

"Problem-based Learning: helping your students gain the most from PBL" 3rd edition, June 1996

Instructor's Guide for "Problem-based Learning: how to gain the most from PBL" ISBN 0-9698725-0-X

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6. How might I use the companion book HTGTM?

The book "How to gain the most from PBL" (**HTGTM**) was written for students to help them

understand what is expected of them in the PBL format you are using,

help them understand, reflect on, and develop their skill and confidence with the process skills needed to work effectively in your PBL format. These skills include:

- managing change and coping with the personal stress and uncertainty that accompanies any change,
- problem solving,
- group process,
- self-directedness and "lifetime learning skills",
- self-assessment skills.

The skills used and developed in this approach are also valued in their career after graduation. Hence, although you will be helping them acquire the skills in the short term to allow them to gain the most from PBL, you also are equipping them with skills for a lifetime. Indeed, our alumni report more positively on "process skills" that they acquired than on the subject knowledge acquired.

So what?

1. Use **HTGTM** to help the students understand what PBL, in all the diverse approaches, is all about. Help them to understand what they are doing.
2. Use **HTGTM** to highlight and help the students develop their "process skills". The process skills used in PBL are, in my view, just as valuable as the whole PBL learning experience. The "process skills" are the goal; PBL is a strategy for us to achieve the goal.
 - a. Show the students that they are learning the subject knowledge through PBL (in an exciting and preferred way) **and** skills that are important in life. Then, list those skills.

b. **HTGTM** identifies and helps develop those skills. Help them use **HTGTM** in the development of the skills.

6.1 Issues related to understanding PBL

For most students - especially those in high schools, colleges and universities - PBL, in which ever version you use, is different from any learning experience they have previously encountered. For mature students returning to school, we should help them see the characteristics of this learning environment. The issues are to define it, illustrate how it is different from most previous approaches to learning, and create a trustful environment where they can talk openly about their worries, concerns and questions.

So how might I use **HTGTM** to address these issues? Use **HTGTM**, especially Chapters 1, 2 and 10 plus the videotapes recommended on p 2-4 or the 25 min videotape available from me, to help them understand. You could do this:

1. By giving a mini-lecture on Chapters 1 and 2;
2. By showing the videotape in class followed by discussion;
3. By making the videotape available in the resource centre where the students can watch it as they need to.
4. By highlighting the structure of each Chapter in **HTGTM**; a problem is posed, what do you know already? what are the issues? and then, in the order of my listing of the issues, the student can go to the section of interest and need only read that section.
5. By using the **eight tasks** listed on p 2-2, as a template for action. This is illustrated in **Resources Section A.7**.
6. By illustrating and emphasizing the importance of the principle of successive approximation. I have found Figure 2-2 in **HTGTM** to be very helpful for getting this idea across.
7. By introducing a discussion question from the exercises at the end of each chapter. (These were created in response to student's questions as we developed our approaches over the past 10 years.)

As your PBL program evolves and continues, students may request clarification of your role. You might find Table 10-2, p. 10-3, to be useful to guide that discussion.

Many of these options do not require the students to buy the text. Naturally, I think they will benefit if they do.

My two "musts"

Sections **B.1** and **B.2** in **Resources** gives timing sheets, sample transparencies and other details for these two workshops.

My experience has been that spending 1 to 1½ h running two workshops based on Chapter 1 in **HTGTM** is essential. Whether we call this a process skill (such as coping effectively with change) or understanding PBL is debatable but students absolutely need this preparation.

My second must is to show, or make available, a videotape showing students in action.

6.2. Issues related to developing process skills

We can treat the process skills as a "black box," pay lip-service to them, hope that the students either have the skills or that they can get by. If so, this book is not one you would require them to have. If they ask for guidance, you might refer them to **HTGTM**.

We could "train" the tutor with these skills. **HTGTM** should be helpful for tutor training sessions. For tutors, I would use all of the workshops in **Resources** Section **B** as the tutor training program.

My recommendation is to value the skills and their development by the students. In other words, send the students through the tutor training program. Empower them with the skills.

In brief:

This book **HTGTM** provides the framework for developing these skills.

Many excellent books have been written on group skills, coping with change, problem solving, self-assessment and self-directed learning. **HTGTM** gives the key ideas. The book is packed full of ideas and offers references for followup. I look at **HTGTM** as the tip of the iceberg. Under the surface we have at least five completely different, more detailed books. Currently, these are available in the forms of the MPS Units listed in Chapter 3.

How then do I use **HTGTM**?

HTGTM can be used to support at least four different approaches:

1. As a text recommended but not required.
2. As a required text to informally support and elucidate what is happening in your course.
3. As a required text for a week-long explicit short course before or at the start of your PBL course to develop some of the process skills.

4. As a required text for mini-process workshops introduced systematically throughout your PBL course to support and gradually build up the process skills as you progress.

6.2-1. Using HTGTM as a recommended text

Remind the students that the text is available to help them on a need-to-know basis. Use the annotated index to help define terms and to lead into the sections that they want help with. Chapters 1, 2 and 10 in **HTGTM** can help them understand what PBL is about. Chapter 1 in **HTGTM** might be particularly appropriate for them to read about 4 weeks into the session. At this time, they become stressed and unsure of their progress. They can become very angry at you because they do not think you are fulfilling "what they think a teacher should do". They might be on the verge of writing nasty letters to the dean with comments about your ability. This happened to me about 4 weeks into a term. Proactively, you can legitimize those feelings and provide them with activities to work their way through their feelings by referring to Taylor's model in Chapter 1 in **HTGTM**. For more on how this model can be used see D.R. Woods, PS Corner, "Self-directed learning, Creating internal representations, More life skills materials", J. of College Science Teaching, **16**, Feb, 384-389 (1987).

In general I hope that the book helps students at any stage in their evolution with PBL.

6.2-2 Use HTGTM as a required text with informal followup

Using **HTGTM** as a required text, you can proactively address issues about the PBL process before they become "problems". Use the book to negotiate and clarify expectations of group members to each other and expectations between the tutor and the group. The exercises at the end of each Chapter are meant to trigger ideas related to these. Hence, at the beginning of each session you might address one issue at the end of a pertinent Chapter. For example, in one of the early sessions, use Exercise 1.5, a force-field diagram.

In addition, I strongly recommend that you use the various feedback forms to help the groups to monitor progress with their process skills. You might ask the students to use the "monitoring" checklists of awareness and skill that are given in **HTGTM** Section **A.1** following page A.2. Modify these to suit your needs. The material in each Chapter in **HTGTM** provides sufficient background for them to understand the rationale. If you are working with many groups concurrently, you might make a transparency to clarify the task.

You might give a 5 minute overview

"Skill is developed by explicitly taking the process apart; developing the student's confidence with each part and continually integrating and applying the skills. Skill is developed by giving them a chance to do the process skills, to have someone hold up a mirror so that they can get direct and rapid feedback about what they did. Then, with this as a starting point, they can compare what they did with research evidence about what

should be done. Then, give them a chance to set goals and practice with feedback. **Research has also shown that empowerment and confidence develops from students reflection, monitoring the process skills or behaviour and working to achieve their goals** (Chamberlain, 1978; Alverno College, 1978; Schon, 1987). The principle of successive approximation suggests three levels of commitment to reflecting and developing confidence:

Level 1: "Reflecting" and informally monitoring by completing the pertinent feedback forms". Completion of these forms will mean an investment of about 5 to 10 min. per session. Such written reflections form evidence. This is the "build" or "bridge" activity described in Chapter 3.

Example journals are given in **Resources**, Section **F.3**.

Level 2: Briefly "reflecting, monitoring and assessing progress" by writing a reflective journal. Writing a journal will take less than 2 h per week. Use the written reflections as evidence from which to draw conclusions about progress. This is a combination of "build, bridge and perhaps extend" that is so vital for transferability of the skill.

Example enriched journals are given in **Resources**, Section **F.4**. You might distribute sample reflective journals to your students to illustrate your expectations.

Level 3: "Reflecting, monitoring and assessing progress" by writing a reflective journal. Writing a journal will take about 3 to 8 h per week. Use the written reflections as evidence from which to draw conclusions about progress. This is a combination of "build, bridge and extend" that is so vital for transferability of the skill.

What is your wish? Do you want to try a pilot study? How would we assess its effectiveness?"

In general, I have found that, although students complain about the amount of time and amount of work required in journal writing, after they have experienced these for a year they realize that without the journal writing they do not see growth in the process skills, and they lack confidence in their skills. You might ask alumni to come back to extol the merits of journal writing.

6.2-3 As a required text for pre-PBL workshops

Some programs (for example, The University of Newcastle Medical school, McMaster University's Chemical Engineering and Engineering and Management programs) use pre-PBL workshops to empower the students with the key process skills. An example, 5-day, 8:30 to 5:00 program is outlined in Table 6-1. Also given are the resources. Many of these are the **MPS** units that we have developed over the past 25 years. These are included because you can obtain teacher's guides and detailed materials on these topics.

6.2-4 As a required text to develop process skills concurrently with PBL

In McMaster University's Theme School program, we have 30 to 40 second year students who have had no formal "training" in any of the process skills. With one instructor and two teaching assistants we created five, 5 to 6-member, tutorless, student groups to start PBL in the subject of "the impact of materials on society". Thus, we had to apply the principles of successive approximation and identify the layering sequence of process skills to develop. The results are summarized in Table 10-3, p 10-5 in **HTGTM**. Thus, we develop the process skills explicitly and concurrently. A typical schedule of workshops is:

Day 1: Introduction to the course; plus 1½ h workshop on Chapter 1. See **Resources Section B.1 and B.2**.

Day 2: 1½ h workshop on problem solving skills. See **Resources Section B.3**.

Day 3: 1½ h workshop on group skills. See **Resources Section B.5**.

Day 4: 30 min to 1½ h workshop on feedback self-directed, interdependent learning. See **Resources Section B.6**.

In general, as the program continues, you would gradually develop their process skills by introducing a richer and richer set of skills. One approach to do this

is outlined in Table 10-3 in **HTGTM**; some details are given in **Resources Section C**.

As mentioned earlier, I believe that the skills are better developed, with the students gaining self-confidence, if journal writing is included as part of the requirements.

6.3 Assessment instruments to give feedback to the students

How can we help the students see that they are acquiring skill? How can we prove to others that the skills exist and are being developed? Appendix on Feedback forms in **HTGTM** gives a set of forms that we have found to be effective. Sections **E** and **F.5**, in **Resources**, give some other instruments that we have found helpful.

6.4 Summary

HTGTM can be used to help tutors and students understand about PBL and the issues in using it effectively.

HTGTM provides a framework for developing the vital process skills needed in PBL. **HTGTM** can be a recommended text, a required text with informal followup, a required text for pre-PBL workshops (for tutors and/or for students) or as a required text to develop the skills concurrently.

HTGTM gives a collection of assessment/feedback forms that help the students develop their confidence with the process skills.

Table 6-1: Suggested outline for a week-long, pre-PBL workshop

Time	Topic	Comments and resources
Day 1: am 20 min	Overview to process skills; importance in life and for PBL;	List names of skills: problem solving, group process, interpersonal skills, self-directed learning, shift from dependent to independent to interdependent learning, self-assessment; rationale for why skills are important, the challenge in developing them; Resource: Section 3.4 of this book. MPS unit 2 and "The MPS Strategy Book".
Day 1: am 3 h rest of morning	Awareness of "what goes on in our mind"	Workshop using Talk Aloud Pairs Problem Solving; sometimes may be omitted and participants go directly to the talk-aloud strategy workshop. Otherwise, this is a prerequisite activity for the Strategy workshop. Resource: MPS Unit 1 and "the MPS Strategy Book". Resources Section C.3.
Day 1: pm 4 h	Strategy workshop	Workshop using Talk Aloud Pairs Problem Solving with the problem solver moving a marker to show the "stage" that they are addressing. An extremely simple and powerful workshop. Resource: Exercise 3.2 in HTGTM. MPS Unit 4 and "the MPS Strategy Book". Resources Section B.3.
Day 2: am and pm 7½ h	Creativity workshop	Helps students brainstorm issues, create hypotheses. Often handled in other programs through a 10 to 30 min introduction to the principles of brainstorming. We have found this to be insufficient to actually develop confidence and personal skills. Resource: mentioned in Chapter 3 in HTGTM. MPS unit 7 and the "MPS Idea Book".
Day 3: am 3½ h	Change and stress management	Addresses one of the most important attitudinal issues in PBL. Can be tied to topics of "time management". Can be handled as topic by itself or intimately connected to the short-term goal of PBL. Resource: contact your local mental health association and ask them to facilitate the workshop. Or use Chapter 1, HTGTM; Others resources include MPS 5 and 17 on time management.
Day 3: pm 4 h	Criteria and decision-making	Needed for assessment, for goal setting, for defining problems and for any evaluation or judgement. Resource: Chapters 3 and 9, HTGTM. MPS 23 and 24 and "The MPS Idea Book".
Day 4: am 3½ h	Self-assessment	Even if the tutor will do much of the assessment, helping the students understand the issues of assessment is vital. This also is a nice extension of the previous topics of criteria and decision-making. Resource: Chapter 9, HTGTM. MPS 3 and Chapter 5 in "The MPS Idea

		Book".
Day 4: pm 4 h	Group skills	Important set of workshops in which one includes as much experience as the students have time for. You might wish to start with activities on interpersonal skills and listening. Although you will not be able to move the group all the way to team behaviour in the limited amount of time, you will be able to plant seeds that will guide future behaviour. Resource: Chapter 5. In particular Exercise 5.5, HTGTM. MPS 27, 29, 45 and 52.
Day 5: am 3½ h	Group skills, chairperson skills	
Day 5: pm 3 h	Teams and team building	
Day 5: pm 1 h	Wrap-up, summary	

6.5 References

Alverno College (1978) Milwaukee, WI. personal communication with Austin Doherty.

Chamberlain, J. (1978) "Eliminating your SDBs: self-defeating behaviours," Brigham Young Bookstore, Provo, UT.

MPS Units. Details are given in Table 3-2, p 3-4 ff.

Most units are available from the Chemical Engineering Department, McMaster University, Hamilton ON L8S 4L7. A teacher's guide is available for most units. More about the program is given in the Postface.

Schon, D.A. (1987) "Educating the Reflective Practitioner: toward a new design for teaching and learning in the professions," Jossey Bass, San Francisco, CA.

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