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Summaries

Lennart Svensson, 2009: Use of language in constituting and expressing conceptions of objects of knowledge/ Användning av språk vid konstituering och uttryckande av uppfattningar av kunskapsobjekt/**. *Pedagogisk Forskning i Sverige*, Vol 14, No 4, pp 261–276. Stockholm. ISSN 1401-6788**

The phenomenographic research on university students' studies and learning started in 1970. In the research there was a focus on how to understand and describe students' personal knowledge of subject matter. This focus was developed as a reaction to the traditional way of constructing and using knowledge tests. It was found to be a problem that those measurements did no give an understanding of students' personal knowledge. As a response to this situation the phenomenographic orientation to describe qualitatively different conceptions of a given subject matter was developed. The differences described in this research orientation are differences in discerning, delimiting and organising content into conceptions, usually expressed in language.

Students' qualitatively different conceptions of a given subject matter were seen as dependent on their approach to the subject matter. Especially two distinctions were used to describe differences in approach, surface and deep approach and atomistic and holistic approach. These differences in approach were found to lead to important differences in conceptions expressed. Students' approaches to and conceptions of subject matter were understood within a view of knowledge and learning as a relation between subject and object. Personal knowledge was seen as a quality of the individual's relation to the world and to objects as different parts of the world, and learning as a matter of change in this quality following experience. This relational view of knowledge avoids problems with a dualistic view, which places the knowledge either external to or within the individual.

A focus on differences in approach to subject matter was a central part of the relational view of learning and meant an emphasis on the acting of the learner. This interest in the learners acting, and approach in acting, has been further developed in later studies on learners' use of language in relation to subject matter. This is a continuation of the earlier research on differences in approach leading to differences in knowledge outcome. This research on the use of language is a deepening of the research on approaches to subject matter. At the same time it represents an alternative view on use of language compared to most cognitive and socio-cultural traditions. This research also addresses the use of language as a central educational problem in a way that has not been done before.

Within education there has been an emphasis on mediating knowledge. The form in which knowledge has been given has to a large extent been as language. Although may be the knowledge has not been seen as equal to the language in which it is expressed, the problem of the relation between content of knowledge and language form has not been carefully dealt with. In education a main problem is how one can start from knowledge given in a certain collectively shared language, and at the same time from the student's personal knowledge and language use, in a way that leads to aimed at learning results.

In education subject matter is presented based on collectively shared language. Then learning of subject matter easily becomes learning about theories, where a given language is a central part of the theories and the learning of those. In the form the theories are given, content of knowledge and language expressions are closely related often through definitions. There is most often little of context given to the choice of expressions. This lack of context is a problem to the students, who have access to other language expressions that may be experienced as relevant, and when the expressions used in the theory are used with other meanings in other contexts.

Descriptions of phenomena in subject matter theories are based on a discerning of a certain relevant content and the use of expressions to express relevant meanings. This means that some meanings of those expressions are relevant and others are not. The requirements of precision of and consistence between those meanings are high within the theory, much higher than the precision and consistence it is reasonable to expect within the students previous knowledge and use of language.

Both different meanings and lesser consistence than in the theory therefore are to be expected in the students' descriptions of subject matter. The students cannot be expected to already have the conceptions of objects presented in the theory, nor the meanings that in the theory relate to parts of the objects. There descriptions of phenomena must be expected to have an unclear and varying relation between expressions and meanings used in the descriptions. How this is the case has been described in several research projects.

One suggestion from previous research is that the differences found in students' descriptions, compared to subject matter theories, and between students, might be explained as depending on alternative conceptual systems. However the empirical data rather gives the picture that the student's do not have an alternative theory or conceptual system to start from. They seem to try to give a description based on experience of the object talked about. They do not either seem to start from some alternative language. Their descriptions are characterized by that they link both to subject matter theory language and every day language in an individually varying way. Their descriptions seem to a large extent to be individually constituted. Thus the situation is that students use subject matter language and every day language to varying extent and in different ways to describe phenomena. They constitute an individual relation to the subject matter theory language, and every day language, and the relation between these specifically in relation to the object of knowledge and the dialogue situation.

The dependence of the meanings of expressions, used by the students, on logical relations and meaning relations to the immediate context of their rather unique description of subject matter, points to limitations in the possibility to explain those meanings as taken from some socially given or theoretical language. It is much more relevant, especially in relation to a process of learning, to assume that the expression of meaning is made in the same way as when creating theories and language, which can not be based on assuming that those meanings are already established. Meanings seem to be created from contexts and elements of those. The meanings created may be more or less in agreement with existing theories and languages. One may even work hard to get them in agreement or to create something different and succeed or not in this.

Expressions may be given meaning through the meanings of other expressions. This meaning is often assumed to be general and reoccurring in the use of the expressions. However, another and more fundamental way of giving meaning to expressions is through using them in specific contexts. It is such uses of expressions that our research has focused on. This research shows that it is insufficient to understand students' use of language expressions as a use of expressions in systems of expressions and concepts, social languages or theories. Language expressions get their functional meaning through the use of them, and this meaning has to be communicated and learned in use. Meanings have to be clarified in relation to context of use and in relation to alternative uses of the same and other expressions. In education it is especially relevant to understand the meaning of expressions as dependent on the function of the use of expressions in conceptualising subject matter.

Thorsten Johansson, 2009: Language and discourses in pedagogical research on learning/ Språk och diskurser i pedagogisk forskning om lärande**/. *Pedagogisk forskning i Sverige*, Vol 14, No 4, pp 277–292, Stockholm. ISSN 1401-6788**

The role of language is central in learning. Language is used for conceptualisation and to communicate understanding. We have therefore in our »Research program for language use and individual learning» investigated questions about language use in a number of ways. One central problem here is the question of what concept of language it is that is used in different theories of pedagogical research to explain learning. A second main theme in our studies is an investigation of the agent's perspective, or first person perspective, in learning.

The two most dominant views in research on learning are different kinds of cognitive and different socio-cultural theories. One could expect them to disagree in their ideas about language, since they hold opposing views about

the foundations of learning. The cognitive school investigates mental models that are supposed to explain learning by conceptualizations, while socio-cultural theories investigate patterns of communication that are supposed to be appropriated in learning. We do however mean that they both share a number of basic presuppositions about language, and that those common ideas are in several ways problematic.

A view on language that is both common and also could be said to be accepted by both cognitive and socio-cultural theories, is a view that we here will call *the linguistic view of language*. It contains the two very common ideas that language consists of a lexicon or a vocabulary, and also a grammar which regulates the lexicon by rules. This view is basic to school grammar and the ordinary view that for example English and German are two different languages.

We believe that the linguistic view is appropriate for grammatical investigations of language but does not suite investigations of learning, since it is based upon vocabularies of languages and not upon understanding of subject matter. We have therefore in our phenomenographic research program developed a model for investigations of language use, which is based upon some ideas in the philosophy of language. The reason for this is that philosophical investigations of language are not based on expressions and vocabulary, but on the conceptual content of the expressions in a language.

As a contrast to Ogden's triangle in philosophy of language we have developed what we call *the broken triangle*. It is a tool for analysis of language use, and not a model of how the mind works. We differentiate between the linguistic and the logical or conceptual approach to language. The linguistic approach is based upon expressions and their role as belonging to different kinds of grammatical categories. The logical approach on the other hand is based upon the role the conceptual content has in understanding. We differentiate between the expression, the intended meaning of an expression, the conception of an object and the object of understanding.

In starting from the meaning of expressions instead of expressions or a vocabulary we are looking at the intention of a language user. We therefore call our view *the intentional-expressive approach to language*, since it is the expressed intention of an agent that is central to the investigation. We thus not only disregard the linguistic view of language as something primarily based upon a vocabulary, we also think that language is not rule governed. The standard view of rules of language is that they decide how expressions can be used and altered, and that they decide how expressions can be put together to form meaningful sentences.

We would rather say that it is the role of an expression that decides how it can be meaningfully used. Its role is based upon the meaning of the expression and not its grammatical classification. The agent's use of language is thus a way to express a meaning with the expression, and it is not regulated by rules but by the intention. We are therefore also interested in the concrete use of language and not in theories of rule governed language use, such as in pragmatics.

We can in socio-cultural theories of discourses find an example of why we think that the linguistic view of language is problematic. One of their main ideas of language is that it is used in communication for learning. Language is supposed, in the learning situation, to be something that is appropriated by the learner as a discourse about a subject-matter. What are appropriated here are then not primarily conceptualizations of the meaning of expressions, but rather the expressions themselves.

The reason for this is that the starting point of the idea of discourses is that they consist of expressions that build up a vocabulary. The meaning of expressions is secondary, and is just supposed to be something that is contained in the expressions. One problem with this assumption is that, since the meaning of the expressions is secondary to the expressions themselves, there is nothing that guarantees which meaning it is that will be associated to the expression. This loose relation between expression and meaning is a big problem in learning, when students are trying to learn a discourse. They are often able to reproduce patterns of language without fully understanding the intended meanings of the words used.

A second idea in the linguistic view of language is that the meaning of expressions just is the general lexical meaning of words. This concept of meaning is an idea of meaning based on a third person perspective. In learning however, understanding is from a first person perspective or agent's perspective. Understanding, even in understanding the third person perspective, is still from the agent's perspective. This means that in theories of discourses one is not only disregarding questions about conceptualizations. These theories do not either consider the agent's own perspective.

We have in our research program investigated language use from the agent perspective since we are interested in the agent's intentions in language use in learning. The reason for this is that we are interested in the agent's own conceptualization of subject matter based on his or her experience. We are interested in how the agent uses language in communication situations in learning to conceptualize and reflect on his or her experience, and also to see how he understands the object of learning.

The cognitive school in theories of learning investigates mental models that are supposed to explain learning by conceptualization, but takes language use as second to conceptualization. Socio-cultural theories investigate patterns of communication that is supposed to be appropriated in learning but do not consider the role of conceptualization. We have in our model for investigation of learning combined a focus on both use of language and conceptualization. We believe that we therefore in a better way than the cognitive schools and the socio-cultural schools have succeeded to describe learning, since we have investigated how language and thought interplay in language use and in conceptualization.

Elsie Anderberg, 2009: The function of language use in knowledge formation/ Språkanvändningens funktion vid kunskapsbildning/**. *Pedagogisk Forskning i Sverige,* Vol 14, No 4, pp 293–310. Stockholm. ISSN 1401-6788**

In the intentional-expressive approach, the field of research is delimited to use of language in relation to individual development of knowledge. The goal is to describe the interplay between verbal expressions, and their meaning in use in expressing the content of understanding of subject matter from the learner's point of view. This is not, as one could expect, a well researched field. The lack of research is due to the delimitation of the phenomena studied in previous research. It is also due to the view of and assumptions about the relation between language use and development of knowledge.

The intentional-expressive approach represents basic research into fundamental questions about the role of language in learning. The function of language use in knowledge formation has been one of the main research interests in developing the intentional-expressive approach to the interplay between expressions, meanings and conceptions when developing understanding of subject matter. The article presents evidence and argues for the value of devoting more attention to the interplay between words, meanings used, and content in learning about a subject matter.

The article consists of four parts. The first and second sections give a short background and description of the intentional-expressive approach. The third section describes how the interplay between conceptual content and meanings is developed, based on empirical investigations, and discusses their significance. The last section stresses the need to pay attention to the interplay in research on learning and in teaching.

Language is crucial in learning in several ways, although it is not always clear how. The constitution of the interplay between use of language and development of knowledge is understood in different ways within different theories and perspectives. Within the cognitive perspective, in theories on conceptual change, there is an analytical approach to the interplay, primarily focusing competition between alternative conceptual systems.

Concepts are thought of as corresponding to information entities or bits, where different constellations or constructions of these entities or parts form the individual knowledge. These mental constructions are considered to constitute linguistic conceptual units integrated in knowledge construction. An alternative to the cognitive theories are the socio-cultural theories on learning, where the »linguistic part» is focused. The approach within this perspective is discursive. Knowledge is seen as constituted in relation to discourses as contexts. Discourses are entities of communication patterns in different social contexts. Students or pupils then have to appropriate patterns of talk in the specific discourse. If they adequately appropriate the specific discourse, they also get an adequate knowledge.

Both perspectives are problematic. No major efforts have been made to investigate the relationship between language use and knowledge formation, regarding how the interplay between content of understanding of subject matter, meanings of linguistic expressions and linguistic expressions are con-

stituted in action from the learner's point of view. Empirical studies carried out in different educational settings involving different subjects (nursing, mathematical instructions, classical mechanics and geography) within the intentional-expressive approach show that individual student's use of language to express understanding of subject matter is ambiguous, dynamic and contextual. Different expressions are used by the same student to express the same meaning and a particular expression can be used with several different meanings.

The relationships between the meanings of expressions used and the content of the understanding are more consistent than the relationships between expressions and their meanings. In spite of a common use of technical terms by students in mechanics in describing understanding of a subject matter, the understanding of the subject matter is more of a commonsense understanding. Also, empirical investigations of different age-groups concerning the character of the interplay between meanings and expressions show that pupils change the expressions used, but not the meaning.

The intentional-expressive approach is developed in phenomenographic research on learning and has developed an alternative conception of language meaning based on the gestalt dimension in the late Wittgenstein's discussion of language. This conception is illustrated by the »broken triangle». The approach invites to a thorough investigation of how the interplay between expression, meaning and conceptual content is developed in knowledge formation from the agent's perspective. The differentiation between conceptions, meanings and expressions provides possibilities to better grasp the ambiguity, as well as the dynamic and contextual character of the role of language in learning.

The interplay between the meanings of the expressions used and the content of the understanding of subject matter is of particular interest. This relation is not only linked to how a specialized system of language is internalized or mediated, since the relation is not seen as one of naming and stable. Rather the relationship is seen as an internal process of constitution, dependent both on the activity of the learner and the immediate context. The understanding of the function of meanings used in expressing conceptions is important, because it has implications for how to reduce rote learning or passive reproduction of knowledge.

Christer Alvegård, 2009: Interplay between expression, meaning and conception of a physical phenomenon in dialogues with college students/ Samspel mellan uttryck, innebörd och uppfattning av ett fysikaliskt fenomen i dialoger med gymnasieelever**/. *Pedagogisk Forskning i Sverige,* Vol 14, No 4, pp 311–329. Stockholm. ISSN 1401-6788**

Language plays a major role in learning, since the meaning of language units and the understanding of objects referred to are constituted in relation to each other. In the intentional-expressive approach, a development within the phenomenographic tradition, language use and meaning are considered from the learner's perspective. The intentional-expressive approach studies individual learner's use of expressions and meanings, in relation to his/her expressed conception of parts of the world.

This study presents empirical findings, from dialogues with 23 pupils in their last year of upper secondary school, concerning the interplay and interrelationships that can be observed between expressions and meanings used by pupils when expressing their understanding of a physical phenomenon. The result shows strong links to the way physics is presented in school, but with a prominent vagueness in conception of the phenomenon and intended meanings of expressions used.

The relation between expression and intended meaning is much weaker than between intended meaning and conception. In learning situations, especially in natural sciences, the ambiguity between expression and meaning may cause problems in pupils' knowledge formation. The disciplinary knowledge and its given linguistic form is often treated as an entity with consistent and stable relationships between how events are conceived theoretically, and which linguistic expressions are used, with which specific meaning. However, a similar correspondence cannot be assumed to exist when it comes to the pupils' explanations.

The way to study and describe learning and individuals' understanding differ between research traditions. Research on individual understanding of physical phenomena has predominantly taken place within the cognitive and socio-cultural traditions. Within the cognitive theories learning is seen within the context of an individual conceptual system with focus on conceptual entities. Within the socio-cultural tradition on learning meaning is identical with meaning within a collective language or discourse. Learning is seen as an appropriation of a specific culture in the form of a discourse. An alternative to these theories on learning is phenomenography where individual and world is not separated, the world is the world experienced by the individual. The world is constituted as an internal relation and knowledge is developed as this relation is changed.

The intentional-expressive approach we have adopted is drawn from phenomenography, where the focus lies on students' or pupils' experiences of conceptions of parts of the world, seen from a first person perspective. The intentional–expressive approach to language, which can be related to the later Wittgenstein's »language in use» in connection to Gestalt theory, allows us to analytically differentiate expression, intended meaning and conception from

each other, when analyzing how pupils express their understanding of a phenomenon, or object of knowledge.

Within the intentional-expressive approach, the role of language in learning is characterized by being internal and contextual. The same holds for the relationship between conception and knowledge object. In the process of describing the conception of a complex knowledge object the learner uses a number of much less complex entities, that we here refer to as *intended meanings*, and these are in turn expressed by *expressions*.

In dialogues pupils were presented with a phenomenon in the form of a knowledge question that offered the opportunity to relate to subject matter. The phenomenon presented was meant to stimulate the pupil to reflect upon his or her conception, expressions and meanings used, as well as on how these are related to each other. The starting question was: »What happens when you throw a ball obliquely up into the air?» The pupil then expressed his or her conception of this phenomenon.

The researcher chose some key expressions used by the pupil in his or her responses to the initial question. These expressions were chosen due to their potential to reveal important aspects of the pupil's conception of the phenomenon. To obtain information concerning intended meanings, the pupil was asked to reflect on these expressions to; (i) identify their meaning(s), (ii) explore their function in relation to the conception of the phenomenon, and (iii) decide upon which expressions and meanings seem to be most relevant, by discerning differences related to the conceptualization of the stated problem.

The analysis of the verbatim transcribed dialogues was made according to the methodology for contextual analysis, using micro-process analysis, a detailed analysis of the interplay between the three components. We differentiate analytically between the expression used by the pupil, the intended meaning, and his/her expressed conception of the phenomenon. As the pupils are expected to understand everyday mechanical phenomena in accordance with Newton's mechanics it is relevant to compare expressed conception and meanings with the discipline.

The analysis shows that intended meanings of used technical terms were always disciplinary in dialogues expressing a disciplinary conception (4 dialogues), whereas in the other dialogues (19) both disciplinary and non-disciplinary meanings were used in expressing the non-disciplinary conception. The way of expressing was often clear and distinct when expressing a disciplinary conception.

However, in a number of dialogues expressing a non-disciplinary conception the expressed conception can be described as a mixture of the pupil's conception of how the subject physics in school describes or explains the phenomenon and an everyday conception of the phenomenon. This mixture results in difficulties for the pupil that are manifested in the character of the interplay between the used expressions, intended meanings and expressed conception. The character of the dialogues expressing a non-disciplinary conception is classified as:

- *Contradicting*; at least one meaning is contradicting a disciplinary meaning (10 dialogues).
- *Mixed*; the conception is shifting back and forth between disciplinary and everyday due to changed intended meaning of at least one expression where no preference for either meaning is given (2 dialogues).
- *Vague*; different types of vagueness are the predominant character (7 dialogues). The vagueness concerns both how actual intended meanings as well as combinations of them are used in expressing the conception.

In general the dialogues show that many pupils have large difficulties in differentiating between the meanings of the expressions force and energy, acceleration and velocity, and kinetic energy and velocity. In addition to vagueness there is a sort of stiffness in the use of technical terms. The pupils often referred to school situations concerning how to communicate on the expression level, which technical terms to use in specific situations, and examples and mathematical formulas presented in the textbook or by the teacher.

Annika Åkerblom, 2009: How pupils in school use the words *air* and *attraction force* to express their understanding of physical phenomena/ Hur elever i grundskolan använder orden *luft* och *dragningskraft* för att uttrycka sin förståelse av fysikaliska fenomen/**. *Pedagogisk Forskning i Sverige,* Vol 14, No 4, pp 330–353. Stockholm. ISSN 1401-6788**

This article is based on a qualitative, empirical study, in which preschool and elementary school children were asked two questions: »What happens when you throw a ball obliquely up in the air?» and »Why doesn't the moon fall down on earth?» The questions presented a problem that could be described in Newtonian physics and basic astronomy. 67 pupils (6, 10, and 14 years old) participated in the study, and a special dialogue format was used. The pupils were encouraged to reflect on their own language use when expressing conceptions of the physical phenomena. In the analysis, two key expressions used by the pupils were focused: *air* and *attraction force*.

Research in science education indicates that many pupils in elementary school find it difficult to understand physics and to use scientific language. Language and language use are crucial for learning, and the difficulties pupils encounter are in certain respects connected to language use. At school, the pupils meet new expressions, which they lack experience of, as well as familiar expressions with new and different meanings. To understand theoretical expressions, the pupil must create appropriate relations to them, and become acquainted with the characteristics of scientific language. For instance, scientific expressions in physics have stable and well defined meanings, while everyday language is characterised by flexibility and ambiguity. In this study,

it is not languages as conceptual systems, or the communicative function of language that are in focus, but how children use socially and culturally constructed language to express understanding about parts of the world.

It is well known that children's intuitive conceptions frequently differ from scientifically correct ideas. Many studies have focused children's misconceptions, or alternative conceptions as they are sometimes called, and the question of what role misconceptions play in learning is a much discussed issue in science education. In studies about how children understand the notions of air and gravity, some prominent themes include the notion that gravity needs air, that there is no gravity in space and that lack of air means weightlessness. Piaget saw in his interviews with children that their conceptions of air were similar to the Aristotelian view of air and motion.

The intentional-expressive approach used in this study was developed by Anderberg, focusing the role of language in learning. The intentional-expressive approach deals with how the relation between language use and knowledge formation is constituted from the learners' point of view. In learning situations, where the meaning of expressions changes or develops in the process, or when similar meanings are expressed in different ways, a structural or lexical description of language is not sufficient to explain and explore those changes. To include the individual learner, a language view drawn from the later Wittgenstein is used, where language meaning is defined by its use. Learning involves a change in the relation between an expression, what is meant by the expression, and the content of the learner's conception of subject matter.

The intentional-expressive approach was developed in the phenomenographic research tradition, which focuses how individuals experience the world and learn to act in it. The dualistic separation between the subject and the world is rejected, since an individual only has access to the world through his or her experience of it. The most fundamental aspect of phenomenography is that experience is explained as an internal relationship, constituted between an individual and a phenomenon. The experience is not separated from what is experienced. Instead the relation is treated as a whole.

Data was collected in a dialogue structure, developed within the intentional-expressive approach. The questions of the dialogue structure are intended to make the children express their understanding of a problem and then focus on key expressions the children used to express their understanding. Thus focus is shifted from the conception of an object to reflection on how the conception was and is to be expressed.

The two questions asked together presented a problem: balls and other objects close to earth fall towards it, unlike the moon. The child was invited to discuss the two questions in relation to each other, choosing which one to start with. Follow-up questions were also asked, to clarify aspects of the answers. As the child explained his or her conception of the problem, key expressions were chosen by the interviewer and asked about. The children were invited to examine, question and investigate what they meant by a certain expression, and how it served to express his or her intended meaning. A comparison was made concerning what meanings the same expressions were given by different

pupils, and what similarities and differences existed in and between the age groups.

The results show that there is no stable and unambiguous relation between expression and meaning when the pupils express their conceptions of physical phenomena. The most noticeable observation is that expressions are given different meanings by different individuals, meanings that sometimes even constitute opposites. There was also variation in how meanings were given to the same expression within the same dialogue.

The great variety of meanings given to the expressions *air* and *attraction force* in the dialogues, were grouped in themes of meaning. Three of the themes were found for both air and attraction force. The themes were named *carrying*, *stabilising* and *delimiting*. In one more theme, *air has attraction force*, air and attraction force were seen as closely connected. The themes were similar to previously described misconceptions about air and attraction force, where air and attraction force are seen as related, especially the notion that objects are weightless where there is no air. While expressions and ways to use expressions change with age, conceptions did not change so much. Regardless of age, the pupils expressed similar conceptions, but they used different words. The six year olds used air with similar meanings to those the older pupils gave to the expression attraction force.

It has been shown that if appropriate conditions are created in learning situations, pupils in preschool and the early years of elementary school are capable of understanding abstract scientific ideas. One important point is not to take for granted that expressions are given the same meanings in different contexts, and by different individuals, but to take the interplay between expressions and meanings into consideration. The variation in meanings given to the same expression may, if made explicit and reflected upon, be used to create awareness and collaborative learning. When awareness of the interplay between expressions and meanings is created, the dynamic and ambiguous character of language use can be made a tool for meaning-making, instead of constituting an obstacle for learning.

Helen Avery, 2009: Preventing major flooding – reflections on language and meaning in a multilingual and interdisciplinary context/ Att förebygga stora översvämningar – reflektioner om språk och mening i ett flerspråkigt och interdisciplinärt sammanhang/**. *Pedagogisk Forskning i Sverige,* Vol 14, No 4, pp 354–373. Stockholm. ISSN 1401-7688**

Higher education in Sweden is today rapidly developing in the direction of increased internationalisation. This involves, among other things, a growing number of modules and programmes taught in English, offered to both Swedish and international students. Non-native speakers have certain problems

with both comprehension and production, which ultimately impact their learning. Subject knowledge may not always be easily transferred across national borders. Internationalisation also entails more heterogeneous student groups, and a greater diversity in prior knowledge and disciplinary background. 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.

The present study uses an intentional-expressive approach, which aims to explore the function of language use and how conceptions are expressed, seen from the learner's perspective. Learning is viewed relationally, and as dependent on the way a learner approaches a phenomenon, while language use is seen as individual and contextually situated. Variation in the way expressions are used, and the meanings they are given by the learner in relation to specific knowledge content, are therefore considered to be central aspects of the learning process.

The study aims to investigate how the language that is used relates to the conceptions that are expressed, and to which extent the discussion is contextualised by the language. The dialogue format used in previous studies was also used in this study, but the interview guide was expanded to include questions relating to the student's mother tongue and native country. 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.

The issue of preventing of major flooding was used to benefit from an earlier study using the same question, and because this issue can be discussed against a variety of geographic and disciplinary contexts. Analysing global environmental problems and principles in different local contexts can give rise to a variety of views. The understanding of environmental issues is intimately linked to culture, world view and values, which influences the manner in which the students approach the issue.

Conversations were conducted in English with 15 students from different countries (7 from East and West-Europe, 2 from Asia, 1 from Africa, 2 from Australia/New Zealand, 3 from South and North America), studying sustainable development on an interdisciplinary English-medium masters programme offered at a Swedish university. 5 were English native speakers. Before entering the programme, these 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. There were 35 students on the programme, and all were invited to participate in the study by e-mail. Conversations were conducted by the author with those who agreed to participate in the students' own seminar room and other nearby university premises within a period of ten days. The material was transcribed verbatim, devoting special attention to pauses and hesitation.

After having answered in English the initial question on how major flooding could be prevented, non-native speakers were asked how key expressions in their explanation could be expressed in their mother tongue, and how the expressions could be paraphrased. They were then given the opportunity to

compare and contrast key expressions in English, in their mother tongue, and between languages.

The analysis of the material focused changes in the aspects that were mentioned in the course of the conversation, and in the way the issues were approached, seen in relation to the questions that were asked. Developments within the individual conversations were investigated, and related to the questions that were asked, concerning language and geographical context.

A number of developments, involving change of topic or manner in which issues were treated, occurred within the conversations, except in the case of two students. The changes that took place in the course of the conversations were different for the individual students. The new aspects that emerged in the explanations appeared to be triggered by the questions in the dialogue format.

Both the question »How would you express this in your own language?» and »Does this exist in your own country?» triggered separate developments in the student's way of discussing the subject. In other words, the issue of how language contextualises knowledge and affects the way the student expresses his or her conceptions, can not simply be reduced to associations connected to another geographical context.

Also, with respect to the relationship between language and the way subject matter is expressed, the learner's perspective must be considered. Although language clearly played an important role, both concerning which topics were mentioned and in how students expressed their conceptions, students had shallow linguistic awareness. 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 to some extent.

Surprisingly, the student's personal experience of flooding and prevention was rarely mentioned until a fairly late stage in the conversation. Students seemed to perceive the situation as an academic context, requiring some kind of disciplinary response. 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, and in line with findings in Anderberg's study, students' knowledge tended to be poorly integrated.

A preliminary conclusion of this study is that enhancing students' awareness of how language contextualises knowledge might reduce tendencies towards compartimentalisation, and thereby give better access to the students' entire knowledge potential in solving complex interdisciplinary issues in the area of sustainable development.