

Bringing critical thinking to the education of developing country professionals

Jonathan E. D. Richmond

Conservatoire National des Arts et Métiers richmond@alum.mit.edu

Cultural differences between Asia and the West and their influence on teaching, are reviewed along with previous experiments in bringing critical thinking to Asian education, and recognition of needs for and barriers to achieving change. Principles driving design and implementation of a two-course sequence in professional transportation studies are presented. Asian students were cast as teachers who made regular presentations and understood they had valuable contributions to make, not traditional passive roles to play.

The students showed an ability to undertake interdisciplinary analysis; to question assumptions of existing practice; and to seek solutions for local needs that often departed from those suggested by commonly-taught Western-based theory. The students gained notably in presentation skills and self-confidence. These are important attributes for attaining change in developing countries. Inferences from the results of the study are limited by the sample of highly-talented graduate students. Further finely-documented experiments involving the implementation of student-centred learning in Asian settings are needed.

Critical thinking, developing country education,
Asian education, professional education, transport planning

INTRODUCTION

The educational methods commonly used in developing countries, particularly rote learning by students expected to be passive recipients of knowledge, are mostly ineffective at training professionals to think critically and creatively about the development needs of their nations. Whether mathematical formulae or facts are memorised, parrot-learned material lacks practical applications without an ability to place it in the context of local environments, where social and economic systems and priorities, finances, and managerial and political practices may be anything other than that outlined in the textbook.

In order to move their countries forward, development professionals require the critical thinking skills to enable them to identify and question planning and operating assumptions, which act as constraints, rather than blindly adopting inappropriate measures which may have become institutionalised. They also need the creativity to design responses to local problems that are sensitive to local needs, and which may require changes to existing practices or the use of approaches that vary from the Western ones taught in textbooks.

Planning for transport systems development and management is one of the most important infrastructure activities for developing countries. Inadequate transport systems limit mobility and commerce. Most of the developing countries of Asia suffer from severe and increasing congestion as rising incomes promote car purchases, and inadequate and poorly-managed road and public transport systems fail to take the strain. Dealing with such intense problems requires not only professionalism but interdisciplinary knowledge and skills, and the ability to understand what actions are appropriate for meeting local needs, and what are politically and organisationally

practical. Transport planning for developing countries therefore presents an excellent case for examining the effectiveness of student-centred teaching practice that engages participants in critical analysis to find effective solutions to complex problems that go beyond easy textbook solutions.

This paper starts with a literature-review based overview of (a) cultural differences between East and West and how they relate to teaching practices commonly used in Asia; (b) of recognition of the need for change in approaches to teaching; (c) previous innovations which have introduced critical thinking to education; and (d) barriers to widespread adaptation of such innovations. It then presents a reformed teaching approach for teaching transport planning introduced at a university in Thailand (which will be referred to as the Asian International University, that is not its real name). Detailed notes on each student's in-class behaviour were taken on a laptop during every class meeting throughout the two courses under the new regime and during a field trip held in Singapore to track student responses to the new educational environment over time and to provide data to evaluate the impact of the experiment. The implications of the experiment for professional education in the developing world are subsequently discussed.

Differences in Eastern and Western Patterns of Socialisation and What it Means for Critical Thinking

In his revealing book, *Why Asians are Less Creative than Westerners*, Singaporean Ng Aik Kwang (2001) identifies characteristics that help explain why passive education is deeply set in Asian culture. The Western concept of the self revolves around individuals in pursuit of their own interests rather than following a group. Emotions tend to focus on the self: pride, anger, joy and sadness, for example. In dealing with others, Westerners tend to be frank and direct, differentiating themselves from others and establishing their uniqueness.

In contrast, an Asian person tends to be “psychologically dependent on the ingroup, and conforms to it instead of following the wishes and desires of his own heart”. Social order and harmony are important, along with the upholding of group social rules and norms. Emotions tend to be ‘other-focused’, such as feelings of shame, embarrassment and empathy. Caution and indirectness are keynotes to interaction, with a focus on reading the other person's mind rather than expressing personal opinions. In this way, group approval is gained (Ng, 2001, p.27). In addition, Ng stated, respect and obedience to parents is emphasised, rather than self-reliance:

The cultural emphasis on filial piety means that children from a traditional Asian family are raised in terms of whether their conduct meets some external moral criteria e.g. not being rude to one's parents or not treating them in a disrespectful manner... Dependence of the child on the parents is encouraged, and breaking the will of the child, so as to obtain complete obedience, is considered desirable. (Ng, 2001, p.29)

Furthermore, Ng (2001) argues that Western socialisation tends to “identify those positively-valued attributes of the self that accentuates the person's uniqueness. Hence, Western caretakers will draw attention to children's positive features, praising and complimenting them”. In the East, principles of obedience to parents and group, rather than individual identification, lead Asian caretakers to “draw a child's attention to shortcomings, problems or potentially negative features that have to be corrected to meet the expectations or norms common in a social relationship” (p.43). In the West, a focus on a person's uniqueness gives them scope for criticism of differences surrounding them. In the East, the ideal was to merge with the group, suppressing differences separating the individual from the group's membership.

The emphasis on obedience and conforming to group expectations, together with the avoidance of losing face as a result of appearing different, limits capacity for creative and critical thinking according to Ng (2001, p.56, p.87). Typical Asian social constructs therefore fit with an authoritarian teaching structure, where the flow of knowledge was from teacher to student. The

role of the student, as a member of a group bound to obey the teacher, is to absorb information provided by the teacher, not to open it up to criticism, and especially not to do so in a way that marks them out from other members of the student group.

Teaching Practices in Asia – The Pervasiveness of Rote Learning

As *Newsweek* pointed out, “Asia’s elite, of course, always knew it takes a lot more than memorisation to make it in the modern world. That’s why they sent their own children to school in the West” (Elliott, 1999). In addition, exclusive private schools have mushroomed in Asian capitals, where they advertise Western-style education. Take this Pakistani school, which headlines “An American educational approach values and encourages Active Learning”:

Learning is not a spectator sport. Students do not learn much just sitting in classes listening to teachers, memorising pre-packaged assignments, and repeating back answers. Students must talk about what they are learning, write about it, relate it to past experiences, and apply it to their daily lives. Students must make what they learn part of themselves. (Lahore American School, web undated)

The promotion of active and critical learning is a hot topic in the West, with a growing literature on critical thinking and curricula innovations (Meyers, 1986, p. 2). While, “The lecture tradition fosters a generally passive style of education in which critical thinking is taught only implicitly or not at all” (Meyers, 1986, p. 2), in the United Kingdom, lectures have traditionally been complemented by small-group tutorials or seminars which revolve around critical discussion of subject matter, and which are at the core of the educational process.

While lectures still play a major role at the university level in the United States, U.S. academic practitioners generally require student participation in class discussions from undergraduate, graduate and professional students. Oral presentations and completion of major papers are regular requirements of many courses in the United States (Haas, 1996, p. 355). Because participation is seen as an integral part of university learning, “American university professors are often frustrated by what they see as a lack of participation by foreign students” (Johnson, 1997, p. 48).

American education is usually considered to promote active learning, “where the students are very much involved in and often responsible for much of the learning that takes place. The ideal student is considered to be creative, inquisitive, resourceful, and – to some respect – skeptical” (Upton, 1989, p. 24, citing Chen, 1981). American teachers, who see themselves as facilitators of learning rather than founts of knowledge, are often willing to admit their ignorance of subjects and are not embarrassed by challenging questions. “Americans will probe for questions, encourage discussion, praise creative thinking and daring ideas; but often they will not give direct answers” (Upton, 1989, p. 25).

In Asia, much education revolves around rote learning. A typical Japanese university lesson, for example, “consists rather heavily of the teacher lecturing while the students take notes which they then repeat in order to pass exams” (Potter 1996, p. 31). In Pakistan, teaching relies heavily on dictation and “examinations are tests of memory” (Hoodbhoy, 1998, p. 251-252).

Perkins (1992, p. 31) questions the value of learning based on the accumulation of facts and routines. He is critical of tests which “press for fact upon fact, procedure upon procedure, emphasizing multiple-choice responding rather than thoughtful performance on complex, open-ended tasks” (p. 32). As a consequence, Perkins says, students remember knowledge when directly quizzed on it, but do not know how to use it in open-ended situations (p. 22). This is a critical deficiency when knowledge is to be applied for real-world problem solving. It puts students taught this way, along with their countries, at a competitive disadvantage.

The origins of rote learning are, however, ancient and rooted in civil practices as well as in the cultural understandings identified by Ng. In China, traditional texts of study, the ancient classics, remained the same over two thousand years of study, and success at civil service exams depended on memorizing them. “Students were not expected to interact with, give their opinions on, evaluate, or discuss the classics; they were expected only to memorise them. Even the slightest deviation in thinking from established orthodox thought was likely to result in failure” (Upton, 1989, p. 21, citing Ebrey, 1981).

In Confucian China, words from the teacher were considered “absolute truth and one did not disagree with them. To do so would be to place oneself in a position of authority over one’s teacher, which was unthinkable” (Upton, 1989, p.22). In modern China, lecture-based education has continued this teacher-centred tradition in which the learner was seen as a passive

receptacle into which knowledge is poured for safekeeping. This prevalent view of students in modern China is well illustrated in the following excerpt from a Chinese student’s description of a good student. “A Chinese student comes to the classroom to **take in** knowledge, to learn everything he doesn’t know yet. He is ready to **receive** whatever his teacher is going to offer. He will listen to the lecture carefully, **write down** everything from the blackboard [into] his notebook, and **follow** the instructor’s chain of thought... So long as he can **take in** everything, comprehension is not of primary concern. (Upton, 1989, p.21, citing Chen, 1985. Emphasis added by Upton)

Similarly, in Thailand, education remains focused on transferring academic knowledge, and on memory-based learning, rather than trying to enhance the learners’ abilities in acquiring knowledge, creativity, and problem solving skills” (Somwung and Sujiva, 2000, p. 87). As a result, Thai education performs poorly at cultivating analytical thinking, critical thinking and problem solving. The passive nature of education is reinforced in Thailand, as in China, by traditions of authority and obedience. Students, of socially lower status than teachers, are expected to be respectful, humble and avoid embarrassing their teachers according to the principle of “greng jai” (Servatamorn 1997, p. 13). “Students greng jai their teacher by not asking questions, even when they do not understand the lesson” (Hallinger and Pornkasem 2000, p. 50). Individualism or standing out from the group is frowned upon in Thai culture (p. 51), a further deterrent to speaking out in class.

In Japan, the same principle held true. McVeigh (2002, p.99) reports that:

Some students had a negative attitude toward those who answered in class: “a person who answers cannot be a nice person”; “such students are imprudent”; students who answer are being bold...” They also explained that they were very much concerned that other students might think they are showing off if they answered (or they might be embarrassed if they gave the wrong answer) (also see Johnson, 1997, p.48).

According to McVeigh (2002), Japanese students are socialised to regard knowledge only as a step towards passing examinations which are the key to getting jobs. “Knowledge is shattered into a vast number of unrelated bits and pieces useful only for filling in exam sheets, filling out forms, and proving to the authorities that one has persevered through the ordeal of ingesting large amounts of data” (p.96). Doing well in exams implies being obedient and uncritical (Yoneyama, 1999, p.146). With high-stress cramming at the school level, Japanese students, by the time they got to university, are “noted for their general passivity and apathy towards matters academic” (McVeigh, 2002, p.232).

Another study compared Indonesian and Dutch student study patterns and found that Indonesians tended to process information in a stepwise fashion, while the Dutch students used deeper learning strategies (Ajisuksmo and Vermunt, 1999, p.56-57). The authors reported that the dominant instructional practice in Indonesia was explanation, with an emphasis on rote-learning to be reproduced in examinations. Teachers are viewed as powerful know-all, responsible for

student learning. Students are seen as know-nothings who must absorb knowledge from teachers and obey them. “Students are not expected to employ their higher cognitive skills, such as relating the information to their prior knowledge, developing analytical and critical views, or relating the subject matter to their social and physical environments or daily experiences” (p. 56).

The Lack of Relevance of Education in Developing Countries

Educational systems established in many developing countries under colonial administrations were arranged to follow Western liberal arts ideals, with an emphasis on learning for learning’s sake. Designed for a social elite, often expatriate, the education system was inappropriate for the needs of the majority of the local population and for stimulating development for the nation as a whole (UNESCO, 1989, p.57).

A recent World Bank study draws attention to the “knowledge gap between the subject matter currently being taught and the knowledge and skills that are required if individuals and countries are to be competitive in the globalized world” (World Bank, 2005, p.71). The bank highlights secondary school curricula that are “profoundly abstract and alien to social and economic needs,” but which hold the key to university access and to elite professional jobs. “Abstract, fact-centred, and decontextualized narrative knowledge prevails in the secondary curriculum... The endemic irrelevance of the secondary curriculum is one of the greatest obstacles to successful expansion of secondary education via curriculum reform” (World Bank, 2005, p.77-78).

The practice of requiring students to absorb facts without recourse to context becomes of particular concern when it extends to the university level, especially if students are engaged in preparation for professional job markets. Obeyesekere (2004, p.35) gives an illustration of this problem in the field of veterinary science in Sri Lanka where teaching is heavily biased towards theory, without adequate practice-based training and little exposure to non-conventional subjects such as practice management, client handling, and finance. The ‘blackboard degree’ received by students tends to be based on a routine of content-based learning and examinations, with little time for real-world clinical skills which are essential to effective veterinary practice.

Knowledge to be taught at Asian universities is often a function of the textbooks used. Educators rarely help translate textbook learning into real-world applications. Very few of them “consider ‘education for nation development’ as the approach to take in their service” (Chalio and Pratern, 1980, p.270). Textbooks come predominantly from the West, furthermore, particularly in areas of science and technology (Ahmed, 1985). “A major difficulty of most developing countries is that while science and technological knowledge is seen as important for solving a country’s problems, such as poverty, disease and illiteracy, its importation from the industrial countries poses difficulties of adaptation and use” (Saha, 1996, p.85). In the area of infrastructure development, for example, resources available may be limited in a development setting, implying a need to adapt or completely transform idealised techniques for Western settings to local realities. Infrastructure usage patterns may be quite different also – with a greater presence of pedestrians and non-motorised vehicles on roads, for example – requiring radically different approaches to design, as well as sensitivity to both national needs and the requirements of low-income users. Students taught only Western-based theory do not acquire the skills to tackle such problems.

The inadequacies of teaching through rote memorisation and the problem of relevance are intertwined. If students are expected to memorise rather than to understand and criticise, they are unlikely to realise that the education they are receiving is irrelevant to the needs of their home countries. Students learn the contents of Western textbooks which may have little application to the problems of their own countries; they pass exams; but they are ill-prepared for the very real and difficult problems their nations must transcend if they are to move forward.

There is Strong Awareness in Asia of a Need for Educational Change

Singapore's Prime Minister Goh Chok Tong contrasted the American and Japanese education systems in a June 1997 speech (Goh, 1997). Americans, he said, were "unsurpassed in their ability to produce highly creative, entrepreneurial individuals... Employers and government in the US are, however, deeply concerned about the low average levels of literacy and numeracy among their young." In contrast, the strict, centrally-controlled Japanese curriculum with its heavy emphasis on testing students' knowledge of factual content was successful when Japan relied on basic knowledge from the West. With Japan now a world leader in many areas, however, "Japan's major employers believe its educational system will not produce the individual creativity, the originality of thought and inventiveness in basic knowledge that they need to retain their competitiveness."

Goh announced a new program for Singapore called "Thinking Schools, Learning Nation," to focus on creative thinking and learning skills. Thinking Schools "must be the crucibles for questioning and searching, within and outside the classroom", he said, emphasising the need to "get away from the idea that it is only the people at the top who should be thinking, and the job of everyone else is to do as told. Instead we want to bring about a spirit of innovation, of learning by doing, of everyone... asking how he can do his job better".

The new initiative was "designed for increased instructional flexibility and relevance. It pushed the system towards a more student-centred, active learning paradigm, with the aim of producing autonomous and independent learners" (Luke et al. 2005). In order to meet the new needs, teachers in Singapore must shift from their traditional role of disseminator. "Instead, a more facilitative and coaching role, whose main task is to provide the scaffolding of knowledge, will be necessary. This means they need to use more active teaching-learning strategies to engage students to actively process the data and to assume more responsibility for their own learning" (Ong, 1999, p.113).

The new Singapore Management University is committed to an "interactive, participative and technologically-enabled learning experience" (SMU, web undated). As its president writes, with ever-changing information and knowledge, "what to know" is facing obsolescence sooner than ever. The importance of educating students in "how to think" is therefore of increasing importance in a knowledge-economy that is constantly evolving and reinventing itself, and is reflected in SMU's "teacher-as-mentor" and "interactive learning" approaches (Hunter, web undated).

Other nations in the region have also seen a need for change. China's leadership has recognised problems with dependency on rote learning (Wan, 1985, p.24). Government agencies have encouraged the use of case study methods and launched training programs for such approaches. The Chinese Case Study Teaching Society was founded, and the journal *Case Study in Business* began operations. Returning Chinese scholars trained in the United States, furthermore, have objected to over dependence on classroom lectures and promoted independent and experiential learning, peer teaching and group learning (Hawkins, 1984; Jiang, 2005, p.234-235).

In Korea, Choon Geun Rhew of the Korean Ministry of Education has complained that traditional education "hampers a balanced development of qualities that shape a good character". With the increasing role of computers, "education will focus on the part of learning which cannot be dealt with by computer, namely high-mental processing skills and character building" (Choon, 1994, p.71).

Bangladesh has shown a commitment in its five-year plans to develop a knowledgeable and socially committed workforce by emphasising relevance in education and improving quality, especially at the higher level (Chowdhury 1997, p.6), while India has seen a similar need to move away from the traditional academic approach of a colonial past and seek a new relevancy (UNESCO, 1989, p.57).

Malaysia has introduced a “Smart Schools Program” (Elliott, 1999), while Thailand’s National Education Commission (NEC) started a major reform program in 1999. Rung Kaewdung, Secretary General of the NEC (Rung, undated web) complained of “chalk and talk” pedagogy and rote learning of “knowledge that is not relevant to the needs of the learner or the community... We do not want... machine-like human beings or a walking dictionary”.

The new Thai program was established to provide training in thinking processes and the application of knowledge for solving problems. It was designed to organise activities that would allow learners to draw from experience and would enable them to think critically. According to Buddhism, Rung writes,

learning has three purposes: learn to know oneself, learn to know the surrounding world, and learn to know the relation between oneself and the surrounding world... Buddhism perceives a human being both as an individual and as a member of society living with others... It can be said that Buddhism is the religion of human development which emphasises the learning of each individual. Thus, learning reform in Thailand is likely to be successful for the concept of learning adopted from western educators goes hand in hand with our own Buddhist concept of learning.

Practice at the Thammasat medical and dental schools, which implemented Problem-Based Learning (PBL), provides an example of reformed practice in operation in Thailand. The approach involves student-centred and collaborative problem-solving in small groups. A tutor acts as a facilitator to encourage the development of clinical reasoning skills to help students choose actions in a patient’s best interest when faced with complex diagnostic situations. The innovative approach to teaching could be introduced at Thammasat because the medical and dental schools were brand new, permitting a fresh start, although the ideas have also been partially adopted in a few other locations in Thailand (Siriwan, 2006).

There is awareness, also, by the Vietnamese government, of the need for educational reform, which was one of the reasons that Royal Melbourne Institute of Technology (RMIT) was invited to set up a campus in Ho Chi Minh City, where student-centred approaches to learning typical of an Australian university were introduced, differing markedly from the practices of local Vietnamese universities and high schools (Paris, 2006).

Evidence Suggests that Asian Students Do Not Want to be Spoon Fed

Force of habit clearly influences student behaviour. Thus, one study on Chinese students in American universities reported that “most Chinese students are completely handicapped in classes where discussion is the main mode of instruction, and few feel comfortable participating” (Upton 1989, p.25). A study of Australian academics teaching in Singapore found that while many students did well in assignments and examinations, some learned large sections of material from texts verbatim (Dunn and Wallace, 2004, p.299).

More significantly, however, that same study found that the majority of students in the Australian-taught university program in Singapore wanted interaction, with interesting face-to-face teaching sessions and real-life experiences and examples from lecturers and tutors (p.297). Another study found that, contrary to stereotype, adult Hong Kong Chinese students reported a stronger preference for high-level learning and avoidance of rote learning than Western Australian students (Watkins and Biggs, 1996, p.49).

Littlewood (2000) received 2307 responses from students studying at the secondary and tertiary level in eight East Asian countries that demonstrated that the stereotype of Asian students as “obedient listeners” did not reflect the roles they would like to adopt:

They do not see the teacher as an authority figure who should not be questioned; they do not want to sit in class passively receiving knowledge; and they are only slightly on

the ‘agreement’ side that the teacher should have a greater role than themselves in evaluating their learning. The results suggest that, if Asian students do indeed adopt the passive classroom attitudes that are often claimed, this is more likely to be a consequence of the educational contexts that have been or are now provided for them, than of any inherent dispositions of the students themselves (p.33).

Citing other studies in Hong Kong and Japan, Littlewood (2000, p.34) concluded that

Asian students do not, in fact, wish to be spoonfed with facts from an all-knowing ‘fount of knowledge’. They want to explore knowledge themselves and find their own answers. Most of all, they want to do this together with their fellow students in an atmosphere which is friendly and supportive. So too, indeed, do the European students who responded: in all of the respects mentioned above, there is much less difference between the average group responses of students in Asia and Europe than there is between the individual responses of students within the same country.

Ho and Crookall (1995) found that Hong Kong students taking part in an exercise in which they were not told what to do, but had to take initiative to plan, make decisions, debate, deal with people from other cultures, handle unpredictability, and manage time and conflict issues, rose to the challenge and took responsibility for their own learning. Kember reported on the results of a series of 90 action learning projects at Hong Kong universities, which introduced a “wide variety of innovative teaching and learning – almost anything other than didactic lecturing to passive students” (Kember, 2000, p.109). Examples of concepts tried included group projects, peer teaching and writing reflective journals as preparation for group discussions. He found that the level of support for the project from students “was greater than that from departmental colleagues and at least as great as that from department heads. This is hardly indicative of a student body resistant to innovative forms of teaching and learning” (p.110-111).

Students sometimes found the new approaches taxing “but eventually came to appreciate them... Those who formed the impression that Asian students resist innovation may not have allowed the students time to adapt. They might not have taken steps to ease the transition process” (p.111). The evidence, Kember found, was that Asian students “are perfectly capable of participating actively in their own learning” (p.117). At RMIT, Ho Chi Minh City, the student-centred emphasis “can be quite a challenge for the students, but they can and do rise to the challenge... Once the Vietnamese students do adjust, they frequently surpass our international students (Australian, Korean, Taiwanese, French, American)” (Paris 2006). In Cambodia, only a small number of students can attend the elite new private universities which are opening, but in that situation as well change is in evidence, with students encouraged to be courageous in expressing their opinions and the culture of saving face replaced with a new spirit of openness (Suon, 2006).

Facilitating a Critical Learning Approach in Asian Settings

Steps are cited in the literature that can help ease the transition from traditional to participatory and critical-thinking based education. In one study of Asian students in an English-speaking university culture, a Thai student remarked, “When I want to say something to the teacher, the body language says, “What you say is not important”, or “Asian people act very stupid”, then I don’t talk anymore” (Major, 2005, p.89). Given that fear of “loss of face” can act as an impediment, furthermore (Watson 1999), it is critical that students be taken seriously and are given the confidence to understand that they have contributions of value to make.

As Nouwen (1966, p.68) writes:

The teacher has first of all to reveal, to take away the veil covering many students’ intellectual life, and help them see that their own life experiences, their own insights and convictions, their own intuitions and formulations are worth serious attention. It is easy to impress students with books they have not read, with situations with which

they are unfamiliar. It is much more difficult to be a receiver who can help the students to distinguish carefully between the wheat and weeds in their own lives and to show the beauty of the gifts they are carrying with them...

Teachers who can detach themselves from their need to impress and control, and who can allow themselves to become receptive for the news that their students carry with them, will find that it is in receptivity that gifts become visible.

Since, as Burton et al. (1960, p.273) state, natural thinking capacities possessed by everyone need training and development, specific steps should be taken to inform students of the values of critical and participatory education, and help given in acquiring techniques for effective learning. Since, "there is nothing natural about learning a framework for analysing a modern novel or management system," analytical frameworks "must be taught explicitly and constructed consciously, beginning with simple operations and building towards complexity and subtlety" (Meyers, 1986, p.10).

Lee (1997) stresses the need for good communication on the part of the teacher – speaking clearly and presenting assignments and other information in ways that could be well understood. As Hodne (1997, p.87) suggests, care should be taken with encouraging quiet students – whether native or non-native speakers – who might be more willing to speak up if risks were minimised. One technique she recommends is to use open-ended rather than specific questions to start discussions. Littlewood (2000, p.34) found that Asian students generally liked working in groups. Advantage could be taken of cultural orientations towards group rather than individual activities by encouraging students to study and do presentations in groups of peers with whom they felt comfortable. Christensen (1987) writes that interaction can also be encouraged by arranging classroom space to provide a hospitable environment for communication: "The primary goal should be for everyone to be able to see everyone else" (p.64).

While it was not typical Asian style for teachers to encourage students with positive feedback on their performance (Hau, 1992), such encouragement can play an important role in facilitating change (Cole and Chan, 1994). "Developing a positive self-concept is crucial for creativity. This is because creativity requires the person to feel confident of himself, i.e., to have faith in his own inner resources as a person. Only then will he be able to attempt to do something that is risky and different from the rest" (Ng 2001, p.184). Nouwen (1966, p.99) calls for the teacher to be seen as a "coach, cheerleader, and source of support" rather than authority figure and taskmaster. A teacher's enthusiasm, interest, and genuine concern help create a challenging yet safe atmosphere in which students feel confident enough to let go of old ways of thinking and try out new ones".

Barriers to Implementing Critical Learning Approaches in Asian Settings

Thoughtful learning requires "settings where teachers and administrators know a lot about learning and working together and have time to learn themselves and where the management style, schedules, and forms of assessment create positive energy in everyone" (Perkins, 1992, p. 195). However, in many traditional Asian educational settings, there is little knowledge of modern educational theories amongst faculty or teachers, and the tradition of presenting the same facts in lectures year after year does not stimulate personal development amongst teachers.

As Yinger (1980, p.58) points out, "Lecturing is obviously a very comfortable mode of teaching, as witness its long tradition and continued predominance. After all, monologue is much less risky than dialogue". Teachers not used to letting go of the controlled safety of the lecture approach are unlikely to be able or willing to move to interactive approaches which encourage critical thinking in the absence of experience or training in skills necessary for successful implementation.

Underlining this point, the World Bank states that there is a:

...profound mismatch between the radically new key competencies demanded of students in the knowledge society and the teaching skills acquired from teacher training colleges and in-service training programs (World Bank, 2004a). For developing countries, designing appropriate policies for selecting and training teachers who can help students acquire the new competencies required by society and labor markets is an extraordinary challenge. The new competencies clearly require that teachers behave in classrooms in a way contrary to the training they receive...

The implementation of curriculum reform is basically a problem of in-service teacher training. And such training is difficult because of the “stickiness” (resilience) of teachers’ preexisting know-how. (World Bank, 2005, p.106-108)

The glue of the traditional is made yet more sticky when central government fails to devise appropriate strategies for implementation of new policies, as has been the case with Thailand’s new educational approaches. In Thailand, Hallinger and Pornkasem (2000, p.48) report, government had tended to regard change as an “event” to be announced, not as a process to be carefully constructed and followed through. Without support, change was on the level of teachers who politely accept orders to implement new approaches without understanding or agreeing to them, and who then fail to implement them (Sykes et. al 1997, p.4-5). The problem is exacerbated because “Thai people would rather maintain things the way they are than to take initiative, be different, or shake the ground... Even if a new practice holds potential for the organisation individuals will feel uncomfortable departing from accepted practice” (Hallinger and Pornkasem, p.52). Even at Thammasat Medical and Dental Schools, where the creation of completely new institutions in 1996 provided the opportunity to adopt student-centred approaches, it was not possible to recruit a full compliment of tutors able to engage adequately using such methods by a decade later, and this had led to frustration among the students (Siriwan, 2006).

Successful participation in interactive approaches is more personally taxing than lecturing. It calls for greater knowledge of the field and preparation on the part of the teacher in order to respond to unexpected questions from students and also to direct debate in fruitful ways. It requires overcoming the cultural hurdles inhibiting free communication identified by Ng and demands the people skills to make students feel personally encouraged and stimulated to participate creatively. Not only must teachers help students avoid “losing face” by inspiring self-confidence; they must also avoid losing face themselves by knowing what they are talking about. As Curle writes, where teachers are not of high calibre “it is advisable that much of the instruction be of a routinised and formal character”. If such teachers “had no guidelines and were expected to display the initiative and flexibility which are rightly lauded in more developed school systems, the result might well be chaotic” (Curle, 1966, p.81).

Pham and Sloper, writing about education in Vietnam, are equally pessimistic about prospects for change, stating that academic staff qualifications were too low for effective work in higher education.

Their training abroad was often related to scholarships available rather than to national needs. They are generally weak in professional areas, particularly in relation to practical knowledge. They are short of new information, have not been trained how to renew knowledge; and another set of crucial issues results from the extreme shortage of knowledge about modern educational theory and research, about teaching methodologies, and how to develop a capacity for self-learning. All of these factors hinder improvement in the professional skills and vocational interests of academic staff. (Pham and Sloper, 1995, p.104)

Ng (2006) makes the point that a pressure for schools to show they had high-scoring students, and for students to perform competitively in examinations, acted as a further barrier to change, with teachers focusing on helping students get good results, and students failing to reflect critically on

the content taught. Instead, they become “exam-smart, learning to spot what are the likely questions to appear in a coming test or exam.” Ng maintains that because of such continuing pressures, change, even in environments such as Singapore, is slow (Ng, 2006).

Active debate on bringing about change in education is nonetheless taking place in both Hong Kong and Singapore, with a growing academic literature on the subject and institutional support for change. Both environments are on a manageable scale, furthermore, which facilitates change. Singapore has the capacity to fund entirely new universities devoted to critical learning approaches in furtherance of its reform objectives. Singapore also has the government control to implement secondary level education reform to feed the universities with students receptive to such approaches.

In contrast, most developing Asian countries are a long way from initiating such moves. The tradition of rote learning is entrenched in practice and cemented by cultural norms which resist attempts at change. Teachers and faculty lack the experience, training, or motivation, furthermore, to make the leap to radically different teaching methodologies. The greater skill required in implementing these new approaches creates an additional barrier. Facilities for training teachers in the new ways do not exist, furthermore, quite apart from the global tradition of avoiding any sort of training for teachers at the university level. Governments lack the resources or institutional abilities to bring about a ready transformation. The scale of change required is daunting in countries of massive populations and lack of central government control. It is perhaps understandable when, under these circumstances, a greater emphasis is put on providing a widely available traditional education, than on promoting reform.

As encouragement to the possibility of change, however, evidence shows that, where experiments have been instituted, Asian students have preferred modern approaches that give them greater opportunities to take more responsibility for their own education as well as to think in broader and more critical ways. Given an inability to institute rapidly comprehensive reforms, such experiments, especially those conducted by Asian nationals returning from education in the West, but also by visitors from the West, promise to open eyes to the potential for change as well as to benefit the students who directly participate in the education they offer.

INTRODUCING CRITICAL URBAN TRANSPORTATION PLANNING TO ASIAN STUDENTS

Planning transportation facilities and services for developing country applications demands critical thinking. It is an area where there is no single so-called ‘right’ answer to be computed by technical means. With increasing wealth precipitating growing motor vehicle ownership, Asia’s cities suffer from congestion and pollution, which inhibit their ability to function commercially just when it is most important for their economies to grow. While the wealthy drive cars, the poor often have inadequate mobility. The public transport upon which they must depend is typically chaotic and mismanaged. Different transport modes are often poorly coordinated and transport is rarely planned in coordination with land-uses.

Transportation solutions often lead to unexpected after-effects. Building more roads encourages more traffic and can lead to more congestion, rather than mitigating it. Recognising such complexity leads to the following sorts of questions in a development setting.

1. Should roads be built, or should efforts be made to manage traffic better, and even restrain it through road and parking pricing, which neither downtown merchants who thrive on road access nor wealthy drivers are going to like?
2. Should public transport be developed, and what form should that development take? Are costly metro rail systems worth the expense, and do they serve actual patterns of needs?

3. Should we develop bus rapid transit, or is the real need to manage more effectively the existing bus system? How can we manage that system better when it is inadequately financed and without the political backing to change things?
4. Should we buy luxurious new buses that the middle classes might like but need to operate them at fares the poor cannot afford? Should we buy buses which cause pollution and are cheap, or a lower number of buses which are environmentally sound but expensive?
5. Is it useful to develop new high-tech road management systems when the police refuse to implement them?
6. What do we do about informal transport systems? Should we ban rickshaws from the streets because they impede the flow of motor traffic, or should we understand that everyone needs to go slower in order to allow affordable and non-polluting transport to survive?
7. What is the role for the private sector? Should it be regulated? Should it be invited to integrate its services with public operations?
8. How do we plan land-use in conjunction with transport? Do we try to plan for high-volume public transport arteries when we know we lack the political ability to shape development to match the new accessibility?
9. How do we deal most effectively with international agencies in order to derive the best advantage for developing countries?
10. What do we do in the face of the institutional malaise and corruption that is endemic in developing countries?

All these questions are messy. In order to be effective professionals, students have to accept that there are no textbook solutions. Instead, they must learn to synthesise a mass of variables at play to come up with paths that are promising under conditions of complexity. This might mean putting aside a costly capital project to make improvements to the basics. It could require abandoning a dream approach to traffic woes and to bring instead changes which the police would accept. It might mean reaching out to politicians to get them to change their understandings; to the public to get them to consider paying more directly for road use; and to public operators to have them learn to live with the private sector.

While students in transportation need to learn a repertoire of technical approaches, they also need to understand concepts in urban planning, economics, finance, management, politics, and, indeed, ethics, to gain the sophistication to go beyond the production of calculable solutions which may look good on paper but that leave the bigger problems untouched. Students need to have the ability to review alternative goals and outcomes broadly, to make trade-offs, and to think critically and strategically in terms of real-world opportunities and constraints.

It was to give this potential to the future Asian professionals studying at Asian International, that teaching for a two-semester sequence of courses was conceived. The experiment provided an opportunity to test whether students schooled in mostly passive learning approaches could rapidly engage student-centred learning, and do so in ways that are productive for stimulating the professionalism needed to evaluate and act on the complex transportation infrastructure problems faced in the developing world.

Cultural issues of traditional learning techniques and teacher-student relationships, and of barriers to change and means to overcoming them cited in the literature above were addressed in designing the pedagogical approach. Relationships between faculty and students at Asian International University are generally formal and based on respect for the authority of the teacher, with students regarded as 'inferiors'. A basic principle employed in this experiment was that students had valuable contributions to offer. The idea was to move away from the role of the

course instructor as the giver of knowledge by making the students directly responsible for the learning process.

Students were given regular assignment sheets, rather than lecture notes. The assignments mostly required preparing interpretations of a series of demanding readings from academic journals and other sources and applying them critically to Asian transportation issues. Especially given the tendency of Asian students to relate well to group identities, students were assigned to work in groups to formulate and deliver presentations. While an assigned group was responsible for each particular presentation, all students in the classes were, however, expected to be ready to discuss the issues raised on each assignment sheet.

When available, a conference room was used, which permitted the group to sit round a table in sight of each other and removed the spotlight from the instructor. When a regular classroom was used, my practice was to sit among the other students while those assigned stood up to make presentations. The effect was to reverse the traditional power relationship: the students giving presentations were put in the role of teachers and leaders.

While very little instructor-based lecturing took place, a detailed class plan was prepared instead for instructor use at each class meeting, outlining points and discussions which should emerge, indicating questions to use as prompts, and ensuring that learning goals were accomplished in a structured setting.

Following the recommendations of several of the authors cited above, a practice of continual positive reinforcement was employed, with the goal of never missing an opportunity to thank and praise a student for making a good point, and using good points from one student to coax ideas from others. At the same time, notes on student performance were continually typed on a laptop as students spoke, making students aware that their performance was being monitored for evaluation purposes and that they had an incentive to participate.

The detailed notes, taken during classes and at other course-related activities, supplied the data for analysis in preparation of this paper. They provided important documentation for measuring the progress and success of the teaching process in giving students the skills and self-confidence needed to move beyond memorisation to employ instead the reflective thinking skills needed to address complex development problems in transportation infrastructure. Note was particularly taken of whether students merely repeated memorised information, or questioned assumptions, tried different approaches, and marshalled concepts creatively to focus with relevance on solutions to address local needs. The progress and changes in responses of each student were tracked over time.

Students were left in no doubt of the need to complete assignments and to perform at a high level, and were engaged actively and energetically at all times, but were treated in a friendly way. I started eating in the student cafeteria, stopping to watch sports when I spotted students I knew playing, and taking a general interest in the students and their welfare in the hope of setting an egalitarian and comfortable ambience. Developing such relationships outside class was particularly appreciated, and was important in winning trust.

Public Transportation Systems

The first of two courses offered by the author in the Transportation Engineering program at Asian International was an introduction to public transportation, taught during the fall 2003 term. The objective was to introduce students to basic concepts important to planning and managing public transport, while opening them up to a critical ability to identify and evaluate alternative choices and reach judgments based on a synthesis of a series of variables at play. Instead of a 'toolbox' approach, which introduces students to a series of engineering techniques and which often dominates courses of this kind, students would be asked to recognise the complexity of the

environment in which management and planning takes place, to realise that there are alternative paths to follow and that each must be evaluated from critical and multidisciplinary perspectives.

Once the class settled down, there were 11 masters' degree candidates registered for the course and one doctoral student who audited. The students came from Bangladesh, India, Nepal, Pakistan, and Thailand. They were used to traditional Asian education, based on lecture techniques, one-way teacher-student communication, and student passivity in class. Other courses in their program at Asian International followed the traditional pattern of lecture presentations, with examinations to test memorisation of formulae and facts and their use in engineering applications, with little reference to larger contextual issues. The basis of this course in critical thinking, where nothing was to be taken for granted, and in egalitarian participation, where the students were to be seen as teachers, therefore promised a quite different experience for the students.

An initial handout told the students what the course was going to be about:

In addition to learning some practical aspects of implementing public transport systems and services, I want us to think through some of the larger issues over making choices. Too often, questions are asked in too narrow a way, and within an untested system of assumptions. I would like us to continually strive to uncover, criticise, and improve the assumptions under which so many decisions are made...

We will try, in this course, to question conventional approaches to public transport design and operation, and we will do so from perspectives of serving users — both commuters who have choices and people of low income who have no choice — of enhancing the environment, and of providing effective management and good value for money...

Assignments... focus on developing an ability to critically engage core issues, and to communicate effectively by both written and oral means. Please note that participation in class is essential and your grade will be affected by your performance in this regard. You should please read the materials I point you to, and be prepared to answer questions and join in a lively discussion in class. While this will not be required during the first few weeks, I would appreciate if those of you not familiar with Powerpoint would kindly learn to use this software over the next month.

Students were told that their contribution was important, and that we could all learn from each other. For the remainder of the first class meeting, however, a lecture was given, introducing students to the dynamic relationship between transport and other attributes of cities using Hall's *Transport – Maker and Breaker of Cities* (Hall, 1992), and by providing a historical account of development patterns in cities, along with an introduction to the main issues in planning public transport for Asian cities.

The students were also given a written assignment, due a week later. They were asked to respond to an open-ended question:

What do you see as the role of public transport in Asian cities? Why? Do you think the government should be involved? If so, how?... Please write no more than four typed double-spaced pages (please check grammar and spelling carefully before submitting), and come to class on Wednesday prepared to discuss your ideas. Please note that your grade for this assignment and for the class as a whole will include an evaluation of your professionalism in presenting ideas orally. It is an important part of preparation for leadership in the professional world to gain confidence in speaking in public, and would like to help you all do this well.

Apart from problems of plagiarism in submissions from two students, who discontinued the class, the remaining papers were mixed in their quality, providing useful diagnostic information on how

to motivate and help each student. The best paper was well-organised and articulate. I noted on one of the less satisfactory papers “listing, rather than analysis.” Many of the students had insightful contributions to make during the in-class discussion of the paper, during which a wide range of issues were put on the floor.

From this point on, assignments, of which there were a total of 11, some at a rate of twice a week, shifted to emphasise oral presentation and critical analysis. The second assignment introduced three articles to help students think about thinking. A classic article by Rittel and Webber (1973) talks about social problems as “wicked problems” as against the “tame” problems engineering or social science was designed to address (the questions about transportation near the beginning of this section reflected an attempt to confront wicked problems). The students were asked if they agreed that social problems could be characterised this way and asked to discuss the implications for planning public transportation effectively. Laski’s (1974) *Limitations of the Expert* introduced students to the shortcomings of narrow one-track thinking in planning, while *Abstract Values and Concrete Highways* by Wachs and Schofer (1969) alerted students to the perils of conducting engineering without reference to values.

These were articles which Western students would find difficult to fathom, but student presentations showed that a strong effort had been made; understanding was good; and many comments insightful. I noted on two of the students with the poorest English-language abilities “Nice Powerpoint. Explains well. Makes real effort” and “Speaks very well, takes risks, wins”.

The course now moved to applied areas, with a discussion of the basis on which people chose to travel and what this could teach us about how consumer behaviour could be changed: getting people out of cars and into public transport, for example.

A general challenge the class faced was the lack of connection with developing country issues in a literature on basic subjects coming almost entirely from the West. Students were asked whether they felt the same relationships reported in the literature held in Asian and American contexts. Did people decide how to travel on the same basis (e.g. of travel time, cost, comfort and convenience) in the different contexts, for example? Issues of relevance and context were brought up in this way throughout the term. In traditional Asian teaching, the students would have been given the answers in lectures and accompanying notes, often with little connection to Asian circumstances. In this course, students were made to understand that there was a variety of empirical evidence available which required critical analysis and interpretation, and that they had to translate Western-derived findings to a local context.

The performance of students in discussion when not assigned to give a presentation varied. Some students acclimatised quickly to the uncommon environment of free speech and had active roles. Other students, particularly those with poorer English language skills, were more reticent in volunteering remarks, with a couple of students inhibited from participating when not specifically called upon. At this stage of the course, despite students’ cooperation in presentations, there was a discomfort level among some students at the heavy interaction, an approach which meant taking risks in an unfamiliar form of communication in a second language. The structured nature of the teaching, with cues and encouragement continually provided during discussion, worked, however, increasingly to draw students to participation in the course format.

The course continued with a session that looked at the relationship between perceived costs of driving as against taking public transport and that asked students to consider if effective subsidies on car parking should be stopped, as suggested in the recommendations of Shoup (1995). A debate was set up, in which one team advocated such a policy for Bangkok, and the other opposed it. The class then got together to move from thesis and antithesis to synthesis, discussing in particular whether the cultural and political climate of Bangkok made it possible to force employers to do things such as charge employees for parking or give money to those who chose to use public transport instead.

The students worked well as teams, marshalling examples that included experience in a number of countries (one student pointed out, and then questioned, the tradition in his country of including 18 litres of gasoline in monthly management salaries) and showing evidence of interdisciplinary understanding. In addition to discussing the economic mechanisms at work, political issues were raised. One student talked of the need for public education, and of how wealthy opponents of pricing parking might be turned into supporters if told the result would be less crowded parking lots and roads. I was particularly pleased that a connection was made with the Rittel and Webber paper we had studied earlier. The article was cited to show that the problem we were facing was “wicked,” having no readily determinate answer, and that we had to talk through a range of possible actions to come up with a viable approach.

One of the students with weak English skills made a strong effort, integrating well into his team. Two other students with similar language problems caught stage fright and were off-target in their presentations. Some students without a specific assignment for this class remained passive in general discussions.

The next subject to be explored was the operational and service characteristics of alternative modes of urban transport. Strategies for improving bus operations, ranging from supervisor-controlled real-time management of existing buses to implementation of new bus rapid transit networks, were next considered, with a particular focus on how to make difficult choices under circumstances of limited resource availability.

One group of students was next asked to review Sanyal’s (1987) article on *The Make-Believe World of the Calcutta Metro-Rail*, and reflect on whether the Calcutta rail system symbolised more than transportation; on who it was built to serve, and on what the existence of the system said about the priorities of planning. Another group was asked how a system could be built that offered little to the poor, who remain in overcrowded buses, and what they felt they would do to ensure their own work was guided by ethical considerations and a desire to serve all sections of society. This discussion attracted a good deal of interest from the students.

Back to technical work, the course now moved to consider attributes of transit networks and their component parts, and approaches for surveying current market behaviour and planning for the future. An assignment was given on transit scheduling, on determining costs and economic principles for pricing, and on approaches to bus route evaluation.

By the end of term, the biggest change was apparent among the students who had started the weakest in terms of both language skills and ability to participate in course activities. These students had worked conscientiously and gained radically in self-confidence, and were giving impressive Powerpoint presentations. Some of this group remained reticent in volunteering comments during general discussions, but contributed when coaxed, and frequently showed insight in applying broader perspectives than they had encountered before.

The students with stronger English language skills not only gave strong presentations, but became increasingly active and creative contributors to discussions. They took on a ready interdisciplinarity in using ideas from one perspective to shed light on another. The change in outlook and performance over the course of the term was clear and dramatic.

Setting a final examination, required by university regulations, was problematic because some of the students lacked the English writing ability to express themselves adequately to respond to challenging questions relevant to the course (see sample questions in the appendix). The solution was to announce that oral examinations would be held for any student whose written examination was questionable. While the stronger students did well in the written examination, the level of conceptual complexity required proved beyond the English language ability of some of the others, even though all students made conscientious efforts. From detailed grades, and comments on performance in presentations for assignments and in other forms of participation collected throughout the term, it was clear that these students had greater capabilities than their writing

suggested. They were invited to explain orally what they meant in their written answers, and their grades were adjusted accordingly.

Developing Transport for Developing Countries

While the first course was underway, a second offering was prepared. Its objective was to focus critically on urban transport system development in the developing world. (Some students registered under the title “Developing Transport for Developing Countries” others under “Urban Transportation Policy and Planning,” and there were some differences in the participation, assignments and examination of the two groups). Six transportation engineering masters students continued from the first course attended, one as an auditor. A seventh, a doctoral student, participated in field-trip activities. In addition, seven masters students from the university’s management school attended, one auditing. Countries represented included Bangladesh, Cambodia, India, Nepal, Pakistan, the Philippines, Thailand, and also France and Canada.

Funds were sought for an international field trip, and these were generously granted by the Government of Singapore through the Singapore International Foundation. While a field-trip to Singapore made the centrepiece of the course, a variety of subjects were covered, with the objective of focusing on how students could develop the broad analytical and synthetic abilities needed to become effective professionals in their home countries.

The teaching principles of the first course were continued, with little lecturing by the instructor; a great deal of teaching by students who were assigned heavy reading and presentation assignments, and an atmosphere of constant structured interaction. As during the first term, some of the students who were new to the form of teaching proved shy at first, but adapted to the needs of their roles as teachers and quite clearly developed in professionalism and self-confidence as the term progressed. Most of the students returning from the course of the first term were off to a flying start, able to express themselves in critical and creative ways without inhibition.

A number of texts provided useful material on developing country transport issues, although they did not cover the nuts and bolts content required as part of the initial Public Transportation Systems course. The book on *Urban Transport, Environment and Equity* by Vasconcellos (2001) is the only one to date from a developing country native and resident, and offers a valuable critical discussion of a range of key issues. In addition, a book from Dimitriou and Banjo (1990) contains a series of pertinent readings, and was also used as a resource.

The course began with student reviews of a report commissioned by the World Business Council for Sustainable Development (2004) for an introductory discussion. Students were asked to characterise the growth of motor vehicle ownership and operation in the developing world, and its impacts on congestion, pollution, the viability of public transport, equity, employment, and land-use patterns. Next, the class read the chapter on *Urban Transport and Poverty Reduction* from a recent World Bank (2002) report, together with chapters related to the subject from Vasconcellos (2001) and White (1990). Students were asked to address a range of issues, including the impacts of motor vehicle growth on the poor; whether it was desirable to avoid subsidies for public transport and encourage a competitive marketplace, as recommended by the World Bank; and problems of mobility for women, children and the disabled.

This discussion sparked disagreement among the students as they learned painfully that there were no simple solutions. One student raised the issue that in Asia disabled people were usually “kept at home,” and was then asked, “Should that be the case?” This led students to both uncertainty and introspection.

Students were next asked to compare and contrast the perceptions of issues in transport planning by engineers, economists, other social scientists, physical planners and politicians as presented by Dimitriou (1990a), and to consider whether there were ways to bring these together. Dimitriou did

not include perceptions of public groups in his discussion, and students were asked whether and how public views should enter into the planning processes.

Considerable time was devoted to a critical evaluation of traditional engineering approaches to urban transportation planning. Stopher and Meyburg (1975) describe the “transportation planning process” as a succession of seven technical steps, at the core of which are a series of forecasts to estimate the future demand for transportation and determine the relative attractiveness of alternative means of travel. The premise of this analysis is that “the demand for travel is repetitive and predictable, and that future transportation systems should be designed to meet a specific, predicted travel demand” (p. 60). The benefits, seen in terms of passengers likely to use alternative systems, can be compared to estimated costs, and the most effective plan supposedly identified.

The engineering students in the group had learned the basic mechanical skills for doing such analysis, but would not normally have acquired a detailed knowledge of the assumptions underlying the tools in use, much less the policy and ethical issues surrounding their application. The students learned that the engineering approach to planning is flawed because there is no such thing as an “accurate” forecast. Forecasts depend upon a series of assumptions, which must be chosen subjectively: about how the population will grow; where people will choose to travel; and about how they will make travel choices. Optimistic assumption choices have led to overestimating ridership and to underestimating their costs, as has been demonstrated by the failure of major transportation projects around the world to meet promised potential (see Richmond, 1998, 2001b; Kain, 1990; Flyvbjerg et. al, 2003; Flyvbjerg et. al, 2006). In one of the few lectures of the course, students were given a presentation of Richmond (2005), Chapter 4, which provides a comprehensive account of engineering modeling in use, illustrating the build-up in error as each new stage of computation is reached.

Students were assigned chapters by Vasconcellos (2001, Ch. 9) and Dimitriou (1990b). Dimitriou also presents a comprehensive treatment of the subject in Dimitriou (1992). These authors discuss issues which make the use of the traditional engineering approach to transportation planning inapplicable to developing country contexts. Students were asked to consider whether it was appropriate to forecast demand for transport based on a decision on whether or not to drive a car when a large share of the population had no such choice. They were invited to consider the equity issues of evaluating transport projects according to ability to save travel time based on wage rates, when the value of time saved by the poor counted for very little (because their earnings were low), with the approach focusing planning on the needs of wealthier car owners.

The class read two articles by Wachs (1985, 1986) on the ethics of forecasting, and discussion branched out into ethics in general, with students showing an ability to see the ethical dilemmas in issues they would not have identified or thought of as ethical beforehand. After the discussion had been underway some time, one student looked at me and asked: “And what is my obligation to be ethical after I have had to pay to purchase my job,” which he said was the normal practice in his country. For once, I was silenced. After a pause, I could only bounce the question back: could the student feel justified in paying a bribe to get a job on the basis that he would be ethical once in the position? Perhaps, more than anything else in this course, this issue showed the need to bring to the surface issues rarely discussed, and subject them to a difficult and messy critical discussion.

The final general topic was on the role of the informal sector, using a variety of readings such as Hilling (1996, pp.205-228), Hook and Replogle (1996), and Simon (1996, pp.115-125) to prepare students to discuss who used informal transport (which included cycle and motor rickshaws and tuk-tuks and vans and minibuses operated by private entrepreneurs) and the importance of such services in the developing world; Gallagher (1992) to consider whether rickshaws should be controlled or promoted in urban environments; and Richmond (2001a) and de Soto (1989, Ch. 4) to compare and contrast the roles of private van and minibus operations in New York and Miami

and in Lima, Peru, and ask whether transport planning should be left in the hands of the government or given to local community operators and cooperatives.

Students with experience from the previous term's participatory teaching were active in discussion, with the exception of one of the quieter students, who took part, but remained a bit apprehensive. The new students became increasingly active, with the exception of one of the Western students who failed to cooperate in expected preparation and participation and who ultimately failed the course. The other Western students were more used to a participatory format, and did well. They did not, however, eclipse Asian students who became increasingly self-confident and active; who frequently applied materials from readings to contexts in their home countries; and who also presented illustrations from their own countries to extend arguments presented in readings and to draw new insights upon which other students could build, and from which their teacher could also learn.

THE SINGAPORE FIELD TRIP

A field trip to Singapore proved the most important element in cementing the students' ability to analyse complex planning and policy issues, interact professionally, and express themselves with self-confidence.

Singapore was an ideal choice for a field trip in the area of transport planning for developing countries. The Singapore government has brought about a transformation in the transport systems it inherited from its colonial past. Not only were road and public transport systems planned together, with pricing controls on car ownership and use accompanying improvements in public transport, but Singapore planned for those systems in coordination with the needs of land-use, housing, and economic development.

Unlike most developing countries, Singapore has been able to act with a powerful as well as integrated government, whose parts have been able to work together to achieve a striking degree of change in the urban environment. Another characteristic of Singapore that sets it apart from most of developing Asia is the degree of integrity in government: corruption is effectively outlawed in Singapore, and clean as well as authoritarian government had removed many of the obstacles that get in the way of progress in many of the nations represented by the students on the field trip. Despite its oft-perceived authoritarianism and central control, Singapore government is also built on principles of meritocracy, in which contributions to discussion were assessed more on their theoretical and practical value than on the rank of the person advocating a position. This is in marked contrast to the status-driven civil services of most other Asian countries. Input from junior levels will not always be followed; however, ideas will be heard and considered.

The visit included four days in Singapore: two days of intensive meetings, followed by a day of visits to housing developments and the conduct of a questionnaire survey on transport issues. The final day was free for the students to spend at leisure until the group met at the airport to return to Bangkok.

Students were required to complete extensive preparation in order to participate in the visit and one student was excluded from the group for failure to comply. All students, whether registered or auditing, were required to complete all assignments, including oral presentations and written papers to be prepared upon return.

Students were assigned a variety of documents to read, including *A World Class Land Transport System*, (Land Transport Authority, 1996), a white paper that set forth the policy principles of change; Cervero's (1998) chapter on *The Master Planned Transit Metropolis: Singapore*; a case-study on *Singapore's Public Transport* (Phang and Walder, 1999); and a series of articles on car restraint, including Goh (2002), Foo (2000), Phang, Wong and Chia (1996), Toh (1994) and Willoughby (2001). A substantial collection of documents and articles on Singapore was also put on reserve in the library.

Students were asked to review the readings in a series of initial assignments and to respond to a further four-page assignment sheet that laid out questions and issues for students to review and address critically while in Singapore. Topics included the relationship of the Singapore Government with the public; the nature of planning processes; the roles of private and public sectors; public management systems; public transport operation, regulation, and performance; evaluation of the new Northeast MRT rail transit line; public transport information systems; the impacts of Singapore's policies that made vehicle purchase expensive and directly priced road use; the relationship of public to individual costs and benefits; and the connections between land use, housing and transport systems in planning and management.

As part of preparation, the Singapore Ambassador to Bangkok visited Asian International, gave a talk and participated in discussions in class and at a dinner buffet reception hosted by the Asian International University president afterwards. At another session, students practised coming up with on-target questions to ask in Singapore.

This intensive preparation paid off in the maturity and professionalism shown by the 14 students during discussions with Singapore officials during the March 17-21, 2004 visit. Presentation and discussion events took place at the Land Transport Authority, the Public Transport Council, the SBS Transit rail and bus operating company, the Urban Redevelopment Authority, and the Housing Development Board. In this way, students could observe how different elements of planning and management were integrated. Our hosts, the Singapore International Foundation, also kindly entertained the group at a lunch.

We met managers and planners at a range of levels. Moving from one organisation to another, the students came to understand how the different parts of the Singapore Government came to work together. A presentation by a human resources official additionally demonstrated how employees could be more open and productive and governance more effective when freed from the tyranny of corruption. One young planner was clearly nervous making a presentation under the watchful eye of his boss, but ultimately did an excellent job, from which the students learned that risks had to be taken, and that Singapore presented a safe environment in which to take professional risks likely to contribute to learning.

The two days of meetings were marked by openness and freedom of discussion. The wide range of officials and planners we met were mostly highly receptive to questions. Some of the students were more active than others, but every one of the students was involved in discussions, and quite a few intensely so and without the traditional Asian inhibitions based on deference to authority. It was thrilling to see the students ask pertinent questions and get responses as professionals and equals. Except for a degree of evasiveness encountered at one meeting where officials were unusually reserved, criticism was answered with honesty, and the students were asked to put forward changes to existing policies they thought appropriate. In perhaps the most telling moment, one student asked the several Land Transport Authority officials present to state whether they set an example by coming to work by public transport. It turned out that most of the officials drove to work, and there was a slight pause after going round the table to collect this series of admissions.

Some of the Singaporeans looked quite exhausted after the barrage they received and, in feedback, expressed their surprise at the activity level of the students.

On the morning of the third day, the group toured a number of public housing projects by public transport, studying links between land-use and transportation on the ground. In the afternoon, the students conducted a survey about transportation use and attitudes at a neighbourhood shopping centre.

Back in Thailand, students wrote papers and gave oral presentations. While, in a few cases, there was still a tendency to list facts rather than to provide analysis, many students showed freedom of expression and insight. Critical questions were raised about a number of Singaporean practices,

including public transport development, regulation and management, and vehicle and road use taxation. We also discussed the extent to which Singaporean approaches would be appropriate in the students' home countries. The quality of oral expression was notably high and, as in the first term, showed a marked improvement in self-confidence compared to performance at the start of term. The sole disappointment came with two instances of plagiarisation in written work.

The students were asked to complete evaluations of the Singapore exercise, the results to be compiled anonymously and kept confidential until after final course grading. All 14 students expressed enthusiasm (see Appendix B for sample remarks).

As the final field-related event, the Singapore Ambassador to Bangkok invited the group, together with the Asian International University president, to dinner at the embassy residence. The Ambassador and his wife were extraordinary hosts, and laid on a lavish banquet providing for every dietary requirement of the ethnically and religiously-diverse group. It was a therapeutic conclusion to the course for the students to be treated as high-status guests, and they responded with grace. The ambassador, his wife, and his staff, made the group feel at ease, and the atmosphere was relaxed, with easy communication.

At the conclusion of the dinner, the ambassador had everyone gather around a large table and asked the students to give him advice on transportation policy for Singapore. The students shared many perceptive observations. This was a fitting conclusion to an experiment in giving a voice to students steeped in passive education. The students were treated as professionals. They recognised that they had value to contribute with their analysis, and they had the self-confidence to consider critically the facts and make recommendations.

As I watched the students exercise their newfound confidence at the Singapore Embassy dinner, I realised that it was a nonsense to think that they had in some way been "Westernised." They had been liberated from inhibitions and found a path to expressing themselves intellectually and socially, an ability that is fundamental to all humanity, which is a key to leadership and to the functioning of nations and societies.

DISCUSSION AND CONCLUSION

An experiment in bringing participation and critical analysis to professional education in Asia brought about a transformation in the behaviour of a group of graduate students from a diverse set of countries. The literature pointed to a long tradition of rote learning and passivity in Asian education, and demonstrated that it was rooted in social customs, which put the teacher in a position of authority as the 'giver of knowledge', and the student as the obedient recipient of this 'gift'.

Evidence of experience in settings such as Hong Kong and Singapore suggests, however, that Asian students do not wish to be spoon fed, and this finding is supported by the results of the teaching reported here. The students on the two-course sequence were transformed into 'teachers,' required to read and interpret materials and present them to the class for critical debate.

Whereas voluntary participation took longer to get going, with the weight of tradition keeping some of the students reticent during general discussions, those responsible for making assigned presentations were put in a position of authority by the nature of their assignment, as well as by their place at the front of the class and in control of the Powerpoint. They rose to the challenge surprisingly quickly. Most notably, the weaker students were the ones who made most visible improvements in the conduct of their presentations and in their self-confidence. The best students acquired strong critical skills and an ability to interpret complex information with multidisciplinary approaches. Some students developed critical abilities to a rather lesser extent, but all became participatory and aware of the range of questions which had to be asked to be effective professionals working in a complex environment where there was no 'right' engineering

approach to apply in the face of limited resources, conflicting goals, and managerial and political dissonance.

While the intensive, structured and disciplined nature of the educational experience, with frequent demanding assignments and continual assessment of performance, did impose stress on the students, the use of positive feedback constantly to praise good points made by students was important in maintaining enthusiasm and morale. During fast-paced class activity, ideas from one student would be put to another student, with responses coaxed with smiles, encouragement, and enthusiasm. The approach to facilitating discussions was more structured than would be typical in a Western setting, and this played a significant role in keeping students on track. Taking a personal interest in the students outside of class was important in replacing a metaphor of master and servant with one of family.

With time, public speaking became more natural to the students, and they gained a sense of the power of their own intellects and enjoyment from making contributions that they knew were of value. The field trip to Singapore and dinner at the ambassador's residence in Bangkok cemented the students' understanding that knowledge was not passive and that they had an active role to play in interpretation and recommendation, and that with such behaviour they had the power to bring about creative change. In this way, the makings of professionalism and leadership were formed. The experiment was therefore successful beyond expectations.

While Asian International has a number of excellent programs and faculty, some of whom use interactive teaching to at least some extent, the predominant educational mode at the university reflects the traditional Asian norm of passivity. Widespread discussions with students around campus indicated a high level of dissatisfaction with this approach, and a will to embrace change. The highest levels of university administration were also supportive of innovative change and of the approaches taken in the experiment described here. Hostility emerged, however, at the level of department leadership, where the success of an alternative approach and its popularity with students was seen as a threat. The flow of negativity sent a message to other faculty to stay in step.

There are limits to the inferences to be drawn from this study for a number of reasons. Education was given at the graduate level to students who generally had high abilities. Student-centred education for those of lower aptitude could be substantially harder to pursue successfully. There were no fixed syllabus or examination requirements to follow, furthermore, allowing student assessment to be designed to evaluate reflective, creative, and synthetic skills. Where such flexibility is not possible, change will be harder to introduce. Finally, the instructor had a broad interdisciplinary background, specific interests in educational theories, and a willingness to devote substantially more time and effort to both preparation and intricate stage management than typical teachers.

The barriers to change cited in the literature review are likely to be hard to circumvent in the absence of central and substantial intervention. Asian university teachers are generally not trained or experienced in interactive teaching, which requires a higher level of confidence in the program area being taught as well as greater people skills than lecturing. Culturally, they are used to being cast in the role of 'superior', with the student as 'inferior', and that is hard to change. Change can therefore often seem threatening.

While the leadership in many Asian countries has recognised the need for educational reform, this is most likely to be achieved in controlled environments such as Singapore and Hong Kong. Change is much harder to realise in other Asian settings, given their larger-scale educational apparatus, the inertia of tradition, and the lack of resources for reform, or mechanisms to bring it about. In this climate, experiments along the lines of the one conducted here are likely to be especially important, when they can be instituted by Asian nationals returning from education in the West; by those few graduates who have experienced such approaches in Asia; or by Western

visitors. It would be valuable for such further efforts to be documented in the research literature given the paucity of detailed accounts of attempts at change. The recent World Bank (2005) study represents an important call to more relevant education at the school level, but the international community needs to focus more resources on bringing change to developing country universities to help them initiate programs capable of producing mature professionals.

In the end, it is questionable whether existing differences between educational traditions in the East and West can be most usefully characterised as 'cultural'. The West has had many long dark ages where dogma has been enforced upon a populace. While advances have been made in educational techniques, especially at the graduate school level, passive and narrow learning still remains common in the West, even if it is in the process of being displaced by more modern approaches (see Richmond 1990 reprinted as Richmond 1995 for a discussion of reforming transportation teaching in the West).

It may, instead, be more helpful to look for universal themes on a human level. When students can be woken to their intellectual potential and allowed to take pleasure in their own creativity, they can choose a path of thoughtful learning whether in the East or the West. When teachers can be taught to let go of the need for authority and control, and participate in the educational enterprise as colleagues and friends of the students, change can happen in either context. It is essential for this to happen if Asia is to produce professionals capable of leading their nations to advances in development and prosperity.

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APPENDIX A: SAMPLE FINAL EXAMINATION QUESTIONS**1. Public Transportation Systems**

- A. Define price elasticity of demand, fixed costs, and marginal costs. Discuss alternative cost-based approaches to pricing transit, including the use of price discrimination (e.g. off-peak fares, travelcards, family fares) to attract additional ridership. Should we base pricing primarily on costs, or also consider environmental and equity policy issues? Would you keep the different aircon and non-aircon bus services/fares in Bangkok? Explain. Would you change the way Skytrain is priced? Why? Consider both ridership and revenue/subsidy implications for both examples.
- B. Discuss the results achieved with bus rapid transit in Curitiba. Compare the potential for improving service by the use of bus rapid transit and rail rapid transit in major developing Asian cities, including a discussion of the differing attributes of rail and bus services. What are the differences in likely costs and benefits, and which groups are most likely to benefit from each type of improvement? Describe how choices might be made under circumstances of limited resource availability. Include a discussion of equity considerations.

2. Developing Transport for Developing Countries/Urban Transportation Planning and Policy

- A. Assess the reliability of UTP 4-step model analysis in a developing country context, focusing on issues of the adequacy of UTP in accounting for actual travel patterns, representing demand relationships, and having available appropriate data. Does modelling as practiced consider the full range of travel opportunities and alternatives for the future? Are the travel priorities and patterns of the poor represented and what is the equity impact on the resource allocations that follows from such modelling? What has been the role of Western ideas and consultants in promoting the use of UTP? When would you justify or oppose the use of UTP in developing country situations, and what alternative approaches to decision-making might you suggest?
- B. Evaluate the performance of road pricing as against vehicle quota system approaches in Singapore from the perspectives of congestion control, economic efficiency (hint: describe the reasons for marginal cost pricing), and social equity. Would you keep both systems in place as at present or develop and/or discontinue either or both of them? How and why? What have you learned from the experience of Singapore about the potential for applying pricing and/or quota restrictions in other countries of the region?

APPENDIX B: SAMPLE COMMENTS FROM SINGAPORE FIELD TRIP EVALUATIONS

On Singapore government and planning I learned that a country with good governance could bring all the people together to attain a cause and can very well succeed even at times of crisis... Transportation planning integrated with housing and development is innovative... It's necessary to have an integrated approach... Singapore transportation planning system is comprehensive and complete in all respects. But there should be more public participation and hearings before carrying out any major transportation project...

On management approaches They are key, even more important than building or planning new facilities... Good coordination among different agencies leads to good outputs and can make things real... in most developing countries, there is no lack of

expertise or “brains,” but what lacks is good management to execute the plans and techniques devised by them.

On meetings with officials It gave us a valuable lesson in professionalism and we were taken into account... They have answered all our queries without hesitation and made us thoroughly understand how they work and make all things possible... We were there to get answers, not just to say “yes” to everything or just memorize... Gave us insights and ideas that can be useful in our countries... The Singaporean professionals inspired me to become more professional and tactful wherever I plan to work... They were a mix of very honest and open to a bit uptight and insecure-natured.

Summing up The assignments given after the visits required our ability to observe and give comments on Singapore and how we can achieve such systems back in our developing countries... This was the highlight of our course... [Asian International] course are usually too much theoretical. This course gives us the opportunity to apply our knowledge in practice. Very valuable... Real course with practical knowledge that brings discussion and deep reflection.

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