

Speaker's Notes for Linking Latitude Workshop

Sustainable lifestyles: living along the Mekong

Integrating recent pedagogical directions with practical classroom strategies for geography students in Years 7-10

Suitable materials are close at hand

David Bowden (1998) *The Mekong Basin: Case Studies in Biodiversity and Ecologically Sustainable Development* Australian Association for Environmental Education Inc: Manly NSW

Robert Lewis (1997) *Vietnam Young People, old Country* Curriculum Corporation: Carlton, Victoria
<http://www.curriculum.edu.au/accessasia/vietnam/secext/secu2mek.htm>

John Paine et al (2000) *Senior Geography 1* Macmillan: Melbourne

Australian Mekong Resource Centre (2004) *Mekong Quest* University of Sydney
http://www.mekong.es.usyd.edu.au/publications/cdroms/mekong_quest.htm

Looking back at learning

Although Piaget's work has been criticised and subject to revision, his studies in child development still provide a general framework for understanding children's mental development. (Lambert and Balderstone, 195). An article from *Geographical Education*, a quarter of a century ago, attempted to measure student's cognitive abilities in Year 6 and Year 10.

(OHT Blachford, 1978, 3(2) 241)

Piaget's theory posited that with increasing maturity a learner becomes capable of considering facts and ideas abstractly whereas Jerome Bruner, of Harvard University, argued that by teaching, preferably using discovery-type methods, the core concepts of a subject, the learner will be able to cope with the problem of transfer much more efficiently and effectively. (Slater, 1973, 78). Both theorists remain relevant in terms of current constructivist learning theory.

(Example from Bruner and trophic level experiment (Slater, 82))

When a student is confronted with a new learning situation, with completely new subject matter, s/he will often approach it on a concrete level (Ausubel (1969) quoted in Blachford). It should be noted that adults also regress far more deeply. Consider the learning situation posed by the car that won't start and the enraged adult kicking the car wheel.

What do we do as teachers when we perceive that the learning task is beyond the cognitive ability of some of our students? Do we provide 'busy work' until they catch up? Or, can we engage students with formal operational thinking? Teachers can assist through judicious questions and provision of stimulus, but it only through individual

understanding that real learning will take place. More graphically, 'To understand is to invent, to build for oneself.' (Leder, 1993)

What prospects are there for engaging students in abstract thinking about sustainability along the Mekong? Bruner (1974 quoted in Blachford) placed great emphasis on the style of presentation. He advocated a movement along a sequence from the iconic to the symbolic. The resources available for 'sustainable lifestyles: living along the Mekong' include well-illustrated resource sheets (Lewis, 30-40) and video, virtual fieldwork and websites (Mekong WebQuest).

Bruner also championed the spiral curriculum: that involved notions of progression as students revisited areas of previous learning, which were then reinforced and refined. In geographical education this progression has been marked by the following 'rules' for achieving understanding:

(OHT from Butt, 2002, 70-71)

Setting up these 'rules' for studying 'sustainable lifestyles: living along the Mekong' would necessitate further thought and preparation on the teacher's part in order to ground these understandings in the student's immediate world.

Another important theorist, Gagne, was well known for his work on learning hierarchies. Cognitive development, he asserted, is a function of learning and is thus concerned with how to develop concepts. (Blachford, 1978, 244) Gagne proposed the following sequence of learning skills.

(OHT Blachford, 244)

This sequence underpinned much inquiry learning in the 1970s in Australian geography classrooms and it is embedded in the materials presented by Lewis and the Mekong WebQuest.

Constructivist Learning Theory

Modern research has demonstrated that the essence of being an effective teacher lies in knowing what to do to foster student learning and being able to do it. (Davidson, 2002, 80). Although there are many theories about learning, constructivist theories of learning predominate:

'A constructivist view of learning perceives children as intellectually active learners already holding ideas or schema, which they make use of their everyday experiences. Learning in classrooms involves the extension, elaboration or modification of their schemata. This process is one by which learners actively make sense of their world by constructing meanings.' (Bennett and Dunne, 1994, 53)

'Thus school knowledge has to become 'action' knowledge. The job of teachers is to facilitate the transfer of school knowledge into action knowledge by focussing on the process of learning.' (Davidson, 2002, 81)

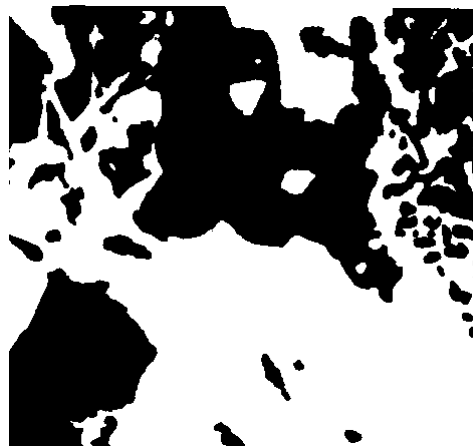
(OHT Conditions for learning, Davidson 2002, 81)

These 'needs' are essentials in any attempt to evaluate the learning materials about 'sustainable lifestyles: living along the Mekong'

Teasing out constructivist learning

‘As its name may imply, *constructivism* emphasizes the *building* (i.e., constructing) that occurs in people's minds when they learn. A simple way to summarize this idea is to refer to *Gestalt* theory; that is, the idea that 'a whole is more than the sum of its parts'. That may be seen by 'observing' the black-and-white image (below). Some people 'see' a geographical location, others detect a mammalian coat (cow) and still others claim the image depicts a bearded man. Apparently, what each person 'sees' (or 'observes') depends more on what is already stored in that person's brain. This suggests that learning from our environment (through our senses) is an *active*, rather than a passive, process. In a way, we seem to *project onto* phenomena what we already know about them. In other words, we each construct a unique mental image by combining information in our heads with the information we receive from our sense organs (in this case, our eyes).’

(OHT of figure below)



<http://www.oise.utoronto.ca/%7Elbencze/Constructivism.html>

WWW Site for John Lawrence Bencze, Assistant Professor, Science Education, OISE/UT (University of Toronto, accessed April 2004)

‘Constructivism is a philosophy of learning founded on the premise that, by reflecting on our experiences, we construct our own understanding of the world we live in. Each of us generates our own "rules" and "mental models," which we use to make sense of our experiences. Learning, therefore, is simply the process of adjusting our mental models to accommodate new experiences.’ (Funderstanding, accessed April, 2004)

<http://www.funderstanding.com/constructivism.cfm>

My construction of the foundations of ‘sustainable lifestyles: living along the Mekong’

I construct a mental model of the Mekong that divides the catchment into its source, transfer and sink zones. I image the variations in hydraulic geometry as the river completes its course, the climatic parameters, operation of the Mekong water cycle, relationships with the biosphere and edaphic variations from alluvium and lithosols to acid sulphate soils. I am aware of the research work on the deleterious aspects of big dam construction and the delicate balance that such vast catchments encompass.

Clearly, each student will be starting from a different mental construct of 'sustainable lifestyles: living along the Mekong'

Discussion of constructivism and learning

'There are several guiding principles of constructivism:

1. Learning is a search for meaning. Therefore, learning must start with the issues around which students are actively trying to construct meaning.' (Funderstanding, op cit) Bowden instructs students to 'list the environmental issues facing the Mekong as you understand them.' (Bowden, 63)
2. 'Meaning requires understanding **wholes** as well as parts. And parts must be understood in the context of wholes. Therefore, the learning process focuses on primary concepts, not isolated facts.' (Funderstanding, op cit) Lewis lists as an outcome that students will 'analyse a variety of views on the use of the natural resource, the Mekong.' (Lewis, 27)
3. 'In order to teach well, we must understand the mental models that students use to perceive the world and the assumptions they make to support those models.' (Funderstanding, op cit) Does concrete or formal operational thinking predominate when the individual student approaches this issue?
4. 'The purpose of learning is for an individual to construct his or her own meaning, not just memorize the "right" answers and regurgitate someone else's meaning. Since education is inherently interdisciplinary, the only valuable way to measure learning is to make the assessment part of the learning process, ensuring it provides students with information on the quality of their learning.' (Funderstanding, op cit). The Mekong WebQuest includes a specific section on assessment as an integral part of the learning package.

How Constructivism Impacts Learning

*'Curriculum--*Constructivism calls for the elimination of a standardized curriculum. Instead, it promotes using curricula customized to the students' prior knowledge. Also, it emphasizes hands-on problem solving.' (Funderstanding, op cit) Again, this is evidenced in the Mekong WebQuest.

*'Instruction--*Under the theory of constructivism, educators focus on making connections between facts and fostering new understanding in students. Instructors tailor their teaching strategies to student responses and encourage students to analyse, interpret, and predict information. Teachers also rely heavily on open-ended questions and promote extensive dialogue among students.' (Funderstanding, op cit) 'How did you arrive at that conclusion?', and, 'How did you decide which information to include and which to leave out'; are suitable questions that move towards metacognition.

*'Assessment--*Constructivism calls for the elimination of grades and standardized testing. Instead, assessment becomes part of the learning process so that students play a larger role in judging their own progress.' (Funderstanding, op cit) Lewis suggests that an essential part of the learning process is, 'not to in fact represent their own country's interest, but to try and decide the course of action that is agreeable to all six countries' (Lewis, 29), thus a laudable learning objective becomes the goal.

How has inquiry-based learning developed since it first became popular?

'Inquiry has always been a part of education. It predates Socrates and his method of leading students to self-knowledge through aggressive questioning. **John Dewey's**

reform of the educational system led to the first inquiry-based learning methods in the United States. Dewey advocated child-centred learning based on real-world experiences.

http://www.thirteen.org/edonline/concept2class/month6/index_sub4.html

‘A geographer is a continual inquirer -- they're looking for relationships between land forms, between culture, between resources, between economics and finding a reason why people are behaving as they are, finding reasons to explain an economy of a region, for example. So that it's finding that pattern and having to know and draw forth information from a variety of resources that helps a geographer do his job as a geographer’

http://www.thirteen.org/edonline/concept2class/month6/index_sub5.html

Arthur L. Costa, co director of the Institute for Intelligent Behaviour in Berkeley, California

Simon Catling (2003) advocates a three-pronged approach to enquiry.

(OHT Fig 6 The three ‘Es’: a structure for geographical enquiry) Catling p. 193

Productive Pedagogies

‘Every few years, a new way of thinking is thrust upon teachers as the Next Big Thing in learning and development. Think Bloom's Taxonomy, de Bono's Six Thinking Hats or Gardner's multiple intelligence approach. However, the latest approach to catch the attention of educators is not really new at all. There are no new theories to learn or strange concepts to grapple with.’

<http://www.det.nsw.edu.au/inform/yr2002/mar/pedagogy.htm>

[OHT thinking hats, de Bono, 10-11]

[OHT multiple intelligences theory and teaching, Haggerty, 59]

[OHT Descriptions of Learning Styles, Lambert, 177]

‘The notion of 'Productive Pedagogies' was developed by a team of educational researchers from the University of Queensland who worked on a project with the snappy title of 'The Queensland School Reform Longitudinal Study' (QSRLS). The QSRLS was commissioned by 'Education Queensland' and involved extensive observation of classroom practice between 1998 and 2001. The findings of the study were used to make recommendations to Education Queensland about the improvement of teaching and learning strategies and assessment practices. They also formed the basis for the development of the Queensland 'New Basics' Project (not to be confused with 'New Basics' in the UK which is more about the '3Rs' than anything productive), which is currently being piloted in some Queensland schools. In a nutshell, 'Productive Pedagogies' is a collection of 20 strategies which together provide us with a framework for teaching and learning which aims to improve student learning outcomes, build relationships and develop critical thinking skills. The 20 productive pedagogies are organised into 4 key areas, namely:

- Intellectual Quality ([Higher-order thinking](#), [Deep knowledge](#), [Deep understanding](#), [Substantive conversation](#), [Knowledge as problematic](#), [Metalanguage](#))
- Connectedness ([Knowledge integration](#), [Background knowledge](#), [Connectedness to the world](#), [Problem-based curriculum](#))

- Supportive Classroom Environment ([Student direction](#), [Social support](#), [Academic engagement](#), [Explicit quality performance criteria](#), [Self-regulation](#))
- Recognition of Difference ([Cultural knowledges](#), [Inclusivity](#), [Narrative](#), [Group identity](#), [Active citizenship](#))

The idea is that teachers choose to emphasise a selection of the pedagogies in any given lesson or unit of work, over time using all of 20 strategies to support student learning.'

<http://www.loretonh.nsw.edu.au/Curriculum/pedagogy/pp.html>

Where has the Quality Teaching model come from?

'The NSW model of pedagogy has been drawn from the "authentic pedagogy" research of Fred Newman and associates at the University of Wisconsin and the "productive pedagogy" research in the Queensland School Reform Longitudinal Study.'

<http://www.curriculumsupport.nsw.edu.au/qualityTeaching/index.cfm?u=3&i=65>

Authentic pedagogy

'At the conclusion of a five-year study, Fred Newmann, Gary Wehlage, and colleagues at WCER's Center on Organization and Restructuring of Schools (CORS) report on "authentic pedagogy" -- a combination of instruction and assessment rooted in a primary concern for high standards of intellectual quality -- and the resulting authentic student achievement, which represents accomplishments that are significant, worthwhile, and meaningful.

Authentic pedagogy aims to nurture independent, critical thinking in students. It intends to help students appreciate, live with, and experience the joy of working with cognitively complex problems. CORS research found that authentic pedagogy contributes to equal opportunity for all students to learn; that is, it helps students from all social backgrounds, rather than magnifying inequalities in achievement between groups that traditionally have been more and less advantaged. Until recently, arguments in support of authentic pedagogy have often been made only on philosophical grounds; the CORS study offers strong empirical justification for it.'

http://www.wcer.wisc.edu/publications/WCER_Highlights/Vol.8_No.3_Fall_1996/Authentic_Pedagogy.html

Quality Teaching

'The features of classroom practice that have been linked to improved student outcomes can be characterised as representing three dimensions of pedagogy:

1. **Intellectual quality** refers to pedagogy focused on producing deep understanding of important, substantive concepts, skills and ideas. Such pedagogy treats knowledge as something that requires active construction and requires students to engage in higher-order thinking and to communicate substantively about what they are learning.
2. **Quality learning environment** refers to pedagogy that creates classrooms where students and teachers work productively in an environment clearly focused on

learning. Such pedagogy sets high and explicit expectations and develops positive relationships between teachers and students and among students.

3. **Significance** refers to pedagogy that helps make learning meaningful and important to students. Such pedagogy draws clear connections with students' prior knowledge and identities, with contexts outside of the classroom, and with multiple ways of knowing or cultural perspectives.'

(OHT below)

	Intellectual quality	Quality learning environment	Significance
Elements	Deep knowledge	Explicit quality criteria	Background knowledge
	Deep understanding	Engagement	Cultural knowledge
	Problematic knowledge	High expectations	Knowledge integration
	Higher-order thinking	Social support	Inclusivity
	Metalanguage	Students' self-regulation	Connectedness
	Substantive communication	Student direction	Narrative

Table 1: The dimensions and elements of the NSW model of pedagogy

A summary discussion of each dimension is provided on the following pages, along with an elaboration of what each element looks like if you were observing a classroom or if you were reviewing a documented assessment task.

<http://www.curriculumsupport.nsw.edu.au/qualityTeaching/docs/QualityTeachEPSColor.pdf>

WebQuests fit nicely into this structure

'Critical Attributes

WebQuests of either short or long duration are deliberately designed to make the best use of a learner's time. There is questionable educational benefit in having learners surfing the net without a clear task in mind, and most schools must ration student connect time severely. To achieve that efficiency and clarity of purpose, WebQuests should contain at least the following parts:

1. An introduction that sets the stage and provides some background information.
2. A task that is doable and interesting.
3. A set of information sources needed to complete the task. Many (though not necessarily all) of the resources are embedded in the WebQuest document itself as anchors pointing to information on the World Wide Web. Information sources might include web documents, experts available via e-mail or realtime conferencing, searchable databases on the net, and books and other documents physically available in the learner's setting. Because pointers to resources are included, the learner is not left to wander through webspace completely adrift.
4. A description of the process the learners should go through in accomplishing the task. The process should be broken out into clearly described steps.
5. Some guidance on how to organize the information acquired. This can take the form of guiding questions, or directions to complete organizational frameworks such as timelines, concept maps, or cause-and-effect diagrams as described by Marzano (1988, 1992) and Clarke (1990).

6. A conclusion that brings closure to the quest, reminds the learners about what they've learned, and perhaps encourages them to extend the experience into other domains.

Some other non-critical attributes of a WebQuest include these:

1. WebQuests are most likely to be group activities, although one could imagine solo quests that might be applicable in distance education or library settings.
2. WebQuests might be enhanced by wrapping motivational elements around the basic structure by giving the learners a role to play (e.g., scientist, detective, reporter), simulated personae to interact with via e-mail, and a scenario to work within (e.g., you've been asked by the Secretary General of the UN to brief him on what's happening in sub-Saharan Africa this week.)
3. WebQuests can be designed within a single discipline or they can be interdisciplinary. Given that designing effective interdisciplinary instruction is more of a challenge than designing for a single content area, WebQuest creators should probably start with the latter until they are comfortable with the format.'

http://edweb.sdsu.edu/courses/edtec596/about_webquests.html

Cognitive acceleration program

(OHTs model of learning in school, cognitive acceleration program, (Lambert, 175, 308)

The Cognitive Acceleration in Science Education (CASE) Project was developed at Kings College, London in the 1990s. (Leat, 2002) It aimed to teach thinking within the confines of a subject discipline rather than be an add-on program such as deBono's CoRT (Cognitive Research Trust) Program. Three important concepts from cognitive psychology lie at the heart of the CASE Project: *cognitive conflict*, *metacognition* and *bridging*.

'*Cognitive conflict* is a term used to describe the dissonance that occurs when a child is presented with a situation which challenges his or her existing conceptual framework or understanding.' (Leat, 139) On first glance students may view the crux of the problem of sustainability along the Mekong as 'population vs. resources'. Through presentation of more in depth material from the sources the students can be persuaded to question this initial assumption. They are forced to revise their learning schemata to include a great variety of factors, many of which require abstract thinking.

Metacognition literally means to be aware of one's own thinking process, but it implies that by thinking about thinking the individual can make conscious choices about strategies employed to tackle a problem. Students develop 'inner speech' facilities to argue and debate with themselves about the roles of NGOs, governments, fishers and tourists and sustainability along the Mekong.

Bridging enables students to tackle unfamiliar problems by using the methodologies, insights and learnings from the Mekong project. Specifically, the Mekong Centre also undertakes comparative work on the Murray Darling Basin and this may be a useful *bridge*. But it is hoped that successful bridging should translate into increased student competency and performance in a number of assessment areas.

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[Bernie Dodge](#), San Diego State University accessed April 2004