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Language use and understanding in a multilingual and interdisciplinary teaching and learning context

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Preface

I would like to thank the participants in this study, as well as those who were kind enough to read the manuscript, contributing to this report with valuable comments and insight. Financial support for the study was provided by Learning Lund, Lund University.

Content

Abstract	4
Introduction	4
Internationalisation in higher education in Sweden today	4
Earlier research	6
Internationalisation and intercultural dimensions	6
English-medium instruction	8
Importance of prior knowledge – the gap does not close with time.....	10
Design and method	13
Aim	13
Design	13
Dialogue format	15
Analysis	16
Findings	17
Variation in examples discussed.....	17
Developments in individual reasoning	18
<i>Level of generality, local or national examples</i>	18
<i>Textbook explanations or local circumstances</i>	19
<i>Relating personally to ideas: values and emotions</i>	21
<i>Shifting between global theories and local understanding</i>	22
<i>Including knowledge from outside the academic context</i>	24
<i>New insights</i>	25
Relationships between questions and treatment of subject matter	27

<i>Reactions to the initial question</i>	27
<i>Paraphrase and translation</i>	28
<i>Explaining differences</i>	31
<i>Relating to personal experience</i>	33
<i>Linguistic context versus geographical context</i>	34
Learning approaches	35
<i>Surface learning and reproduction</i>	35
<i>Good communication skills</i>	36
<i>Awareness of communication issues</i>	36
<i>Limited linguistic awareness</i>	37
<i>Vagueness and experimenting new ideas</i>	37
<i>Problems relating personal and academic knowledge</i>	38
Other aspects to studying on an international programme.....	38
<i>Inequalities in position</i>	38
<i>Inequalities in learning</i>	39
Discussion	40
Simplified registers and issues of context	40
<i>Discussing an unfamiliar phenomenon</i>	40
<i>Context provided in a stylised manner</i>	41
<i>Interdisciplinary learning situations</i>	42
<i>Intercultural learning situations</i>	42
Footnotes	44
Literature	46
References	46
Further reading	52

Table 1: Mother tongue and language of participants' prior studies..... 14

Being multilingual implies a capacity to see things from different perspectives, to put yourself in somebody else's place and to express one's ideas in different terms.

(Figel 2006a)

We all evolved here, we all came different, from different parts of the world, and we evolved, ... much stronger people, yeah. Language is a way of ... evolving also, I guess.

(international student)

Abstract

The present study was undertaken in the frame of the research programme Language Use and Individual Learning at the Department of Education at Lund University, using the intentional-expressive dialogue format developed within this programme. The dialogue format was adjusted to study language use and understanding in a multilingual and interdisciplinary higher education context, by including questions relating to the students' mother tongue and home countries. 15 international students on an interdisciplinary programme for sustainable development studies were asked in individual sessions how they believed major flooding could be prevented. The study aimed to investigate how certain aspects of language use affected the students' responses, when answering a question related to this environmental issue. The diversity in students' linguistic and disciplinary backgrounds was reflected in the wide range of variation of examples and perspectives found in their suggestions for preventive action, and in different ways of responding to the questions in the dialogue. Findings also show that, when asked how they would express it in their mother tongue, most of the students included new elements in their explanations, or changed the manner in which they approached the topic, compared to their first explanation in English.

Introduction

Internationalisation in higher education in Sweden today

Higher education in Sweden is today rapidly developing in the direction of increased internationalisation (Högskoleverket 2008:7 R ; NAHE 2003), concurrently with an anticipated possibility of introducing fees for international students¹. Mobility represents an essential part of the Lisbon Agenda, and is expected to make a major contribution to developing a European Higher Education Area. The European Commission has formulated the ambition to double the proportion of graduates with mobility experience². Nevertheless, despite clear policy aims, numerous obstacles to student mobility remain, and the percentage of students in Europe studying abroad remains relatively low³.

Students studying abroad will in most cases be studying in a foreign language, and the language of instruction is therefore an important issue in internationalisation. The European Union has a clear policy in favour of plurilingualism and diversity. The Council of Europe has, for instance, set a goal that encourages all Europeans to know two languages other than their own (Breidbach 2003). In the European Commission's public consultation on multilingualism 14 September – 15 November 2007 (p. 10) it is stressed that:

People must learn that there is not only one language, one culture, one truth and one point of view.

In a similar vein, Figel (2006a), Member of the European Commission responsible for Education, Training, Culture and Youth, maintains that:

Respect for diversity is a key element of creativity and innovation, and is central for solidarity and mutual understanding.

The *mother tongue* of the respondents in the Commission's consultation on multilingualism included 57 different languages. From these, the three biggest were *Italian (24%), French (13%)* and *German (9%)*. A significant percentage (10%) of the respondents declared their mother tongue to be other than one of the 23 official languages of the EU (European Commission 2007a, p. 6). Nevertheless, this diversity is not reflected in higher education, where English is dominant as *lingua franca*.

In Sweden, internationalisation involves, among other things, a rapidly growing number of modules and programmes taught in English, and that are offered to both Swedish and international students⁴. But changing the language of instruction has certain consequences for the quality and type of learning that is afforded. Non-native speakers have problems with both comprehension and production, which ultimately impacts their learning (Airey 2006; Klaassen 2001). Internationalisation also entails more heterogeneous student groups, and a greater diversity in prior knowledge and disciplinary background (Börjesson 2005; Carroll & Ryan 2005; Gunnarsson & Öhman 1997; Van Leeuwen & Wilkinson 2003; Wilkinson 2004).

The dominance of English as language of instruction not only tends to disadvantage non-native speakers, but influences the content and structures of knowledge production (cf. ; Alexander 2002; Ammon 2001; De Vita & Case 2003; Gunnarsson 2001a; Höglin 2002). The underlying assumption that subject matter is essentially the 'same' and universally valid can be challenged. Furthermore, even in the natural sciences, medicine or engineering, subject knowledge may not always be easily transferred across national borders and applied in other societies or contexts of professional practice. This latter aspect will be further discussed in the present study.

It thus appears that internationalisation and changing the medium of instruction fundamentally changes many of the basic conditions for teaching and learning in higher education. Simply applying existing approaches to teaching and learning is insufficient, and more diversified research on learning in multilingual and interdisciplinary contexts is urgently needed.

In the following, a number of strands of research with relevance to internationalisation and English-medium instruction are briefly presented, as a background to the present study. A short description is then given of the study's design and aim. Here, focus is no longer on the wider context of internationalisation and language policy, but rather on how individual students on an international programme deal with subject matter in English and their mother tongue. Findings are summarised, and certain of the implications relevant for teaching international programmes are discussed.

Earlier research

Internationalisation and intercultural dimensions

The learning situation that is constituted when students conduct academic studies in a language which is not their own has been considered from a variety of perspectives. What is known as the *internationalisation* of higher education not only deals with student learning, but includes choice and framing of subject matter, developing intercultural sensitivity and competencies, adapting organisational structures, exchange of teaching and research staff, cooperation between universities, the recognition of qualifications and licences to practice, joint research projects and publication of research, as well as transfer of know how (for an overview, see Caruana & Spurling 2007). In this context, the ensuing need for a ‘curriculum approach’ to internationalisation has been stressed (Barnett & Coate 2005).

The experience of international students, in particular exchange students, has been regularly documented and evaluated. Georgiou (2007) examines the impact of international studies on identity, and observes that the learning experience is strongly influenced by culture, status, linguistic proficiency, expectations and the financial situation of the international student (see also Wilkinson 1998).

Students’ expectations, motivation and intention with their studies vary (Caudery, Petersen & Shaw 2008; Sherry, Bhat, Beaver & Ling 2004), which will affect both which aspects are focused during their studies, and how much energy students are prepared to invest. Are they primarily concerned with learning core subject matter, or with the prestige of the academic institution and adding the period abroad to their CV? Do they wish to enlarge their horizons, meet students from other countries, or just improve their language skills? Do they have opportunities to ‘catch up’ and remedy problems with the subject matter later? What is the cost of failure, and which alternative options do students have?

Caudery, Petersen & Shaw (2007) observe that the four main objectives of students studying abroad under the Erasmus scheme have been found to be: learning a culture or personal development by means of such learning, improved knowledge of a foreign language, academic learning, and professional enhancement (see also Figel 2006a and b; Maiworm 2001). Neither content nor language learning were the highest priority.

Phenomenographical studies of learning in higher education have highlighted the importance of ‘intentional objects of learning’, which are the result of the way awareness is directed towards the world, and are distinguished against a particular background. Students’ specific intentions in the learning situation are a crucial element for learning outcomes. If learning is defined as a change in the relationship between a learner and the world (Marton & Booth 1997), it is not sufficient to see a particular course as a given entity regardless of context. The learning situation will depend, not only on the course itself, but on the previous experience and intentions learners bring with them, and how they relate to the course. With respect to international programmes, a further consideration is that positions that students occupy in

their home countries and abroad differ socially speaking, and as a consequence, the mere fact that international programmes address students who find themselves in a different position will affect learning outcomes.

However, many of the evaluations of student mobility programmes are carried out with a view to justifying expenses and administrative practices, and have little to say about learning or qualitative issues in the learning experience. Evaluations tend to focus student satisfaction, or practical organisational and legal issues, such as the mutual recognition of qualifications (see also European Commission 2007b: *National trends in the Bologna Process*). While several organisations advocate mobility and internationalisation in higher education⁵, current trends in this area are also linked to structural pressures that may be subject to discussion. The dominance of English has been criticised, and De Vita and Case (2003) point to the risks in offering a mono-cultural model of internationalisation.

It is also important to look at how the particular language used relates to the subject matter. Language is not simply a neutral ‘medium’ for universally valid subject matter: it contextualises a topic, and inserts it into a specific culture. Among other things, the language will change the conversational and conceptual frame in which a given topic is discussed. When using a national language, the centre of perspective will be national. But when using English lingua franca, this changes to international, or even ‘anglo-centric’, where US/UK conditions, values and societies define the ‘norm’ (for a detailed discussion in an Indian context, see Dash 2009). Implicit values and assumptions concerning social structures may differ considerably.

Other strands of research focus the *intercultural dimension* of both content and learning situation on international courses⁶. Internationalisation is informed by differing academic and organisational climates and cultures (Becher & Trowler 2002; Frost & Jean 2000; Peterson & Spencer 1990). Woods (2007) also considers disciplines to form distinct cultures, and *interdisciplinarity* is therefore seen as a particular form of intercultural communication. Woods combines focus on subject matter understanding with issues of language competence.

International students are *bearers of alternative knowledge, perspectives and life experiences* (Carroll & Ryan, 2005, p. 9). Besides their language skills, various types of students will bring their expectations and individual resources with them into the classroom, including diverse values, levels and areas of prior knowledge, differing personal and academic experience, or varying professional ambitions, as well as representing diversity in study routines and attitudes.

At the same time, diversity in student backgrounds constitutes a challenge to constructing deep understanding of subject matter in the sciences. On the one hand, the students lack a shared frame of reference allowing them to situate new subject matter, and discuss concrete applications or examples based in personal experience. On the other hand, teachers generally lack the knowledge or resources needed to meet students ‘where they are’. Differences in prior knowledge, frames of reference and modes of reasoning mean that very little can be

taken for granted. Basic notions and assumptions would need to be discussed from a variety of angles, and exemplified, but syllabi seldom offer the time needed for such groundwork. Ultimately, also, more heterogeneous backgrounds implies that students need extensive skills in directing their own learning (Candy 1989). They need the ability to identify and remedy their gaps in knowledge on their own, with a minimum of support from the learning environment.

Besides the question of cultural and disciplinary background, other issues also need to be considered: Do the students occupy the same position with respect to the language of instruction? What is the relative status of the different languages, and their speakers? The position that the students' native language occupies compared to the language of instruction, will clearly affect the learning experience (Alexander 2002; Dash 2009; Georgiou 2007). Teachers are another important factor, since they will respond in diverse manners to the challenges of heterogeneous classrooms, and to the difficulties inherent in teaching complex subject matter using simplified registers with limited verbal resources (Vinke 1995).

English-medium instruction

Although the issue of quality of learning in foreign-language mediated instruction in higher education has not received much attention until quite recently, a certain amount of research has nevertheless been conducted, where the question has been to see if students learn subject matter just as well in a foreign language, or not. Different aspects have been studied, such as listening comprehension, note-taking, and recall of subject matter (see for instance Airey 2006; Coleman 2006; Carroll-Boegh 2005; Gangaram Panday, Beijer & Hajer 2007; Hellekjaer & Westergaard 2003; Klaassen 2001; Soltau 2007; Söderlundh 2004; Wilson 2002; Wächter & Maiworm 2008; Yip, Tsang & Cheung 2003).

The sciences present specific conditions, compared to other types of subject matter. Macrea (1997) suggests that learning in a second language has less impact on technical subjects, as the numerical nature of the content makes it more accessible than subjects dependent on verbal description. However, relying heavily on mathematical expression does not prevent inadequate understanding of the notions the signs are intended to express. While an adequate interpretation of *mathematical representation* is a particularly important aspect of foreign language medium science education (Airey & Linder 2006), it needs to be coupled with a sufficient grasp of the actual phenomena represented (Erduran & Jimenez-Aleixandre 2009; Erduran & Villamanan 2009; von Aufschnaiter, Erduran, Osborne & Simon 2008).

In studies of English-medium physics courses in Sweden (Airey 2006, 2009), it appeared that when taught in English, the students asked and answered fewer questions. They reported being less able to follow the lectures and take notes at the same time. Students adapted to being taught in English by; asking questions after the lecture, no longer taking notes in class, reading sections of work before class or using the lecture for mechanical note taking. Students initially focused the mathematical nature of equations, while the physics conceptualisation and real world meaning was absent.

Studies of English-medium taught engineering courses in the Netherlands (Klaassen 2001) suggest that students are focused on the word and sentence level comprehension, rather than developing understanding of subject matter. Additionally, Klaassen's findings indicate that not only is deep understanding hampered, but scores for reproductive aspects of learning also decrease in connection with the foreign language of instruction. It further appeared that subject-specific prior knowledge influenced surface and deep learning results significantly. Effective lecturing behaviour influenced students' perceived understanding, but did not appear in learning results. Students with a higher language confidence generally showed comparatively more deep learning strategies, but these did not always lead to deep learning outcomes. Finally, although surface learning question results were no longer noticeably influenced (after a certain period of adjustment), deep learning question results were significantly and adversely influenced by the language of instruction. In other studies of English-medium instruction followed and given by non-native speakers, it was found that lecturers need more time to prepare lectures and their performance suffers (Vinke, 1995).

In a survey of English-medium programmes at Nordic colleges and universities, Hellekjær & Westergaard (2003) observed that despite individual variation, a considerable percentage of students had problems. These involved lecture comprehension, reading, taking part in discussions, making oral presentations, and writing in general as well as for examinations. Furthermore, the extent of these problems increased markedly when the number of programmes expanded beyond well-established Master programmes for limited numbers of foreign students, to include undergraduate level courses and domestic students. Hellekjær & Westergaard (2003, p. 77) argue:

It is probable that the undergraduate programs in the Scandinavian countries [compared to masters level programs] have less academically advanced students taught in larger groups. In these programs, when considered separately, the attested language problems are no longer insignificant. This is an important finding that institutions should be aware of when expansion of programs taught in English is planned.

Hellekjaer (2005) reports that according to test scores of the senior upper secondary school respondents from the General Studies branch in Norway, two thirds would not manage the level required for admission to universities in English speaking countries. Likewise, test and self assessment scores of university level respondents indicated that reading problems persisted in higher education, with between 30 and 40 percent of the respondents experiencing difficulties. These findings also have implications for Sweden, since levels of English proficiency have been found to be very similar among the Scandinavian countries⁷ (Bonnet 2004). With respect to international courses hosting foreign students, although Masters level students certainly represent a select elite, even very high language score requirements hardly ensure sufficient skills, and very few universities can afford to make their entrance requirements prohibitive.

Cummins (2000) has long drawn attention to the considerable gap between language skills needed to communicate fluently, and those required to study advanced academic subject matter. To address learning problems that may ensue, Cummins has particularly stressed the importance of a sufficient grasp of basic notions, and also suggests contextualising knowledge to promote understanding when language proficiency is insufficient (Cummins & Swain 1986).

A basic problem with research investigating academic achievement in foreign-language mediated courses is that in several respects, these types of courses are not comparable to regular courses in the students' native language. Hellekjaer & Westergaard (2003) have drawn attention to the differences between undergraduate and Master level students and the selection that occurs (see discussion above). Also, it would not be possible to simply extrapolate results from courses where students have the specific motivation to learn in a foreign medium, as in Klaassen's study (2001), to situations where they have no other option.

Ultimately, however, learning objectives for foreign-language mediated courses, as well as aspects such as grading criteria, will very much depend on how the course is conceived by decision-makers. If, for instance, on an English-medium course the students are assumed to already 'know' the subject matter, learning problems will tend to be attributed to 'poor language'. At the other extreme, native speakers are assumed to 'know' the language, and problems will instead be seen as 'poor knowledge', rather than insufficient literacy (cf. Airey 2006; Gangaram Panday, Beijer & Hajer 2007; Hellekjaer & Westergaard 2003). In certain cases, very approximate English lingua franca skills may be considered sufficient, while in others, awarding academic qualifications will correspond to the level of proficiency that is actually required to function professionally in English-speaking contexts.

We therefore need to consider the objective of a given programme: is it above all educational and inclusive (i.e. to teach national and/or international students subject matter in an optimal manner)? Or is it seen by decision-makers as a means to *select* a minority who may achieve both adequate subject knowledge and a level of proficiency in English that allows them to function alongside native English speakers? Does the academic institution see it as its responsibility to provide necessary resources to achieve learning goals, or does this responsibility lie with the student?

Importance of prior knowledge – the gap does not close with time

Earlier research suggests that prior knowledge is particularly important on foreign-language medium courses (see Klaassen 2001). One aspect of this issue is that if students have misconceptions to start with, these do not clear up over time. Instead, the gap between high achievers and low achievers tends to grow. When knowledge is merely approximate, the student may search for additional information to gain more precision, while the students who are really lost tend to remain so. This type of learning problems has been observed and

discussed with respect to secondary schools (see for instance Lim Falk 2008; Yip et al. 2003), since failure to complete secondary education is seen as a problem. In higher education, it may be more difficult to identify students' motives for changing the direction of their studies, leaving university or not pursuing a particular programme.

The fact that the proportion of students with a poor command of English is higher in upper secondary school than at university (cf. Hellekjaer 2005) suggests that English language proficiency may be an important factor determining which secondary pupils are able or willing to carry on their studies to tertiary levels. Many programmes include sufficient command of English as an entry requirement. An additional selection based on command of English seems to occur between undergraduate and Master levels (Hellekjaer & Westergaard 2003).

Although widespread throughout Europe today⁸, Content and Language Integrated Learning (CLIL) is in many respects still in its infancy, and often uses conventional second language teaching pedagogies, rather than considering issues of content. Krashen's Input Hypothesis (Krashen 1985) stipulates that 'comprehensible input' is needed for language acquisition. This means that in order to learn a new language, the student should first understand the main gist of what is being said, in order to match 'known content' to 'unknown verbal forms of expression'. In its most extreme form, Krashen's hypothesis has been criticised, and it has also been argued that learners also need a certain measure of uncertainty, to constantly restructure their growing language and correct earlier misconceptions. Nevertheless, there is an intrinsic problem with acquiring new vocabulary in a domain where the student lacks enough previous disciplinary knowledge to 'fill in the blanks', or make educated guesses about aspects that remain unclear.

Also, in language studies, the objective is to achieve automatic reproduction. Systematic opportunities are provided in second language studies for the learner to verify interlanguage hypotheses, correct mistakes, and progressively achieve a better approximation of the target language. By contrast, in the study of other types of subject matter, the aim may be to achieve awareness and understanding, rather than automatised reproduction. Systematic opportunities may not be afforded to revise earlier misconceptions. Experience from second language teaching pedagogy can therefore not be directly applied in a CLIL programme. Attempting CLIL pedagogy on international courses where students have widely differing linguistic and disciplinary backgrounds poses an additional challenge.

On the other hand, when content is focused, issues of language tend to be left to separate remedial programmes, such as Language for Special Purposes, academic writing courses, and transitional or study skills classes. Without knowledge of the subject matter, language teachers will not see where the central learning problems lie. In either case, integration between language and content is lacking.

Experiences from efforts to promote bilingualism in countries with several national languages show that to achieve a functioning bilingualism, considerable resources are required from an early age. Long years of study and practice are needed to reach sufficient levels of literacy

and proficiency (Cummins 2000), as well as to develop the skills to function in multilingual environments and translate between languages (Presas 2000). However, for specific disciplinary areas, a certain degree of “bilingual scientific literacy” may be achieved in a shorter period of time (Airey 2009).

It remains that academic studies in a foreign language undoubtedly require skills that go beyond those targeted in traditional L2 teaching. When investigating foreign-language mediated courses in higher education, it is therefore essential to see these courses against the background of the entire education system, and society more generally. Have the students followed a bilingual or English-medium programme already at secondary level? To what extent is multilingualism part of their daily life?

Even when students do pass exams successfully, and attain the formal learning goals, their actual grasp of subject matter may not be satisfactory. As seen above, there is reason to believe that the language of instruction affects the manner in which students learn (Airey 2006). If the language of instruction makes it difficult to understand the meaning, a tendency towards surface learning and reproduction may result (Klaassen 2001). This has serious implications, particularly at a time when structural pressures encourage both universities and students to adopt a ‘minimalist’ approach. Imitating procedures, replicating formulae or repeating wording is in many instances all that is needed to pass exams.

While surface-oriented methods of assessment reflect students’ ability to replicate current knowledge and procedures, they may not give much information concerning students’ understanding or potential to live and work in rapidly changing societies. This involves capacities that go beyond any predefined set of tasks and contexts. Without understanding, it is difficult to recognise and flexibly apply the relevant parts of a previously learned procedure for solving novel problems (Gott, Parker Hall, Pokomy, Dibble & Glaser 1993). And although it is widely assumed that specialised or generic skills and knowledge acquired through education will eventually be transferable, exercising transfer and learning how to creatively apply knowledge to new contexts may not be a central part of training (Barnett & Coate 2005).

By contrast, learner autonomy and self-directed learning (Boekharts 1997; Candy 1989), involving extended study skills to manage the learner’s own learning processes and a deeper understanding of subject matter, form a more solid basis for transfer learning, lifelong learning, and future professional development. In recent years, the potential of inquiry-based learning has been explored (see for instance Verbaan 2008). In multilingual learning environments, students additionally need skills for coping with the specific problems this form of studies entails.

Design and method

Aim

The present study investigates one of the challenges on a multidisciplinary and international programme: the ways language conversationally and conceptually frames a topic, in relation to the question which is asked. How is the subject matter contextualised by the particular language which is used or considered? How does language affect the disciplinary or geographical aspects discussed? Developments which take place in individual dialogues are analysed as a function of the questions in the intentional-expressive dialogue format. Certain issues of linguistic awareness are discussed. Finally, certain other salient features of the students' experience are described

Design

The present study uses an intentional-expressive approach (Anderberg 2000, 2003; Anderberg, Svensson, Alvegård & Johansson 2008; Svensson, Anderberg, Alvegård & Johansson 2006), which aims to explore the function of language use and how conceptions are expressed, seen from the learner's perspective. Learning is viewed relationally, as the way a learner approaches a phenomenon (Marton & Booth 1997), while language use is seen as individual and contextually situated. Variation in the way expressions are used is therefore considered to be a central aspect of the learning process, as well as the meanings expressions are given by the learner in relation to specific knowledge content.

The study is based on a dialogue with international Master students concerning the prevention of major flooding, and aims to investigate how the language that is used in the dialogue relates to the conceptions of subject matter that are expressed, and to which extent the discussion is contextualised by the language. The process and development that occurs in the course of the conversation is explored in the reflections of the individual students. The dialogue format used in this study was originally developed by Anderberg (2003) and Anderberg et al. (2008). It has been used in the other studies in the research programme *Language Use and Individual Learning* at the Department of Education at Lund University (Alvegård & Anderberg 2006; Dash 2009; Åkerblom 2008), to investigate the relationship between language and thought in knowledge formation. The dialogue format aims at directing the student's attention, both towards the knowledge content, and towards the linguistic expression, to stimulate reflection on the function of language use. However, in the present study, the format was expanded to also include questions relating to the student's mother tongue and native country (see questions **p. 15** below).

Dialogues were conducted in English with 15 students, aged 22 – 32, coming from a number of different countries (7 East and West-Europe, 2 Asia, 1 Africa, 2 Australia/New Zealand, 3 South and North America). The students had been studying on an interdisciplinary English-medium Master programme in environmental studies offered at a Swedish university. Five male and 10 female students participated. Participating students had different types of linguistic background (see Table 1). One group (5 students) had English as their mother tongue, coming from a wide range of English-speaking countries. A second group were

bilingual, largely educated in English, but with other local or regional languages as mother tongue. One student was bilingual, with English mother tongue, but educated in French, The main group were non-native English speakers. Several students had prior experience of English-medium academic courses, and/or studying foreign languages abroad.

<i>Mother tongue:</i>	<i>English</i>	<i>Other languages</i>
Prior education in English	G, I, M, N	C, H, L
Bilingual education (F/E)	E	
Prior education in mother tongue (other than English)		A, B, D, F, J, K; L,O

Table 1: Mother tongue and language of participants' prior studies

At the time of the study, a total of 35 students were studying on the Master programme in environmental studies. All had been invited by e-mail to participate in the study. 16 students responded to the invitation, but it turned out to be impossible to find a convenient time to meet one of them, so only 15 students participated in the study. Individual dialogues were conducted by the author in the students' own seminar room and other nearby university premises within a period of ten days. The material was transcribed according to Linell's (1994) level III. Special attention was devoted to pauses and hesitation.

The issue of preventing of major flooding was used for the original question, to benefit from an earlier study using the same question (Anderberg 2003), and because preventive environmental strategies involving the causes and impact of flooding can be discussed against a variety of geographic and disciplinary contexts. Drawing on Scott and Gough (2003) and Lundberg (2005), Johansson (2008) remarks that analysing global environmental problems and principals in different local contexts can give rise to a variety of views. The understanding of environmental issues is also intimately linked to culture, world view and values (Callicott 1997), which may therefore the manner in which the students approach the question.

Issues specifically relating to flooding had been discussed on certain of the courses the students were taking, and preventive environmental strategies were a central issue in the students' current studies. Before entering the programme, students had studied a wide range of related subjects in their home countries, and some of them had professional experience in the area, leading to considerable differences in prior knowledge.

Dialogue format

In the intentional-expressive dialogue format, an *initial question* is first asked. Subsequently *key expressions* in the student's response to the question are selected, and discussed in

focusing sequences. The key expressions are explored in detail, and then related to the phenomenon which was the subject of the initial question. Finally, the initial question is repeated.

The intentional-expressive dialogue aims to clarify the function of language use in knowledge formation, by shifting between focus on subject content and focus on verbal expression, as well as introducing the ‘simultaneous’ focus of how the verbal expression relates to the student’s conceptions of the object discussed. The intentional-expressive dialogue format forms the basic frame for the present study, although supplementary questions have been introduced, to adapt the format to multilingual settings.

The students were first briefly asked about their name and background, and informed that the purpose of the conversation was to observe variation in how the topic was approached and adapt the dialogue format, not to test their knowledge of language or subject matter. They were then asked the initial question: *How can major flooding be prevented?*

After the initial question on how major flooding could be prevented, the author selected some key expressions from the students’ explanation, which were then explored in focusing sequences. Additionally, non-native speakers were asked how key words or expressions in their suggestion for preventive action could be expressed in their mother tongue, and how they could be paraphrased. Both native and non-native speakers were asked to give examples of what they meant, and were then given the opportunity to compare and contrast key expressions, in English and in their mother tongue.

1. Initial question:

- *How can major flooding be prevented?*
- *Please summarise the most important points!*

2. Focusing sequences:

- *How would you say (key expression) in your own language?*
- *What do you mean by that? / What were you thinking of when you used that expression? / Were you thinking of a particular case?*
- *Does this exist in your own country?*
- *Can you give an example?*
- *Is there another way you could say that? / Could you use another word or expression to describe what you want to say?*
- *Is there a difference? / What is the difference?*
- *Which expression fits best?*
- *Is there a difference in how you say this in English, and in your own language?*

3. Repetition of initial question:

- *How can major flooding be prevented?*

- *Is there any difference from what you initially said?*

4. Additional questions:

- *How do you feel about the conversation we just had?*
- *And what do you think about your studies here in Sweden?*

The original question *How can major flooding be prevented?* provided opportunities for a wide range of interpretation, so that the students' responses could reflect their own conceptions. Care was also taken in the dialogue to encourage all types of response, and avoid interrupting or limiting the students' reasoning.

Analysis

Analysis of the material focused:

- a) changes in the conceptualisation of the subject matter as it appeared in the course of the dialogue, and in which way the issues were approached, as a function of the questions that were asked (*How would you say this in your own language? - Does this exist in your own country?- Can you give an example?*).

This type of developments involved bringing in significant new notions in the proposals for preventive strategies or explanations of key notions. Developments within the individual dialogues were investigated, and related to the questions that were asked.

- b) which disciplinary or geographical framing the students associated to.

This type of developments involved setting the topic in a different frame.

- c) changes in the way of reasoning.

This type of developments involved shifting the meaning given to notions that had already been mentioned, or changing the approach to these.

The material showed a very wide range of variation in the responses to the questions of the dialogue format, and in the developments that took place during the conversations. This variation is therefore described in the following as it appeared in the material. No attempt has been made to group individual responses into comprehensive categories of description in a phenomenographic sense.

In the following, the variation in responses to the initial question is first outlined, including the general or specific examples the students initially had in mind. Afterwards, certain developments and changes in approach are described, that took place during the dialogue. The manner in which students responded to the various questions of the dialogue is discussed. Prominent features in the students' learning skills and their approach to learning on an

international programme are considered. Finally, certain differences are brought forward, concerning the attitude and experience of native English speakers compared to non-native speakers.

Findings

Variation in examples discussed

Answers to the initial question (*How can major flooding be prevented?*) showed that there was no obvious way to understand this question, and considerable variation occurred in the ways it was actually understood and how it was contextualised. A few students were reluctant to answer such a general question, and asked what it meant, or which context was referred to. They were informed that they could answer in any way they pleased. Other students took the question as an abstract / general issue, and answered in a relatively abstract / general manner. This often related to academic subjects or theoretical notions in connection to sustainability studies. Students also spontaneously associated to quite different places or types of flooding, when asked *What do you mean by that? / What were you thinking of when you used that expression? / Were you thinking of a particular case?*

Typically, they already had some particular situation in mind, and could answer what they had been thinking of when they answered the initial question. By contrast, they frequently had difficulties to give an example of what they meant by different key expressions they had used earlier, in answer to the question *Can you give an example?*

Among the examples the students had in mind when answering the initial question, we find: no particular place, speaking in general (students D, N); international examples (Bangladesh – a typical textbook example of destructive flooding, but which is also needed as a basis for agriculture (O); hurricane Katrina and New Orleans – information from the media (F); a regional example (flooding close to student's home country (C)– information from the media); a regional example from the student's home country – information from the media (H); the locality in Sweden where the conversation took place (either as a hypothetical case (I), or related to concrete preventive work carried out by the student as part of the course (B)); a place project work had been carried out: a town in the student's home country (E); a Swedish town (B); a virtual locality/landscape (used as example for a modelling assignment during the course (L)); the student's home locality that had recently been flooded (B, G).

It was not always immediately apparent from the phrasing of students' answers, what type of situation they had in mind. In one case, phrasing was very general, but the student explained that she had been thinking of hurricane Katrina and the pictures in the media. In another case, the student's description appeared to be very detailed and concrete (L), suggesting a lived experience, but it turned out that the student had in fact been thinking of a particular virtual modelling assignment from the course.

Developments in individual reasoning

In the course of the conversations, the students brought up new examples, discussed additional aspects of the issue, or discussed the questions in a substantially different manner. Such developments or shifts of perspective occurred within all the conversations, except in the case of two students (N, L).

Students N and L *expanded* the arguments that they had presented in their response to the initial question. They *clarified* the meaning of the key expressions they had used, and *gave examples of what they had meant*. Conversations with students N and L were detailed and coherent. Student N was a native English speaker, while student L had studied in English in his home country. They both seemed confident in their opinions. However, they differed from the other students by not introducing new ideas in the course of the conversations.

By contrast, all the other students did introduce new ideas in response to the different questions. The questions in the focusing sequences concerned key expressions used in the initial explanation, so in some sense the students were still talking about the ‘same thing’ (preventing major flooding), with respect to the ‘same’ arguments or key concepts. However, the student’s point of view changed, or the subject was treated in a quite different manner.

The changes that took place in the course of the conversations were different for the individual students. Certain tendencies could be observed and will be discussed in the following, but it did not seem relevant to group the students into categories. Instead, the most striking characteristic of the material was the diversity it presented. The new aspects that emerged in the explanations appeared to be triggered by the questions in the dialogue format, and this issue will be discussed later, in the section *Relationships between questions and treatment of subject matter*. The excerpts presented in the following are intended to illustrate some of the changes in treatment or perspective that occurred in the conversations.

Level of generality, local or national examples

Student (A) spoke in general initially, but only because he did not receive an indication about the context. By contrast, discussions about his home country were freer and more extensive, although including references to the debate in the media. Some students kept the discussion at an abstract/ general level, even when later asked about their home country (D), while others brought in new aspects in relation to a more specific or personally experienced situation.

Student (H) did not discuss an example from her own region, until she had considered the issue in her local language. While her initial explanations concerned lakes and dams, she later also came to discuss rivers, in relation to her own region:

H: I mean.... I’m thinking where I come from is a different part of (my country). [...] (*Name of location*) is famous for water bodies, so even people,... I would be worried, if ... we were discussing a lot about lakes, I would speak more of rivers, where I come from, I would say “rivers”, I would not say ‘natural resources’, you know, explicitly, I

would say it is a river.... this particular river, which goes through my, behind my house, in this town, ... I would not use technical terms.

The case of student (H) is particularly complex, since three languages are involved: English, the regional language in which she had conducted her studies, and her mother tongue. In her case, the different languages corresponded both to different examples (lakes or the river in her home town), and to different types of knowledge. The knowledge this student had about the problems concerning the lakes came from debates in the media, while the situation concerning the river in her home town came from lived experience and discussions in her own social environment. In the course of the conversation, when looking for ways to translate the expression, this student realised that technical terms like ‘natural resources’ would not be appropriate to discuss preventive measures with the local population.

Textbook explanations or local circumstances

Student (K) shifted in the course of the conversation, from textbook examples (flooding in plains, Bangladesh, Thames) in response to the initial question, to later discussing the situation in her home region (flooding in mountains). In the first case, her knowledge is theoretical and fairly abstract. She explains that her initial response is general:

K: Well, it depends on the circumstances. (laughs) You could try a more ...natural approach, with say... forests, or vegetation. Ah.. . or you can ... try to construct barriers, or dams. Ah just, yeah. (laughs) I think these are two major things you could do. Yeah. [...] As far as, well, I’m not an expert on this subject, but I think ah ... you can ah....I’d either try an approach which is closer to nature, with vegetation, or an more engineering-based approach, like buildings and barriers or basins to retain water, or ... yeah.

[...]

I: Are you speaking in general, ... or are you thinking about a particular example?

K: Ah, well, ah... I mean.... I am thinking about (*name of her country*), of course, where we have as far as I know ... possibilities of dealing with problems with floodings. But I also know examples from Bangladesh, for example. So, I think you could use this in general. Yeah. Because it’s really very general. (laughs)

The fact that (K) mentions Bangladesh is here a clear indication that the example she imagines is taken from a textbook. Bangladesh was also mentioned by some of the other students as an example, and their reasoning about prevention then also concerned that type of context.

In the following excerpts, the more general explanation of ‘an approach closer to nature’ concerned the option of letting a river meander in the plains (she was thinking of a project she had heard of on the river Thames).

K: Well, if you have, .. what do we have, well, for example ... well, I mean there are these projects, like when you have a river, and you have problems with floodings, then you just give this river more space to... maybe an area where there is more nature and there are not so many people, and things to be harmed, so you just give it a bit more space and more ... (sighs) ah.... more ... how do you say that? (pause) hm, so that actually it can flood, but it won't really harm people, because ...there's the area that can retain the water. It's not like this that all the water is just in one narrow channel and then of course it floods. So that is what I say is "close to nature". I mean it needs some more space and is more difficult to do, but it's close to nature.

I: And are you talking in general or are you thinking of a particular example?

K: Ah... I've heard of some examples, but I can't really remember... where these rivers are, ... I don't know. (pause) I have no specific knowledge about the subject, so I just.... I've heard some things, and ... you know, you remember that they did something like this.... but I don't really know where it was. Wasn't there a project with the river Thames? ... I think there was, but I'm not sure.

When student (K) later discusses the situation in her home country, flood prevention has to do with water rushing down steep slopes.

I: When you were using these expressions, were you thinking of a particular case, or were you talking in general?

K: With the second expression, I was thinking of (*name of her country*), because we have, you know, we have mountains, we have particularly problems with ...hm ah ... riversah hm ... steep slopes ...yeah ... that bring in materials from the mountains, so it's a very special kind of flooding, so ... hm ...yeah.... we have very special problems connected with floodings and ... in this case, ... the ...using ...ah or constructing something, to prevent floodings is very, ah ... can be very helpful, it's normally, what is done, normally, and maybe, we don't have problems ... yeah, we have a very specific situation.

The changes in examples triggered by the questions brought to light certain contradictions in the way this student understood the issues. Concerning the textbook examples, the student expressed the view that both 'technical' and 'natural' solutions were possible. When it came to her own country, she instead maintained that 'technical' solutions were necessary, because 'natural' solutions were 'soft', and therefore could not be 'effective'. (However, in the course of explaining the meaning of these expressions, she eventually modified this reasoning again).

Relating personally to ideas: values and emotions

The discussion relating to expressions in student K's mother tongue was also more emotional than her initial response. This appeared in her intonation and body language, but also in the type of arguments she used, and that she used certain expressions that could no longer be linked to the textbooks.

I: And if you say *natürlicher Ansatz*,

K: Hm, yeah

I: what does that mean precisely?

K: Hm (long pause)... precisely? (laughs) hm.... (long pause). It's, I think it's ...(pause) it's not ... really of use in this field. I mean, it's..., as I said it's really very ... broad. You could say that it almost sounds like you know these ...ah ...ah... really radical ecologists, who say everything has to be natural, and (...) and if you say *nahe an der Natur*, hm (mumbles), *diese Massnahmen seien nahe an dem, an der Natur sein*, und *sich an der Natur orientieren*, it's ... vielleicht *an der Natur orientieren*, dann, then it's.... hm it's clearer. And it's... ah.... it would be more useful ... and I would say it's ... then I would really think that this person might have something ... a real solution to offer. (laughs) I don't know, it's just afeeling. [...]

Later, her response becomes more emotional:

I: And how would you say “engineering-based approach” in German?

K: Hm... (pause) ..hm ... *technischer Ansatz*, *technisch* ..(pause) *technisch*, yeah but....hm We also have a specific word (laughs), which I associate with an engineering-based approach,hm it's like hm... *Verbauen*, ...hm .. *Fluss verbauen* it means more like constructing something on the river hm... but it only applies to rivers, that's why I was hesitant, ...

I: And if you say *verbauen*, what precisely do you mean?

K: Ah...hm..(pause) I just ... I don't think it's helpful, actually. I mean if you translate it, it's yeah, you construct.... something, in this area, where you have problems with floodings, and that's like a man-made structure, and that is not a natural ... which you add to this area [...]

K: And *verbauen* really applies to this area of flooding, for me really, there is a very defined area where you can use it. It really only applies to floodings connected with rivers. So it's not if you have problems at the sea-side, or it's very narrow. I would prefer *technischer Ansatz*, for someone who is not native German speaking, this would be enough to explain.... what's going on (laughs) [...]

While the more theoretical expression ‘*technischer Ansatz*’ used by student (K) was a direct translation from English, the emotionally charged ‘*verbauen*’ is more closely associated to her local context. The latter expression tends to have negative associations ((= *versperren*) to obstruct, to block, *sich alle Chancen/ die Zukunft verbauen* to spoil one's chances / one's prospects for the future; (= *schlecht bauen*) to construct badly; (= *verderben*) to botch, German – English Collins dictionary).

Student (H) also shifted from a matter-of-fact response to the initial question, to a much more emotional discussion of ways to express her ideas. In her initial response she talks about administration and infrastructure:

I: And what would be the main points for you?

H: Reforestation. And ... planned public development, I mean public works. How do you call it? Infrastructure. Planned infrastructure. [...] Well, I meant to say infrastructure, but the word that came to my mind was “public works”, because ... it’s this group, called the Public work department which takes up infrastructure development in (my country). So I could immediately relate them to public works. What I meant to say is ... infrastructure. Proper roads, proper bridges, proper dams. That’s necessary. Hm, There are a lot of problems with ...hm ... too many dams being constructed. And, they lead to unforeseen flooding. And also, ... hm... urban sprawl. Expansion. [...]

Later, in the focusing sequences, the response becomes more personal, and charged with emotions:

H: Well, hm, (pause) “natural resources” is the easiest way to say, to term it. But ... Or I would say “lakes”, as simply as I can say. These beautiful lakes, people like lakes, it’s part of your ... cultural identity, and , if you like ... nature, which I would only like, I would say, I would simply say “this lake”, protection of the lake. It’s not right, ...hm ... they’re flooding this lake, ... I’d use the word “lake”.

Here, student (H) started with a discussion of the political and administrative aspects of the question. But when later asked to explain a notion in the local language, the whole tone changes. She introduces the aspects of beauty, of affection and of identity.

Shifting between global theories and local understanding

In some cases, the original ideas were not expanded on, but instead changed more fundamentally. The most striking example is (C). In response to the initial question, and in response to the question if this existed in her home country, this student discussed a particular incident of flooding in her region. Surplus water had been released from a large dam in a neighbouring country some years previously. This had a terrible impact on local farmers, due to poor information. Referring to this example, she explains that there is ‘natural’ flooding and ‘manmade’ flooding. While the former is positive, the latter can be disastrous, she argues. Although the example is local (the dam that the student mentions is a specific dam in her region), the arguments are general:

C: There’s two ah.... aspects of flooding. We have ah.....how nature works and we have ahsort of, ah ... sometimes ... people get in the way. When nature works the way it should, floods happen, wetlands flood, different river systems flood and people’s agriculture, livelihoods ah depend on it, they use that, you know After the floods are gone, this land they use for growing crops, because it’s very fertile, and so in that case preventing a flood would be actually ah... ah....ah... you know, killing people, in a way. Because you could build a dam and stop the flooding

occurring, ... but the people, their soil would lose its fertility, and people wouldn't be able to grow their crops for very long after that.

And then you have another concept of flooding, which in a way is manmade, and it's because people build dams and create landscapes, where water can't behave the way it naturally would, it can't go into the ground, it can't run off properly. Then you have built-up areas, like urban areas, and you have, ah releasing of dam water, sometimes when the dam capacity is reached, and then if you, if it is released too fast at the rate which ah the natural river system wouldn't allow it, then you create a flood, and that could be dangerous for people living downstream, and if they are not informed about the opening of the dam, or you don't manage the way the water flows, that's a flood, and that is again dangerous to people, in that first of all, you have sort of created an artificial environment, where the water is not flowing ah..... how it normally would. And then it would be.... ah you would when you open ah ... the floodgates, so to say, ah... then ah ... if the people downstream are not informed they are not able to move out of the way of the flood, then you have caused ah ... you know, a flood.

Preventive strategies were discussed in connection to this example that related to more adequate information, above all considering the economic situation and interests of the farmers. This type of reasoning did not differ substantially from similar ideas put forward concerning quite different geographical contexts (by students O, J, I, H, A). Such explanations could also be related to the notion of involving different 'stakeholders', which was part of the strategies taught on the environmental studies programme she was following.

By contrast, when (C) was asked about how to say key expressions in her native language, she was not able to find corresponding expressions. She even declares that 'flooding' does not occur in her country (which is counterfactual, since massive seasonal flooding does occur in the country). The statement that there is 'no flooding' also appears to stand in direct contradiction to the explanations she had provided earlier, where she had discussed a concrete incident in the region.

I: If you take an element of that which is "managing the way the water flows", how would you say that in your local languages?

C: I don't know, that one, I Because I was just thinking about that, before when you asked me about conceptualising a flood in the local language, because my..... I've never experienced it, like a flood, ah ah in terms of ... catastrophe and in my my own experience, and in the experience of other people that I know, that is, my grandmother, or you know, older relatives in my family, because it's It very rarely happens in my own country. Very, very rarely. We have drought, more often than we haveahah flood. So, maybe that could be something to do with it. I'm sure there's a term that exists. I may just not know it, because I've never had to sort of use it, or have it described, or in ... [...] But I don't know how to conceptualise it, or say it. I can say "the water came", or "the water ... sort of ... you know rose above the banks of the river", but I am sure there must be, sort of like a term or a word that is used for flood, but I actually don't know it.

In the course of the conversation it appears that the English term ‘flooding’ has associations that can not be found when discussing issues of ‘water rising above the banks’ in her local languages. For instance the English term ‘flooding’ is associated to an idea of something that is not the way it should be, something that is disastrous and should be prevented. The phenomenon of water rising above the banks of the river was not conceptualised like this in her local languages. Although flooding might cause damage, it was not seen as something that should or could be ‘prevented’.

Student (C) then went on to explain that in her country, people’s action was motivated by a desire to be respected, and that action needed to take the form of social events, expressing cohesion and continuity with the past. Arguments needed to be based in traditional sayings that summarised earlier generations’ experience. If such traditional sayings and stories that could be related to the prevention of flooding did not exist, it would not be possible to argue for a new line of action.

In other words, introducing the question of local languages here led to radical changes in how the student approached the issue of preventing flooding. When asked in English, she gave a fairly general ‘global’ discussion in terms of economic factors and providing adequate information to the farmers. But when asked how to express the notions in her own language, this student moved to a very ‘local’ reflection, involving intimate knowledge of cultural specifics. For instance, ‘information’ was no longer simply a matter of telling the farmers that the dam would be opened. This reflection finally even led the student to express doubts concerning the relevance and feasibility of the field work she was about to undertake, since it involved working in a remote rural region of her country, where she did not have first-hand knowledge of the local language and customs.

Including knowledge from outside the academic context

In C’s case, the entire manner of talking also changed when she was discussing how to explain things in her local languages. She became personal, and mentioned her family history:

C: (...) I have lived in a multilingual cosmopolitan city all my life. [...] Both my parents were (*name of local ethnic group*).

She talked about stories being ‘passed down’ and traditional forms of knowledge:

C: , because I think if there had been a flood in my grandmother’s lifetime, or even in the lifetime of her mother, she it would have been a story, it would have been passed down.

The meaning of different proverbs used in her mother tongue was explained. Some examples of proverbs that occurred in the conversation are:

- *A field which has been ploughed before* (to express ‘how nature works’, but also that it is easy to reconnect to a person you have once known).

- *Fatherhood is a myth, motherhood is a reality* (to explain why the authority of chieftainship is passed down on the mother's side).
- *One tree doesn't make a forest* (about community and how you have to be together).

A theoretical concept (like 'prevention' or 'flooding') could, accordingly, not simply be 'translated' into C's language as an isolated idea, this student argued. It had to connect to stories, traditional behaviour, and the wisdom or knowledge that was embodied in local proverbs.

New insights

Although not always leading to shifts of perspective as radical as in the case of (C), it appears from several of the conversations that the dialogue prompted reflection, leading to new insights. This was also expressed and commented on by several students. For instance, (O) explains that the question makes her 'realise' something:

O: ... and now when you ask me, I suddenly realise, also sustainably ... sustainable methods of development for planning for infrastructure.

(H) becomes aware that much of what she knows comes from newspapers (because it becomes evident that her 'knowledge' is linked to the language used in the newspapers):

H: I was thinking of two different places at the same time, ... thinking of the village and the city, and hm I just know, very little, not much, I just realised that I know only what I read in the newspaper, and,yeah it's nothing much I know. Yeah.

Finally, (D) is very explicit about the fact that her thoughts and explanations are a constant 'process', and not stable ideas:

D: I mean, I'm myself in a process, where I want to understand what I, ... where I want to act, and how it's working, and what I'm thinking about it, and if this world is wrong, or right, and if I want to change the world or keep this structure, or just modify a bit. It's kind of really in process in my head, and here I'm just learning how to, you know, like, ah, this is interesting actually, I never thought about drawing that way, so it's a bit messy (laughs).

Such reflection could be the result of challenging assumptions concerning the meaning of key notions. Student (K), for instance, initially defined the notion of 'soft' as something opposed to solutions that could be 'useful':

K: so, if I hear it in German, and of somebody talking about yeah, a *natürlicher Ansatz*, it sounds really very soft and very.... ah, probably not very useful, if you talk about flooding, and then someone says, yeah, a *natürlicher Ansatz*. It's not very... it does not.... I wouldn't really think that this person has a solution to offer (laughs), because it sounds like soft ... [...]

I: ... could you tell me precisely what you mean?

K: Yeah.... 'soft' (laughs) (pause) 'soft solutions', that's a very (laughs).... it has more to do with ... I mean, an engineering solution wouldn't be a soft solution, right?, because it's very ... rational ah ah uses a certain technology, and does not necessarily include social factorsand ... does not necessarily respect nature so this is everything that is not soft, and everything else is 'soft' (laughs) , so it's more like taking the social circumstances, for example like the ecological circumstances into ... into account, ... that's what I would understand, if somebody is talking about a soft solution.

I: And you were also talking about 'useful' solutions, could you ...

K: Yeah useful... well, maybe, how do you call it effici(ent)?, effective? I don't know.. that has an effect (laughs), that can be a solution that it's not, it doesn't you thought it's a solution, and it doesn't really work. (laughs) A solution is supposed to be useful, right?

Having to make the effort of explaining what she meant appears to have changed the way student (K) understood this issue. Although the student had at one point assumed that only technical solutions would be 'useful' or 'effective', she later reflected that 'soft' methods might also work (be 'useful'), so that the distinction she had made earlier was not relevant.

K: "Useful" is really a bad word, I don't know....

I: Could you give an example?

K: A "soft solution" would be like I mentioned before, you could try to give the river a bit more space, and ...hm ... ah I think it would be effective too. And ...(pause) hm..... ah... it's really very hard. (laughs) Hm.... (pause)... (mumbles "effective solutions").... (long pause) Principally speaking, a solution is effective, if it reaches the target you wanted to reach. Right? And it does not depend on the methods you use, I mean, if it's effective it is effective, and it works and prevents flooding. [...]

The standpoint that appeared in connection with expressing her ideas in her own language is particularly interesting, since the Master programme the student was following is based on the notion of integrating various disciplines and aspects.

The initial explanation, using English expressions ('natural' or 'engineering-based' approach), was in this case consistent with the ideas she had been learning about on the programme. By contrast, her explanation using German expressions initially stood in contradiction to the theories taught on the programme. Including social and ecological aspects (an approach that is advocated by the environmental studies programme) was in her local context first associated with being 'soft', as an approach promoted by 'radical ecologists', and therefore seen as something that could not be 'useful'. It seems student (K) did not realise these contradictions until she had to explain both standpoints in the same conversational context.

The insights gained by the students in the course of these conversations might in other words be triggered by placing in the same conversational context, knowledge which would otherwise

have remained “compartmentalised” (cf. Baetens Beardsmore 1982) in separate linguistic contexts (mother tongue and English, respectively).

It is important to stress that the changes in perspective or treatment that occurred during the conversations did not necessarily lead to new ‘understanding’. Although all conversations (except L and N) show some kind of development, the material does not allow clear conclusions to be drawn regarding the stability or scope of such changes. In some cases, the topic was successively treated in different manners during the conversation, but without resulting in a new position when the conversation was closed. On the other hand, even when new ideas concerning a particular aspect were not expressed during the dialogue, it is possible that unresolved contradictions and open questions may have continued to feed reflection after the end of the conversation, thereby stimulating a learning process.

Relationships between questions and treatment of subject matter

Reactions to the initial question

The initial question was phrased as generally as possible, leaving all interpretations open. However, the general academic context the dialogues were situated in would be expected to lead to an academic interpretation of the type of answers expected, and in fact, several students related the issue to academic disciplines and knowledge, as well as to more everyday contexts (see *Variation in examples discussed*, above).

The initial question *How can major flooding be prevented?* was put in English, and made it easy for the students to use/reproduce expressions and notions (in English) from their current area of studies concerning preventive strategies. Several students did so, but academic notions and analytical frames from prior studies also appeared.

Paraphrase and translation

The question *How do you say this in your own language?* induced students to express equivalent ideas, either a) using technical language from their earlier areas of study, or to b) try to paraphrase the meaning using everyday language.

The questions *Is there another way you could say that?* and *What do you mean by?* were used to prompt paraphrasing. The students had to think about what they actually meant, and this produced a certain amount of hesitation.

K: And when you say ‘nature’, what exactly do you mean?

(laughs) That's difficult. Nature.... in this context, what did I mean? "closer to nature"(mumbles) I think, in this context it was ... I don't think I included humans in nature in this context. ... Although I know you should. But if I say it is closer to nature, it obviously does not include human-made structures.... and...hm.... (laughs) and... hm ... so ...ah ... this ...ah.... (sighs), in this case it would mean that this approach should (pause).... hm. ...respectah ...(pause) certain mechanisms that are there, and ... in an (sighs) ... ecosystem (pause) (sighs) (pause)

I: OK, maybe we'll get back to that.....

K: yeah, it's difficult

However, by comparison, asking for equivalent expressions in the native language seemed to require even greater efforts. There were extremely long pauses, hesitations, and several students commented on the difficulty. This suggests compartmentalisation (Baetens Beardsmore 1982), separating the context of current English-medium studies from the rest of the student's knowledge and experience. The following excerpts illustrate some of the problems the students had, when asked to express a key notion in their own language.

I: AndHow would you say "approach closer to nature" in your own language?

K: Hm,..... interesting question.....hm.... ah..... (pause) You know that's the thing. Since I have started to study in English this is something, I have started to think about it. If I will be able to explain some things in my own language. Because I know these expressions in English. And..... it's sometimes very hard to find ... the German equivalent.

Student (K) is relatively weak in English, so it is possible that in her case the problems she is experiencing are caused by the combination of poor English skills and not being used to translate this type of expressions.

I: And how would you say that in your own language?

D: I would say (pause) *politique*, hm *transdisciplinaire* (laughs) I have to shift in French now, I would say (pause) Yeah, I think its really strange, because now when I'm talking with French people, sometimes just English words are coming, because they are more sharp to define what I want to define, because in French, I don't think about the word, the precise word, its really strange, because I think, like in French when you traduce *transdisciplinaire*, transdisciplinary policy, its a bit strange too, to hear, I think, so I don't know. (pause)

[...]

I: And 'stakeholder', how would you say that in your own language?

D: (pause), *je dirais .. des personnes qui ont* I try to think in French (laughs) *des personnes qui ont différentes compétences*. And (pause) yeah. *Des... des, des* stakeholders hm, yeah. The English is in my brain and French (laughs). Yeah. Yeah.

The problems student (D) experiences here are especially interesting, since they concern two notions that are both central in the Master programme of environmental studies. One is the question of integrating competences and knowledge from different disciplines in policy-making, while the other is the notion of involving various ‘stakeholders’ in preventive action.

I: And how would you express this in your own language? [...]

F: Always difficult to switch in another language. Ah ... (sigh), now are where the mental blocks kicks in (laughs). I haven’t been using it for almost two years now. Ah

[...]

F: [...] and yeah, you saw that I had a difficulty to find an appropriate word for ‘evaluation’.

I: Aha.

F: Because there is no direct equivalent to this word in my language.

Like student (H) below, student (F) also has difficulties finding equivalences between the administrative system of his home country and Swedish forms of organisation. This makes it difficult for him to link knowledge from his earlier studies (assessing risks based on technical grounds) to the issues treated in the programme of environmental studies. On the programme, important issues are, among other things, how decision-making bodies can access technical expertise, how experts in various disciplines can cooperate, and how society at large can be involved in both decision-making and implementation. Problems in identifying equivalences between the cases discussed on the programme on the one hand, and his local context, on the other, will therefore lead to some difficulties in applying theoretical knowledge from the programme to the structures of his local context.

I: how would you express something like ‘planned development of infrastructure’?

H: Well, ... I do not use them on a daily basis. But ... we have newspapers.... where I come from ... our regional newspapers are quite strong, so when I read them in the papers, I understand, I am familiar with some terms.... but the words that come to my mind are English terms. So, do you want the terms? (*expression in student’s language of prior studies*) is a ‘plan’, or ... is a plan so you would say ah... hm (long pause) oh, I don’t know the technical terms, but ... I ... understand them when I read them, but I have not used them for a long time. I have forgotten the technical terms. I have learned my mother tongue as... , throughout my schooling, as a language, you have to learn ten years of schooling so, ... I am familiar with all the technicalities of the language, but when you ask me now, I just can’t find the right... I can use many words, but I can’t ... pinpoint as it is the word we use. (mumbles)

[...]

I: Is there another way you can express it?

H: Yeah, I can say that ... I would say ... (pause)...ah ... if I was ... yeah, I could easily say that, if I was talking I could convince somebody of what I have to say in my own language.

I: And how would you say ...?

H: I would say(pause) .. ah ... (*expression in local language*) (pause) (*expression*) (pause) hm (pause) (*expression*). (*expression*) means 'floods', and (*expression*) like how you have your 'kommun' (Note: Swedish municipality /council), you have like (*expression*) in (my country), so it brings the bureaucracy down to the villages, so, I would say, (*expression*) (pause) (*expression*) – I could go insane! (mumbles, laughs).

In the last example, (H) tries to find an expression in her own local language. She is not satisfied, and therefore tries a number of different possibilities, without much success. Like (C), this particular student was very persistent, and tried for a long time to find equivalent expressions concerning the prevention of flooding in her local language. Other students who experienced similar problems usually gave up after one or two attempts.

The material obviously does not directly reflect the students' learning or knowledge about the notions that are discussed here. Various skills interact. Poor language skills will prevent the same student who has some difficulties understanding a notion precisely in terms of the ideas it represents (comprehension problems), will maybe also have difficulties asking precise questions to clarify his/her understanding (problems with oral expression). The same weaknesses will then make it difficult for the student to verbalise his/her understanding, paraphrase it, give examples, or eventually also 'translate' the notion to another cultural or disciplinary system of knowledge. Inversely, 'translation' skills are not just a matter of basic linguistic skills and practice, but also a matter of identifying the wider pattern of beliefs and assumptions that a particular notion fits into. You do not just translate 'words', you try to find an equivalence in 'meaning'.

Explaining differences

After the initial question, students were asked about the meaning of key expressions, then asked to compare with the English expressions they had used earlier (*Is there a difference? / What is the difference? - Which expression fits best? - Is there a difference in how you say this in English, and in your own language?*) Both translation back into English, and in particular, commenting on differences, seemed to be difficult tasks, also producing hesitation, pauses, and comments on the difficulty.

I: Is there a difference in saying 'stakeholders' and *personnes qui ont différentes compétences*?

D: Stakeholders would maybe be more, more (sighs). Hm (pause). French. Hm (pause). Yeah, because in stakeholders you have the idea of taking part of... of (long pause). (sighs) No, I can't find the word. [...]

D: [...] when you say 'intelligent planning' in English, it sounds more like a concept, and in French it sounds maybe like a sentence, but not really, so its different. The way the language I don't know if you understand what I mean (laughs). [...]

D: Yeah, but I think it's a bit strange to say it in French. Do you understand better what I mean? Or?

Some students closed the discussion quite quickly, by saying that there was no significant difference. Other students made great efforts, but either could not identify the differences, or could not find words to express these differences.

Only a few students were able to discuss differences in meaning explicitly and in detail. Fluency in English made it easier for the students to clarify subtle points. Nevertheless, difficulties experienced by the students when discussing differences still mainly related to the problem of putting a 'feeling' into words.

I: And if you say *natürlicher Ansatz* or "approach closer to nature", is there a difference?

K: Hm, yeah. Yeah there is a difference (laughs). Because when I ..., when I say that in German, I see that this is very, you know very philosophical. You know, you put...it's... and ...(sighs) I realise like... that the meaning..... that could be used in a ... yeah, a really very very broad sense, for everything. And if I say it in English, I mean it will be in a more specific sense, ... so, I don't know. If I say "approach closer to nature", it's...ah... the word "approach" for me is more, it sounds to me rather scientific..... So,...maybe....yeah, ... maybe the English description is more.... sounds more appropriate. But then if I translate it to German, it doesn't sound that appropriate any more. I would have to think of something really to describe it in German properly. Maybe because I just have a deeper understanding of the real of the meaning connected with the German words I use. (pause) So I would have to think of I don't know... (pause) *Natur... Nahe an der Natur* (mumbles to herself).

However, although the researcher had knowledge of this student's native language, the possibility to code-switch to the native language did not seem to make it easier to explain.

K: Ah.. *Natürlich natürlicher Ansatz*. (pause) (sighs) Yeah (laughs). The second would be *technisch*, a technical ... (long pause). It's good that you speak German too, do you? (laughs and does not pursue explanation)

In certain cases, explanations of possible preventive strategies included expressions that referred to administration, legislation, decision-making bodies and institutions. In this case, comparing differences and similarities between languages corresponded to differences and

similarities in national institutional structures, which some students were able to discuss (B, D, J, I).

D: [...] what I was learning in (*name of her country*), in my two years of land use planner, was more how to fit in the administration.

In other cases, influencing public opinion, and differences in social structures and mentality were involved (A, C, H, I, J, M, O). Local-global differences in climate, geomorphology or settlement structures seemed relatively easy to verbalise, as long as these remained very general, while such differences brought up issues of technical terminology when they became more specific (C, F, K, L M, O).

From the point of view of method, the noticeable difficulties students experienced in verbalising what they meant, does not necessarily imply that they did not have a clear idea of what they wanted to say. Nor does the fact that they were unable to translate an expression or explain differences between expressions, imply that they did not “know” what key expressions meant, or that they did not perceive differences. Particularly for non-native speakers, many of these difficulties can be attributed to inadequate means of verbal expression.

However, although the difficulties the students experienced in explaining what they meant does not give any definite information about their current state of knowledge or understanding, the lack of verbal means of expression is certainly problematic for developing new knowledge. It clearly hampers students from functioning satisfactorily in an international learning context.

It is significant that in many cases it seemed easier for students to *refer to a situation* (which was assumed to be commonly known), rather than *verbally explain* what they meant (see discussion of examples provided by students under the sections *Variation in examples discussed* and *Developments in individual reasoning*, above).

Relating to personal experience

Three of the dialogue questions (*How do you say this in your own language? Does this exist in your own country? and Were you thinking of a particular case?*) could be related to the students’ personal experience or background, as opposed to their current English-medium studies in Sweden: ‘Personal experience’ here includes non-academic sources of information, such as the media. Hurricane Katrina, for instance, was mentioned by several students:

I: Aha. Okey, ah... when you are talking about all these things, evaluation of risks, and identification of solution, and implementation of measures, are you talking in general, or were you thinking of a particular case?

F: Yeah, I had images of Katrina from New Orleans coming to my mind, mostly when I was thinking about this, hm. [...]

C: But the concept of a flood, per se, is It's only a catastrophe if people are in the way, in a way. It's not if, ah for instance, ah you know the hurricane, or is it ah.... I'm not sure what it's called ... you know, in New Orleans, in North America. If there were no people in Louisiana, in those states, then it wouldn't have been a catastrophe, it would have just been another you know, Maybe it wouldn't have been on the news, but it's more about ... ah.... because people are there, and there's damage to property and there's That's the only conceptualisation sort of a flood is a disaster [...]

But there is a difference between the students' lived experience, and informal knowledge gained through the media (see also student H's comments on this subject). Student (C) discusses the difficulties of talking about matters which do not relate to her personal experience:

C: But I've only known of one flood, in my lifetime, and that wasn't, I wasn't even affected by A flood is in (*name of her country*) something you also sort of hear about on TV.... And because like, ... the news is in English, so I can only sort of conceptualise it like the word 'flood' in English, and even, so I've never, ah thought about it in my own ah.... because it's not part of my experience, it's part of the experience of other people, and it's really not an expression of people who are close to me. The experience of people in other countries, in other ah ...

References to personal lived experience do not occupy a prominent position in the students' explanations, compared to textbook examples, previous academic studies and discussions from the media. Also, personal experiences were generally not mentioned until a fairly late stage of the conversations. It is interesting to note that student (G) (who was a native English speaker) spontaneously switched to her local dialect when she discussed flooding in her own town. When discussing flooding in general, the same student used a standard academic pronunciation. This shift in dialect supports the tendency observed across the conversations to see certain forms of knowledge / experience associated to a particular form of language.

Linguistic context versus geographical context

The questions *How would you express this in your own language?* and *Does this exist in your own country?* both triggered developments in the student's way of discussing the subject. Since the reactions to questions varied so much between individuals, it is not possible to establish general categories of responses on the basis of the material of this study. Nevertheless, it is possible to say that these two questions triggered distinct developments - that is, these questions are not interchangeable.

When students were asked both questions, the additional question (*Does this exist in your own country?*) consistently led to new elements in the discussion. It is unlikely that this is just the effect of a longer conversation, with more time to think and speak, because new main

questions were not brought in until a particular topic had been exhausted, and the student did not have more to say on that matter. In other words, the different questions of the dialogue format each trigger specific reactions. The student is not just gradually expanding the original explanation as a reaction to the overall dialogue process, with the researcher continuously asking questions and wanting further details about the meaning of different notions.

For instance, in the case of (C), the question *How do you say this in your own language?* was asked after *Does this exist in your country?*, and brought very different dimensions into the conversation. In her case, while the question about country just led to a local example illustrating a ‘global’ theoretical type of reasoning, the question of language led to a discussion of mechanisms that were culturally specific (see excerpts in the section *Developments in individual reasoning*, above).

By contrast, in the case of (F), the question of language (*How do you say this in your own language?*) did not alter the student’s theoretical reasoning substantially, while the question of country (*Does this exist in your country?*) brought up the fact that local populations and policy makers might feel very differently about objectives for water management.

I: Hm, do these situations exist in your own country?

F: Yes, hm, yeah, floodings happen in (*name of his country*), on a rather regular basis, especially in spring, when the snow melts. And this ah, ... meltwater goes into the rivers, so rivers go out of their shores, and can flood their populations ... inhabited areas, also,, in my home region, where I was born and raised, before I was born, it was a ah... village, ah... that’s, ah..., its, ah... basic economic activity was agriculture, because of the quality of the soil there, but then the central government decided to use, the ah... power, of the river flowing in there to generate electricity.

I: Aha.

F: So they built a big dam, they dammed the river, and so the valley, where all the agricultural activities was happening, it was flooded, and it became a water reservoir, artificial sea, so I can think about this situation as well.

I: Hm

F: Then of course it was something controlled. [...]

F: [...] but you can say like in that case it was more like a forced ah... How do you call it, forced, ah...emigration, of ah ... population [...]

F: But in that case, of my home region, ah, ... maybe there was, ah, I don’t know, maybe there was a considerable opposition, because people were living there for generation, they had their houses, they knew their immediate local environment, so [...] maybe they were very unwilling to be evacuated.

Like students (C) and (F), all the students showed differences in reaction to the two questions, although the questions led to different responses depending on the individual student.

In other words, the issue of how language contextualises knowledge (Cummins 2000; Cummins, J. & Swain, M. 1986; Gumpertz 1982, 1999) and affects the way the student expresses his/her conceptions, can not simply be reduced to associations connected to another geographical context. The conversations show that geographical context was extremely important for the kind of arguments the students presented, but the efforts to translate into their native language introduced other aspects as well.

Learning approaches

Surface learning and reproduction

Some of the research existing on foreign-language medium instruction suggests that surface learning and reproduction increase (see for instance Airey 2006; Klaassen 2001; Yip et al. 2003). If such conclusions apply to the context studied here, one might expect that technical terms would simply be repeated in the conversations, and that students would have difficulties paraphrasing in their own words, or giving concrete examples. The conversations with students in this study in fact contain frequent instances of students having problems paraphrasing and giving examples of what they mean.

I: Ah, could you give some examples of what you mean?

F: Of what I mean by those things?

I: Yes, for example the evaluation of risks, could you give an example?

F: Hm, from real life, or how I described it? Hm Ah, well maybe not in regard to major flooding, but for example the work of the international climate..... intergovernmental climate panel, on climate change, IPCC. They were studying through models, how climate changes might affect ecosystems, and human populations, and they were putting probabilities on their spectrum, of those models, and finding, ah..., the most vulnerable aspects of.... Ah ... living nature, and human civilisation that, will be affected by, ah, global climate change, so this is how, ..., will be identifying the risks, coming from this, threat of global warming.

I: Aha, and when you were talking about identifying solutions, could you give an example?

F: (pause), ah..., (pause), hm, ... Well, I don't know if I can come up with something really concrete, maybe because this situation's so common, and happens so often, and it just, ah .. can be ... and it can be any gathering of people who are concerned with something.

Native speakers generally showed less hesitation, and had less difficulties using other words to express what they meant (paraphrasing, in response to the question *Is there another way you could say that?*), or giving examples (in response to the question *Can you give an example?*). The material therefore supports the overall assumption that non-native speakers had more problems of comprehension and expression of subject matter.

Good communication skills

One way of coping with the challenge of comprehension and expression difficulties in a foreign language, is to develop greater tolerance towards imprecision. This means, for instance, learning to talk in a clumsy and imprecise manner, counting on the listener to fill in the blanks and understand what is meant, regardless of what is actually said, etc. In the conversations, all the students in the group had good communication skills, and were able to communicate well, though they were not always verbally explicit or precise. The students also regularly requested confirmation that they had understood the questions, and that their own explanations were understood.

However, mere discursive fluency does not ensure understanding (Airey 2006; Anderberg et al. 2008). Many science students are *discursively fluent*, but show no appropriate experience of the corresponding way of knowing the world.

Awareness of communication issues

Several of the students (F, H, D, A, G, C) comment on issues of language and/or language use. Several refer to language as a problem. Some say that they occasionally use expressions without having a clear idea of what they actually mean.

However, above all, students focus the communicative process. Several reflect on the problem of how they will be able to communicate in their future professional life with people with different backgrounds. They think the fact that they have studied these subjects in English might make it more difficult for them to work in this field in their home countries.

I: AndHow would you say “approach closer to nature” in your own language?

K: Hm,..... interesting question.....hm.... ah..... (pause) You know that’s the thing. Since I have started to study in English this is something, I have started to think about it. If I will be able to explain some things in my own language. Because I know these expressions in English. And..... it’s sometimes very hard to find ... the German equivalent.

Instead, they felt that what they had learnt on the course might be useful for working in a similar mixed or international environment as on the course, and where English is used as language of communication (cf. Georgiou 2007, and the discussion on motivation in Klaassen 2001).

The students who participated in this study were close to the end of their studies, and it is therefore not surprising that they were concerned about the question of how they were going to apply practically in their future careers the theoretical knowledge they had gained on the programme.

Limited linguistic awareness

Although language clearly played an important role, both with respect to which topics were mentioned and in how students expressed their conceptions, students had shallow linguistic awareness (cf. Åkerblom 2008). While they were able to discuss how language affects communication, they had difficulties discussing differences of meaning, and how these related to the ideas they wanted to express. However, focusing thoughts that were difficult to express verbally may have stimulated students' reflection.

Vagueness and experimenting new ideas

Another consequence of the multilingual learning situation seems to be that non-native speakers learned to live with a greater degree of uncertainty. Hellekjaer has found that *“students in CLIL courses who at the outset read very slowly and carefully had to change how they read to manage the course”* (Hellekjaer 2005, p. 201). Among the positive aspects related to this lack of precision among students in the present study was a certain openness to experiment ideas that were new and not yet very clear. The downside was that the students who did not have English as their mother tongue were forced to reason in a rather general and vague way all the time. Native speakers would be able to choose between a more open experimenting mode of discussion and a greater degree of clarity and precision, depending on their intentions.

Problems relating personal and academic knowledge

Surprisingly, the student's personal experience of flooding and prevention was rarely mentioned until a fairly late stage in the conversations. Students seemed to perceive the situation as an academic context, requiring some kind of disciplinary response (Bardovi-Harlig & Harford 2005). They often had difficulties finding concrete examples for the theoretical principles they discussed, while examples from the media (such as the hurricane Katrina) were relatively frequent. Disciplinary concepts from the students' prior studies played a prominent role in the explanations.

In many of the students' explanations, theoretical concepts did not seem to function as an expansion of personal knowledge from everyday experience (cf. Österlind 2005), and in line with findings in Anderberg's (2003) study, students' knowledge tended to be poorly integrated. A preliminary conclusion of the present study is therefore that enhancing students' awareness of how language contextualises knowledge might reduce tendencies towards

compartmentalisation (Beatens Beardsmore 1982; Becher & Trowler 2002), and thereby give better access to the students' entire knowledge potential in solving complex interdisciplinary issues in the area of sustainable development.

Other aspects to learning on an international programme

The present study was not designed to compare learning that takes place in the student's own language with learning in a foreign language, in terms of achievement, but rather to explore qualitative features that characterise students' approach to subject matter and how this may relate to language. Their learning experience on an international programme was not focused in the dialogues as part of the main questionnaire and focusing sequences. Nevertheless, based on this empirical material, certain observations and deductions can be made in this respect.

The following is mostly based on students' answers at the very end of the conversation, to a very generally phrased question: *And what do you think about your studies here in Sweden?* but also includes remarks and reactions from other parts of the dialogue.

Several students remarked on the fact that using English as a medium of instruction creates inequalities between the students in the classroom (cf. findings in Welikala & Watkins 2008).

Inequalities in position

Non-native speakers remarked that native speakers took more space. They spoke more often, could express themselves better, and were therefore able to argue for their ideas. By contrast, students felt that non-natives speakers spoke less, were not able to express themselves clearly and in detail, and were therefore not able to present their arguments in a convincing manner. They felt that there was a tendency to evaluate the quality of students' ideas on the basis of their eloquence.

H: [...] hm ... more than the classes, it was interesting as studies, the way we expressed in English, all of us trying to talk, and our proficiency in English, very very different levels. Hm .. very difficult to understand each other ... because of accent, and the words you'd use, ... ah ... even though I spoke English, and learned English at school, I'd tend to use a little too technical terms when talking, yes, it was always refining your English, when you talked to a native English speaker, they had simple ways of expressing it, but because ... we tried to ... remember all the technical terms which we had learned at school, and... you'd try to complicate the sentence, instead of saying it very simple, you would use too many words to express it, and when you would listen to another person talking, you'd realise that you could have expressed it in a simple way. Hm, learning, but sometimes you'd think, ... hm ... language gets too much attention. Beyond, artistically like, ... as a part of literature, when you write a poem or something, or you listen to a song, there is a different way of doing it, while talking, language is more a medium of conversation, but sometimes, it goes beyond that, hm ... it becomes part of an identity, getting noticed, ... or ... because it's part of the identity, hm ... and I think that's not good. Because, there are people who know much more, and in depth, who fail to express what they think, because

... they are scared to express themselves in the very limited way they know, being scared of being ridiculed in front of everybody.

Inequalities in learning

Some native speakers expressed that the level was lower than what they would normally expect of a Masters course, and that discussions tended to be slow, difficult and overly simplified, because certain non-native speakers had difficulties understanding, expressing themselves or identifying what the topic of discussion was. Several non-native speakers instead described the courses as very demanding, and felt they had to struggle to keep up.

K: It's the first time that I really have to read and write and listen and speak in English, - all the time! it's (laughs) ..yeah... (laughs)... quite hard.

In other words, although all students praised the open and friendly atmosphere on the programme, there were also tensions between conflicting value systems or norms concerning verbal expression: the openness and tolerance for imprecision expected in English lingua franca contexts, clashing with requirements for clarity and stringency normally found in English-speaking academic contexts.

Discussion

Simplified registers and issues of context

There is a fundamental and important difference in the use of a 'simplified register'⁹, such as English lingua franca, for purposes of communication and using it for purposes of knowledge formation. If two speakers have a shared frame of reference, and a shared understanding of phenomena in a given context, simply *referring* to an idea may be sufficient. In this case it is not necessarily problematic that a simplified register is used, or that language does not conform to normal grammatical or stylistic standards for academic language. In such cases, non-verbal communication such as gestures and expressive sounds may suffice, but also a simple code or shorthand could be used, provided the users already know what the symbols stand for. This is for instance the case in the formalised 'mathematical' expressions used in physics or chemistry. As long as all speakers involved 'know what they are talking about', and agree on different implications, communication may function. Missing information can in other words be supplemented by a context, to the extent that speakers interpret this context in similar ways.

Findings of the present study clearly show that not only do general ideas on preventive strategies vary greatly, but also the types of situation envisaged when speaking of ‘flooding’ can be extremely diverse. This has importance for discussions concerning possible solutions, since the different situations are connected to different types of causes of flooding.

It is also clear that although the questions in the dialogue format did lead to various developments and to a different framing of the topic than the initial question, no automatic link can be observed in the conversations between ‘context’ (as framed by a specific question and the way it is phrased), on the one hand, and the way students respond to the question. Asking questions in English during a conversation taking place in a locality in Sweden does not *automatically* lead to associations relating to their current English-medium studies, nor to Swedish local examples, although some students did associate in these directions. Inversely, asking questions about their mother tongue does not automatically lead students to associate to examples from their home countries, although in several cases such examples were given. Instead, students’ response appears to be a function of how they individually perceived the conversational cues and context at a given moment.

Discussing an unfamiliar phenomenon

In education and research, a number of situations exist where the use of a simplified register may be problematic. In particular, problems may arise, if all speakers are not already familiar with all relevant aspects of the phenomena that are discussed. This is typically the case in a learning situation. When natural language is used in education, it can describe something previously unknown, by analogy and drawing on a fund of common knowledge and experience. The complexity and precision of analogies and distinctions that can be made will depend on the expressive range of the register (or registers) that are used, and here simplified registers are no longer equivalent to standard academic usage. Most educational policies stress the importance of adequate literacy for academic achievement. The observed importance of prior knowledge for the effectiveness of foreign-language medium instruction (cf. Klaassen 2001) provides empirical support for this line of reasoning.

In the present study, for instance, one of the students appeared to have misunderstood the key notion of ‘stakeholders’ (student D). Clearly, she had not heard of anything equivalent in her prior studies. She did not know any equivalent term in her own language, and different stakeholders were in fact not involved in land use planning institutions in her home country. Instead, she had deduced that the word had to do with different areas of expertise, since experts from various fields could be involved in land use planning in her home country.

Context provided in a stylised manner

In textbooks, a short description of a case, a picture or just a reference, will often be used to 'represent' the complexities of problems and conditions existing in an actual situation. In heterogeneous groups, participants are less likely to have shared experiences, or shared positions and perspectives in such experiences, that they can identify with a stylised representation. Here, context cannot 'in itself' supply the information that is lacking in verbal communication, unless such representations correspond to actual shared experiences. Textbook examples and illustrations that might function as context for homogenous groups are therefore less likely to do so for heterogeneous groups of learners. Similar reasoning can be applied to contextualising material that is often provided in distance learning to supplement problems in proficiency and verbal communication.

In the empirical material of the present study of language use and knowledge formation, students made frequent references to textbook examples and the media. Hurricane Katrina, for instance, constituted a shared frame of reference, and flooding in Bangladesh.

However, media accounts tend to be stereotyped, and knowledge of the actual circumstances surrounding events may not be sufficient to feed in-depth reflection on the issues involved. Although such textbook or media examples placed arguments in a kind of context, it did not necessarily correspond to a quality of understanding that allowed students to connect abstract notions learned on the programme to concrete situations in their home countries. In relation to language and knowledge formation, a distinction should therefore be made between real contexts, and conventional representations of context.

In multilingual learning situations, it is likely that conventionally expressed contextualisation of the kind found in textbook 'cases' is not enough. Explicit discussions are needed on how conversational or educational context is perceived and interpreted. With respect to the relationship between language focused and how subject matter is expressed, the individual learner's perspective must be considered.

Interdisciplinary learning situations

Interdisciplinary learning situations can be of various kinds. The subject matter and approaches to it may pertain to, or result from, research in different disciplines. In such cases, there will not be any single way of understanding a phenomenon, the context in which it is discussed, how reliable and relevant knowledge may be obtained, or the use that knowledge will eventually be put to. This clearly puts a heavy functional load on communication, since very little can be taken for granted.

In the present study, for instance, one student based all his arguments on risk management, which was his previous field of studies. Another student based her reasoning on land use planning, since she was a land use planner.

I: What are you thinking about when you say that?

D: I am thinking about, because my background is land use planner, so I think it is something that we can do a lot of action to prevent.

A third student combined arguments from her own background in wetland preservation with discussions from the media, and had difficulties finding a coherent standpoint. Student (A) had previously studied media communication, and based his reasoning on issues of information and communication through the media. Student (J) had studied law, and based her arguments on preventive action through appropriate legislation. Arguments and conclusions clearly varied depending on students' disciplinary backgrounds.

Intercultural learning situations

Whenever there is not a single given manner of understanding a phenomenon, its context or the aims of the learning situation, not only do many aspects have to be discussed in order to clarify what is meant, but also, the object of learning will be negotiated. Both the relative status of languages and the limited expressive potential of a simplified register will influence the outcome of such negotiation, and contribute to defining positions of power. This can lead to certain groups of students being less involved in discussions and feeling alienated from the outcomes of discussions (cf. Welikala & Watkins 2008), which will in turn affect motivation, what they learn, and how they relate to this knowledge. Although the issue was not specifically focused in this study, several comments indicate that the group experienced tensions of status/position based on linguistic proficiency.

Conclusion

In the present study, the manner in which language contextualises or frames subject matter has been given particular attention. Among other things, it could be observed that notable changes occurred in the manner the topic was discussed, depending on the context that was signalled by use of English, on the one hand, and by asking questions concerning the student's mother tongue, on the other.

Some kind of development took place in all the dialogues, except two of the students. These developments in the students' responses appeared to be triggered by the questions that were asked. Naturally, it is not possible from the findings to determine if, in the long term, such developments may eventually lead to substantially new insights, widening or greater precision in the students' conceptions of the subject matter. However, on the one hand several students said that the dialogue had made them think (about things they had not considered previously). On the other hand, the large number of pauses and hesitations in the students' responses is an indication that they were probably reflecting on their answers as they spoke, and not simply expressing an idea they already had.

On English-medium international multidisciplinary programmes, it can be supposed that students come with quite different ways of seeing issues, whether from cultural, geographical or disciplinary perspectives. Within a given field of knowledge, where learners share the same frames of reference, it may be sufficient to *refer* to a particular phenomenon, using the ‘shorthand’ of a disciplinary expression. But when learning takes place across disciplines, assumptions and framing need to be explicitly discussed and *explained*. This places a much greater load on verbal expression, at the same time as many students use English in a rather imprecise manner, and have to struggle to express themselves.

Finally, although all participating students had a reasonably good command of English, students’ perceptions and experience of the programme clearly differed, depending on whether they were native speakers of English or non-native speakers. While native speakers felt that discussions were simplistic or at a much ‘lower’ level than expected, non-native speakers felt that the studies were a challenge. On a policy level, attention therefore needs to be paid to the fact that foreign-language mediated instruction will not only impact learning achievement, but also has implications with respect to depth and quality of learning. It affects the type of skills and content learned or neglected, and ultimately, the ways knowledge is applied in society.

Footnotes

- (1) *Budgetpropositionen för 2009* (Budget proposal for 2009, presented to the Swedish Parliament, September 22nd, 2008).
- (2) "Geographical and inter-sectoral mobility needs to increase substantially. The proportion of graduates who have spent at least one term or semester abroad or with experience in industry should at least double. This is even more true for researchers. All forms of mobility should be explicitly valued as a factor enriching studies at all levels (including research training at doctoral level), but also improving the career progression of university researchers and staff."

Communication of 10 May 2006, from the Commission to the Council and the European Parliament, delivering on the modernisation agenda for universities: Education, Research and Innovation. Available at http://ec.europa.eu/education/policies/2010/doc/comuniv2006_en.pdf (accessed June 13, 2008)

- (3) In 2004 and excluding the European mobility programmes, 401 124 students, corresponding to 2.2 % of the total European student population, studied for at least a year in a European country of which they were not nationals (Eurydice , 2007: *Key data on higher education in Europe, 2007 Edition*. European Commission, Eurostat). It should be noted, however, that these figures only include part of the students concerned by internationalisation, since other categories of international students come from outside Europe (see also *Atlas of student mobility*: <http://atlas.iienetwork.org/>).
- (4) HSV 2008:7 R, NAHE 2003. For information on the situation in Europe, see also the ACA/GES Database of Programmes Taught in English <http://www.study-info.eu/>, listing most Bachelor and Master programmes in Europe that are taught entirely in English.
- (5) Such as the Academic Cooperation Association (ACA, <http://www.aca-secretariat.be/>), an umbrella organisation for a number of European and overseas institutions active in the area of internationalisation and academic cooperation.
- (6) For instance, the International Association for Intercultural Education (http://www.iaie.org/1_about.htm) addresses issues of intercultural education, multi-cultural education, anti-racist education, human rights education, conflict-resolution, and multi-lingualism.
- (7) Although in Sweden the level of English is generally sufficient for simple communicative purposes, great differences exist across Europe, even concerning basic skills. According to a European survey (Commission of the European Communities ,

2006: *Europeans and their Languages. Summary*. Special Eurobarometer survey 243/Wave 64.3.), 44 per cent of Europeans say that they do not have a language other than their mother tongue in which they are able to have a conversation. 56 per cent, on the other hand, claim that they have a least one foreign language, while 28 per cent that they have at least two foreign languages in which they can have a conversation.

Not only tertiary education, but also many professional activities today involve precise communication in a foreign language or are based on learning and development in multilingual settings, aggravating the effect of such inequalities across Europe (see also Breidbach 2003).

(8) http://ec.europa.eu/education/languages/language-teaching/doc236_en.htm.

(9) The term was coined by Ferguson (see for instance Ferguson, C.A., & Gumperz, J. D. (1975). *Absence of copula and the notion of simplicity: A study of normal speech, baby talk, foreigner talk and pidgins*. In D. Hymes (Ed.), *Pidginization and creolization of languages* (pp. 141–150). Cambridge: Cambridge University Press).

Simplified registers have mainly been studied in the context of second language acquisition, despite potential implications for teaching of subject matter. For instance, Arthur et al. (1980) found that native speakers not only make linguistic adjustments to their non-native speaker counterparts, but they also tend to simplify the *content* when addressing a non-native speaker (Arthur, B., Weinar, R., Culver, M., Lee, Y. Ja & Thomas, D. (1980). *The Register of Impersonal Discourse to Foreigners: Verbal adjustments to foreign accent*. In D. Larsen-Freeman (Ed.), *Discourse Analysis in Second Language Research*, pp. 111-124).

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