TES Special Issue

Learning by Knowledge Networking Across Cultures:

The Experience of Joint Courses in Environmental Studies for Malaysian and Danish Engineering and Science Students

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Abstract: Engineers and planners working in trans-national production and aid project interventions in Third World countries must be able to 're-invent' technological systems across cultures and plan and build the capacities of their counterparts.

A series of joint courses on cleaner production (CP) and environmental impact assessment (EIA) in Malaysia 1998-2003 has sought to address these needs for new competences. Differences in educational background and the work culture of the participants have presented difficulties during these courses, in particular in terms of achieving a mixed team building to turn some of the obstacles into resources for knowledge sharing. However, students have stressed their positive experience of cross-cultural communication.

While a joint course of three week duration by itself may involve only limited cross-cultural learning, serving primarily as an introduction to a long-term field study, the course efficiently initiates the involvement of the students into, and their interaction with, the socio-political and cultural context of the host country. Thus, learning across cultures requires a longer term process whereby mixed teams leave the classroom, collect data together in the field, negotiate and agree on the analysis, and sustain the exchange of knowledge, possibly through virtual peer-to-peer networking.

Keywords: Field courses, cross-cultural, environmental studies, problem-based learning.

1. Introduction

As part of the Danish University Consortium for Environment and Development, Industry & Urban Areas (DUCED, I&UA) Project, a series of joint courses on cleaner production (CP) and environmental impact assessment (EIA) was conducted in Malaysia 1998-2003 in cooperation with the Malaysian University Consortium for Environment & Development, Industry & Urban Areas (MUCED, I&UA).

DUCED and MUCED, I&UA received financial support from The Danish Co-operation for Environment and Development, Ministry of Environment and Energy (DANCED); support was given to similar university consortia in Thailand and South Africa. In December 2001, DANCED was absorbed into the Danish International Development Assistance, Ministry of Foreign Affairs (DANIDA) due to a change of government. The project ended in 2004.

The overall objective of the initial Danish university consortium project was to increase the capacity and competence of the Danish education and research resource base for the Danish Environmental Assistance in DANCED target cooperation countries. Its main components were a) curriculum development in environmental studies at Master's level, including the development of new course modules and upgrading of existing modules; b) staff exchange, including joint development of case studies for course materials and co-teaching c) student exchange, including joint courses; and d) the formation of cross-consortia research networks on environmental problems of mutual interest. Key priorities were the promotion of inter-disciplinary perspectives in environmental studies and problem-based learning.

2. 'Scan Globally - Reinvent Locally'

Since colonial times, Danish engineers have worked overseas in infrastructure development, construction, and production. A number of examples can be found: The building of railways in Siam was one of such early efforts. In Dutch East India, Danish engineers were extensively involved in construction and sugar refining. The technology for producing cement has been transferred to numerous facilities. Also the development of telecommunication e.g., in China and Japan,

came about with the assistance of Danish engineers. During the post-war period, Danish consultancies and suppliers obtained major contracts with government funded technical cooperation projects in the newly independent, developing countries.

Reviewing the experience of early technology transfer, a recent UNDP report (Fukuda Parr et al. 2002) has summarized the adverse impact of development pursued through displacement. It advocates an alternative paradigm giving the central role to capacity development in the host country at three levels by:

- Enabling individuals to embark on a continuous process of learning building on existing knowledge and skills;
- Seeking out existing institutions, however nascent, and encouraging these to grow - building on their current capacities;
- Strengthening capacities in the society as a whole, e.g. by creating opportunities to enable trained people to use and expand their skills instead of joining the brain-drain.

Rather than providing a foreign blueprint, this paradigm implies that knowledge acquisition and institutional innovations for capacity building are initiated as a process of development as pursued by transformation. The commitment and ownership of the agency in the host country is in the central focus, as available knowledge and technologies are sought, selected, analysed, modified, disassembled and recombined to fit local needs: 'Scan globally - reinvent locally'!

Targeting middle-income countries, DANCED emphasised capacity building rather than supply of equipment. The concept of capacity building was initially defined simply as a departure from conventional training schemes for human resource development. In a more elaborate version (DANCED 2000), the agency drew a distinction between developing the capacity of a recipient organisation and institutional capacities, i.e. external stakeholders and their interrelationships providing the context of operation for the particular organisation. In adopting these concepts of capacity building, project planners and project staff in a DANCED project are challenged to implement an extensive participatory approach, which can produce a thorough and precise analysis of the key stakeholders.

3. Competences in Capacity Development

In 1996, DANCED commissioned an analysis of the Danish resource base of the advisory component for its environmental aid projects (Danmarks Teknologiske Institut 1996). The report identified three areas of competences:

- 1. Technical-professional qualifications, including relevant education with a sufficiently broad scope to address environmental problems;
- 'Soft' competences, including team-building and management, process-oriented, inter-sector working methods, intercultural communication and understanding, and popular participation;
- 3. Knowledge about language and culture of the host country.

The report concludes that 'soft' competences needs to be given a much higher priority in the educational development of the Danish resource base, while the technical-professional competences should not be downgraded but more precisely targeted.

The Director of DANCED, Mogens Dyhr Nielsen, further specified the requirements for key expatriate personnel in DANCED projects during a DANIDA/DANCED workshop on Capacity Development in Environment (CDE) in 1998 (Dyhr-Nielsen 1998):

The *Chief Project Facilitator* (CPF) is the counterpart to the Project Director of the implementing agency and acts as head of the international support team through the entire project period. Key qualifications may include:

- Generalist level experience related to the technical issues of the project.
- Ability to identify limited key priority issues
- Ability to facilitate and moderate stakeholder interests
- Pedagogical communication abilities
- Negotiation and conflict resolution experience
- Cultural and social sensibility.

The *medium term CDE staff* are the actual "workers" and they should be attached to the project at least for 6-12 months and work under the coaching leadership of the CPF on concept development issues, establishment of demonstrations, on-the-job training, coaching of counterparts, etc. As this staff

work under the day-to-day supervision of the CPF, it may be possible to accept a relatively limited overseas work experience. This staff component may also provide direct on-the-job training opportunities to junior staff. Key qualifications may include:

- Issue-level technical experience on the particular activity
- Creativity combined with pragmatism
- Ability to coach and to allow local counterparts to solve problems at the expense of output quality
- Ability to listen and respond positively and constructively
- Cultural and social sensibility.

In addition, the *short-term trouble-shooters* should be called in on request if specific specialist needs in terms of technical skills arise. The duration may be from three to six weeks. However, often use of local expertise may be more relevant and cost-efficient than calling in international experts.

A shortage of personnel with a "softer" skills profile pointed to the need of expanding the Danish resource base. This need formed a basic rationale for supporting Danish university consortia to upgrade their Master's programmes in environmental studies.

4. The Concept of Joint Courses

The joint courses were developed as a new core component available to Master's students attending the DUCED universities. Initially, they were inspired by the experience of field stations established by natural science departments, and accordingly termed 'field courses'. Bringing Danish students to the working context of expatriate facilitators, the courses would respond to the need for 'soft' competences of Danish resource base.

Participating in a joint course often led to a midterm or Master's thesis project based on a case study of a DANCED supported capacity development, which includes a longer period of field study. As such, joint courses may serve to motivate and initiate Danish students' learning of 'soft' competences, which in the context of a larger study will be enhanced targeting the solution of specific environmental problems and integrating capacity building methodologies.

This original objective remains. However, the joint courses held in Thailand, Malaysia, South Africa and Botswana, with fifty-fifty participation of host and visiting students, had additional aims. Apart from being a mechanism for introducing an intercultural dimension to education for both students and tutors of the consortia, the courses were envisaged as a means of introducing improved teaching techniques, inter-disciplinary and problem-oriented approaches. Today, students within various disciplines from Denmark (this includes students from various nationalities studying in Denmark) work together with students from Thailand, Malaysia, South Africa, or Botswana. The courses are open for Master's students who are aiming at a Certificate as Intensively Trained Master in Environmental Studies. For DUCED students, this involves a field study of minimum three months duration (DUCED, I&UA 2003). Subsequently, further objectives have been specified:

- Joint courses should be integrated into the DUCED Certificate Program as well as into the Master's programs of the partner consortia in order to support the curriculum development in all consortia.
- The partner consortia should be able to conduct joint courses as a long term, sustainable, activity after the project period.
- In terms of content, the course topics should focus on those environmental issues, which are given priority in the DANCED country programs. The aim is to position them as a third 'column' of capacity next to the government and the private sector, and followed by non-governmental organizations (NGOs). The consortia research networks are the main resource in this effort.
- As joint courses become part of the Master's programs of the partner consortia, they can also be offered as specialized, continued education for professionals in industry, the private sector, government, NGOs and DANCED supported projects.

The DANCED/DANIDA funding of the university consortia came to an end in 2004. However, the Erasmus Mundus Master's Programme may provide alternative funding options for the joint courses. In Denmark, DANIDA has established a scholarship facility for Master's thesis projects including long-term field studies related to DANIDA interventions.

5. Planning for Cross-Cultural Learning

The topic of the most recent joint course conducted in Malaysia in January 2003 was 'Environmental Impact Assessment (EIA) and Public Participation'. During the planning, the following course objectives were defined:

- To develop an understanding of conditions, methods, processes and outcome of stakeholders' involvement in planning and policy-making related to the Environment Impact Assessment of a particular development project
- To study cases of recent EIA studies conducted in Malaysia, in particular with regard to the methodologies adopted
- To exchange experiences on environmental regulation and environmental awareness in relation to the policy cultures of Malaysia, Denmark and other countries
- To provide a forum of inter-cultural dialogue between Malaysian and Danish Master's students exploring, among other things, approaches to study, life on campus and improvement of the environment.

The theme of the course provides an illustrative example on perspectives and problems in utilizing European experiences in an Asian context. Denmark has a long tradition of public participation in environmental policy and a decade of experience with public participation in EIA, whereas the experience with public participation in environmental policy and EIA in the Malaysian context is rather limited (Stærdahl et al. 2003). Thus, focusing on public participation EIA in Malaysia provides an opportunity to consider whether more public participation would be beneficial in the Malaysian context, and how it could be integrated into the existing institutions taking the Malaysian cultural and political tradition and present situation into account. For the Malaysian students it provides a good case for considering whether foreign experiences are useful and how. For the European students it provides a good case for reinventing European experiences in the Malaysian context.

The course consists of two parts: a one week lecture program in class – broken up by a few field excursions - and a two week study in the field by mixed MUCED-DUCED groups, each focusing on one selected case study. Each group will work with the original EIA

documentation on e.g. the construction of a highway, a dam, a railway or an incinerator. The group will visit the site, interview people affected by the particular project, experts and other stakeholders. While a DUCED supervisor contributes to research design and methodology, the MUCED supervisor, who in most cases was directly involved in the EIA study, will assist the group in interpreting their findings.

The course was concluded with a full day evaluation seminar, as the written report of each group is presented and discussed during a one hour session. Planning the lecture program was done through email exchanges between the Danish and Malaysian organizers. From the Danish point of view, one key problem was to ensure relevance and coherence, as Malaysian guest lectures are scheduled in the program. Their inclusion is made by recommendation, and seldom based on a previous, joint experience. The preparation of case studies for the group work the key component in facilitating Problem-Based-Learning (PBL) – has met several challenges, as the organizers have struggled to clarify problem focus, availability of documents, and supervision arrangements through e-mail exchanges.

During the first week of the course, team building exercises and group formation were initiated. Those DUCED participants, for whom the joint course was the first phase in a long term field study, had already formed groups. However, during the course they were expected to split up and join the mixed groups. These groups might have doubts about the benefit of splitting up and pursuing case study topics, which do not directly contribute to their long term field project. This scepticism and hesitation about their 'counterparts' tended to wear off, as they started to mingle and participate in the intercultural games during the first week, which concluded with a joint social excursion.

6. The Students' Evaluation of the Course

Evaluations were conducted twice during the course. Upon completion of the plenary programme after the first week the students were asked to rate around 20 different aspects of the course ranging from relevance of the objectives of the course programme to quality of quality of food and accommodation. On a scale from 1 to 5 the average score was 3.4 (between 'satisfactory' and 'very satisfactory'). One of the highest

scores was on relevance of the objectives scoring 4 ('very satisfactory') and the lowest was the rating of the accommodation scoring 2.4 (between 'fairly satisfactory' and 'satisfactory'). Overall, the MUCED students were slightly more satisfied than the DUCED students (a difference on 0.4). At end of the course, the students were asked once again to evaluate the course. They were asked to rate some aspects of the outcome of the course (table 1) and in a number of open questions asked about how the course could be improved and what had been especially beneficial for them.

Table 1 shows that the in terms of improving the students understanding of public participation and EIA in Malaysia the course scored quite high with 4 ('Yes, quite a lot'). When it comes to learning new methods and concepts (question 2)) the MUCED participants scored higher than the DUCED students, whereas both groups found that they had become better at communicating across cultures (question 4).

The students were also asked open-ended questions about the course. One of the questions was "Please indicate what have been the most positive elements or benefits from the course?" 26 statements were made in response to this question. The statements were categorised after content in three categories: 'cross-cultural experience', 'public participation, EIA and environment' and finally 'others'. Some of the statements contain several elements, thus altogether 31 categorisations were made. 15 elements were categorised as being related to cross cultural experience. For example one of the MUCED students answered "Meet new people, new experience. Get to know Danish kind of work" and one of the DUCED students answered "Learn about the Malaysian culture and work with people from another culture". Eight elements were categorised as related to public participation, EIA and environment, for example one of the MUCED students answered "Exposure to public participation in EIA report", and eight elements answers were in relation to other issues for example "encouragement to speak more in English and to voice out openly".

The most striking thing about the evaluations is the importance the students ascribe to the cross-cultural experience. The students find the objectives of the course relevant, and they find that the objectives have been reached. But when they are asked to formulate

Table 1: Course participants' rating of the three weeks joint course

| | All | MUCED | DUCED |
|---|-----|-------|-------|
| Has the course given you a better understanding of community participation in environmental policy in Malaysia? | 4,0 | 4,0 | 4,0 |
| 2. Have you learned new concepts and methods? | 3,3 | 3,8 | 2,9 |
| 3). Overall, did the course meet your expectations? | 3,5 | 3,7 | 3,3 |
| 4) Do you think you have become better in communicating across cultures? | 3,7 | 3,8 | 3,6 |

The scale is from 1 to five (5 is 'Yes, very much' and 1 is 'No, not at all'). N is 27, 13 MUCED students and 14 DUCED students.

in their own words what has been most beneficial for them, a huge number of the students emphasise the experience of working in a cross-cultural setting.

7. The Success and Limitations of Joint Courses

In 1996, Walker, Bridges and Chan reported on their experiment to introduce PBL at the Chinese University of Hong Kong that the first tension they met was the notion among Chinese students that the teacher is the "wise person", or the giver of wisdom. PBL is the antithesis: learning must be discovered by the participants. The social values of group work interaction presented another challenge. Conflict avoidance, reliance on high status third parties to resolve conflicts, culturally sanctioned deference to group members with high status, inhibited the discussions on definition of the focal problem. There was a feeling of "being lost at sea". Nonetheless, the group work process was completed and at the time of presentation the groups all appeared confident and proud of their achievement. Walker and his colleagues asked the question: Would PBL produce a similar learning process and outcome in a non-Western culture as reported in the West? Their study did not offer a full answer.

The experiences from the group work during MUCED-DUCED joint courses are in many ways similar to those achieved at the Chinese University of Hong Kong. We cannot claim a more definite result. However, we will try to elaborate Walker's question and offer some suggestions for developing cross-cultural learning programs.

The statements made by the long term DUCED

students during the course evaluation placed positive emphasis on the brief overview of the Malaysian economy, culture and politics and the effective introduction to useful contacts. They feel that the intercultural experience and the logistic support have saved time and trouble and given them a push forward in the right direction in their field work. Looking at the combined feedback, there is no doubt that participants and organizers have gained valuable experiences in cross-cultural communication.

Also, the DUCED students have experienced that attitudes toward and procedures in relation to environmental problems can be rather different from those they were familiar with from their home country. The MUCED students for their part have become acquainted with theories, methods and practices attached to critical environmental research, which beside the introduction to specific planning tools might have raised their environmental consciousness.

Assessing the joint course experience, we need a concept of learning, which differs from a functionalist view of simple acquisition of knowledge transmitted by others. While this notion may apply to the collection of factual information prior to going into the field, it is definitely inadequate in capturing the learning process as a new context and its problems are encountered and being interpreted.

Rather, a dialectical view of learning as the combined assimilation and transformation (Rasmussen 1998), by which new learning is built on existing knowledge, is relevant. In a layer between the known and unknown, new knowledge is related to something, with which the students are already familiar. They differentiate, generalize, use analogies, and break away from what

they already know, in the effort to come to terms with a new environment of experiences. Working in the field, the exposure induces learning, which goes beyond what most of the formal lecture program is able to convey.

The concept of situated learning introduced by Lave and Wenger (applied by Ribeiro et al.(2002) in their discussion on field work) places emphasis on the context dependency of learning. The learner moves from legitimate peripheral to full participation in a community of practitioners. Crossing cultures in this process adds to the complexity and challenge. "Culture shock" refers to the phenomenon of loosing orientation, as a person's scheme of interpretation becomes obsolete in a foreign environment.

For some DUCED students, it was a shock to discover that Malaysian civil servants deliberately try to hide facts and critical issues. The students may be used to reluctant or non-informative answers from public authorities. However, the outright cover up of what they felt should be transparent as a matter of public interest definitely did shake them. In this example, the DUCED students may have acquired extensive knowledge about Malaysian economy, society and culture. However, it was only the encounter with a particular practice that triggered their reflections about the implications of a different socio-political regime.

The DUCED students have to interact simultaneously with a range of different contexts including:

- The national cultures of everyday life
- Stakeholder representatives in public authorities, the private sector, and in community-based organizations, each having different objectives, interests and resources
- The university institution and its staff and students (adapted from Ribeiro et al.)

In each of these encounters they are challenged to rethink their original perceptions. To what extent does this process develop into inter-cultural learning, whereby original notions are transcended, the initial amazement is substituted by a penetration of the new context, and schemes of interpretation are re-invented? In our opinion, this depends upon the guidance and clues, which the MUCED students and staff can provide.

Another example illustrates this point. Towards the end of the joint course in January 2003, DUCED staff raised the question: Are the ways we are handling the problems in the West the only and the most efficient way of handling them in a Malay context. In Denmark, students traditionally develop a critical attitude to the environment discussing both the environment and technological innovations. The MUCED students are most often proud of their country's technological innovations, and consider that environmental problems should be solved via co-operation between the actors in the field. They do not see the confrontational attitude as the most efficient. It does not fit in to the traditional conflict solving culture; hence it can counteract positive dialogue. On the other hand, Danish experience shows that environmental planning is an issue embedded in contrasting interests, and prioritizing between the environment and economy is not only a technical issue but also a highly political one.

To move beyond this contradiction, extensive dialoguing between MUCED and DUCED staff and students is needed. The DUCED "side" tends to interpret the non-confrontational approach as a lack of understanding of underlying conflicting interests. MUCED on its part may be taken aback by the lack of sensitivity and rudeness displayed by their DUCED counterparts.

The students interact extensively as they live together on campus and work in the mixed groups. Does this involve a process of enculturation facilitating intercultural learning beyond the initial "shock", whereby concepts and theoretical framework are being shared? At this point, our claim is that the exposure facilitates an inter-cultural training experience which initiates the involvement of DUCED students into the sociopolitical and cultural context. As such, it serves as an introduction to their long-term field study.

MUCED staff has repeatedly requested that joint courses should be conducted in Denmark - as an alternative to the conventional consortia student exchange program. They argue that MUCED students will benefit from exposure to the Danish atmosphere and work ethics, i.e. if a structured study program has been prepared, the objective of which is more than just learning a new technique. Thus, there is a shared interest between both parties to take further steps towards inter-cultural learning.

We feel that the bonding among the mixed group of students, their social involvement in the issues being studied, and the reunion activities - which they organised on their own initiative after the conclusion of the joint course, provide a key driving force, from which the dynamics in a vision of inter-cultural knowledge networking may be drawn.

8. Inter-Cultural Knowledge Networking

So far, the definition of course topic, the lecture programming and the focusing the case studies are being prepared by the staff at the initiative of DUCED. The first step in a vision for inter-cultural learning program would be an early formulation of the key problems to be addressed in the case studies for group work. This should be developed as a truly joint effort, which would reflect current concerns and issues in both countries, allowing comparative perspectives to be included. Jointly identifying the case study problems could also reveal differences in teaching approach, mode of supervision and grading practices. A second step would be a particular effort to try to 'synchronize' the problem areas addressed in the longer term projects being planned or conducted by the participating students from both MUCED and DUCED. The third step would be the joint course itself, now placing emphasis on bringing the students on a par in terms of theoretical framework and methodological approach, as contributions from MUCED and DUCED are presented and discussed. The shared problem areas and exchange of analytical procedures could allow a fourth step: a continuation of joint field work after the conclusion of the joint course, as MUCED and DUCED students engage in long term projects in mixed groups. Obviously, a number of practicalities have to be overcome in terms of timing, resources and credit transfer.

To strengthen the component of peer-to-peer learning in the students' interaction, which runs through the whole process, we suggest to develop a continued, decentralized networking facility. This would serve as the basic and transparent format for student and staff activities from initial contact, throughout the planning and implementation stages, to the resulting knowledge networking. The networking in face-to-face relations and in a virtual format must be fully integrated to support each other. The vision includes long-term networking after the participants have graduated e.g. business projects, PhD research

collaboration, and profession-based sharing of knowledge and experience.

9. Conclusion

We have presented the origin and experiences of a series of joint courses. It has been the aim of these courses to depart from the traditional conception of knowledge transfer implying that developed countries should 'teach' the developing countries how to do things in the right way. Of course, Denmark has a long experience with environmental problems and planning which is relevant to hand on to new industrialised countries such as Malaysia, which within a few years will face serious environmental problems unless a proactive environmental planning concept is implemented. However, knowledge sharing is the overall objective of the joint courses. If a common understanding should be constructed, and the Danish participants should not return with the prejudice that 'the Malaysians must learn to do it in the right way', it is of decisive importance the opportunities to develop courses of long duration both for Danish students in Malaysia and Malaysian students in Denmark are maintained. In this way, the valuable experiences gained will not be lost but further developed.

Joint courses in Denmark for Malaysian students have yet to be conducted. The Erasmus Mundus Master's programme may provide a framework for such initiatives. Only mutual exposure, learning and social interaction makes the vision of long term peer-to-peer networking meaningful. Thus, in Denmark, innovations to the conventional student exchange programs are needed.

We have asked the question: Are East and West learning from each other or are we only learning to communicate with each other? The first answer is that we might have missed much if we had not tried. The second answer is: While a joint course of three week duration by itself may involve only limited cross-cultural learning, serving primarily as an introduction to a long-term field study, the course efficiently initiates the involvement of the students into and their interaction with the socio-political and cultural context of the host country. Thus, learning across cultures requires a longer term process whereby mixed teams leave the class room, collect data together in the field, negotiate and agree on

the analysis, and sustain the exchange of knowledge, possibly through virtual peer-to-peer networking. And the third and final answer is that these critical self-reflections need to be carried forward in a long-term, sustained co-operation between supervisors from the different countries exploring the options for technology enhanced, peer-to-peer learning networks so that conventional course delivery may in the long term be effectively replaced.

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