot of time to become acquainted with the main objectives of the course and to get used to this new way of working. It was a new experience for them to be held responsible for their own learning process in groups. After two meetings, the atmosphere in all groups was good and students were enthusiastic about being supervised by the student-assistants. Also, they put a lot of effort into the poster-presentations and extra's like video programs, slide-presentations and photographs.

This information suggested three changes. When training of the group-leaders, more attention had to be paid to the first phase of the course and to the way that group-leaders could motivate students to work on their own. A lecture to clarify goals, process, organisation and assessment should precede the group meetings during which also a well-known professional talks about his career as

a mechanical engineer in order to motivate the students to collect relevant information.

Does the course produce the expected knowledge? Product evaluation can tell us something about cognitive growth, changes in vocational interests and knowledge of working together in groups.

Students have to write down their knowledge of job options in mechanical engineering, both before and after the course. While, before the course, students are unable to describe more than one job option, they are capable of describing up to 6 job options at the end of the course.

In the individual examination, students are also asked to show their knowledge of the relationships between different job options. On average, students wrote four good descriptions, the norm for a satisfactory mark being three.

The course stimulated personal interest in a specific job option for 52% of the students and the percentage of students that had a preference for a certain option increased from 48% to 69%.

As a check on their ability to work together, students had to write down aptitudes which are important for working in groups. Students gave averaged 4 good descriptions of relevant aptitudes and this was the norm for a satisfactory assessment.

The overall conclusion is that the course is satisfactory and its main goal is being achieved. The changes suggested will be made operational in the following year and the third generation of students in mechanical engineering finished the course in 1985.

#### CONCLUSIONS

When compared with students of the "old" system before the project started, the percentage of students who could see sufficient incentives for a career in the field of mechanical engineering increased from 40 to 60 percent.

From the group interviews it appeared that:

- making a poster was not attractive and many students would rather interview more people working in practice
- relationships with other disciplines had been neglected in the project
- problem recognizing and solving was not described adequately
- working in groups was a beneficial point
- making appointments with people was much easier for many students after they had finished the course.