The role of the tutor in a problem based curriculum

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The role of the tutor

in a problem based learning curriculum

Willem de Grave, Jos Moust, Jeannette Hommes

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Foreword

Problem-based education is becoming increasingly prevalent in universities and institutes of higher education throughout the Netherlands. The first university to introduce this form of teaching was the University of Maastricht. When this concept of teaching was introduced in the various faculties it soon became clear that the role of teaching staff would have to change. Teachers, in their new capacity as 'tutor', that is, the individual responsible for guiding the problem-based learning process in the tutorial setting, found it particularly difficult to adapt to this new role and persistent misunderstandings remained as to how this new role should be filled. There was a growing realisation that more information and training was needed on this new educational task. As a result, various training programmes were introduced within the different faculties and a study was carried out into the effects of the different styles of tutoring. Gradually, a great deal of know-how on the role of tutor has been accumulated.
This book, which deals with the role of the tutor in problem-based learning draws upon this know-how so that fresh light can be shed on this new teaching role. Examples throughout the book will help to illustrate the most important tasks of the tutor in greater detail. A number of practical suggestions are also given as to how the role of the tutor can be carried out more effectively.

Willem de Grave
Jos Moust
Jeannette Hommes

Maastricht, June 2003

1 Introduction

1.1 Why write a book about the role of the tutor?

Many courses in higher education are adopting problem-based learning methods for their curricula. This form of education allows the student more freedom to plan, effectuate and evaluate his learning activities. a teaching Problem-based learning is an example of a student-based approach to education. However, this new form of teaching has necessitated a radical change in the methods used by teaching staff in their curricula.
In problem-based learning, the tutor must assume role which is different from any other. A tutor is a teacher who is responsible for stimulating tutorial-based students into working together to find solutions to the problems which they have been assigned. The role of a tutor is not to impart information directly to students, but to assist them in the learning and group processes. The tutor's support consists of empowering students in the acquisition of knowledge and improving group interdependence. The role of tutor demands a different perspective on teaching and learning and calls upon other teaching and educational-psychological know-how and skills than those with which he is most familiar. The aim of this book is to shed more light on the role of the tutor.

1.2 Who has this book been written for?

This book has been primarily written for teachers in higher education who are assuming the position of tutor for the first time or for those who already have some experience with the role. For teachers who are unfamiliar with the role, the book will hopefully be able to illustrate the various facets of being a tutor. For teachers who are already acquainted with the role of tutor, this book may serve as a tool in helping them to

critically evaluate their performance hitherto as tutor. In addition to fully-fledged teachers, older students too can sometimes be called upon to act as tutor in problem-based learning. This book likewise offers these student-tutors a broad overview of the various tasks of a tutor and the way in which these tasks can be carried out effectively. Finally, this book provides a reference to educational psychologists looking into teaching environments where teachers have taken on different roles.

1.3 The structure of the book and how to use it

Chapter 2 first describes the attributes of the (new) role of the tutor and discusses effective tutoring. Chapter 3 deals with the tasks performed by the tutor in the learning process in the tutorial and the skills required of the tutor to carry out these tasks effectively. In chapter 4, the tasks of a tutor in guiding the group process and the individual performances of students are considered as well as the teaching of key skills in professional teamwork. Finally, chapter 5 examines ways in which the tutor might help activate students in developing autonomous learning skills. Consideration is given to the way in which a tutor can provide support to self-directed learning in a tutorial throughout the student's period of study.
In addition to this book, we would recommend reading Problem based learning; a student guide (Moust, Bouhuijs, & Schmidt, 2001). A know-how of the problem based learning process in tutorials is important to understanding the role of the tutor.

2 The role of an effective tutor

The aim of higher education is to turn today's student into tomorrow's professional. Kaldeway (1999) uses a number of keywords to characterise this professional: enterprising; practically-oriented; inquisitive; communicative; reflective; and expert.
These characteristics require some qualifications, that is, the demands made by the labour market on graduates:

- *enterprising* – learning how to take on responsibilities for oneself;
- *practically-oriented* – learning how to deal with non-standard (creative) practical problems;
- *inquisitive* – learning to gather and to present information;
- *communicative* – learning to collaborate (in a team) and learning to work;
- *reflective* – learning to analyse and adjust one's actions;
- *expert* – learning to keep on top of and to develop one's field of expertise.

Competences of graduates

The demands placed on the modern professional have a bearing on the way education is organised. A curriculum founded on problem-based learning is able to produce proficiencies that match these qualifications. The proficiencies or competences of students consist of a mix of knowledge, skills and attitude which, within a particular context can bring about desired behaviour (De Bie & Mostert, 2000).
The proficiencies required of students in a problem-based learning environment will have a bearing on the tasks of the teacher, that is, in his new role as coach in the tutorial. In order to perform these tasks effectively, the tutor will have to have recourse to specific set of know-how, skills and disposition. For example, the tutor will have to be able to draw on competences which enable him to guide the learning process, the group interaction and the self-directed learning of

students effectively. This chapter will look at these proficiencies in closer detail. This chapter also lays the groundwork for the remaining chapters which will deal with these aspects in greater detail. However, a short description of the key aspects of problem-based learning will first be given in the following section.

2.1 Problem-based learning

The problem-based curriculum is made up of study blocks lasting from six to eight weeks in which topic-related subject matter and skills are integrated. These study blocks can be either multi-disciplinary or inter-disciplinary in character. For example, the Faculty of Medicine might offer topics such as 'Blood Loss' or 'Abdominal Complaints; the Faculty of Business Studies, 'Organisation and Marketing' or 'Investment and Reporting'; the Faculty of Psychology, 'Body and Behaviour' or 'Human Knowledge'; and the Faculty of Law, 'Legal Acts' or 'Unlawful Conduct'. At the start of each study block, students receive a block book in which the timetable for the study activities, an introduction to the topic, a set of problems and a list of information sources are set out. Twice a week, students meet for a two hour tutorial. The tutorial group consists of around ten students and a tutor. During these tutorials, students must analyse theoretical and practical problems which have been set by their teachers. The learning process for students starts with the analysis of a new problem based on their prior knowledge. Their task is to hypothesise on the underlying principles, mechanisms or processes which may account for phenomena described in the form of a theoretical problem, or to devise procedures and solutions which may help to resolve or deal with a practical problem. During this analytical process, students will discover that their prior knowledge is often insufficient to account for or to solve all the phenomena set down in the problem. The prior knowledge they possess is less correct, incomplete or less accessible than they first thought. During the analysis conflicting ideas, uncertainties and questions will arise which will require more detailed study. Differences of opinion, inconsistencies and ambiguities will provide the basis for the formulation of learning objectives. Following the initial tutorial, the students will go away and study in order to come up with answers to their questions. They will be

given two days to analyse books, journals, videos, anatomical or computer models, look for answers on the internet and/or consult their teachers. After this period of self-study, tutorial members will meet up again, this time to synthesise the information gleaned from the various sources. During this period of integration, students will attempt to differentiate between the major and minor issues in the material studied, put forward examples to substantiate puzzling information and critically evaluate whether the conclusions arrived at by the tutorial members correspond to the facts, their own interpretations and the views expressed in the various sources of information. Where possible, the ambiguities which arise as a result of studying this new information become crystallised. Finally, the newly acquired information is grafted onto the original or analogous problem. This phase of synthesis concludes with a critical review of the way in which they have worked together in analysing and synthesising the problem. A start is then made on analysing a new problem. For a more detailed description of the way in which students learn and work together within the context of problem-based learning see Moust and De Grave (2000) and Schmidt and Moust (1998).

In analysing problems and integrating newly acquired information, although a high level of self-activity, autonomy and selfdiscipline is expected of students, students are not left completely to their own devices. They are given guidance in their learning process and group interaction by the tutor.

2.2 Competences of the tutor with respect to the learning process, group interaction and self-study

Box 2.1

Example intervention focusing on the learning process (described by a first-year medical student)

During a case-study in a tutorial on intestinal cancer, students embarked on a discussion of its causes and the possible risk factors involved. One student suggested radiation, whilst another put forward smoking. Neither of these propositions was followed up to any great degree and the tutorial could come up with few other ideas. The tutor responded by asking pertinent questions and offering guidance. This helped activate the group into looking at the problem more closely and coming up with more detailed explanations. For example, when someone suggested smoking as being a risk factor, he asked us to consider whether it wasn't smoking that was the primary cause of lung cancer. "Why should that be so?", he went on. The tutorial group responded by saying one possible cause was the amount of dust entering the lungs as a result of smoking. "That's correct", the tutor continued, "so what passes through the intestines?" "Food?", we suggested. "That's right. So what therefore, might be a major risk factor in the case of intestinal cancer?" The group suggested specific food substances as a possible cause and when the tutor asked us to come up with examples, it brought about a further round of discussion. In so doing, the tutor was able to point us in the right direction.

Competences of the tutor with respect to the learning process

One of the key competences of an effective tutor for stimulating the learning process in the tutorial group is formed by pedagogical content knowledge (Irby & Wilkinson, 1998; Magnussen, Krajcek & Borko, 1999). Pedagogical content knowledge can be described as the assimilation of specific subject matter within a specific educational context. More precisely, this means that the tutor must possess the necessary know-how and be able to intervene effectively to questions such as, "What do I need to do in order to help my stu-

dents understand this difficult problem more easily? What do the students already know about the subject? What misconceptions do they have on the subject? What do they find particularly difficult in learning? What is the best way of making my students aware of the fact that they still have an insufficient grasp of the subject?" This pedagogical content knowledge can be cultivated by harnessing his own knowledge of the subject matter, a general knowledge of learning processes and educational principles involved and knowledge of the educational context.

Whilst subject matter knowledge on the part of the tutor is a necessary pre-condition for being able to stimulating students in the acquisition and processing of knowledge, it is still not sufficient by itself. A study into effective tutoring (Moust, 1999) has backed up the necessity of this subject-based knowledge on the part of the tutor. Tutors who are actively involved in broad-based and multi-disciplinary study blocks will not only be confronted by subject areas, with which they are familiar, but also by subject areas about which they might have little knowledge whatsoever. A tutor who wants to be effective in such situations therefore, must study this "new", little-known subject matter beforehand in much greater detail. It is important for tutors not only to have a thorough understanding of the subject matter, but also for them to gain a broad-based knowledge of the learning processes and related educational principles involved, so that they are able to develop proficiencies with respect to pedagogical content knowledge. Often, tutors will hold implicit views about how students learn and how to stimulate their acquisition of knowledge. These views are based on their own experiences both as one-time student and more latterly as a teacher and it is these experiences that will strongly influence the way in which he performs as a tutor. In order to function effectively in this role, it is important for the tutor to have an insight into research studies and theoretical models of the learning processes and the educational principles that have a bearing on problem-based learning. For example, an understanding of the latest theories on cognitive psychology and co-operative learning are essential in supporting problem-based learning.

Lastly, knowledge of the educational context is an essential pre-requisite for the tutor in order to develop pedagogical content knowledge. If a tutor wishes to adapt his interven-

tions effectively so that the needs of his students can be met, knowledge of their backgrounds and motivation is essential. In addition, knowledge of the explicit aims of the course of study as well as knowledge of the 'hidden' curriculum provides other examples of the knowledge required in the framework of a particular educational context.

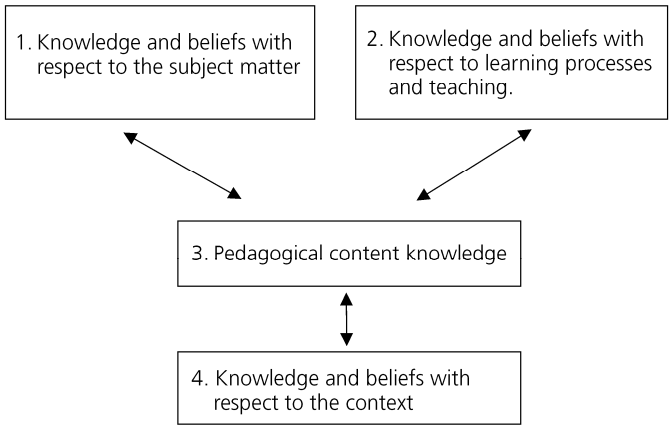

Figure 2.1 Domains of tutor knowledge (after Magnussen, Krajcek & Borko)

In order to stimulate the learning process within the tutorial, the tutor can make interventions which are based on different skills. Typical skills might include the ability to ask the right question, being able to deal with students' questions, explaining and reflecting on the learning process. A good tutor will be able to use all these skills effectively.
Likewise, a tutor's attitude to his tutorial students is of no less importance in stimulating the problem-based learning process. By adopting a particular attitude, the tutor must also demonstrate his willingness to learn in the tutorial context as well as give his students the freedom to take on self-responsibility. If students are expected to show a large degree of openness as part of their own learning process, the same is also expected of the tutor.

Box 2.2

Example of tutor intervention focusing on the group process (described by a third-year medical student)

Sometimes in a tutorial you get the feeling you've reached a dead end. It's not because we've not done the work, but it's usually down to the make-up of the group. Maybe it's because the students as a group are reticent to participate in group discussion and debate or maybe one or more members of the group might feel uneasy about being in the close company of particular others. In this situation, it is difficult for both the discussion leader and the tutor to get the discussion moving. The way our tutor tackled the problem was highly commendable in this respect and, as far as I know, the entire group appreciated his contribution. He acted out the role of the patient who was the subject of the case in question and his performance was convincing. First of all, it meant he was able to break the ice in the tutorial, helping the discussions to get underway and, secondly, the case in question became much less theoretical. Despite the difficulty of the subject matter, by making timely and pertinent remarks or questions, he was able to turn it into a highly enjoyable study block with enthusiastic participants and amusing highlights.

Competences of the tutor with respect to the group process

The ability to work and communicate together are indispensable skills in problem-based learning. The tutor can play a crucial role in cultivating these skills. If a tutor wishes to nurture these interactive skills amongst his tutorial students, he must be able to fall back on knowledge and skills relating to group dynamics (Dolmans, Wolfhagen, Scherpbier & Van de Vleuten, 2001). This includes knowledge and skills with respect to group processes, leadership and providing support to dysfunctional groups or individual students. The tutor's role in the group process consists of explaining the facets of co-operation between students and encouraging them to reflect on these and helping them to optimise these levels of co-operation.

In addition to knowledge and skills with respect to group dynamics, it is important for tutors to possess skills which facilitate the development of a good relationship with the tutorial

group. In their model of effective tutorship, Schmidt & Moust (1995) emphasis the importance of being able to strike up an authentic relationship with the students in the tutorial group. In developing such a relationship with the group an open attitude with respect to the students is essential.
In addition to these tutor-based skills, he must also possess the knowledge and skills required respectively by the discussion leader, the scribe or tutorial group participant. The tutor must also be able to intervene in response to the way in which these roles are carried out by the students and sometimes act as a role model. First and foremost, the tutor must be able to draw upon knowledge and skills which help encourage the way in which students can reflect on these skills. One of his tasks will be to coach students in the acquisition of these competences.

Box 2.3

Example of tutor intervention concerned with the autonomous learning of students (described by a first-year medical student)

I was recently in a tutorial group where the tutor regularly gave us suggestions on reading matter. After formulating our learning objectives, she presented us with all sorts of reading suggestions, or better said, she tended to focus on just one piece of reference material which she highly recommended. She also singled out the chapters which she felt were important to help us attain these learning objectives. Given her level of expertise in the area, we tended to focus our efforts on these specific references and ignore the rest. When it came to looking at the subject matter in the tutorial group, discussions were slow in coming because we had all studied the same material. By having only studied a single source, we had missed out on other points of view on the subject matter, so we asked fewer questions and were unable to feed off each other. Discussions in the tutorial became shorter and shorter. Clearly, the tutor had given us too little freedom in seeking out the information for ourselves and this did not generate a great deal of productivity within the tutorial group.

Competences of the tutor for autonomous student learning

Problem-based learning is an approach to education which demands a great deal of autonomy and self-activity on the part of the student. A tuto must therefore feel capable enough to get his students to learn independently. As well as having an understanding of how students are able to develop these independent learning skills, it also means a tutor should adopt a different attitude with respect to the contribution he makes and to the acquisition and processing of information. For example, one of his tasks must be to allow students sufficient freedom to direct their own learning process and not make them overly dependent on his own knowledge and skills. Another of the tutor's tasks is to give students an increasing level of self-responsibility. This means challenging them into accepting a greater degree of responsibility for their own learning process, the group process and the acquisition of important communicative skills.

The following chapters elaborate on the competences necessary for a tutor to optimise the learning process, the group process and independent study on the part of students. The next chapter deals with the competences involved in the learning process.

3 The tutor and the learning process

A major task of the tutor is to optimise the problem-based learning process. This necessitates a number of roles on his part. The tutor for example, might take on one of the following roles: role model; challenger; expert; or activator of the learning process. In order to perform these roles effectively a tutor needs to employ a wide range of intervention methods and possess the necessary skills to do this. In the tutorial setting, these intervention methods demand skills which focus on aspects such as how to ask questions; how to respond to them; how to listen actively; how to give explanations; and how to activate reflection. Finally, with respect to the learning process, it is essential for the tutor to adopt an open attitude towards his students. This will demonstrate that he too has something to learn from the subject matter.
The following sections look at the various roles of the tutor, the types of intervention available, the skills that are necessary to perform these interventions and the approach which is required by the tutor.

3.1 The different roles of the tutor in the learning process

In stimulating the problem-based learning process, the tutor can act out a number of specific roles. In describing these different roles, as a starting point, we have divided these roles into categories for the teacher in process-oriented teaching (Vermunt & Verloop, 1999). These roles are: the diagnostician, the challenger, the role model, the activator, the monitor and the evaluator.

The tutor as diagnostician
Problem-based learning requires students to activate their prior knowledge. This is necessary for a number of reasons,

for example, so that they can engage in discussion with each other, get across clearly their own point of view in relation to the subject matter, explain the subject matter in their own words to others and apply the knowledge they have acquired in case studies. This will enable the tutor to see at first hand how students learn and in turn, make it easier for him to diagnose the learning process. For example, after a problem has been analysed, a tutor should be able to identify the extent of this prior knowledge, the deficiencies that exist and any misconceptions regarding the prior knowledge.
At the reporting phase, which follows the period of self-study, the tutor will be able to observe to what extent the subject matter has been mastered and whether the students are in fact able to apply their knowledge of the subject matter.
In diagnosing the learning process, the tutors can perform interventions which help optimise this learning process.

The tutor as challenger
Students, either individually or collectively, are not always inclined to push themselves to the limit when it comes to learning and thinking activities in and outside the tutorial setting. Often the tutor will have to challenge his students into experimenting with new thinking strategies. At the reporting phase, students have a tendency to concentrate solely on giving answers to the learning objectives. There is an unwillingness or reticence on the part of students to apply their acquired knowledge to the original case or to other cases. The tutor's task is to stimulate them into doing this.

The tutor as model
Many of the interventions available to the tutor in the tutorial setting (see examples in the Maastricht Tutoring Skills Checklist, Appendix 1) provide useful examples with respect to the learning and/or group process. Modelling can be carried out more explicitly or less explicitly. In a case of the former he may start thinking aloud or take time to reflect on this modelling and its effects on the learning process. For instance, the tutor might act as a model for the way in which students ask questions amongst themselves. Not only the tutor, but students too, can often act as an important and effective model for learning and thinking strategies and for developing skills that are essential for problem-based learning. By reflecting on these experiences together with the tutorial

group, the tutor is able to stimulate the required learning behaviour.

The tutor as activator
Often students will already have recourse to knowledge and learning and thinking strategies, but fail to use these sufficiently, if at all. It is then up to the tutor to activate his students into applying this knowledge effectively. For example, students may gloss over an analysis of a particular problem, with the result that their explanations are too shallow and vague. This often occurs because students are not adequately able to activate their prior knowledge. When this happens, the tutor must be able to use brainstorming techniques in order to get students to analyse the problem in greater detail. If, for example, the tutor can pinpoint exactly at which stage this prior knowledge was acquired during the course work, he will be able to make reference to this and activate students into applying this knowledge at the initial case-analysis phase, thereby generating explanations for the current problem. Furthermore, students, at the brainstorming stage, are more wont to provide answers than come up with effective reasons. By stimulating students into giving more explicit arguments, it is possible to analyse the problem in greater depth.
The role of tutor as activator differs from that of challenger. On the one hand, in the case of activation, students already possess knowledge and skills (but use them insufficiently) whilst, on the other hand, in the case of challenging, students - both individually and collectively - are forced into experimenting with new kinds of behaviour and pushing themselves to the limit with respect to insight into the subject matter.

The tutor as monitor
As monitor, it is the task of the tutor to oversee the overall progress of the tutorial group and of its individual students and to establish to what extent the subject matter has been-grasped. For example, if he feels that the task is too simple for the students, the tutor can choose to vary the complexity of the problem task. For instance, in the faculty of medicine, if a patient's case study is defined too openly it might provide students with insufficient footing to explore it further. Depending on the level of the students, the tutor might alter the complexity of the case study by providing more or less infor-

mation on the patient, whichever the case may be. In this way the tutor is able to make sure that the nature of the problem is attuned to the case in question.

The tutor as evaluator and stimulator of reflection
Although the roles of tutor and evaluator have so far been differentiated, in time the tutor will begin to take on a role as evaluator (Van der Vleuten & Driessen, 2000). As he gains a new understanding of assessment, the difference between teaching and assessment aspects will gradually dissipate. Assessment will focus primarily on student's (overall) professional skills and attitude. Increasingly, vis-à-vis this knowledge, the tutor will start to take on a more evaluative role.

The tutor as consultant
This is a role not specifically referred to by Vermunt and Verloop (1999) but one which nevertheless is pertinent to the tutor. A tutor's task is to teach students how to take advantage of his expertise as effectively and as efficiently as possible. The most common form of consultation in the tutorial setting is through question and answer. Whilst consultation is a constant factor throughout the problem-based learning process, it will be most apparent at the reporting phase. Of course, students from another tutorial group might also want to consult this tutor.
In order to optimise the learning process in the tutorial, an effective tutor will have to have a command of the aforementioned roles. In order to carry out these roles, more specific interventions are required. A list of possible tutor interventions during the various phases of problem-based learning is provided in the Maastricht Tutoring Skills Checklist (Appendix 1). The following section deals with the interventions listed on this checklist.

3.2 Tutor interventions during the problem-based learning process.

The most important tutor-based interventions aimed at optimising the learning process of the tutorial group can be found in the Maastricht Tutoring Skills Checklist (Appendix 1)
This checklist can be used by the tutor, for example, as a basis for more specific feedback on his performance in the tutorial. The tutor's own profile can be compared with that of an 'ef-

fective tutor' after having examined the checklist (De Grave, Dolmans, & Van der Vleuten, 1999). In this way, the tutor will be able to formulate his own learning objectives.

3.3 Skills required by the tutor for stimulating the learning process

Asking and answering questions
One of the tutor's most frequent tasks in the tutorial is to ask questions and the way in which he does this can serve as an example to students. This 'model' behaviour can help the students to learn and as such, should be made more explicit by the tutor. An essential pre-condition on the part of the tutor is for him to possess the expertise needed to ask the right questions in the context of problem-based learning and he should also be aware of this behaviour.

Reasons of asking questions

The reasons why tutors ask questions in the tutorial setting can vary. A number of these are listed below. It is important however for a tutor to be aware of the objectives he has set himself when asking the questions. It is important for a tutor to define these objectives beforehand otherwise questioning will become too one-sided.

Reasons why a tutor might ask questions.

- To explain the purpose of the discussion in terms of content and approach
- To draw attention to inconsistencies in the discussion
- To put the discussion into context or to give it a more definite shape
- To stimulate intensification of the discussion
- To check on the level to which students have understood the subject matter (e.g. any deficiencies and the correctness of what they have learnt)
- To check on the accuracy of the decision making
- To steer the discussion (e.g. to widen it)
- To stimulate integration and organisation of knowledge
- To stimulate application and transfer of knowledge
- To stimulate interaction and participation in the group
- To stimulate reflection vis-à-vis the learning process
- To invoke various different perspectives, interpretations and points of view in relation to the subject matter

- To ensure a scientific basis for reasoning/arguments
- To stimulate clarification of thought processes

Types of questions

The questions asked by a tutor should help stimulate the learning activities and thinking strategies required of students. The tutor's questioning should not simply be limited to factual questions and those testing the students' understanding of the subject. Questions should also be aimed at activating cognitive learning activities such as analysis, synthesis, application and evaluation. In particular, it is these types of question that will result in a more profound discourse of the subject matter. In turn this will lead to a better learning outcome. Generally, we can surmise that a tutor will have to operate flexibly and ask a wide range of questions depending on the learning process of the group. In addition to questions relating to cognitive learning activities, questions should be as open ended as possible. This means that more than one answer to the question is possible. Open questions, more then closed questions, will prompt more answers and discussion amongst students and as such, generate more cognitive activities and skills.
The next section will deal with several types of questions which help stimulate the learning and thinking activities of students in tutorial-based learning (Brookfield & Preskill, 1999).

Questions regarding additional clarification or greater detail
These can be questions focusing on the line of reasoning behind a question or answer; questions requiring greater precision (for instance, using concrete examples); or questions into abstractions or definitions. One example of such a question might be: "If we adopt this solution, what are its pros and cons?" The questions are aimed at stimulating students into thinking in the tutorial, because it is easier for them to come up with answers to this type of question. These types of question can be important during both the initial case analysis phase and the reporting phase.

Questions about the relationship between the statements made by different group members
Examples of these types of questions are those which relate to contradictions or complementarities in statements made by individual tutorial members. Questions which follow a

statement made by one student to another (correctly or incorrectly) also belong to this category. An example of such a question might be: "Does John's statement square up with Liz's?" Such questions are aimed at stimulating interaction between tutorial group members, so helping to make the various ideas and standpoints more explicit. This kind of interaction will bring about an intensification and broadening of the problem-based learning process, both at the initial case analysis phase and the reporting phase. These kinds of questions also enable the tutor to take a back seat during the interaction.

Questions that refer to hypothetical situations
These questions are often structured in the following way: "If A occurs ... then ...?" or "Suppose that... what would happen...?". Examples of such questions are: "Suppose the government lowered taxes. What would be the effect on the demand curve?" or: "If this woman was 60 years old instead of 30 years old, what would be the diagnosis?" These types of questions show up the constructive nature of problem-based learning. By asking such questions, students are required to go one step further than the information they already possess and come up with explanations and arguments. These types of questions can be posed by the tutor at both the initial case analysis phase (when constructing a hypothesis) as well as at the reporting phase, when they are used to encourage students to use their knowledge in a much wider context.

Questions on relationships between cause and effect
Because many questions in the tutorial concentrate on the formulation of theory (initial case analysis phase) and the application of the theoretical knowledge (reporting phase), many of the questions asked by the tutor will focus on theories and the relationship between cause and effect. Often, these involve the construction of consistent, complex causal links in which the relationships between concepts must be clearly defined and specified. In fact, they also involve the scientific criteria for theories and theoretical knowledge. An example of this type of question might be: "Why is there a high prevalence of thunderstorms in specific regions of the United States?" Such questions posed by the tutor help to point out any uncertainties, inconsistencies and faulty reasoning on the part of students, so making the student aware of these short-

comings. At the same time, students will learn to argue scientifically and think critically.

Questions relating to summaries, integration and application of knowledge
At various stages during problem-based learning, it is important to summarise the preceding discussion and to distil the knowledge thus far acquired. An example of such a question might be: "What do you think are the most important explanations for the fact that this boy is still alive?" Such questions asked by the tutor, help students develop abstractions (i.e. differentiating between matters of primary and secondary importance) and apply this knowledge. In this way students will learn how to structure their knowledge and to access this knowledge more easily. 'Summarised' questions or those relating to primary and secondary issues can be asked either at the initial case analysis phase or at the reporting phase. Questions relating to the application of knowledge are usually asked at the reporting phase.

Questions into reflection and evaluation
In the main, this type of question will be asked at the reporting phase, but it might also occur at moments when the tutorial group needs to reflect on its own learning process and results. An example of such a question that might be set at the formulation of learning objectives stage is: "What gaps in knowledge did you experience in the brainstorming session?" Later, at the reporting phase, questions that may be asked are: "Can you now answer the question that was raised at the initial case analysis phase?" and "Were the hypotheses correct?" Such questions aim to encourage self-evaluation, critical thinking and learning to learn. The result of such questions might be the formulation of new learning and might lead to experimentation with new behaviour. These types of question stimulate awareness of the student's own learning process and own learning results (meta-cognition), which is a necessary pre-condition for students to increase their ability in giving direction to their own learning process.

Ways in which questions can be asked

The effectiveness of a question is not only determined by the nature of the question, but also by the way in which it is asked. Below are a number of suggestions on how the tutor might ask questions effectively:

- Always allow the student sufficient time to answer the question (approx. 5 seconds). A difficult question will require time to answer.
- Ask questions in which the context is clear to students. Questions must link up with the students' thinking process as much as possible. If a tutor wishes to put a question to the group, he can, for example, first provide a short (but relevant) summary before posing the question. Another option is to first refer back to the relevant information on a blackboard or flip-chart before asking the question. If the tutor decides to ask individual students, he might wish to refer to a student's individual contribution to the discussion and tie in the question accordingly.
- Questions should be clear and specific. Avoid ambiguous and vague questions.
- Avoid rhetorical questions. These are not proper questions, because the students know the answers already.
- When asking questions, use words that the students will understand.
- Encourage students to answer difficult questions by providing hints or reformulating the question.
- Ask questions to individual students as well as to the group as a whole. When asking individual questions, try to stop it becoming a one-to-one discussion while other students in the tutorial simply look on. Try to involve the rest of the group after having asked the question.
- When putting a question to the whole group, try to involve them all in answering the question. For example, when asking the question, look at each individual in turn.
- When asking a question to an individual, refer to him or her by name. This will create a positive atmosphere.
- Do not ask more than one question at a time.
- Do not always ask the questions to the same students.
- Take note of your own non-verbal communication when asking questions. This should assist the questioning.
- Do not ask questions in such a way that it becomes a guessing game.
- Preferably ask questions which you, as tutor, don't automatically know the answers to. For example, after a short discussion in the tutorial on abortion, the tutor might ask an individual student, "And what is your opinion on the matter?"

Student questions

Another good way of stimulating discussion in the tutorial, is to get students to ask the questions themselves (Dillon, 1990). The tutor can play an important part in this. Below are a few examples of the kinds of intervention a tutor might make to encourage this.
First and foremost, tutors can their students into asking effective questions by acting either as an implicit or an explicit model for the students. Suggestions made in the previous section provide an example of how a tutor might act as an implicit model. A tutor might act as an explicit model in one of the four following ways:

Acting as an explicit model in asking questions

- The tutor might think aloud about the content, objective or formulation of the tutors' own questions, for example: "I'm going to ask this question in order to see whether you're able to apply this knowledge effectively".
- If a student asks a pertinent question, the tutor should sayso and explain why it is such a good question. An example: "That's a good question, because it shows how you can differentiate between these two diseases".
- The tutor should also make plain to students that there are some questions asked by students that might help the tutor to learn, for example: "I see from your question that I was too quick to assume you'd understood the subject matter in question."
- The tutor can help students deliberate critically about thetype and the quality of the questions, by encouraging them to reformulate the questions so that the questions become better.

Another way of getting students to ask the questions is to make them aware of the importance of this aspect in problem-based learning. Questions that are asked in an overly explicit manner are part and parcel of the process of problem-based learning in the tutorial group. For example, a lot of attention is given to questions during the problem formulation phase and when the learning objectives are defined in the initial case analysis phase. At these moments, it is crucial for the tutor to stimulate and monitor the quality and the level of these questions in the tutorial.
In addition to paying more explicit attention to questions in the tutorial, questions will also need to be asked by students

during the initial case analysis phase and the reporting phases of problem-based learning. For example, during the reporting phase, it is important for students in the tutorial to ask each other questions about the subject matter. If students have studied the various information sources properly, it will be possible to ask questions such as: "Did you use a different book? Was the information explained more clearly?" This use of different information sources will stimulate questions and in turn lead to more interaction and discussion within the tutorial group. At the reporting phase, once the subject matter has been studied, it's important not only for information to be exchanged, but also that interaction and discussion is generated. By asking each other questions, interaction will be brought about, so improving the effectiveness of the learning process. At this phase in the tutorial, it is possible for the tutor to point out to students the importance of asking questions by collectively analysing the interaction within the group and then reflecting on the quality of the questions asked and the effects that these had on the learning process.

Reacting to students' questions

Situations will arise in a tutorial when students will, by asking questions, consult the tutor's expertise on a said subject. Studies carried out into critical situations occurring within tutorials back up this proposition (De Grave, Dolmans & Vleuten, 2001). At the initial case analysis phase, the questions will mainly relate to the direction of the learning process, such as, "Is this what we have to learn?" At the reporting phase, questions usually relate to the way in which the subject matter fits together, such as, "I'm unclear about this particular aspect. Can you explain it, seeing as it's your field of study?" Whilst these and other questions might seem quite legitimate, some potential danger is involved. Before the tutor is aware of it, he will have fallen into the trap of providing quick answers to a whole range of students' questions. So how should a tutor deal with questions from students? The tutor's approach must be able to demonstrate how students, through effective and efficient questioning, can benefit from the tutor's expertise. In the context of problem-based learning, the consultation of an expert is seen as an important professional skill.

But what tutor expertise exactly can the student call upon? The expertise of a tutor manifests itself through the following:

Tutor expertise

- Knowledge of the subject matter. For example, theoretical knowledge, knowledge of resources (quality, variety, points of view), current status of knowledge.
- Pedagogical content knowledge. For example, knowledge of possible misconceptions students have with regard to the subject matter, knowledge of the nature and causes of these misconceptions and how these misconceptions can be corrected.
- Knowledge of the teaching block. For example, knowledge of tutor instructions, the purpose of the task, how the task can be broadened and deepened where necessary, knowledge of other teaching methods in the block, such as lectures, practicals, knowledge of the structure and content of the block, knowledge of the study load with respect to the various problems and knowledge of assessment in the block.
- Knowledge of the curriculum. For example, knowledge of student's prior knowledge acquired on the basis of other curriculum modules, knowledge of the curriculum structure and knowledge of how the current block fits in with the other blocks.
- Knowledge of the professional context of the problem on which the students are working. For example, knowledge with respect to a problem not otherwise treated in a textbook, such as the clinical experience of a specialist.

By asking questions, students will be able to tap the various aspects of a tutor's expertise. However, a tutor should not blithely proceed in exposing his expertise, but take the following considerations into account before responding to students' questions.

Clearing up any ambiguities on the part of students

Questions asked by students might be individual (i.e. asked by one or more students) or collective (i.e. asked by the discussion leader) in nature. In the first instance, the tutor will have to determine whether the question applies to the whole group. If this is not the case, he can answer the question by

passing it back to the whole group. If, on the other hand, it involves the whole group, the tutor will often find it necessary to ask for a more detailed or specific formulation to the question. By paraphrasing the question, the tutor can put a different accent on the question, for example, by asking, "Do you mean it's not clear why blood pressure drops in this case?" If the question is unclear, the tutor may ask the group as a whole to give a clearer indication of exactly why they find it difficult to understand and formulate the problem more accurately in the form of a question. By using a more specific line of questioning, more often than not, students will be able to come up with an answer for themselves. Clarification and specification of a question are essential because then it will become obvious to the tutor whether students are able to express clearly the difficulty they have in understanding the problem. If students are unable to re-formulate a question more effectively, this probably indicates that they have not studied enough. Whilst tardy progress as a result of a poorly formulated question might indicate a lack of proper study, it might also reveal gaps in the students' self-study. Questions requiring clarification and specification will provide the tutor with certain feedback vis-à-vis the quality and quantity of the self-study carried out by the group. At the same time, these tutor interventions provide a model for the way experts should be consulted. If a question is more properly formulated students will be able to benefit more from the tutor's answer.

Providing hints so that students are able to discover the answers for themselves

Once the ambiguities of students have been cleared up, the tutor can help by giving helpful hints so that students can come up with answers for themselves. A tutor can provide these hints in a number of ways in a tutorial, for example, by indicating a particular line of thought ("try thinking of something else...."), by applying structure (encouraging a diagrammatic representation or providing a structure), or by suggesting an aid ("can you draw it?"). These hints can vary in form, content and direction. They may range from openly formulated suggestions (for example, "Can you illustrate that in a control mechanism?"), to direct suggestions (for example, more specific questioning). Direct and indirect hints are therefore helpful in guiding the discussion. An indirect hint,

for example, might be when the tutor provides the students with a counter example.

Explaining the subject matter
If students persist in their questioning, even after the tutor has attempted to clarify the question and given useful hints, the tutor can always proceed to give an answer to the question on the basis of his expertise. The tutor does this by explanation. The more detailed the explanation is in relation to the question and to the foregoing learning process, the more effective the explanation will be. The explanation may be based on the unique knowledge that the tutor possesses (as pointed out in the section on Tutor Expertise). For example, because of his own specific knowledge of reference works, a tutor might help clear up ambiguities arising from the diversity of standpoints found in these. The effectiveness of the explanation can of course be further improved by known factors such as, structure, the use of examples, interaction with the group, use of language, eye contact, etc. His explanation should be kept to a minimum, since this uses up the time that could otherwise be effectively used for the reporting phase. If the tutor takes up too much time, he might draw the focus of attention in the group too much towards himself. In general, it can be said that a tutor's explanation should concentrate more on his own unique knowledge and less on the reference works, because students (could) have studied these by themselves.

Referring to other sources of information in answers to questions
At first sight, the most efficient way of answering students' questions in the tutorial would seem to give a direct response. However, in certain circumstances, it is preferable for the tutor to refrain from giving a direct answer, but to refer in the first instance to other sources. This is certainly the case when students have not studied enough. In this event, the tutor should make specific reference to the relevant books, because otherwise students will reap the rewards of inadequate preparation for the tutorial. Depending on the questions asked, the tutor may advise his students to attend additional lectures (or seminars), at which the relevant issues are dealt with by the experts. Students will also be able to ask supplementary questions during this lecture. This is not only a more efficient way of working, but it also places less of a burden on

the limited time available at the reporting phase. In other cases, the tutor might refer students to experts who have arranged a practical at which their questions can be answered. A tutor might also refer students to a lecture or a practical because he lacks the detailed knowledge himself. Experience shows that, despite the tutor's considerable knowledge, students can sometimes pose questions which he is unable to answer. When making these references, the tutor should point out the wealth of information sources available and that students should think carefully about these sources before consulting one of them.

In some tutorials, tutors may deal with questions in a different way to the aforementioned scenario. The tutor may decide to overlook the first two considerations and explain the subject matter directly. If this happens, the tutor runs a risk that students will - unwittingly - become over reliant on him.

The way in which the tutor asks students questions may not only help to stimulate the thought processes within the group, many other actions on the part of the tutor can also goad students into thinking and help generate more discussion within the tutorial. Possible actions are considered in more detail below.

Active listening

An important skill of the tutor in stimulating discussion amongst students is an ability to listen actively. Active listening can manifest itself in a number of ways:

- Active listening means encouraging students to make a positive, acceptable (but objective) contribution to the discussion. A tutor can help achieve this by nodding his head, maintaining eye contact with the whole group or those who are speaking or by the use of other gestures.
- Active listening also means paraphrasing the contributions of students, such as, "If I understand you correctly, you are saying...."
- Active listening can also entail reflecting on the unspoken reactions of students, for example, by saying: "John looks as if he doesn't entirely agree with the statement."
- Active listening might also be manifested by summarising important deliberations made by students or demonstrating the necessity of these.

Other skills

In addition to active listening tutors may intervene in the tutorial group by means of non-verbal signals, by providing in-

formation and by dealing with flawed arguments on the part of students. A number of alternative tutor interventions are listed below.

- When a student gives an incorrect answer to a question asked by the tutor, he can explain why the answer is incorrect and what can be learned from making this mistake. For example: "The answer you've given is a common misconception which can be avoided in the following way."
- Make notes of aspects which you think should be dealt with later on, for example, incorrect assumptions or matters which are left hanging in mid air, but are still important to the discussion. Taking notes is also a form of active listening, as well as reacting to something which has been said earlier. When bringing up a relevant aspect from the discussion at a later stage, the tutor can also turn to annotations made on the blackboard/whiteboard by the scribe.
- By staying quiet and by not breaking up silences with a quick response, the tutor is able to encourage discussion.
- The tutor can encourage the students to discuss along by non-verbal signs, for example by looking around.
- Make it known to the group that there are a number of conflicting ideas and make them aware of these ideas.
- An interesting alternative to asking questions suggested by Dillon (1990) is for the tutor to put forward a proposition (based on information, an example or an opinion) which is either at odds with or supports what students are saying. In the first instance, the tutor introduces an anomaly or a counterargument which may help stimulate students to prolong the discussion. A study into the cognitive and meta-cognitive processes during problem-based learning revealed the importance of contradictory information to the generation of explanations (De Grave, Boshuizen & Schmidt, 1999). The effectiveness of the contradictory information, examples and opinions depends largely on the moment at which the interjection is made. One danger in making an anomalous intervention of this kind is that it might easily lead to a discussion between the tutor and the group, so placing the tutor at the fulcrum of the discussion. The trick is to pass the initiative for the discussion back to the students. In the second instance (i.e. complementary propositions), the tutor can provide students with an example which backs up the students' thought processes and stimulate them into mulling over the problem

for longer. When there is an exchange of views (for example during a discussion task), a danger exists that one opinion gets aired more extensively than another, so impeding further discussion. The tutor might then play devil's advocate by introducing a contradictory argument, so helping once again to generate discussion. Again, the tutor should take care not to draw too much attention to him.

- The tutor will often use a combination of questions and alternative interventions in order to activate discussion in the tutorial. To give a commonly used example, a tutor will often first summarise part of the discussion and then pose a question.

Stimulating reflection

One way of stimulating self directed learning is to make students aware of this learning process and to encourage reflection. The tutor can provide an important stimulus to this process through observation. A few examples may help to illustrate this:

- When little headway is being made during a brainstorming session and students start repeating themselves, the tutor can make them aware of this and help them to take charge of their own learning process (if the students themselves are unable to do so), by pointing this out and explaining the situation.
- Point out contradictions in the discussion which the students themselves are unaware of.
- Getting students to think out loud is one way of helping them become aware of their own thought processes.
- Getting the students to reflect on the stronger and weaker aspects of their learning process in the tutorial group at the evaluation stage. The tutor can be an imporant catalyst in raising this awareness by making his own observations on the process.
- Getting students to put into words what they believe to have been the most important learning effect in the tutorial group. This will help them become aware of the learning process in the tutorial and likewise activate a discussion on the productivity of the tutorial group.

The tutor is required to have a number of tools at his disposal in order to raise the awareness of the learning process among students. A tutor should for example, be able to observe effectively and be able to convey these observations to the stu-

dents. Another skill on the part of the tutor is his ability to point out discrepancies, for example, between the ideas of students, between the expected and actual procedures, or between the questions asked during the initial case analysis phase (i.e. brainstorming) and the learning objectives formulated later on. By asking questions, the tutor is also able to help raise the awareness of students with respect to the learning process. Improving an awareness of the learning process amongst students is an important precondition in helping them to control the course of this learning process for themselves.

3.4 The attitude of the tutor vis-à-vis the learning process

As a prerequisite to achieving effective problem-based learning, the tutor must adopt an open attitude to the learning process in the tutorial. This open attitude can be communicated to students in a number of ways. Some suggestions are listed below:

- During the introduction in the initial tutorial, stress the unique character of each group and point out that the tutor too will learn from the tutorial.
- Avoid being a know-all and be receptive to surprising turns in the tutorial.
- When feedback is required between students, be the first one to ask for feedback.
- Be explicit when explaining why and how the tutor might learn something from the tutorial.
- Be positive when evaluating contributions of students towards the learning process, even when false arguments are put forward.

The following chapter expands on the competences of the tutor with respect to knowledge of co-operation in the group and the way in which communicative skills can be learnt in the tutorial.

4 The tutor and the group process

An effective group process is an essential prerequisite for a student's ability to learn successfully. One of the tutor's tasks in the tutorial is to engender co-operation and interaction. In order to be able to make effective interventions in the group process, it is important for a tutor to have a sound understanding of the various stages of group development and possible communication patterns. As well as initiating cooperation between students, a tutor must also be able to encourage the development of students' communication skills. These include the following: taking charge of group discussions; working as a team; giving oral presentations; providing and receiving feedback; arguing; and listening. A systematic process of evaluation can improve upon the quality of these skills.

The following section deals with the various stages of group development. Afterwards, we focus on a key aid to the development of this group process: the Schwarz diagnosis-intervention cycle. We then take a look at communication patterns in tutorial groups and the sociogram as a means of identifying levels of interaction within the group. Finally, we describe the different ways in which the tutor can help stimulate students' communication skills.

4.1 Group development and the role of the tutor

A tutorial group has clear objectives. On the one hand, students have a desire to learn about aspects of a particular branch of study and on the other hand, they are set on improving their communication skills. However, not all tutorial groups can achieve these goals effectively. Productivity will vary substantially between groups. One important factor affecting productivity is the extent to which students in a tutorial are able to develop a coherent group. A number of stages

can be identified in this development process and only when each of these stages has been successfully carried through can it be said that an effective level of productivity has been achieved. It is important for the tutor to have a clear understanding of these stages; otherwise he may end up interpreting particular events in the tutorial incorrectly. The speed at which each tutorial group is able to complete the various stages varies depending on the size and make-up of the group, and the age and personalities of its group members. Tuckman and Jensen (1977) developed a model for group development. They identified five different stages of development.

Stages of group development

Stage 1: Forming

Forming represents the first stage in group development. At this stage a clearer picture will emerge of group composition and, wittingly or unwittingly, each member of the group will have a number of questions with respect to (Remmerswaal, 1995):

- Identity and membership. Group members will start to ask questions like: What's expected of me? How am I supposed to act? What is my role?
- Control, power and influence. Group members will ask themselves: Who can I influence? Who is it that decides on the way ahead? To what extent can I attain my wishes and requirements in the group?
- Openness and acceptance. Group members will ask themselves: To what extent can I make personal remarks? How much of myself do I need to expose? Where are the boundaries? What kind of freedom do I have?

In addition to all the questions a student may have over his own personal role, at this stage there will be still some uncertainty about the objectives of the tutorial group. Students will ask themselves the following types of questions:

- What do I need to know about the subject matter at the end of the study block?
- What am I expected to do? Do I need to write a paper or give a presentation?
- What is required to get a pass mark for this block?

Once a student has completed a number of study blocks, his expectations with respect to the tutorial group will become much clearer. When the student is given the block book and

the names of those in his tutorial group, he can begin to form some idea of what's expected of him in relation to the rest of the group. The student, for example, will hold a particular view about other group members, such as: she's exceptionally bright; he never says a word; she works hard; or I don't know her. Depending on the make-up of the group, the student will be able to form some idea of how the group is likely to function. If there are a lot of talkative students in the group, one expectation might be that it will be a lively group with lots of discussion. The level of interest and enjoyment might depend on the tutor, especially if the student already has some experience of working with the tutor and on the extent to which his area of expertise is likely to contribute to the discussion.

Closely related to the objectives of the tutorial are the respective opinions of the tutor and the students regarding the tutorials adopted approach to the work. It would be wrong to assume that tutors and group members have implicit, jointly held views on the tutorial's objectives and its way of working (Hitchcock and Anderson, 1997). If people start to get frustrated, the group usually realises that it has not agreed on how to function. At the first stage of group development, the setting of objectives and agreements on the method of work has a dual role. First and foremost, it will help clear up any misunderstandings, as everyone in the group knows what is expected of them and has committed themselves to the agreements made. Secondly, if there is any discord, the group can always refer back to the programme of work they have agreed on. At this first stage of group development, the tutor can make an important contribution. For example, during the first tutorial meeting he should state as clearly as possible what the objectives of the tutorial are, the way it will work and how productivity can be monitored. Instead of going headlong into a discussion on the subject matter and the tasks, he should first take time for everyone to get to know each other and to agree on the ground rules on how the group will function.

Ground rules

Ground rules for effective functioning in the tutorial (see Schmidt & Moust, 1998) might be, for example:

- We start on time.
- If you cannot make it, tell the tutor or one of the other tutorial members.

- Always prepare well before each tutorial meeting.
- Take an active part in the discussions, both at the initial case analysis phase and at the reporting phase.
- Contribute as much relevant information as possible. Try to look at the problem from all angles.
- Be as clear and concise as possible, giving examples.
- Be critical with respect to ideas, not with respect to other students.
- Ensure that discussions are thorough, both at the initial case analysis phase and at the reporting phase.
- Show respect for the views of other group members.

Stage 2: Storming

Storming is so called because it is the most turbulent stage of group development, characterised as it is by a large measure of frustration. Once the tutorial group has started its work, specific group members might start to express their views on the level of preparation and participation by others in the tutorial and the intensity with which the tasks have been discussed. This kind of frustration is not usually voiced during the tutorial meeting, but instead expressed in a non-verbal manner.

A lot of things can annoy students. For example, taciturn or overbearing group members, freeriders, a tutor who intervenes too quickly or too slowly or a discussion leader who's not performing his task properly. At this stage, the task of the tutor is to develop common values and norms with respect to the objectives, the method of working and the way in which the productivity of the group is monitored. According to Hitchcock and Andersen, the most effective way of dealing with the frustrations of students is to tackle their grievances head on. Sometimes there is a tendency among tutors to assume that these frustrations will simply go away if they ignore them, but by avoiding confrontation the chances are that the tutorial group will perform poorly. By allowing students to discuss a conflict, the group will be given the opportunity to get to know each other and to develop in a way that satisfies everyone. An open discussion is useful in engendering confidence in each other. In fact, the conclusion can be drawn that this conflict phase cannot be avoided and that the tutor must intervene as soon as students start to get quarrelsome. In addressing the dilemma, the tutor can ask himself a number of questions, such as:

- Are my observations of students' behaviour adequate for me to make a reliable diagnosis of the situation?
- Has the group agreed beforehand on how to deal with conflict situations (one of the ground rules)?
- Does the problem relate to an individual student, a small group of students or the whole group? Who do I address first?
- If I don't intervene, will one of the group members step in?
- What might be the consequences if this happens?
- Do we have enough time to discuss the problem fully with the group?
- Does the problem warrant further discussion?
- Do I possess the necessary skills to intervene properly?

Stage 3: Norming
Norming is said to occur when the members of the group and the tutor agree on norms for the way in which they will work. If the first two stages of group development have been concluded satisfactorily, the group members will approach this stage much more constructively with respect to the interpersonal differences identified, and will co-operate to an adequate level in the tutorial meetings. The students and the tutor will develop common norms about how to get on with each other and how the discussions will take place. Participation is more or less even throughout the group and group cohesion and mutual trust will grow. For example, frustrations that may have been expressed towards one of the other group members will have subsided into a more acquiescent attitude.

Stage 4: Performing
This is the stage at which students perform to an optimum level. The tutorial group will work in keeping with the agreements they made amongst each other beforehand. Meetings are productive, students are motivated and want to feed off each other. Group cohesion can clearly be identified as well as an all-round positive attitude, so creating an atmosphere in which students are able to experiment. Students listen actively to each other and there is effective interaction within the group. Decision-making is also effective and the agreements made beforehand kept to. The tutor and the students accept and act upon the feedback they receive from each other.

Furthermore, the group will have devised effective ways of how to deal with differences and frustrations within the group. However, this stage is not immune to dips in productivity. If this does happen, the tutor should deal with this directly with the group and reach an agreement on how to correct the situation.

Stage 5: Adjourning
Adjourning is the stage at which members of the group go their separate ways. At this stage students and tutor part company. Regardless of the extent to which group development has taken place, this final stage is inevitable. Usually after about 6 to 8 weeks, at the end of the block, the tutorial group will be disbanded. During the final meeting, the group will reflect on how it has functioned throughout the block. Students and the tutor will be able to discuss points about which they were happy or unhappy. This can take place individually or collectively. For aspects of the work that require change, it's important to indicate the way in which these changes can be implemented for future reference. Tutorial groups which have operated constructively in a positive atmosphere and which have completed all the stages of group development successfully might regret the break-up of the group. Still, there will be other groups which get bogged down at the second stage of group development and are unable to arrive at common norms along which to proceed. These students will be more than pleased to see the back of the tutorial group.

This model of group development illustrates that if the first two stages are concluded successfully, this can have a positive effect on the productivity of the group. At the initial stages, the tutor and his students agree on the ground rules they will be adopting to enable co-operation in the block. The tutor can make his contribution to this objective, by agreeing with the students during the first meeting that an evaluation will be held after every meeting and feedback regularly given. In addition to preventive intervention, the tutor can intervene curatively. If there is a disagreement or an air of frustration in the group, the most effective solution is to deal with this directly and discuss it with the group.

4.2 Tutor interventions

The description of the stages in group development has revealed the importance of tutor interventions in creating optimum conditions for group cooperation. One dilemma facing a tutor is when and how to intervene. A useful aid in overcoming this dilemma is provided by Schwarz's diagnosis-intervention cycle (1994). This cycle comprises six steps, the first three of which focus on the dilemma and the last three of which focus on the tutor intervention (see figure 4.1).

The three diagnostic stages relate to the deliberations of the tutor. The tutor first observes the behaviour of his tutorial group, identifying any specific forms of behaviour. For example, he might observe that three of his students constantly refrain from taking part in the discussion. In the second stage, the tutor will draw his conclusions with respect to this behaviour. In the above case, the tutor might come to the conclusion that the three group members have not put in sufficient preparation and as such, have nothing to contribute. The result will be that it is left to the other group members to participate in the discussion, whilst ignoring the other three students.

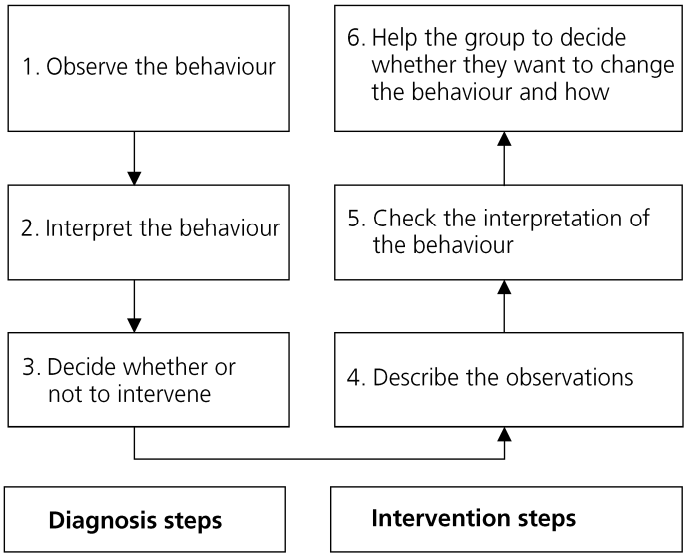

Figure 4.1 The diagnosis-intervention cycle (adapted from Schwarz, 1994)

During the third step of the diagnosis, the tutor decides on whether or not to discuss it with the group. If he decides to discuss his observations then he will move from the diagnosis stage to the intervention stage. During the fourth step, the tutor will describe the observed behaviour by allowing group members to reflect on their behaviour and by pointing out that the three students have so far declined to participate in the discussion. During the fifth step, the tutor will give some background to his observations and discuss with the group the assumptions he has made which might help explain this behaviour. In the aforementioned situation, for example, the tutor will put forward the assumption that the three students have done no preparation and have therefore nothing to contribute. The other students are already aware of this fact and because this irritates them, decide to ignore the three other group members because they have nothing constructive to contribute anyway. At this stage it is important to check on whether the conclusions that have been reached are indeed correct. Assuming that the tutor and the students are in agreement about the conclusion he makes, during the sixth step they can discuss how they are to redress this situation in the future. For example, they might decide that the three students go away and will study the literature and will be the first to make their contributions at the next meeting, if the other students are willing to allow this.

If the cycle is followed correctly, the tutor will be able to get a better idea of when and how to intervene. The tutor must also decide on at what level to intervene. Schwarz identifies five possible levels of intervention.

Intervention levels

Level 1: Structural-functional interventions

The accent here is on the values, norms and perceptions with respect to the role and functions of the group members. Possible interventions might relate to the role of the discussion leader, whether the group will take minutes or how the discussion leader is appointed. Here are some examples:

- "What are the pros and cons of appointing a scribe and writing out the minutes?"
- "What do you believe the tasks of a discussion leader are?"
- "What do you expect of group members during the meeting?"

Level 2: Goal-oriented and executive interventions
Here the accent is on values and norms relating to the objectives of the tutorial group. Interventions might, for example, focus on the intensity of the reporting phase or the scope and depth of the brainstorming session.
Some examples:

- "What do we have to change to ensure that we attain sufficient depth during the reporting phase?"
- "At the brainstorming stage we only looked at two or three particular aspects in any great depth. What can we do to be more creative at this stage?"

Level 3: Instrumental interventions
Here the accent is on values and norms that relate to the change in behaviour and working relationships. At this level, the group will discuss how individual behaviour may help or hinder the effectiveness of the tutorial. For example, the discussion might focus on the effect of an individual's non-participation in the tutorial or of a student's unwillingness to share information. Here are two examples:

- "Harry, I've noticed you've prepared well for the tutorial but you've not taken any part yet. Your contribution may have led to a widening of the discussion. How come you've got nothing to contribute?"
- "Ingrid, the examples you gave in the initial case analysis phase and at the reporting phase have helped shape the discussion and provided it with some depth. It would be helpful if other group members could give some more examples of their own".

Level 4: Interpersonal interventions
Here the accent focuses on values, norms and perceptions which the group members hold in respect of each other. There is only a slight difference between interpersonal and instrumental interventions. The former relate more to feelings that group members have towards other members. Some examples:

- "Martin, how do you feel about Sheryl interrupting you all the time?"
- "Martin and Jim, I've noticed you regularly talking among yourselves, which has been annoying the other group members. Is that correct and have you noticed this yourselves?"

Level 5: Intrapersonal interventions
Here the accent is on values, norms and perceptions which group members hold about themselves with respect to the way in which they function within the group. The purpose of these interventions is to raise self-awareness amongst individual group members. Some examples:

- "Why do you think you keep disagreeing with the other group members, Peter?"
- "Michael, I've noticed you reading from your notes or your book when reporting the learning objectives. Do you think you might be do it without looking at your book next time?"

The intensity of the interventions may vary from level 1 to level 5 respectively, from superficial to in-depth. The tutor can vary the level of intervention, depending on the stage at which the group development now finds itself. Structural-functional interventions can be used at all stages of group development, but will be particularly effective at the first stage of development (forming). Level 2 and level 3 interventions, namely goal-oriented/ executive and instrumental interventions, are mainly helpful during the first two stages of development (forming and storming). Interpersonal and intrapersonal interventions (levels 4 and 5) are most effective when there is a feeling of security and openness within the group. This is usually the case at the norming and performing stages.

4.3 Patterns of communication in the tutorial and the quality of communication

There may be moments during the tutorial when the tutor feels that participation by group members is not what it should be, but is not able to pinpoint exactly what the problem is. It may be a general sense of unease which he is unable to describe objectively. One way of diagnosing the participation of group members is to observe the patterns of communication within the group. This will indicate exactly who is communicating with whom and allow the tutor to draw conclusions with respect to the communication structure of the group.

Communication patterns

Shaw (1978) differentiates between centralised and decentralised structures of communication. In a centralised struc-

ture, a key role is acted out by a single person, who is responsible for much of the communication. Other members of the tutorial hardly communicate with their fellow members, if at all, but always via the central figure. The latter may be a discussion leader or another person, but may even be the tutor. If the tutor is responsible for guiding the communication, the tutorial is said to be tutorled. This centralised structure is sometimes referred to as the wheel structure with the axle occupies the central position. Whilst the centralised structure may be satisfactory to the central person, it leads to reduced levels of interaction between group members in which motivation is also diminished.
The other communication structure is referred to as the decentralised communication structure - also known as the circle structure. Every member of the tutorial group has the same opportunity to communicate and can communicate with any other of the tutorial group. The advantage of the decentralised structure is that interaction, involvement and satisfaction of the members of the tutorial is raised. In this case, the role of the tutor is to facilitate communication within the group and so stimulate the participation of and interaction between group members (Moust & De Grave, 2000). Of course, the two communication structures specified by Shaw, the centralised and the decentralised, represent the two extremes of a scale on which communication actually takes place. To increase effectiveness in the group, the tutor should therefore encourage a more decentralised structure, so enabling group members to more easily achieve optimum levels of interaction and involvement. It is important that each group member is able to make a contribution. A decentralised structure helps create more balanced levels of participation. One important benefit is that the decentralised structure helps reduce the risk of subgroup discussions or dialogues between two group members, between a student and the discussion leader and between a student and the tutor. Quieter students are also encouraged to participate in a decentralised structure.

Sociogram

One means of identifying patterns of communication in a tutorial group is to construct a sociogram, otherwise referred to as Bales' interaction matrix (Remmerswaal, 1995). This can be devised in the following manner: on a sheet of paper, draw a plan of where students sit in the group and assign each indi-

vidual a number. Draw up two columns. In the first column jot down the number of the person who says something and in the second column, note the number of the person to whom the statement is directed. If what is being said is addressed to the whole group, denote this with a figure 0. Register communication over a period of 15 minutes during the initial case analysis phase and again over a period of 15 minutes in the reporting phase. After the meeting, the pattern of communication can be drawn by linking the numbers in the columns with the numbers on the plan. Make plans for both phases of the tutorial group. In this way it is possible to see whether there are any differences in patterns between the initial case analysis phase and the reporting phase. A simplified version of this sociogram can be found in figure 4.2. The sociogram shows that student number 1 occupies a central role since most of what is said is directed at him. It can also be seen that students 3 and 2 and students 5 and 6 hold subgroup discussions. On the basis of this visualisation, you can, for example, ask students 3 and 2 and students 5 and 6 to direct what they say towards the whole group instead of keeping it to themselves, as well as pointing out that the discussion should not only be directed towards student number 1.

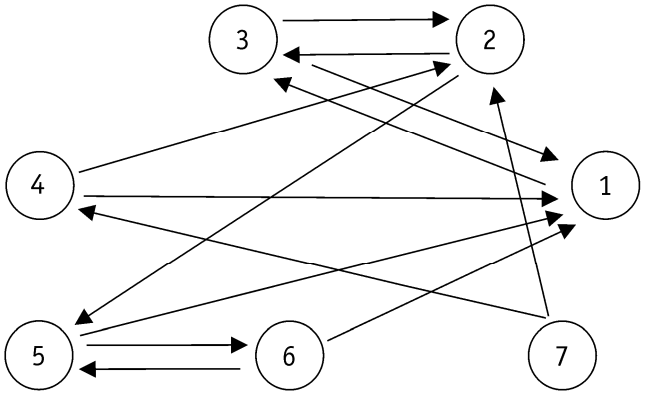

Figure 4.2 Example of a sociogram

By visualising the patterns of communication in the tutorial group in this way, you will gain a clearer picture of communication flows and whether participation levels of students are in proportion. The tutor can use this diagnosis when he shares his evaluation with the group. The outcome of the diagnosis will determine whether the tutor decides to continue

with the same manner of communication or to agree with the group members on implementing a new communication structure. The sociogram can be repeated in subsequent tutorials to check on whether there have been any changes in the patterns.

Contributions in the tutorial group

Observing these patterns will help you gain an insight into the communication structure within the tutorial group. The next step is to analyse the contributions made by students and the effect they have on the quality of the task-related discussion. We can identify four different types of contributions made by students: task-based contributions; process-based contributions; a combination of the two; and dysfunctional contributions (Remmerswaal, 1995). Task-based contributions are important for carrying out the group-related task. Examples of task-based contributions are: taking initiatives, asking for information, offering opinions, providing information and summarising. Process-based contributions are directed more towards the group process and the atmosphere within the group. Examples of process-based contributions are: encouragement, proposing changes in the way you deal with things, drawing up rules and procedures and expressing the feelings of the group. A combination of task-based and process-based contributions is also possible. Examples include evaluating, mediating and reducing tension.
Lastly, the fourth type of contribution relates to dysfunctional behaviour. The following kinds of conduct can be discerned: aggressive behaviour, being obstructive, getting on one's hobby horse, acting the goat and deliberate withdrawal.
In the first instance, it is the discussion leader who is responsible for task and process-based contributions. He is, of course, not the only one responsible for carrying out these tasks in the group. Others too should be held accountable for making constructive contributions with the stimulation of either the discussion leader or the tutor (Moust & De Grave, 2000).

4.4 Developing communicative skills

The tutor has the possibility of providing students individual feedback on the way in which they function. Once group development has stabilised, he can encourage them to develop their communicative skills. Here are some examples of com-

municative skills that students can acquire through their work in the tutorial group: taking charge of group discussions; functioning in a team; dealing with problems in a team; providing feedback to each other; active listening; written and oral presentations; and keeping to agreements. A study by Schmidt (2001) amongst a hundred former students of the University of Maastricht, revealed that graduates and employers alike are keen to benefit from these skills. The tutorial group provides students with an appropriate platform on which to acquire and develop these skills.

Assessment criteria

The tutor can coach the development of these skills amongst students. Coaching can be done in a structured fashion. The first step is to draw up a list of criteria for the specific skills that are needed. This can be done together with the students during the first tutorial meeting. Many educational establishments these days have devised feedback forms for such aspects as discussion leadership and presentations. These forms list a number of points that can be used as criteria. An example of such a feedback form relating to discussion leadership can be found in appendix 2. This form is used in the Faculty of Economics and Business Management at the University of Maastricht and can be used for two purposes: firstly, as a checklist in preparing for the role of discussion leader and secondly, as an observation form during tutorials. It should be added that the validity and the reliability of this list has not been scientifically tested. The form is filled in during the tutorial by the tutor and two of the students. At the start of the meeting, the student who has been assigned to act as discussion leader indicates a number of specific aspects on which he wishes to be provided with feedback. At the end of the tutorial, oral feedback is given and all students will be given the opportunity to air their reactions. Additionally, the two students and the tutor will give their written feedback to the student involved. Other examples of assessment and scoring lists can be found in other publications such as, Van der Vleuten and Driessen (2000) and Cluitmans, Dekkers and Van der Made (2000). There are of course other ways in which these skills can be evaluated. One is the self-assessment method, for example, by using the same feedback form. The student himself can fill this in using a points system to rate his own skills. This way, students are able to reflect on their own performance and become more aware of the quality of their own work.

Self-assessment

In most case, self-assessment will not only lead to an improvement in skills, but also the taking on of a greater responsibility for one's own learning process and an improvement in problem-solving skills (Dochy, Segers & Sluijsmans, 1999).

Peer assessment

Another form of evaluation is assessment by the group. This is also referred to as peer assessment. Likewise, group members can fill in the same forms and discuss it amongst themselves. In this way, students are able to compare their own selfassessment with the evaluation as given by the group. A strength-weakness analysis can be made on the basis of this comparison. The outcome of the evaluation can lead to new learning objectives being set for the next time they are assigned the role of discussion leader.

Tutor assessment

In addition to self-assessment and peer assessment, there is also a third method of evaluation: tutor assessment. Here, the tutor is responsible for assessing the skills of the student. Likewise, feedback forms can be filled in for this process. In practice, we are usually confronted with a combination of assessment methods, for example, self-assessment combined with either peer assessment or tutor assessment, or both. This is sometimes referred to as co-assessment. An important question in assessing communicative skills is the extent to which the evaluations have summative or formative goals. The answer is determined largely by the examination requirements at the end of each block. If the requirements specifically state that communicative skills are a pre-requisite for gaining a pass mark, then it is clear that the evaluation's objective is summative. Communicative skills are therefore necessary in order to pass the exam. If the objectives are summative, it is recommended to use the co-assessment method. In such situations, the tutor fulfils a dual role. He is not only the coach of the learning and group process, but he is also assessor. This can lead to some confusion of roles. In order to prevent or at least reduce the confusion, it is important to set yourself clear assessment targets beforehand. The student then knows what is expected of him and it is clear for the tutor what needs to be assessed. If the evaluation of communicative skills has a formative goal, i.e. students get feedback about positive aspects of their skills and about aspects which

can be improved, all possible forms of assessment can be chosen (Dochy, Segers & Sluijsmans, 1999).
Appendix 3 provides us with an example of a tutor's assessment of a student's functioning in the tutorial. This list is used both formatively and summatively in the Faculty of Medicine at the University of Maastricht. The assessment criteria specified are intended as points for consideration in the discussion and the assessment of the student in the tutorial.

This chapter has dealt with the role of the tutor in stimulating the group process. It discusses the importance of the process of group development and tutor intervention levels and the way in which these help in raising the productivity of the tutorial group. Other key issues discussed in this chapter are the patterns of communication in tutorial groups and the development of communicative skills. For example, in what way can the tutor contribute to these? Another of the tutor's tasks is to activate self learning amongst students. Ways in which a tutor can help bring this about are described in the next chapter.

5 The tutor and self-directed learning

Self-directed learning can be defined as a student's ability to assume control of his own learning process. A student capable of self-directed learning has a capacity to decide on the amount, the time and the manner in which he wants to learn. This means he is able to plan his study time satisfactorily, generate the motivation to work on his learning tasks and use various learning strategies in a flexible way.
One of the key objectives of problem-based learning is to foster a greater level of self-directed learning. Both inside and outside the context of the tutorial group, it is an aspect that demands a great deal of attention on the part of the student and the teaching staff. One of the tasks of the tutor is to help students develop self-directed or independent learning skills. In the context of problem-based learning, self-directed learning not only means paying attention to the learning process of individual students, but also nurturing an interest in the development of collaboration. This chapter looks in turn at the necessity of self-directed learning, the process of transition from novice to expert, the way in which the tutor can assist students in assuming greater control over their learning process and tutor contributions pitched at the students' level of self-directed learning. This chapter ends with a retrospective on the main topics in the gradual acquisition of self-directed learning by students.

5.1 The necessity of self-directed learning

Self-directed learning, that is, "learning to learn", is becoming an increasingly important aspect of the modern world. The lines along which society is developing means that citizens and professionals are being asked to participate in the process of lifelong learning.

Lifelong learning has become important because of:
Radical changes in the make-up of professions. In the last few decades, the life span of know-how required to carry out a profession has been rapidly diminishing. Know-how and skills which were once relevant for a long time are now becoming increasingly outdated. This has necessitated a continuous programme of re-training. Nowadays, the tendency is for professions to work more and more together, so that professionals have to keep very much abreast of developments in other disciplines so that interdisciplinary problems can be tackled collectively.
Technological and professional developments are bringing about changes in required levels of organisational structure, management and cooperation. Nowadays, the tendency is for organisations to be 'horizontal' in nature with the result that, increasingly, management and employees are having to work together in temporary of semi-permanent teams on problem-solving complex problems.
Modern society is rapidly becoming a service-centred and knowledge-based one in which the creation of new knowledge is playing an increasingly important role. Social changes are being brought about by internationalisation and globalisation in the business and the educational world, as well as by demographic trends such as immigration and emigration.

These developments mean that our future professionals are being required to develop a way of thinking which properly enables them to anticipate and to prepare for situations which change very quickly. In order to attain this required way of thinking, two aspects are of vital importance. Firstly, students will be required to gain a thorough grounding in the discipline that they will later pursue in a professional capacity and, secondly, students will be required to show a willingness to reflect on the way in which they study and possess an ability to deploy their style of learning in a flexible manner.

5.2 The transition from novice to expert

Learning can be described as a way of developing cognitive and practical skills which can be applied within the student's future professional environment. The cognitive and practical skills required for a profession are characterised by two elements. Not only is a command of the subject matter required,

but also a command of the cognitive skills which are needed to structure, modify and apply the know-how. The student must be able to interpret professional situations and to deal with them effectively. Teaching can be described as the stimulation of these learning and cognitive processes needed for the structuring, modification and application of their knowledge base (Vermunt & Verloop, 1999). The educational setting has to support the student in his transition from novice to expert in his chosen discipline.

Differences in the way novices and experts think and act

In this area too, the tutor can play a vital role. Tutorial group members start out as novices in their chosen professional discipline. A great deal of the specialist subject matter and the way of reasoning will be largely new to them. The process of development of students into professional experts is a gradual one. The different ways in which novices and experts study and assimilate information has been widely documented (Elen, Lowyck & Van den Branden, 1991; Glaser & Chi, 1988; Bransford, Brown & Cocking, 1999). The knowledge base of novices with respect to the various disciplines is confined and often compartmentalised into isolated units, which bear no relation to each other. In explaining phenomena or solving problems they rely mainly on a common-sense understanding of the problem or vague, semi-inconsistent or irrational concepts. When a problem is analysed, novices will tend to pick out only the most obvious facets. Novices have difficulty in differentiating between the main issues and the side issues and they approach problem-solving in a step-by-step fashion. The most important differences in the way novices and experts assimilate information is summarised in table 5.1

Table 5.1 Differences in the assimilation of information by novices and experts

Novices	Experts
• Have a knowledge base with is limited and fragmented. • Use everyday or vague concepts. • Easily develop misconceptions • Primarily use a step by step process of reasoning. • Strongly focused on superficial aspects of information. • Need to have relationships explained. • Acquisition of knowledge is slow and tedious on account of poor organisation of knowledge.	• Have a knowledge base that is extensive and well structured. • Are quick to use a wide-number of domain specific concepts. • Use condensed and flexible cognitive processes. • Are quick to separate main issues and side issues. • Are quick to identify the 'hidden' relationships and the misinformation of problems with which they are confronted. • Their extensive knowledge base enables them to absorb new information more quickly.

If novices are not given proper guidance in how to assimilate new information more independently, there is a danger that they will slip into routine, ineffective, inefficient and tutor-dependent learning patterns and, as a result, have to rely on the guidance of the tutor throughout the study. The nature and frequency of tutor regulation can vary during the course of the study. When students are more practiced in methods of self-directed learning and acquire more expertise in the discipline, the need for external regulation in the self-directed learning process will diminish and the student will adopt a more autonomous approach to learning.

5.3 Contributions of the tutor to the development of self-directed learning practices

This section describes how a tutor can contribute to the development of self-directed learning among students, both inside and outside the confines of the tutorial. The descriptions used are based on Vermunt's model of congruence and frictions (1992).
Vermunt distinguishes three general levels of students' self-direction and three ways of directing the learning process by the instructor. On the spectrum of self-directed learning students vary between a low, intermediate and high degree of self-regulation. Teachers can either regulate students' learning in a strong, shared or loose manner (see figure 5.1).

Degree of external tutor regulation			
Level of self-regulation by tutorial group members	Strong	Shared	Loose
high	Destructive friction (7)	Destructive friction (8)	Congruence (9)
intermediate	destructive friction (4)	congruence (5)	Constructive friction (6)
low	congruence (1)	Constructive friction (2)	Destructive friction (3)

Figure 5.1 Interplay between the style of tutor-regulation and the level of self-regulation by the members of the tutorial group (after Vermunt, 1992).

In this model, tutor regulation runs synchronously and asynchronously to the level of self-regulation the student is able to give to his study activities. Vermunt categorises a synchronous situation with congruence. Congruence occurs when students' learning strategies and tutors' teaching strategies are compatible. However, the style of tutor regulation can be at odds with the student's ability. In such a scenario, friction, in the words of Vermunt, is said to occur. Vermunt differentiates between constructive and destructive friction. Constructive friction occurs when the self-directed learning of the

student is stimulated. Destructive friction is said to occur in situations where the learning independence of the student has been either under or overestimated. This under or overestimation of a student's learning independence can lead to a reduction in the learning and cognitive activities of students, which means that potential skills are not being developed and existing skills are not activated. Vermunt advocates learning situations in which constructive friction exists, that is, a situation where friction exists between a student's ability for self directed learning and the learning requirements which will enable him to think like an expert. The following passage describes a number of congruent, constructive and destructive regulation activities.

Tutor contributions to students with a low level of self-regulation

If the level of students' self-directed learning is still relatively low, for example, during the initial units of the first year, the tutor will quite often have to act out a number of activities which are necessary for students to complete the problem-based curriculum adequately. For instance, the tutor demonstrates (models) ways in which students can practice problem-based study skills and carry out specific learning activities. Examples of such tutor contributions include the following (cell 1 in Figure 5.1):

Congruence

- The tutor demonstrates how a tutorial should be chaired. Afterwards, he will help students act out these leadership activities by at times taking charge of the tutorial himself whilst explaining his reasons for doing so.
- The tutor demonstrates, for example, the Seven jump. Afterwards, he gets students to act out the procedure (the Seven jump) themselves. He may at times intervene, perform any necessary readjustments and explain his reasons for doing so.
- The tutor shows students how they might seek out other sources of information on their own, for example, by using the library or other resources.
- The tutor explains some of the relationships between the various problems. Afterwards, he will ask students to actively seek out these relationships. During the reporting phase, he will pay attention to these kinds of contributions by group members.

- The tutor provides examples of the way in which literature can be summarised. He will then encourage students to make summaries on a regular basis for themselves.
- The tutor sifts out the main issues covered in literature from the side issues. During the reporting phase he will constantly urge his students to make clear distinctions with respect to the structure of the literature studied.

In all these cases, the instructional behaviour of the tutor is said to be congruent with the level of student self-regulation. A congruent tutor contribution exists when there is a balance between the level of the students' learning independence in a tutorial group and the method of tutor regulation.
In general it can be said that rigid regulation, meaning the explicit acting out of cognitive, affective and regulative learning activities, is hardly ever necessary in higher education. Students will have already acquired some experience of these learning activities at secondary school or afterwards, so that the modelling of these learning and cognitive activities is superfluous in most cases. What is important at this stage, however, is to demonstrate how students should study in a problem-based learning environment.

Constructive friction

Although the congruent method of tutor regulation is pitched at the level of student self-regulation, this style of regulation has the disadvantage that it doesn't actively encourage students to act more independently. Students instead require learning situations with constructive frictions in which, helped by tutor regulation, they are stimulated into performing all kinds of learning activities on a more independent footing. To do this, the teacher will share with his students the various teaching or learning activities which are necessary for a more thorough assimilation of the subject matter. Regular evaluation and reflection of activities will provide students a better insight into their rate of progress. Examples of shared regulation which bring about constructive frictions amongst students with a low level of self-regulation include the following (cell 2 in Figure 5.1):

- The students themselves are responsible for taking charge of the tutorial. If the tutor takes charge, he should explain his reasons for doing so. At the evaluation stage, together, students and tutor will reflect on the course of action and provide suggestions for improvement.

- The tutor draws the students' attention to facets of the problem definition which are relevant for the analysis, but which they have overlooked. After having discussed the problem, he will point out how these hidden signals of a problem can best be identified and interpreted.
- The tutor provides students with concrete examples, analogies and metaphors with respect to the subject matter, if they are unable to come up with these themselves.
- The tutor helps students to identify the relationships between specific aspects of the subject matter by focussing on the differences and similarities between various disciplines.
- The tutor points out the sequence of questions that need to be dealt with for a particular problem definition within a particular discipline. Afterwards the tutor tries to encourage students to formulate the same types of questions for comparable problem definitions.
- The tutor presents problem situations which are related to those in the block book and asks students to use their knowledge to tackle these.
- The tutor demonstrates how specific know-how can be used to explain or solve a problem. Afterwards he invites his students to do the same for similar kinds of problems.
- The tutor encourages his students to reflect critically on the subject matter studied by asking probing questions. Afterwards he allows his students time to reflect on the added value of their reports by having them deliberate explicitly and discuss their learning and cognitive activities.

Destructive friction by overestimation

Some tutor interventions however, can hinder and even obstruct students' self directed learning. This can occur, for example, when a tutor either overestimates or underestimates the students' capacity for self directed learning. Cell 3 in figure 5.1 provides us with an example of a learning situation in which the tutor overestimates the ability of his students' independent learning. The gap between the tutor's expectations and the students' actual ability is too great. Students are unable to keep pace with the tutor because they are not capable of meeting his perceived expectations of them. Some examples of tutor regulation activities which may cause destructive friction and impede self-directed learning include:

- The tutor only intervenes when he realises students are floundering, but instead of trying to redress their bewil-

derment, he simply asks them why they are not able to identify the specific relationships in the subject matter.
- The tutor indicates the way in which he would like to have a particular problem dealt with without first explaining the cognitive processes involved. Likewise he may present new domain-specific ideas without making clear the relationship between these and the students' prior knowledge of the subject matter. As a consequence, students may become uncertain as to how to handle tutor contributions.
- The tutor remarks that the discussion leaders should improve their methods of leadership without explaining how they might be able to do this. As a result students are unable to gain any clear picture of what is expected of them.
- When students do ask questions, he stalls, saying, "Problem-based learning requires students to act independently. I am not allowed to interfere in your learning activities." In so doing, students are left feeling abandoned.

When the functional collaboration between tutor and students is poor, this will severely restrict the productive potential of tutorial group members. Students will start to wonder what the relevance of problem-based learning is for their own learning process. This not only has a negative effect on the self-directed learning patterns of students, but it also causes a headache for other tutors involved at the later stages of the curriculum. They will have a harder task of convincing students of the need for independent learning.

Tutor contributions to students with an intermediate level of self-regulation

Destructive friction by underestimation

When members of a tutorial group start to become more adept at self-directed learning, a different style of tutor regulation is required. Tutors who apply a rigid style of regulation at this stage will often find that it will be counterproductive. This is, for example, the case when the tutor underestimates the self-directed learning capacity of the students and starts to act out a wide range of learning activities which students are already quite capable of carrying out independently. This 'spoon-fed' style of regulation will deprive students of the possibility to extend and apply their learning skills. As a result, students might actually lose these acquired skills and start to show tutor-dependent behaviour. Cell 4 of figure 5.2 depicts a situation in which independent learning is said to

be restricted. Some examples of tutor regulation which cause destructive friction are listed below:

- The tutor provides concrete examples, structures and relationships with respect to the information brought up by students, even though the students have demonstrated an ability to carry out these learning activities to a reasonable level. In time, students will be liable to leave the learning activities to the tutor.
- During brainstorming sessions, the tutor tries to guide the ideas of the students in the direction he wishes to take. In consequence, students will feel uncertain about their own explanations and solutions. In subsequent tutorial meetings students, instead of exploring the information they have assimilated, will seek eye contact with the tutor to discover whether or not they are on the right track.
- The tutor gives too frequent an indication of learning objectives and the literature students are required to study. This deprives tutorial members of self-responsibility for their learning process. In such cases, students will wait for the tutor to provide them with details on the most important learning objectives and reference works and ask the tutor explicitly to list the learning objectives and literature.
- The tutor assumes de facto the role of the discussion leader without giving his reasons for doing so. At this point, the student who has been designated as discussion leader becomes uncertain as to his own role and future discussion leaders start to assume a cautious posture.
- When evaluating the group and learning processes, the tutor starts off by making critical remarks. He disregards other opinions proffered by the students, often with the result that students will resign themselves to accepting the assessment and feedback of the tutor.

When students have mastered an intermediate level of self directed learning, the teaching activities of the tutor referred to in cell 2 in figure 5.1 reach congruence. Students may be able to cope with the learning and group activities for which an adequate level of tutor regulation has been given, but they experience little or no development with respect to self-directed learning (cell 5 in figure 5.1).

Constructive frictions

Tutor regulation which generates constructive friction at this

level and which, as a result, might lead to a higher level of self-directed learning (cell 6 in figure 5.1) includes:

- The tutor allows students to provide each other with feedback vis-à-vis their cognitive and learning activities. He lets students reflect on whether or not they have understood and can use the subject matter properly or on whether they have a sufficient insight of the subject matter. Only when students have evaluated their contributions to the learning process amongst themselves, he does offer his own opinion.
- The tutor encourages students to prepare their own programme of contents for the tutorial meetings.
- The tutor gives students the chance to formulate for themselves the criteria for a productive tutorial and then discusses the productivity of their contributions.
- At fixed points during a tutorial the tutor will check on whether students have fully grasped the subject matter and are able to use it. For example, the tutor might present problems which differ slightly, but which are nevertheless closely related to those set in the block book. He also asks students whether they can use this knowledge with respect to the problem. He gets students to devise questions whereby they are able to test each other with respect to the subject matter.
- The tutor devotes regular attention to the main thrust of the block book. He encourages students to establish relationships between the various objectives of the block book and the various secondary aspects dealt with.
- The tutor asks students to devise their own assessment criteria for evaluating communicative interaction within the tutorial group.

Tutor contributions to students with a high level of self-regulation

If, over time, students have developed a high level of self-regulation with respect to their learning activities, a high degree of rigid tutor regulation will lead to destructive frictions (activities referred to in cells 1, 2, 4 and 5 in figure 5.1). Students will then revert back to tutor-dependent behaviour.

Congruence

Tutor regulation activities specified in cell 6 will now bring about congruence between the learning activities of the students and tutor guidance. Other activities that might be per-

formed by a tutor at this level of self-regulation (cell 9) might include:

- The tutor allows students to develop and introduce their own case studies for problem-based learning in the tutorial group.
- Students are allowed a much greater amount of freedom in consulting other sources of information.
- The tutor (in his absence) allows students the opportunity to carry out the problem-based learning process independently. He only discusses the results of their studies with them on a periodic basis (e.g. once every three meetings).
- The tutor participates in the tutorial group only when students explicitly require him for consultation on a particular subject.

In general, it can be said that students start to function at this high level of self-regulation in the final years of their problem-based curriculum. At this stage, students will be presented with optional blocks, part of the content of which they willdetermine themselves. Other methods of learning will also be provided during the final stages of the study during which students will assume a much greater degree of self-responsibility for the shape and content of their studies, for example, project-based teaching. Eventually, tutor guidance with respect to the cognitive, affective and regulative functioning of students becomes minimal and the balance of responsibilities vis-à-vis the professional competences with respect to team skills and co-assessment will now shift towards the student.

5.4 Roles of tutors at various levels of students' independence

The previous section, describing the role of tutor contributions aimed at the various levels of self directed learning, a number of regulation models were implicitly defined.

Model behaviour

If students are unable to develop a necessary level of self-directed learning, it is essential for the tutor to assume responsibility for the learning activities of students. It is then up to the tutor to model the desired study patterns. Depending on the nature and complexity of the desired results, the intensity, frequency and duration with which particular learning activities are acted out, can vary. In general, regula-

tive processing activities and more complex problem-based study skills - such as student self-diagnosis of learning activities, discussion leadership and feedback - will have to be performed by the tutor much more frequently over a longer period of time. Students can quickly assume responsibility for comparatively simple activities, such as repetition and structuring of the subject matter or summarisation of parts of a discussion.

Coaching

Congruent and constructive tutor contributions, at the level of cells 2, 5 and 6 in figure 5.1, require a 'coaching' style of tutor regulation. This means that the tutor will only intervene when he observes that contributions made by students are insufficient for the required level of understanding. According to Verhoeven and Vlerken (1997) coaching is all about the processes which are able to influence and develop the self-regulation mechanism. "Coaching is not about impressing yourself on others, but about getting the best out of others". A prerequisite for good coaching on the part of a tutor is an ability to make students aware of their self-responsibility for their own learning process. This means constantly seeking a balance between the processes of external regulation and student self-regulation. In order to do this effectively an involvement in the student's learning process is essential. In order to help propel students towards the level of independence required of them, the tutor, as coach, must be able to act out a number of tasks simultaneously. He must be able to analyse the learning process of his students and identify the weak links. He must challenge his students into exploring learning activities, which they would otherwise not be aware of or be afraid to use. He must activate the use of these activities and together analyse the usefulness of this in their learning process. The tutor—as diagnostician, challenger, activator and evaluator (Vermunt, 1998)—will then be able to help students on the road to independence.

Consultant

At the level of cell 9 in figure 5.1, the contributions of the tutor are primarily student initiated. At this level, students are highly adept at working independently in a problem-based learning environment and can demonstrate a high degree of learning independence. At this stage, efforts will concentrate on refining those skills which satisfy the professional norms and values that students will require after their studies.

Gradually, the tutor will assume the role of adviser or consultant, with students now consulting the tutor for domain-specific expertise. When students come with their own case studies and problem-solving exercises, he will be able to provide them with the 'tips of the trade', that is, aspects of the profession not always covered in the text books, but which are nevertheless part and parcel of a professional's personal expertise. The tutor can also point out possible sources of misinformation introduced into a practical problem, either deliberately or unwittingly. In dialogue with the student, the tutor can show him how such complex problems can be analysed and solved. When this stage has been reached, the tutor can treat his students as colleagues and equals.

5.5 Final conclusions

To summarise, we can conclude that the tutor has an important role to play in the gradual transition from external regulation—through instruction—to self-regulation of learning processes.

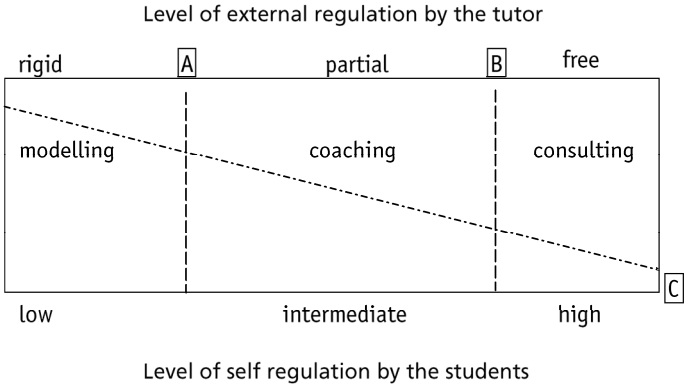

Figure 5.2 The gradual transition from tutor regulated to student regulated learning activities

The information in figure 5.2 contains three components. Firstly, when students are first faced with the problem-based environment, they are not complete novices when it comes to learning and cognitive skills. They will have already acquired these skills up to a certain level at secondary school. The aim of problem-based learning is to build on these skills. It should be added that there is in fact no end to the process of self-

regulation of learning and cognitive activities. Students are always able to refine, modify and extend these skills depending on the learning environment in which they later find themselves after their studies. Lifelong learning has become a term which is more or less synonymous with self directed learning. As such, the diagonal line C in figure 5.2 has not been drawn from the top left to the bottom right hand corner in order to reflect this view.

Secondly, figure 5.2 indicates the relative importance of the three forms of tutor regulation: modelling, coaching and consulting. The dotted lines, A & B, illustrate, on the one hand, that there needs to be a smooth transition from one style of regulation to the other, depending on the level of independent learning shown by students. Depending on the level of skills demonstrated, the tutor will have to adapt his style of regulation, either progressively or regressively. The same lines also indicate the relative importance of the tutor's coaching style. Coaching is not only the most widely used of the three styles employed by the tutor, it also represents the most effective way of assisting students in the development of the self-directed learning process. Acting in various functions - as diagnostician, challenger, activator and evaluator - the tutor can analyse the learning process of students, stimulate their independence as well as reflect together with them on the progress they make in this area. In addition, the tutor must also closely monitor the product, as well as the learning process both inside and outside the tutorial group.

Thirdly, the accepted view that the contributions of the tutor will gradually begin to pale as students develop their learning processes, would not seem to ring true. A great deal of literature would seem to imply that a tutor, having guided his students towards the required level of learning and cognitive activities, is no longer required to intervene. Barrows (1998), for example, talks about 'fading away'. Of course, a tutor will be able to leave a large part of the learning and cognitive activities to his students, but, as we have already seen, the acquisition and refinement of self directed learning activities does not end here. During the latter stages of their study, students must be able to consult domain-specific experts, in preparation for real-life situations in professional practice. These refined, complex learning and cognitive skills can be fine-tuned during optional courses and on-the-job training programmes.

In the description of tutor activities for regulating the learning process of students in the tutorial setting, the emphasis has been on the contributions made by the tutor in totality. In addition, the tutor can, of course, also focus on the learning processes of individual students by stimulating them separately to carry out cognitive, affective and regulative activities. Neither has any explicit attention been paid to the fact that students can help out each other in the acquisition of these learning and cognitive activities. In particular, progress evaluations in tutorial meetings can provide an instrument to achieve these goals. Students can then be asked to reflect on the worth of each other's feedback and on the learning activities which are difficult to grasp. The tutor can also encourage his students to provide each other with feedback regarding the extent to which and the way in which they perform these learning and cognitive activities. Students who are better able to carry out these activities can support those fellow students who are less able to cope with these activities in acquiring these skills.

Finally, somewhat unrelated to what has been stated above, the gradual transition from external tutor regulation to student self-regulation of learning processes, can also be supported by the explicit embedding of two activities into the curriculum. On the one hand, those responsible for designing problembased learning courses, for example, block coordinators and year coordinators, in consultation with tutors, can try to determine which specific cognitive, affective and regulative activities are suitable for transfer to students over one or more blocks. Subsequently, during the process of tutor regulation in tutorials, as well as at the assessment stage, tutors will be able to pay more than the normal amount of attention to specific acquisition activities of students and consciously build these learning and cognitive activities into their teaching programmes. On the other hand, in addition to tutor interventions, specific features of the instruction material can gradually offer more opportunities for independent learning. At the beginning of the problem-based curriculum, students may be presented, for example, with problems that are relatively uncomplicated and more structured in nature than at the later stages of the curriculum. At the later stages of the curriculum, these problems can become more complex and open, requiring students to act more independently in both a procedural and a cognitive sense. Towards the end of the

study, students can be asked to provide their own case material which will be discussed by fellow students. Other learning environments with problem-based characteristics, for example, project learning, twin-track learning methods or reflections on on-the job training programmes, can likewise provide support in the development of self-directed learning.

6 Literature

Barrows, H.S. (1988). *The tutorial process*. Illinois: Southern Illinois University School of Medicine.

Bie, D. de, & Mostert, P. (2000). Competentie, over de overbodigheid van een modieus begrip. *Onderzoek van Onderwijs, 29, 2*, 20-22.

Bransford, J.D., Brown, A.L., & Cocking R.R. (Eds.) (1999). *How People Learn: Brain, Mind, Experience and School*. Washington, D.C.: National Academic Press.

Cluitmans, J., Dekkers M., & Made R. van der (2000). *Toetsing en zelfstandig leren. Gevarieerd toetsen binnen probleemgestuurd onderwijs en projectonderwijs in het HBO en MBO*. Leiden: SMD Educatieve Uitgevers.

Dillon, J.T. (1990). *The practice of questioning*. Londen: Routledge.

Dochy, F., Segers, M., & Sluijsmans, D. (1999). The use of self-, peer and co-assessment in higher education: a review. *Studies in Higher Education*, *24,* 3, 331 –351.

Dolmans, D.H.J.M., Wolfhagen H.A.P., Scherpbier A.J.J.A., & Vleuten, C.P.M. van der (1998). Relationship of tutors' group-dynamic skills to their performance ratings in problem-based learning. *Academic Medicine*, *76,* 5, 473-476.

Elen, J., Lowyck, J., & Branden , J. van den (1991). *Ontwikkelen van schriftelijk studiemateriaal*. Leuven: Acco.

Glaser, R., & Chi, M.T.H. (1988). Overview. In: M.T.H. Chi, R. Glaser, & M.J.Farr (Eds.) *The Nature of Expertise.* Hillsdale (NJ): Erlbaum.

Grave, W. de, Boshuizen, P. & Schmidt H. (1999). Probleemgestuurd leren als kennisconstructie. *Onderzoek van onderwijs, 28, 2*, 22—25.

Grave, W.S., Dolmans, D.H.J.M., & Vleuten, C.P.M. van der (1999). Profiles of effective tutors in problem-based learning: Scaffolding student learning. *Medical Education, 33*, 12, 901-907.

Grave, W.S. de, Dolmans D.H.J.M., & Vleuten, C.P.M. van der (2001). Student perceptions about the occurrence of critical incidents in tutorial groups. *Medical Teacher, 23,*1 , 49-54).

Hitchcock, M.A., & Anderson, A.S. (1997). Dealing with dysfunctional tutorial groups, *Teaching and Learning in Medicine, 9*, 1, 19 –24.

Irby, D.M., & Wilkinson, L. (1996). Models of faculty development for problem based learning. *Advances in Health Sciendes Education. 1*, 69-81.

Kaldeway, J. (1999). Een omschrijving van 'leren leren'. *Onderzoek van Onderwijs, 28, 2*, 19-21.

Magnussen, S., Krajcik, J., & Borko, H. (1999). Nature, sources, and development of pedagogical content knowledge for science teaching. In: Gess-Newsome, J., & N.G. Lederman, (Eds.) *Examining pedagogical content knowledge,* 95-132. Dordrecht: Kluwer Academic Publishers.

Moust, J.H.C., Bouhuijs, P.A.J., & Schmidt H.G. (1997). *Probleemgestuurd leren.* Groningen, Wolters-Noordhoff.

Moust, J. (1999). De invloed van de vakinhoudelijke deskundigheid van de tutor. *Onderzoek van Onderwijs, 28*, *3*, 35-38.

Moust, J.H.C., & Grave, W.S. de (2000*). Werken in onderwijsgroepen*. Groningen: Wolters-Noordhoff.

Moust, J.H.C., Bouhuijs, P.A.J., & Schmidt, H.G. (2001). *Problem-based learning. A student guide*. Groningen: Wolters-Noordhoff

Remmerswaal, J. (1995). *Handboek groepsdynamica; een nieuwe inleiding op theorie en praktijk*. Baarn: Nelissen.

Schmidt, H.G., & Moust. J.H.C. (1998). *Probleemgestuurd onderwijs*. Praktijk en theorie. Groningen: Wolters-Noordhoff.

Schmidt, H.G., & Molen, H.T. van der (2001). Long-term effects of problem-based learning: Self-judgements by graduates. *Academic Medicine*.

Shaw, M.E. (1978). Communication networks fourteen years later. In: Berkowitz,L. (Ed.), *Group Processes*. New York: Academic Press.

Schwarz, R.M. (1994). *The Skilled Facilitator; Practical Wisdom for Developing Effective Groups*. San Francisco: Jossey-Bass Publishers.

Tuckman, B., & Jensen N. (1977). Stages of small group development revisited. *Group and Organizational Studies, 2*, 419-427.

Vleuten, C.P.M. van der, & Driessen, E.W. (2000). *Toetsing in probleemgestuurd onderwijs*. Groningen: Wolters-Noordhoff.

Verhoeven, W., & Vlerken, A. van (1997). De basisprincipes van coaching. In: J. de Ruijter (Red.) *De docent als coach*. Baarn: Nelissen.

Vermunt, J. (1998). Leeractiviteiten van leerlingen. In: L. Verschaffel en J.D. Vermunt (Eds.) *Het leren van leerlingen*. Alphen aan den Rijn: Samson.

Vermunt, J.D., & Verloop, N. (1999). Congruence and friction between learning and teaching. *Learning and Instruction, 9,* 257—280.

Vermunt, J. (1992). Leerstijlen en sturen van leerprocessen in het hoger onderwijs. Naar procesgerichte instructie in zelfstandig denken. Amsterdam/Lisse: Swets & Zeitlinger.

Appendix 1
The Maastricht Tutor Skills Questionnaire (general version)

Tutor intervention in the initial case analysis phase

Tutor functioning	actual entirely disagree				entirely agree	desired entirely disagree				entirely agree
1. Stimulates sufficient depth and breadth in the formulation of the problem statements.	1	2	3	4	5	1	2	3	4	5
2. Stimulates awareness of gaps in prior knowledge.	1	2	3	4	5	1	2	3	4	5
3. Stimulates reanimation of the discussion when explanations dried up.	1	2	3	4	5	1	2	3	4	5
4. Stimulates participation by as many students as possible.	1	2	3	4	5	1	2	3	4	5
5. Stimulates deepening brainstorming activities, for example by questioning, clarification and explaining relationships.	1	2	3	4	5	1	2	3	4	5
6. Stimulates interaction and discussion.	1	2	3	4	5	1	2	3	4	5
7. Stimulates finalise explanations in the problem definition as much as possible.	1	2	3	4	5	1	2	3	4	5
8. Stimulates brainstorming in sufficient depth and breadth.	1	2	3	4	5	1	2	3	4	5
9. Stimulates an awareness of conflicting ideas.	1	2	3	4	5	1	2	3	4	5
10. Stimulates an awareness of the main issues and the secondary issues.	1	2	3	4	5	1	2	3	4	5
11. Stimulates sufficient breadth and depth in formulating learning objectives.	1	2	3	4	5	1	2	3	4	5
12. Stimulates the formulation of precise and workable learning objectives.	1	2	3	4	5	1	2	3	4	5
13. When formulating learning objectives, points out apparent gaps in the initial case analysis phase.	1	2	3	4	5	1	2	3	4	5
14. Stimulates consultation of different literature and other study resources.	1	2	3	4	5	1	2	3	4	5
15. Gives advice on different literature and other study resources.	1	2	3	4	5	1	2	3	4	5
16. The tutor guides the group at the right moment during the initial case analysis phase.	1	2	3	4	5	1	2	3	4	5
17. The tutor helped properly explain the difficulties we students have with the subject matter.	1	2	3	4	5	1	2	3	4	5
18. Provides support to the student in his/her role as discussion leader.	1	2	3	4	5	1	2	3	4	5

Tutor intervention in the initial case analysis phase

Tutor functioning	actual					desired				
	entirely disagree				entirely agree	entirely disagree				entirely agree
19. Stimulates students into making summary lists of literature covered and other study resources used.	1	2	3	4	5	1	2	3	4	5
20. Helped indicate and evaluate differences and similarities between resources (quality, limitations, topicality).	1	2	3	4	5	1	2	3	4	5
21. Corrects misconceptions with respect to subject matter.	1	2	3	4	5	1	2	3	4	5
22. Checks whether misconceptions from the intial case analysis phase have been corrected.	1	2	3	4	5	1	2	3	4	5
23. Ensures that students have a sufficient grasp of the subject matter.	1	2	3	4	5	1	2	3	4	5
24. Stimulates interaction in the group.	1	2	3	4	5	1	2	3	4	5
25. Stimulates students into making relationships (e.g. cause and effect, link between physiology and anatomy).	1	2	3	4	5	1	2	3	4	5
26. Stimulates visualisation of knowledge (use of (black)board, diagrams).	1	2	3	4	5	1	2	3	4	5
27. Stimulates learning activities other than simply reading aloud notes or copies.	1	2	3	4	5	1	2	3	4	5
28. Stimulates integration of accumulated knowledge with other cases studies in the same block.	1	2	3	4	5	1	2	3	4	5
29. Stimulates to finalise the integration of knowledge.	1	2	3	4	5	1	2	3	4	5
30. Stimulates clarifying ambiguities (difficulties; questions) students experienced with respect to the subject matter.	1	2	3	4	5	1	2	3	4	5
31. Stimulates the group through hints and asking students to come up with their own solutions to these questions (difficulties).	1	2	3	4	5	1	2	3	4	5
32. Answers questions (if tutor is expert on the subject).	1	2	3	4	5	1	2	3	4	5
33. Stimulates students into consulting sources of information (experts, literature, surgery) to clear up ambiguities.	1	2	3	4	5	1	2	3	4	5
34. Stimulates awareness of gaps in knowledge still present in the reporting phase.	1	2	3	4	5	1	2	3	4	5
35. Stimulates participation by all students during the reporting phase.	1	2	3	4	5	1	2	3	4	5
36. Stimulates feedback and an explanation of the case in question.	1	2	3	4	5	1	2	3	4	5
37. Stimulates application of knowledge by making slight changes to the case study.	1	2	3	4	5	1	2	3	4	5
38. Stimulates self-assessment in the tutorial group.	1	2	3	4	5	1	2	3	4	5
39. Directs the group at the right moment during the reporting phase.	1	2	3	4	5	1	2	3	4	5
40. Provides support to the student in his/her role as discussion leader.	1	2	3	4	5	1	2	3	4	5

Appendix 2

Feedback form with respect to discussion leadership and group functioning

Feedback form for discussion leader
Name of discussion leader:
Task number:
Name of observer:
Individual aspects:

Observe the role of the discussion leader and answer the following questions:
1. What, in my overall opinion, did the discussion leader do well?

2. What, in my overall opinion, did the discussion leader do poorly?

Indicate this by placing a circle around one of the three categories.
If necessary add any comments.

The discussion leader	*prepared well*	*satisfactory*	*could do better*
• prepared well	1	2	3
• presented an agenda	1	2	3
• good time-management	1	2	3
• stimulated a discussion of the minutes	1	2	3
• repeated the learning objectives of the previous task	1	2	3
• followed the seven-step procedure	1	2	3
• gave regular summaries at the right times	1	2	3
• encouraged everyone to take part in the discussions	1	2	3

The discussion leader	*prepared well*	*satisfactory*	*could do better*
• asked for elucidation when there were ambiguities	1	2	3
• encouraged the use of the (black)board when this was necessary	1	2	3
• asked for references during the concluding phase	1	2	3
• helped bring about a discussion on the relationship between the literature and the task at the concluding phase	1	2	3
• repeated the learning objectives for the following meeting	1	2	3
Group functioning			
• group participants had prepared well	1	2	3
• concluding discussions had sufficient depth	1	2	3
• the preliminary discussions regarding the task were stimulating	1	2	3
• all group participants made a contribution to the discussion	1	2	3
• the tutor helped regulate group functioning when this was required	1	2	3
• the mood in the group was co-operative	1	2	3

Appendix 3

Behavioral aspects of professionalism in pre-clinical settings

Dealing with work*	**Interim judgement**	**Final judgement**
Issues concerning students' behaviour · preparation of tasks · completeness in performing tasks · brainstorming tasks · active participation in a group · report back · other issues.....	· deserves attention · satisfied explanation:	· deserves attention · satisfied explanation:
Dealing with others*		
Issues concerning students' behaviour · working in a team · listening to others · perrformance as a chair of a group · summarizing discussions · other issues……..	· deserves attention · satisfied explanation:	· deserves attention · satisfied explanation:
Dealing with oneself*		
Issues concerning students' behaviour · dealing with feedback · giving feedback · the ability to reflect · dealing with appointments · being in time · other issues……..	· deserves attention · satisfied explanation	· deserves attention · satisfied explanation
INTERIM JUDGEMENT: □ unsatisfactory □ satisfactory □ good □ no judgement, because student was absent to frequently		**FINAL JUDGEMENT:** □ unsatisfactory □ satisfactory □ good □ no judgement, because student was absent to frequently
Deserves attention: the behaviour concerning the issues stated in the left column deserve attention or change of behaviour concerning these issues is desirable **Satisfied:** the student performs adequate given the circumstances *Explanation on the other side of this sheet		**Unsatisfactory:** below the expected average level of the tutorial group. Items for improvement are clear and easy tom mention **Satisfactory:** on the expected level of the tutorial group. Some issues for improvement rest. **Good**: student performs better than the expected average of the group **No judgement**: the student is so frequently absent, that no judgement is possible