

Introducing PBL c:\pbl\intro-wksp-tr

1. What is PBL?
2. See small group, self-directed, self assessed, interdependent PBL in action
3. Why select PBL? The claims
4. Options for PBL
5. Setting up small group, self-directed PBL
6. Getting started: Goals
7. Getting started: problems, assessment
8. Prep. time: key “process skills”
9. Prep. time: their expectations & your
10. Anticipating & solving the downsides
11. Evaluating: showing how well it works
12. Summary

Introducing PBL 1. What is PBL?

Activity:
Enjoy most.....

When *really* learn?...

TIME _____

Introducing PBL 1. What is PBL?

Like a research process:

- ! don't know the answer when you start:
pose a problem or hypothesis.
- ! don't know all the background
knowledge when you start: learn as you
need it.
- ! adjust as you go along.
- ! exciting/ motivating.
- ! use a problem solving approach.
- ! student sets goals; faculty coach
- ! student "owns" much of the process

Introducing PBL 1. What is PBL?

Problem *drives* the learning

1. pick problem, explore , identify issues
2. identify what know already
3. identify what need to know
4. prioritize learning needs, plan
5. learn (gather data)
6. share new knowledge with others
7. use knowledge to solve problem
8. assess, reflect, elaborate

Introducing PBL 1. What is PBL?

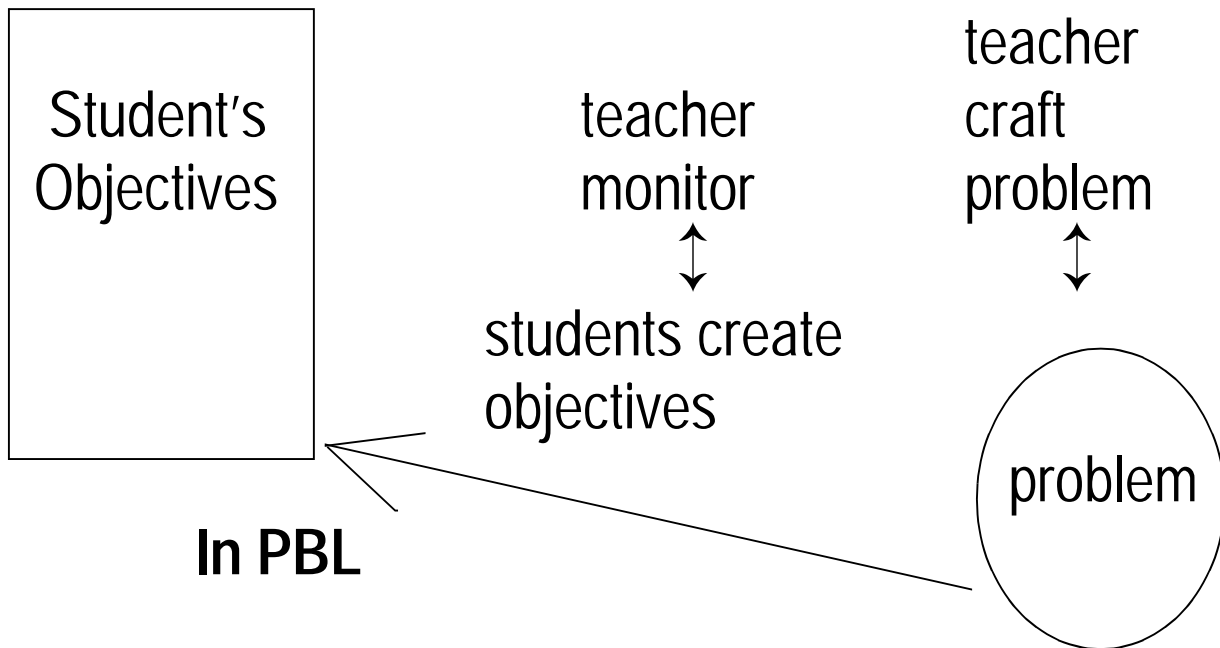
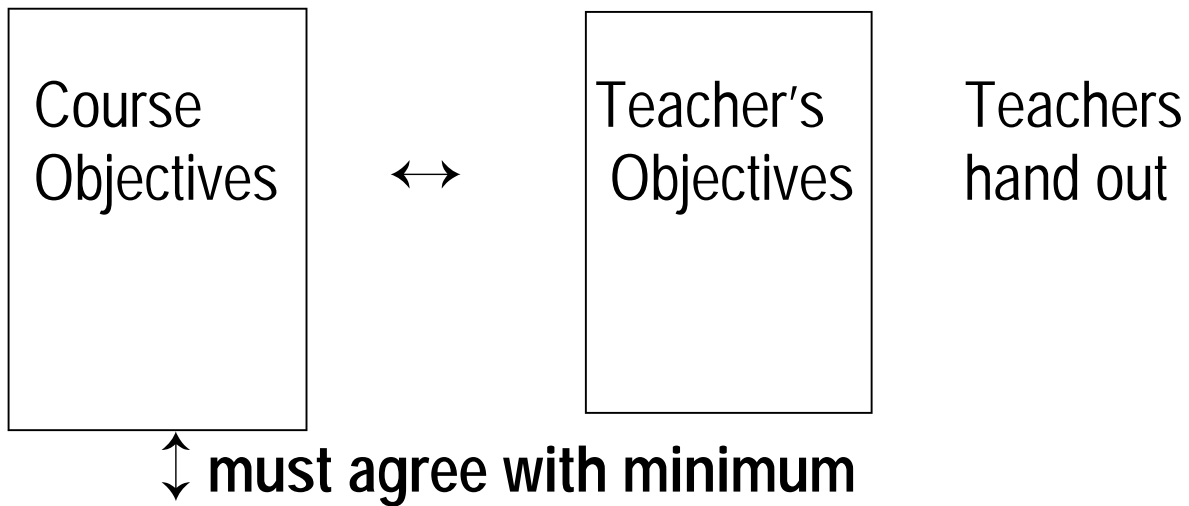
Who owns the process

	Teacher	Share	Student
1. pick problem; list issues			
2. what you know			
3. what need to know;			
4. prioritize; contract			
5. learn (& teach)			<i>L</i>
6. share			
7. solve problem			
8. assess			

Introducing PBL 1. What is PBL?

If we let the students select the goals, don't we give them licence to do what they want, rather than our goals? No

In teacher based



Introducing PBL 1. What is PBL?

	Teacher directed	Teacher guided	Student directed
Subject based	lecture	Personalized System of Instruction	self study home work peer teach
			self-directed learning, SDL (contract)
		discussion	Coop
	Problem based		workshops games, roles simulation
case studies problem-based "synthesis"		Guided design	small group, SDL research

Introducing PBL 1. What is PBL?

	Subject based	Problem based
Teacher	defines, selects, presents,	prepares, facilitates
Knowledge/skills to be learned	selected by teacher	selected by student
Student learning driven by	teacher inspiration	need to know to solve problem
Student skills needed	note taking	problem solving, needs identification, issue listing,
Student attitude needed	usual, dependent learner; perhaps, independent learner	willing to learn how to learn; interdependent learner;
Teacher attitude	why aren't they motivated?	will they be able to learn on their own?

Introducing PBL 2. small group, self-directed, self assessed PBL: a student group in action:

Context: see 3 meetings:

Goals

Teach

Feedback/test/ assess

Subject context: 3rd or 4th year engng. economics

Learning goals: interest, depreciation, read financial statements, investments, risk, tax (personal and corporate)

Problem: joined a company, offer stock purchase plan, good personal investment?

Tutorless groups:
empowerment with accountability

Introducing PBL 2. small group, self-directed, self assessed PBL: a student group in action:

Empowerment **plus** Accountability

What task?	Who is responsible?	How do you make them accountable?
Your learning	the team	Make all process components visible & seek feedback about product: Forms
To identify the critical core knowledge to be learned	team-tutor	Write out: goals/objectives (for tutor feedback) Forms
To learn it; and M to function well as a group, M to learn how to learn	team	Contract with each other; & Write reflective journal that M makes individual contributions visible; and M provides evidence for growth Forms

Our approach is to use forms to make individual

actions visible to all. Written evidence.

Introducing PBL 2. small group, self-directed, self assessed PBL: a student group in action:

Forms used: in context of published Goals & criteria for:

M Chairperson skills

- Feedback from all about the

Task function (and chair's contribution)

Morale function (and chair's contribution)

5 strengths

2 areas to work on

seen in video

+ agenda

M Lifelong learning skills

- Quality of teaching: feedback from all about

Knowledge

Instruction

Followup needed

5 strengths

2 areas to work on

seen in video

+ teach notes and concept map

+ checklist of skill in issue identification

+ test question & solution + answer

Introducing PBL 2. small group, self-directed,
self assessed PBL: a student group in
action:

Activity:

Reflections: what have you discovered about PBL?
about an approach? might it work for you?

Questions:

TIME _____

+++++

Discuss with neighbour

TIME _____

Introducing PBL 3. Why select PBL? claims

M Improved learning	Should but ?
M Prefer deep learning	Yes.
M Better learning environment	Yes.
M Cued for later recall	Should but ? diver
M Not as much learned	MD. US NBME I: Slightly less but using wrong measures; 80% time subjects; 20% process
Core learned	Yes. MPS; better prepared
M Learn lifelong learning skills	Yes.
M Learn problem solving, team skills etc.	Yes. MD. US NBME II: clinical but only admit skilled. Yes. MD. more empathetic and whole person MDs No. MPS; not without workshops on target skills No, opportunity to develop.

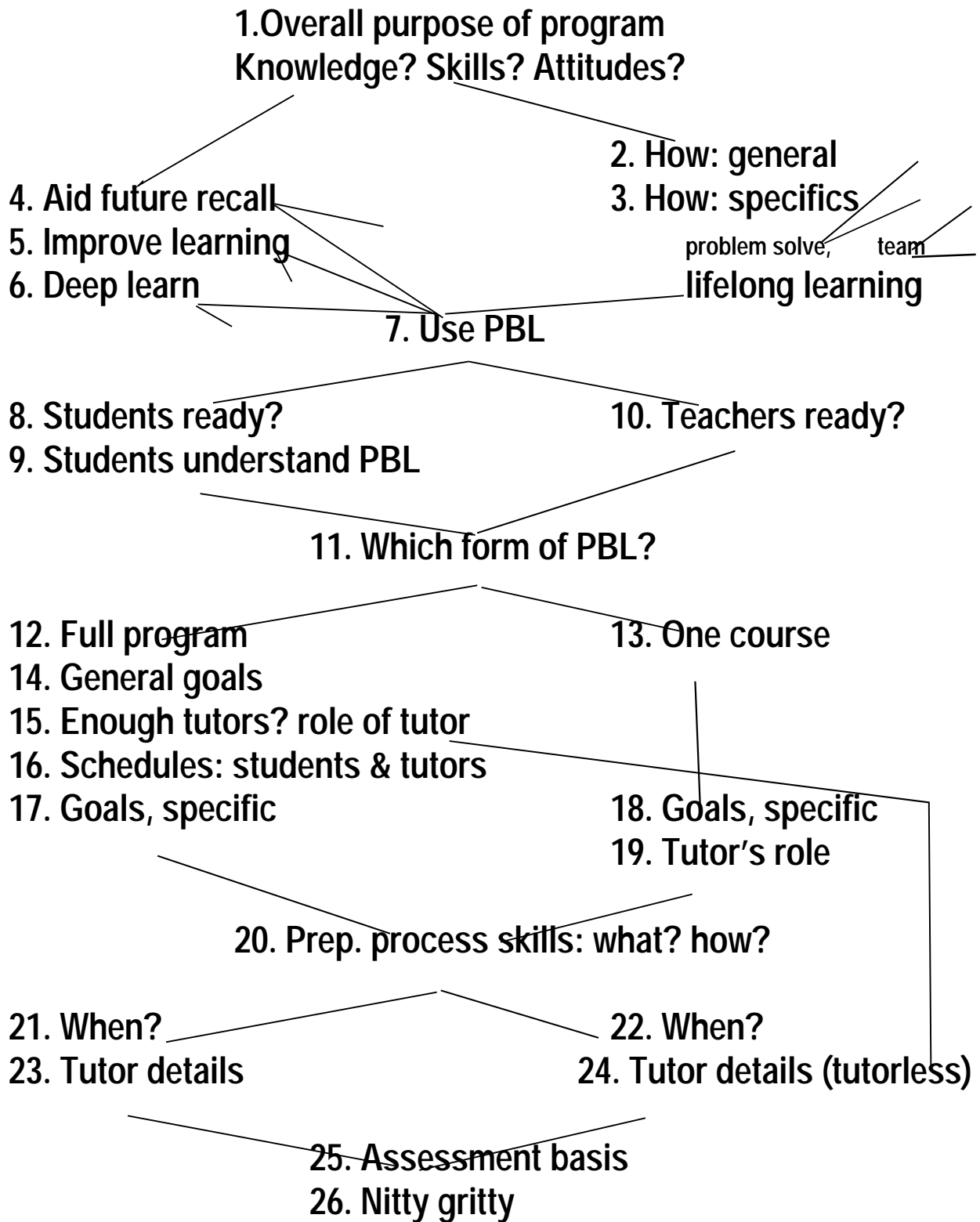
Introducing PBL 4. Options for PBL?

one-on-one			small coop group			
one	large-class		tutorless			tutored
research	Branda's PBEE	Socratic	Guided design	Socratic	MPS	medical school model
ongoing	single event; single issue	ongoing	prepared written feedback		ongoing	ongoing
need:	time to mark & prepare	think on feet	prep		prep	think on feet; skills in group process
problem solving			problem solving & group skills			

Am. J. Pharmaceutical Ed., 60, 231-238 (1996)

PBL: when? who? where? what? how? c:\pbl

Donald R. Woods, copyright 2001



Introducing PBL 5. Setting up small group, SDL PBL

Illustrate the overall process with tutorless groups

! start small: 3 week section

! reduce knowledge expected and value process skills as outcomes;

how?

some 3 credit courses have 1 of fill;

focus on core fundamentals

student use in subsequent courses

needs in year 2030?

importance of learning to fish

not giving them more fish;

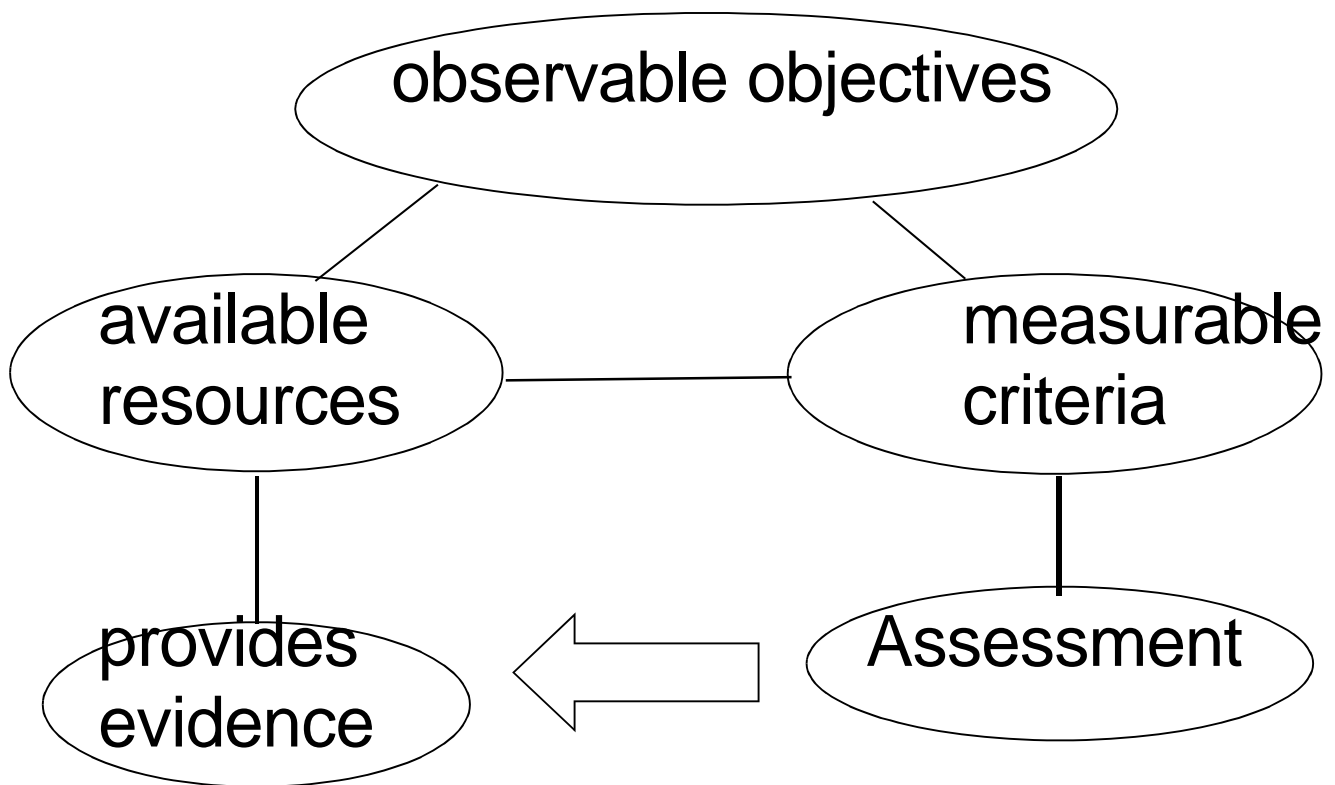
! create learning objectives (& assessment) for

- subject knowledge

- process skills

! design with assessment as model

Introducing PBL 5. Setting up small group, SDL,
PBL *For assessment to be valid, reliable,
explicit the main issues are:*



Introducing PBL 5. Setting up small group, SDL, PBL

- ! select a problem
- ! visualize timing and meetings

Goals

Teach

Feedback

- ! organize the groups 4 to 6

! create the resources: list and rate your favourite texts/articles; explain in simple terms

! decide on how to handle the objectives: you give? they generate & you monitor?

Prep. Time for students:

! intro: to PBL; to change & stress management?

! process skills?

Introducing PBL 6. Getting started: Goals

All PBL

Goals for program

Goals for Phase (20 to 30 week; 2 terms)

Goals for semester (10-15 week)

Goals for a case/problem

Guidelines: 2 -3 h student meeting.

students: 60 h/week; 120 h/subject, 6 subjects/term

Prep. time for faculty for 1st time teach new material

10:1; use 20:1

M	T	W	T	F	M	T	W	T	F	individual per case	no. of cases	Learning goals for case
		T		G			T		G	60 h	10 -12	1 week's worth from 6 courses but will be split 5 to 6 ways because of team
	G					T				120 h	3 - 5	2 week's worth from 6 courses but will be split 5 to 6 ways because of team

All contract to learn different pieces of the puzzle.

May pose problem in stages: part 1, part 2, part 3

May supply a "problem box" that has stage material in it.

Individual 60 h: 6 h meet; 10 h prep. for teach for 20 - 30 min ;

44 h for synthesis and learning other knowledge.

Introducing PBL 6. Getting started: Goals

3 week part of a Single course or hybrid program

Goals for semester (10-15 week)

Goals for one week = case/problem

Guidelines: 50 min class time available for goals & for teach students: 60 h/week; 120 h/subject, 6 subjects/term or semester

3 to 5 h of “homework” time/week for my course.

Prep. time for faculty for 1st time teach new material 10:1; use 20:1

M	T	W	T	F	M	T	W	T	F	individual per case	no. of cases	Learning goals for case
		T		G			T		G	3 - 5 h	3 in 3 weeks	1 week's worth from 1 courses but split 5 to 6 ways because 5 - 6 in group. About 6 to 10

All contract to learn different pieces of the puzzle.

Usual pose problem in single scenario although other data may be on in library

May supply a “problem box” that has stage material in it.

Individual 3-5 h homework hours: 3.5 h prep. for his/her piece for 10 m

teach ;

1.5 h for synthesis and learning other knowledge.

Introducing PBL 7. Getting started: creating problem & assessment.

Activity: The case of 1. Linda's complaint

You, a teacher in a PBL program, are talking to Linda, a student graduating from your PBL program. She confides in you, *"I believe I know the expected subject knowledge but I really don't think that my problem solving skill or group skills have improved. Perhaps the curriculum planners can look more closely at the skill development being claimed in the program."*

Introducing PBL 7. Getting started: creating problems assessment. *Experience, critique, create:*

Activity:

As a group of _____

- 1) introduce yourselves**
- 2) identify a chairperson**
- 3) brainstorm the issues this case raises**
- 4) prioritize the issues: criterion: what do you want to gain from this session in the context of the issues raised.**
- 5) may be called up report top issue.**

TIME _____

Brief detour: Focus on Process skills:

“group work” Form _____

Activity:

As group, rate your Task and Morale

TIME 4 min

+++++

Individuals report (30 s each) contribution to group;

not for discussion!

TIME 3 min

+++++

As group, list 5 strengths

2 areas to work on

TIME 3 min

Introducing PBL 7. Getting started: creating problems & assessment. Example learning issues

Introducing PBL 7. Getting started: creating problems & assessment. Example:

Introducing PBL 7. Getting started: creating problems & assessment.

M how to develop “process skill:”

- problem solving,
- group skills,
- self assessment,

M embedding process skill development into PBL

M assessment: self, tutor, teacher, marks

M helping students see success, develop confidence, trust

M how to design program to meet global outcomes

M gathering student feedback, monitoring, program evaluation

M

M

M

Introducing PBL 7. Getting started: creating problems & assessment.

Activity: Write reflections:

is it easy to get learning issues that match teachers?

what made it easy? difficult?

key words in the case?

TIME _____

+++++

Discuss with neighbour

TIME _____

Introducing PBL 7. Getting started: creating problems & assessment. Examples for individual course:

Context: teacher train

Target Objectives:

learning styles
role of teacher vs
student in learning
definition of learning
are test results
consistent with learning
can predict how well
students will do?
how to communicate
advice so that it will be
accepted
student preparation
prior to course
remedial strategies
student development
grades & rewards

Advice to students:

(from Dale Roy, McMaster)

You are teaching a large enrollment first year course for the second time in a row. Last year it was a matter of getting the bugs worked out but this year you are determined to make the course more effective.

One thing that you found peculiar last year was that you were not really able to say who would do well in the course. Some students that you thought were doing well, had a tough time by the end of the year; the final work of several others was a pleasant surprise. It seems that different students learned quite different things and in quite different ways.

The first month of term is over. you have decided to set aside your lecture for next week and to talk instead to your students about learning.

Introducing PBL 7. Getting started: creating problems assessment. Criteria for effective cases: p _____

1. chosen learning goals achievable.
2. the learning goals:
 - consistent with the stage of development;
 - builds on and activates prior knowledge.
3. goals integrate knowledge, skills across subjects.

4. scenario contains cues to help student make learning outcomes = teacher's.
5. an appropriate level of complexity is included.
6. the scenario allows an openness.
7. the scenario is motivational and relevant.
8. scenario similar to professional practice.
9. the scenario promotes student activity.
10. any data given should be raw data (like you encounter in practice).
11. the scenario identifies the context, gives a concrete scenario and clearly identifies the expected task without spelling out specifics.

Introducing PBL 7. Getting started: creating problems & assessment. *Critique*

Activity: Critique one of the cases (in education or in engineering)

Case _____ your choice _____

As _____

TIME _____

+++++

Discuss with neighbour

TIME _____

Introducing PBL 7. Getting started: creating problems & assessment. *Create scenario.*

M Consider the goals you selected in Step 6.

M Revisit and adjust to satisfy criteria

M Select a problem from the end of the chapter that requires that student demonstrate they have learned the goals.

M Adjust problem to satisfy criteria

M Test it out

Activity: create scenario

TIME _____

+++++

Activity: test it out.

Exchange with neighbour or colleague in similar area.

TIME _____

Introducing PBL 7. Getting started: creating problems & assessment. Think about assessment of subject knowledge (mainly to help students see that they have learned the knowledge).

Some options:

M Student summary of the quality of knowledge learned.

M Group solution to the problem.

M Individual concept maps of the knowledge.

M Individual Test and Exams of the knowledge, TETK.
created by teacher, peers, groups, individuals, self

M Individual teach notes and learning contract.

M Peer assessment of the quality of the knowledge brought to the teaching task.

Introducing PBL 8 Prep. time: Process skills

PS Skill

*Interpersonal
Skill*

1. awareness

4. strategy

5. stress mgt.

7. creativity

23. criteria

24. deciding

26. listening

27. group

29. chair

45. conflict

PBL

SG PBL

3. self assess

PBL

49. cope change

36. self directed L

SDL SA SG

Introducing PBL 8 Prep. time: Process skills

When and how:

pre-screen

before: student and tutor workshops

before: tutor workshops

during explicit student workshops

during: use feedback forms

during: provide target skills plus feedback forms.

Introducing PBL 8 Prep. time: students ready? teachers ready?

students: ready?

process skills?

maturity?

know their role? use Perry inventory

know what and why you chose PBL

manage change?

teachers ready?

guide on the side vs sage on the stage

thrill from student accomplishment

being the assessor to assessor of the process

students use to assess

standard keeper

coach

training in coaching especially process skills

control

Introducing PBL 10. Anticipate/sole downsides

Issue	Conventional lecture	PBL
"coverage"	100	50 at start; 80 once familiar with process
student stress	low	high; something new
learning objectives	students aware of 100% if faculty prepare	students can create 60 - 80% of faculty
subject focus	one subject at a time in depth	can integrate; learn layers of breadth.
student focus	collect sample solutions	systematic PS approach
relative no of cases seen	10	1
assessment	traditional exam	self-assessment

Introducing PBL 10. Anticipating and solving down sides

! empowering the students- making them accountable

make actions visible

- feedback forms
- journal writing
- evidence for students assessment

! set up environment; establish course norms:

- all do "fair share"
- don't attend
- change groups

! empower them with lifetime learning skills

! assess student's performance:

- help students gather evidence;

! evaluate the program

Introducing PBL 10. Anticipating and solving down sides

individual reports: consistency among individuals

Group A

Name	Perry start	Perry end	Comments about teaching in teach meetings	Comments about process of SDL
A.A	4.5	4.5	6.75, 6.8, 7.5 6.75, 6.75, 7.25 6.25, 6.33, 7.25	Learning objectives hardest to create; Frustration with meeting C6 because others didn't prepare Enjoyed this type of learning environment "SDL is not as time saving as I thought." "I'm glad that I don't have to listen to lectures on this topic. I was stimulated by working with others to solve a problem under time constraints."
A.B	3.5	4.	6.5, 6.4, 7.2 6.5, 6.6, 7.2 6.25, 6.2, 7.2	"What I like best is the small group atmosphere that is relaxed and where questions can be asked during the lessons without apprehension." "at the end of three problems, I still do not find this the best way to learn." After the second problem: "I think the group has a better outlook on SDL now that we realize that we can do this."
A.C	2.5		6.75, 6.14, 6.14 5.75, 6.3, 6.3 6.75, 6.14, 6.14	"SDL showed me my strengths and weaknesses in communication and expressing myself."
A.D			6.4, 6.7, 7.3 6.4, 6.9, 7.3 6.6, 6.8, 7.5	
A.E	3.5	5	6, 6.5, 7.5 6, 6, 7.5 6.25, 6.5, 7.5	"By the third cycle, every member has become very efficient in presenting their research material. The group understands the styles of learning for each of the members and, as a result, materials were presented without ambiguities or misunderstanding." "As the learning progression increased, the morale of the group also increased."

Introducing PBL 10. Anticipating and solving down sides

Third meeting, C6, was the tough one with not all doing their fair share. The group did not confront this directly.

Wide range of Perry attitude. Although learning style information was given to everyone about all the group members, these data were not formally reported or used by group. Group too generous in ratings.

Overall estimate: 2 shifted to PBL out of 5;

B tried but preferred lecture; D and C didn't try. QLI

M Both students and teachers must value the “process skills” and “lifelong learning skills”. PBL must be seen as being more than learning subject knowledge!

M Structure is needed on your part and careful preparation of the students and their attitudes is important;

M not all students will embrace this approach nor gain the same amount from the experience

M students self report that the goals meeting is the most difficult.

Introducing PBL 11. Evaluating: showing how well it works

Pre- post tests

LASQ

Exit surveys

Course Perceptions Questionnaire

Survey alumni re cued later recall

Perry attitude

Recruiter survey

Summary

DISCOVERY

	Discovered	Application