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Knowledge and Language Development: Students discussing how Physical Geography and Geomorphology have influence on life conditions and human activities

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Recent research has shown that there are strong connections between knowledge development and language development and that this should not be separated in teaching. Despite this there is a tradition, hard to kill, in Swedish Primary schools to teach language separated from content. Furthermore, language development has been associated with the formal aspects of how to read and write both in educational and political discourse. This has earlier been regarded as a matter for Swedish teachers only.

Over the last few years, Swedish teacher education has been criticised for not acknowledging what recent research has shown, namely the importance of content-based and functional reading and writing, irrespective of what subject the student has chosen. In recognition of these findings, changes have been carried out in the syllabi for all subjects in teacher education at Malmö University. The basic idea is to make students aware that children develop their language if in school they are given the opportunity to examine their living conditions and the world that they live in. When you communicate with others and analyse and interpret your experiences in order to understand your own and others' living conditions you might say that language *is* the 'life world'. In this process language and understanding are developed in a dialectic relationship. In our paper we will investigate how the changes towards content based teaching is being implemented in university courses and in teaching in partner schools. Our main interest is to study and to document the connection between language and knowledge development from both a theoretical and a practical perspective.

Language Development and Subject studies

Issues concerning language development are dealing with both functional and formal aspects. The functional aspects focus language use and understanding in varying contexts, that is our ability to talk, read and write about a specific content. The formal aspects e.g. technical aspects focus on reading and writing or the capability to express yourself in a language other than your mother tongue. Different situations and different content imply specific talking, reading and writing. Björk & Liberg (1996) wrote:

The later in school we get, the bigger difference there is between the texts in varying subjects ... In other words it is of utmost importance that teachers in different subjects know the typical characteristics of the texts in order to support and to help their students work to become familiar with these linguistic varieties. (s.17, our translation)

In a previous course book, '*Dialog, samspel och lärande/Dialogue, Interplay and Learning*', (Dysthe 2003), used during the students' first term, socio-cultural perspectives

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emanating from theories by Bakhtin (1981) and Vygotskij (1978; 1986) are discussed. In this course the theories about language, dialogue and learning are followed up with Dysthe et al (2002) '*Skriva för att lära/ Writing to Learn*' and Bergman et al (2001), '*Två flugor i en smäll/Kill two birds in one stone*', *to learn in a second language*. The theme in both books is that language development and knowledge development are intertwined communicative processes. The home environment provides the everyday and informal understanding of different concepts. Education has to take its starting point in the student's understanding of life processes in the world in order to support the development of scientific explanations. In connection to this the terms *base* (everyday and informal) and *extension* (scientific) are used. Dyson (1993) and Malmgren (1996) both emphasize that teaching has to take its starting point in the social worlds of the children. Teachers must be open to the everyday experiences of the pupils and encourage them to read and write about matters concerning their own lives. Malmgren says that children at school must be given the possibility to examine their internal and external world. Hargreaves (2003) also highlights the risk of focusing isolated skill training. Doing this you may eliminate cross curriculum global education which is the core of cosmopolitan identity.

Our starting point

Our starting point was work carried out during the autumn term of 2005 with a group of 180 new students in the department of Nature - Environment - Society. The students' main subjects are Mathematics, Science and Geography. They all interviewed tutors in their respective partner schools about language development within their subjects. They also studied textbooks and observed lessons. Their findings were published as articles, features and chronicles in the student netpaper *Orkanvarning* (Hurricane Warning, www.lut.mah.se), and commented on in an editorial article by Jan Nilsson. The students' texts showed that a great number of the interviewed teachers viewed matters dealing with language development and reading and writing as a concern only for teachers teaching Swedish. Only in a couple of examples the interviewed teachers stressed the relation between knowledge development and language development.

Geography, Environment and Learning

As a result of the study above and with the syllabus as a starting point, we chose to follow two groups of students from the start of their first course in Physical Geography – Geomorphology within the main subject Geography, Environment and Learning. The course we chose for our study is part of Teacher Education for students who are going to teach in Pre-school, Recreational activities, Primary School and Upper Secondary School. Practice and interdisciplinary seminars are included in the course.

Ethnicity, migration, gender and environment both constitute content in the course and are used as perspectives on conditions for learning. On a base level students get acquainted with how and why these perspectives are important in society and what kind of changes we may see in a historical perspective. Knowledge, based on the perspectives, is used as a tool when interpreting the curricula to make didactic choices. To increase understanding of the complexity of these issues, students on an advanced level shall be able to frame a presentation of problems where the perspectives are made distinct.

The main subject, Geography, Environment and Learning, focuses the interplay in the past, present and future between humans and the physical space we live in and reasons for similarities and differences regarding conditions of life. An international perspective, dealing with global issues like making comparisons between East, West, North and South constitute a substantial part of the main subject. On an advanced level students have the possibility to enter deeply into the comparative perspectives by accomplishing a part of the course in another country. Important issues like survival, the use of resources, ecology, and environmental influence are also focused on. Sustainable development is the main thread throughout the courses.

The aim of the course in focus of this study is that the students shall develop their knowledge and understanding of basic concepts concerning endogenous and exogenous processes. Furthermore the students shall develop their understanding of how Physical Geography and Geomorphology have influence on life conditions and human activities and improve their ability to draw conclusions and generalizing from physical geographical observations.

Another aim is that the students shall gain a better insight into the importance of dialogue regarding children's and young persons' conceptual development. This requires an increased understanding of processes of importance for spoken language, reading and writing development and how this is connected to knowledge development. In relation to this the students must reflect on and problematise their own needs of knowledge within those areas.

It is of vital importance for the students to understand that this is basically a matter of democracy, whether children and young people should be included or excluded from discussions about issues concerning all human mankind.

How the study was carried out

The first thing we did was to attend three introductory lectures. During those lectures observations and reflections about content and language were documented. The lecturers focused on how and why the landscape is formed as it is and what implications it has on humans' life conditions. Content dealt with was e.g. plate tectonics, volcanic eruptions and why there are mountains and plains in different parts of the world. Every topic has its specific abstract and scientific concepts that are hard for children to understand. The students' task was to plan lessons where they had taken this into consideration while explaining the different phenomena to the pupils. In order to manage this, the students for themselves had to clarify the importance of the close connection between content and language in order to help all pupils to develop an understanding and to be able to take part in discussions. Instructions and a set of tasks for the students were formulated as follows: When planning lessons with your class choose one of the tasks mentioned below and work in groups of five – six persons.

- Identify all concepts that you use.
- Use some children of appropriate age as 'test persons' to try out your explanations. Encourage them to discuss and to ask questions. You can either talk to children at your school or children in your neighbourhood.

- Make references to course literature. See also the texts about language development in the student net paper *Orkanvarning*. (Hurricane Warning)
- What aspects related to language and knowledge developing issues are possible to identify in the chosen task? What complex of problems do you choose to stress and to illustrate?
- Prepare yourselves so that anyone of you can give an account of and explain in mixed groups. Write a short text in which you describe how you have planned a lesson and why it's carried out that way. Bring this text to the seminar. During the seminar both students and teachers will give comments and eventually ask questions.

The tasks read as follows:

1. You are going to meet a class of ten year olds on a visit from the Northern mountainous part of Sweden. They are amazed about the flat landscape in Scania and want to know why it looks like this.
2. Your class, a year five, is going to visit a class in the Northern part of Sweden. Your pupils want to know why there are such high mountains and why it is so cold.
3. You have got a class with twelve year old pupils of an inquiring mind. They have heard about the Tsunami causing so much misery. They want to know why the big wave moved in all four cardinal points so that Africa, India and Asia suffered heavy losses.
4. You are going to introduce the geological time line to a class of nine year olds. They do not understand the symbolic language that you use, saying that 'prehistoric time is as much as ten times around the classroom and that man appeared five minutes to twelve'. In what ways can you solve this problem?
5. The children in your pre-school group want to know why the earth is rotating.
6. You are going to explain to a class of thirteen year olds why and how Africa and South America drifted apart.

The seminars

All together, eight groups accounted for their work, four groups in each seminar. In both seminars the students had chosen three out of the six different tasks. We therefore decided to let each group account for their own results instead of doing it in mixed groups. Each seminar lasted for two hours. In the first seminar, tasks three, four and seven were chosen. In the second group the students had chosen to work with tasks one, three and six.

Most of the groups intended to use different methods to find out about the children's *pre-understanding* of the content. Examples of methods were *brainstorming* and making *mind maps* to initiate the formulating of open questions. One of the groups differed from the others by acting as teachers and letting the audience act as pupils. All the other groups described how they intended to carry out their lessons.

All groups used different forms of illustrations and/or models in order to explain the different phenomena. Some of the groups also intended to let the children themselves use models. An example of this was using cuttings from map-sheets of South America and Africa as a jigsaw puzzle in order to illustrate the drift of continents. In addition to this

all groups stressed the importance of dialogue between the children throughout the lesson.

What we could see, though, was that all groups except for one meant that it was necessary to start by explaining the meaning of some central concepts in order for the children to understand the different phenomena. This was done in a simple vocabulary way.

Discussion

The students' pedagogical *intentions* in theory can be described as progressive. They were all using open questions, pupils' pre-understanding, dialogue and different sorts of models and illustrations when they talked about how to work with the problem issues. So far it would be adequate to talk about a teaching intending to develop the children's language skills in a functional way (Dysthe 2002, Malmgren 1996). The students' intentions to find out about the children's pre-understanding also showed openness towards the social worlds of the children and knowledge that they have gained through different forms of media (Dyson 1993). On the other hand we can also see that the students in practice are influenced by more conservative and formal teaching traditions. Instead of using concrete methods in order to make the children learn different central concepts in a functional way the students in all groups, except for one, planned to explain these central concepts isolated from the teaching context. This is what tradition prescribes: first you have to learn the meaning of different words and concepts through formal, isolated skill training and *then* you can use them within a defined context of knowledge.

As we can see there is a gap between the students' rhetoric and practice. Although the students have read about and discussed modern theories about the strong connections between language and knowledge development in the course books, more conservative and formal ideas about learning and language development seem to have a greater impact on them. Several plausible reasons why it is like this might be considered. One is what students themselves have experienced in school and remember as the correct way of doing things. Another contributing reason is the one reflected by partner school teachers in the articles published in the student net paper, stating that language development is a formal business concerning spelling and grammar and best taken care of by colleagues teaching Swedish. What became most obvious however is that the students themselves are struggling with two parallel processes: their own understanding of and ability to take part in the specific subject discourse and at the same time being able to explain this to children of different age. To handle this dilemma many of the students seem to act in an instrumental way by simply using the concepts from the content and explaining them as words from a vocabulary. This is the contrary of the meaning of getting acquainted with the subject language discourse as quoted above, (Björk & Liberg 1996).

There is, though, one exception from this traditional pattern. One of the groups accounted for their work by acting as teachers and letting the audience act as pupils. In this role play the students could not explain the meaning of different central concepts by simply using a word list. Instead they had to explain the meaning of the concepts in many different ways as a result of the questions they got from the audience acting as pupils. The audience did not accept a formal translation of the concepts. They required deeper understanding. Since constant dialogue took place it was not possible to isolate

the concepts from the context that they were embedded in. Instead they were negotiated and explained *within* and as a vital part of this context.

All groups also intended to use different forms of models and illustrations. The basic idea of this of course was to make the different phenomena more concrete and understandable. What we could see, though, was that many of the models and illustrations were so constructed and abstract that they did not contribute to the understanding of the concepts. On the contrary the pictures and models sometimes made it even more difficult to understand the phenomena that the students tried to explain.

All the groups also planned to initiate a dialogue between the children throughout the intended lesson. A dialogue can be carried out in different ways depending on the questions that the pupils are given to discuss. An authentic dialogue is characterised by openness. That means there are no correct answers, 'owned' by the teacher that the discussion is supposed to result in. Instead the persons who are involved in the discussion are free to choose the direction and the result of it. Further on an open, authentic discussion is not necessarily supposed to result in consensus. On the contrary vital and open discussions, owned by the participants, very well might lead to different results or 'answers' because the persons taking part in the discussion have different hypotheses based on their pre understanding, experiences and knowledge. The problem for the students was that the explanations of the phenomena that they were trying to explain to their pupils were not open. There was a correct explanation in all of the examples, an explanation that the students 'knew' but didn't fully understand themselves. The consequence might very well be that no open dialogue between the pupils will take place. Instead there is an obvious risk that the dialogue between the pupils may result in a guessing game where they try to find out the correct answer without necessarily understanding it.

How we intend to proceed

During the first part of autumn 2006 we intend to visit a smaller group among the same students during their practice. We will primarily focus on the following:

- Comparing what is said about language development and knowledge development in the local curriculum formulated by the schools and the students' course curricula. What discrepancies and similarities can be found at what level?
- Making interviews with teachers in partner schools concerning their thoughts about language and knowledge development and how they implement this in their own practice.
- Is there anything teachers in partner schools miss concerning these matters in the students' education?
- Observing lessons that the students are responsible for, focusing on how the students in their concrete teaching handle knowledge and language development.
- What possibilities the students offer the pupils to discuss their own life conditions and everyday experiences in intercultural dialogues.
- Ask the teachers to carry out their own observations of the same lessons.
- Arrange for dialogues between teachers, students and ourselves.

During the practice the students will be engaged in interactive dialogues on an Internet platform where they are encouraged to discuss the content that they have dealt with, how

the lessons have been carried out and what kind of problems they have faced. After the practice the students will also be asked to write a paper or an article for the net paper about their practice experiences. In these texts the students are supposed to make connections between their practice experiences and the theoretical frames concerning knowledge and language development.

The results of this documentation will, in corporation with the subject teachers, be used in the planning of the next course starting in November 2006.

During that course new observations of lectures will be carried out in order to see how the students' experiences from the previous course and their practice are handled with and discussed within the main subject. We will also examine how the results of the documentation described above are possible to use in the new course. In connection to this we will make new interviews, this time with students and subject teachers. What we want to find out is how the students this far in the process define their own needs concerning matters that have to do with the relationship between language and knowledge development.

The result of our following study will be published in a report late spring 2007.

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