

Problem-based Learning: How the Learning is Experienced

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Goals

- Experience of problem-based learning, encompassing:
 - Initial discussion of problem
 - Information gathering
 - Refinement
- Themes from qualitative data
- Course design for your discipline

Why Change?

(adapted from Woods 1994:1-1)

PBL cycle: student tasks

- Explore problem to identify issues
- Try to solve with current knowledge
- Identify what is not yet known
- Prioritize the learning needs, goals, objectives
- Self-study, preparation
- Share with group: get perspective, learn from others
- Apply the knowledge: rounds, summary, question
- Reflection on learning process (self feedback)

Barrows (1980)

- Students were not getting “truly helpful” information on their competencies
- New assessment/performance of competency added: problem
- Technical proficiency
- Not being accessed and applied in context

“Why use PBL?”

The traditional sequencing of learning does not reflect real life interaction with the material
(Neufeld & Barrows 1974, 1043)

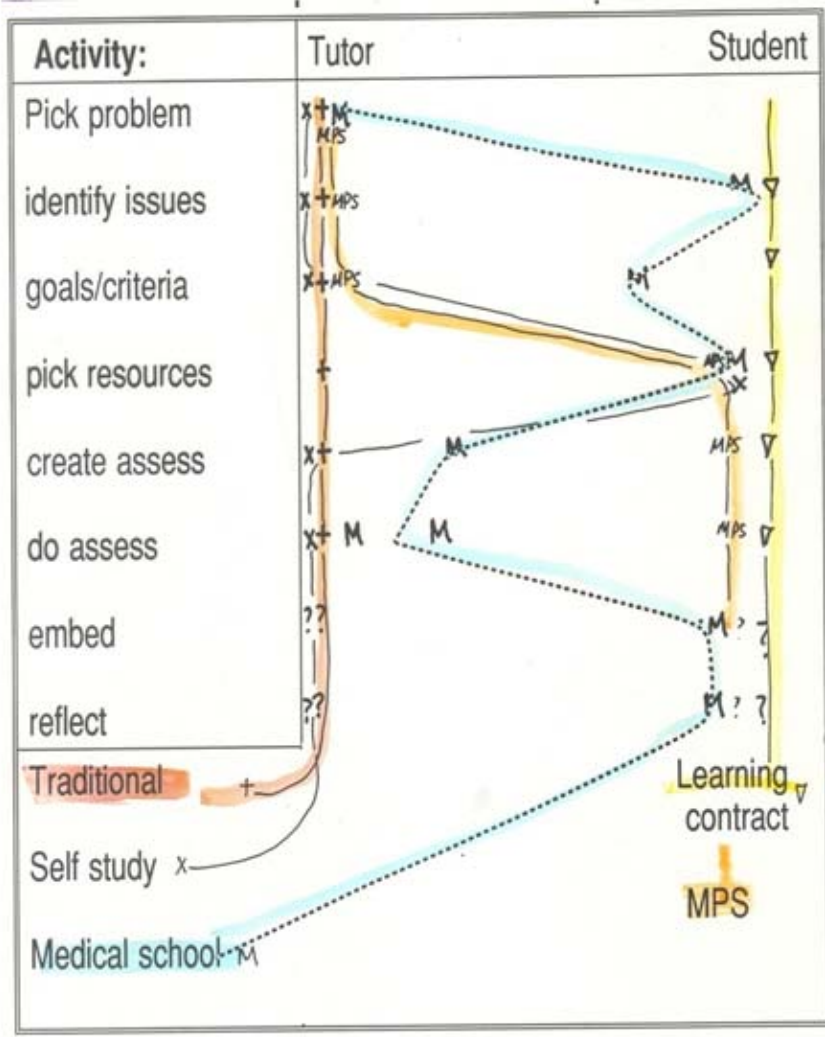
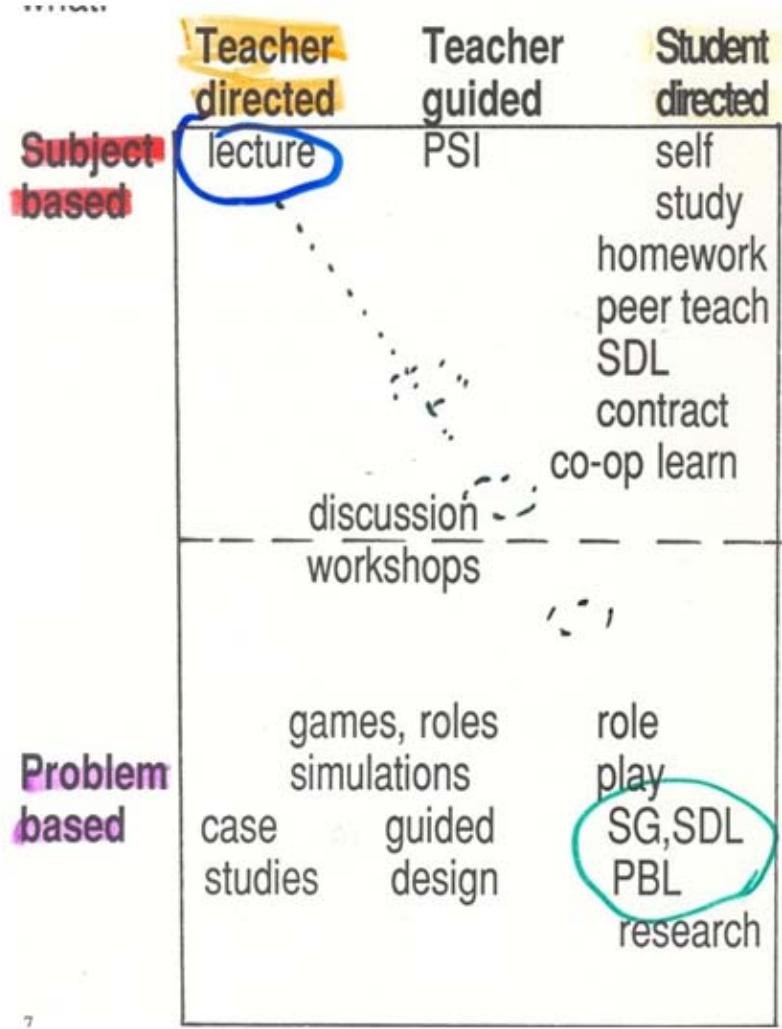
“PBL... is really about knowledge, learned in the context in which it will later be used so that hopefully transfer can be facilitated.”
(Norman 1997, 264)

“Why use PBL?” (Woods 2012)

- Subject knowledge comparable to traditional
- Statistically significant improvements in motivation, retention, problem solving, team skills, confidence
- Statistically significant deep learning and perception of learning environment
- Teaches information gathering

	Teacher directed	Teacher guided	Student directed
Subject based	lecture	PSI	self study homework peer teach SDL contract co-op learn
	discussion	workshops	
Problem based	games, roles simulations case studies	guided design	role play SG,SDL PBL research

(Woods, Cornell Univ. keynote Jan 2012)



(Woods, Cornell Univ. keynote Jan 2012)

U Waterloo: Study

International Economics

A second year survey course

At least two Economics courses

75% from outside of Econ major

Complex, content rich

Informed voters

Small-group, self directed PBL

U Waterloo: Study

Data

Inventory data (Gainen, Lancaster)

Reflections

Focus groups

(Course grade)

Lancaster Approaches

- A family of survey instruments developed in the 1970s and 1980s (Ramsden, Entwistle and coauthors): student *approach* and *intention*

Approaches to Studying Questionnaire:

(Entwistle 1981) Differentiates learning for understanding (*deep*) and rote/unintegrated (*surface*) approaches to learning

Course Perceptions Questionnaire:

(Entwistle 1987) students' perception of the learning environment influences approach to learning

Students' Ave. Approach to Learning

	Strategic	Surface	Deep	SCORE
Beginning of Class (n=50)	16.7	15.5	17.2	18.4
End of Class (n=53)	16.3	15.4	16.4	17.2
Paired Difference (n=44)	-0.5	-0.1	-0.8	-0.9
Entwistle & Ramsden 1983	12.7	13.7	14.2	13

Students' Average Course Perceptions

	GT	OS	FL	CG	VR	SC	WL	FT	CPQ	CC	SC	s/c
Beginning of Class (n = 50)	7.8	7.2	6.7	8.3	7.3	5.8	6.0	7.7	30	9.4	15	2.1
End of Class (n = 53)	9.3	9.9	8.6	5.6	6.5	6.0	5.8	4.5	36	7.3	18	3.5
<i>Paired Difference</i> (n = 44)	1.4	2.8	1.7	-3.2	-1.2	0.1	-0.4	-3.5	5.5	-2.3	3.1	1.35

GT = good teaching; OS = openness to students; FL = freedom to learn; CG = clarity in goals
 VR = vocational relevance; SC = social climate; WL = workload; FT = formal teaching methods
 CPQ = total of these; CC = control-centered (10 + workload – freedom)
 SC = student-centered (sum of good teaching + freedom); s/c = ratio of SC/CC

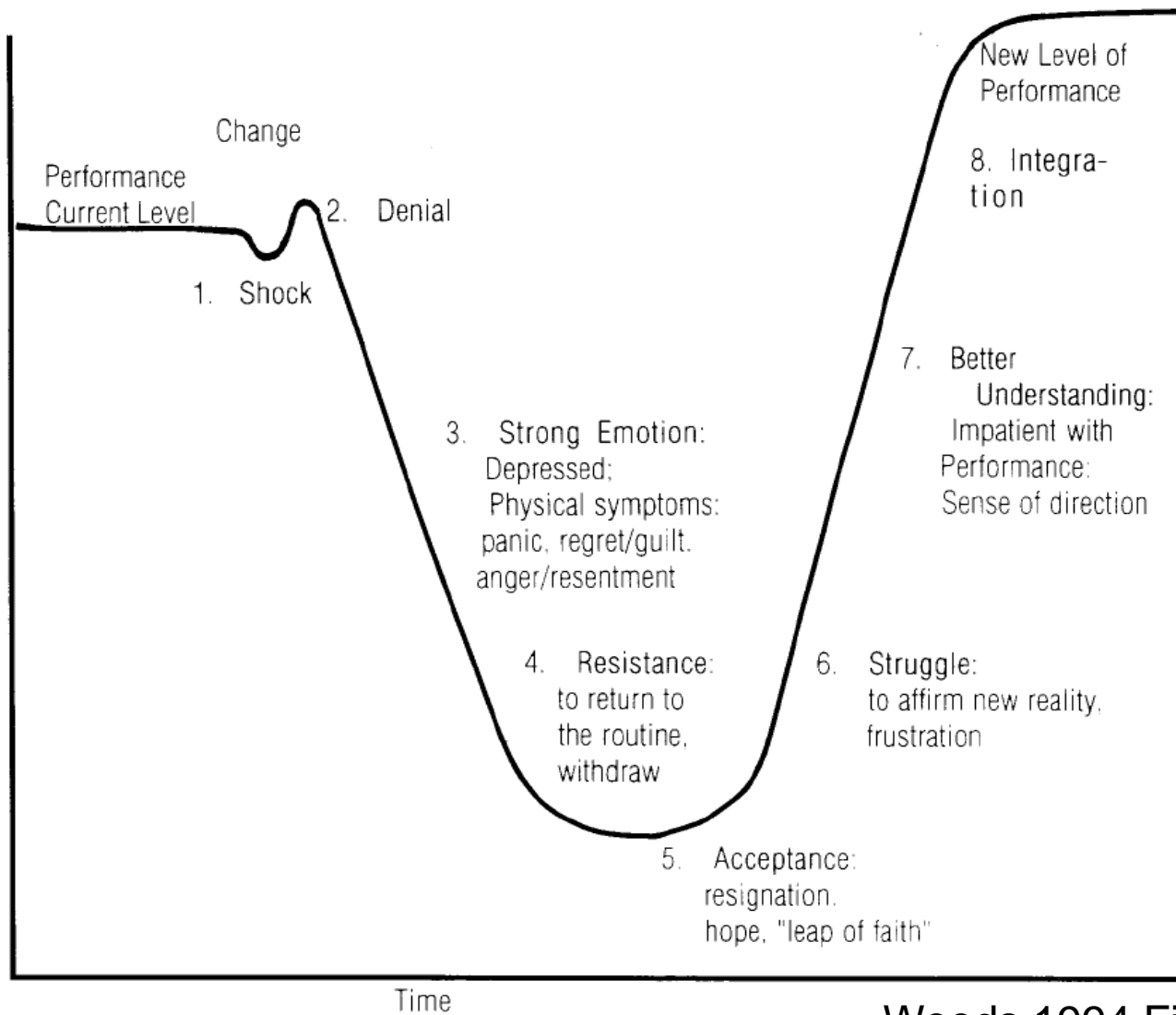
Reflection question

“How have the experiences in this course enhanced understanding of international events?”

What do you need to do to respond in an informed way in future?”

Themes from Reflections

- Novelty
- Trust
- Challenge of ambiguity



Woods 1994 Figure 1-1

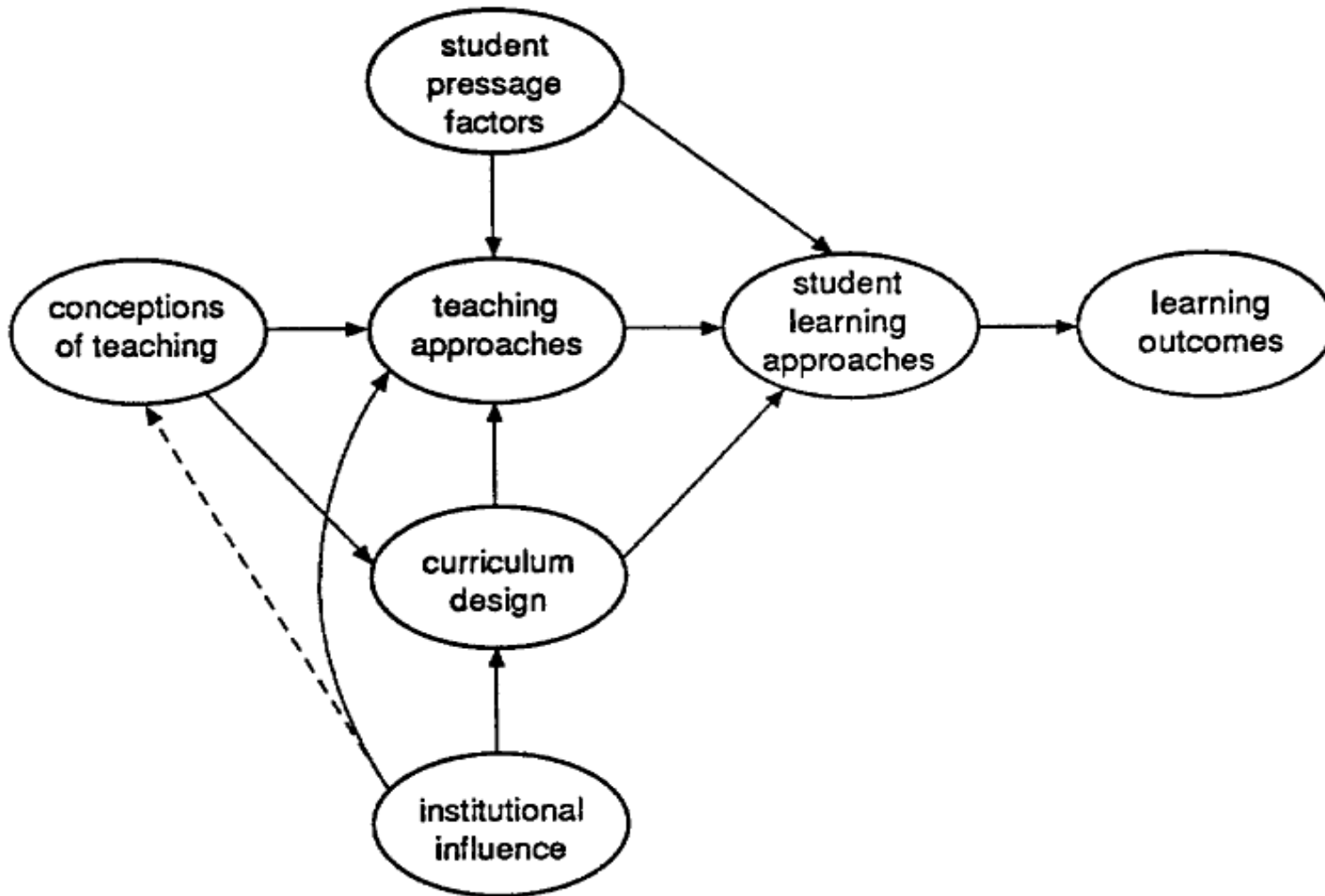


Figure 3. The relationship between conceptions of teaching, teaching approaches and learning outcomes.

Kember (1997)

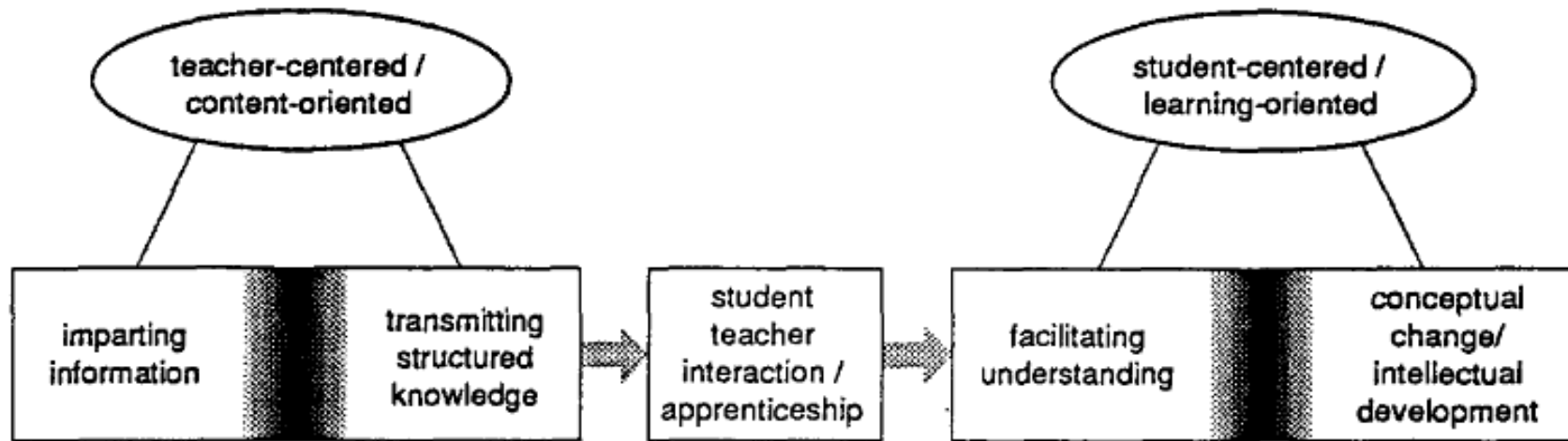


Figure 2. A multiple-level categorisation model of conceptions of teaching.

Back to “Why Change?”

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“The learning paradigm ends the lecture’s privileged position, honoring in its place whatever approaches serve best to prompt learning of particular knowledge by particular students.”

Barr and Tagg (1995:14)

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