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Languaging and visualisation method for grammar teaching: A conceptual change theory perspective

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ABSTRACT: Conceptual grammatical knowledge is an area which causes problems at different levels of education. This article examines the ideas of conceptual change theory as a basis for establishing a new grammar teaching method. The research strategy which I use is educational design research and the research data have been collected from teacher students in two Finnish universities in 2011-2013. When learning the concepts of grammar, problems appear in the form of reduced definitions of concepts and misuse or mixing of different grammatical categories. The languaging and visualisation method induces learners to make the meanings clear and express their grammatical thinking through different modes: speaking, writing and drawing. The categories of grammatical concepts are made visible by charts and hierarchies, which helps students to apprehend the ontological differences between the categories. By following students' languaging processes, a teacher gains a deeper understanding of their conceptual grammatical knowledge.

KEYWORDS: Conceptual change theory, conceptual knowledge, grammar teaching, higher education, languaging, visualisation.

INTRODUCTION

The background for my research on teaching grammar is pupils' conceptual knowledge and what it entails for compulsory basic education. After compulsory basic education, there appears to be knowledge gaps or unsatisfactory performances in the linguistic knowledge of 15-year-old pupils (cf. Lappalainen, 2006, 2011). These gaps appear in the same areas as teacher students have at the beginning of their L1 courses. The basic conceptual knowledge should have been gained before entering university but that seems not to be the case. Although the selection criteria for primary-school teaching education are strict (the intake is 900 applicants out of 7000), there exists a wide variation in the initial knowledge base of the students (cf. Rättyä, 2011a; Tainio & Routarinne 2012). If pupils' knowledge of the basic concepts, for example, "sentence", is poor and if pupils are not familiar with the metalanguage (linguistic concepts) their teachers are using, this will affect their writing and text comprehension skills. In my courses in class-teacher education, I have found difficulties and gaps in my students' conceptual grammatical knowledge similar to those that pupils in compulsory basic education have.

Finnish teacher students' problems with basic conceptual and linguistic knowledge became more apparent at the beginning of the 2010s, when several researchers directed their research interests to students' subject content knowledge. In May 2012, a group of L1 professionals from a number of Finnish universities set up an informal network for grammar-teaching scholars. The collegial discussions between the teachers at different universities focused on the lack of students' conceptual

grammatical knowledge and the problems it caused in L1 courses for teacher-students. Teaching could not be conducted at the required conceptual level, because the basic concepts of language structure (word classes, sentence constituents) posed difficulties for some of the students (Rättyä, 2011a; Rättyä, 2013a; Tainio & Routarinne 2012). The same problem has also been the subject of several international studies on teacher trainees' conceptual grammatical knowledge (for example, Cajkler & Hislam, 2002; Hislam & Cajkler, 2004; Harper & Rennie, 2009; Myhill, Jones, Lines, & Watson, 2012.)

As a teacher educator, my interest lies in subject content knowledge and pedagogical content knowledge (Shulman, 1987) that a future teacher should have. One motive for my research has been to find teaching methods which will improve the learning of grammatical knowledge. At the moment, there is no research dealing with grammar teaching methods at the higher education level in Finland.

This paper, part of an educational design research project started in 2010 and consisting of a number of research cycles, discusses the question of teaching grammatical concepts in teacher education. The aims of my research project are to create methods which can be used in grammar teaching and establish the theoretical basis for these methods. The purpose of this paper is to describe a teaching method called languaging in the perspective of an on-going educational design research project in two Finnish universities. By languaging I refer to a procedure where students speak out their thinking processes and strategies they use when doing an exercise. The languaging verbalises the procedure for the students themselves, for their co-students and for their teachers (Joutsenlahti, 2003). This article begins with a brief note on the structure of the Finnish teacher education system and its mother tongue (L1) courses. The article will then describe the research design, research strategy and data used in the research project. The results are summarised shortly but the main emphasis is on the theoretical aspects of the method and on elaborating teaching methods in the framework of conceptual change theory.

L1 COURSES IN THE CLASS: CLASS-TEACHER EDUCATION IN FINLAND

Finnish comprehensive school-teachers are trained at eight universities. The quality of teachers and teacher education has been mentioned as one factor explaining our PISA success (PISA = Programme for International Students Assessment). (For a more detailed description of the teacher education system in Finland, cf. Malinen, Väisänen & Savolainen, 2012.) Class-teacher education consists of a Bachelor of Education degree (comprising 180 ECTS credits) and a Master of Education degree (120 ECTS credits), which are to be completed in approximately five years. The studies include four modules of practice teaching, three of which take place in university practice schools. The major subject studies include 60 ECTS credits in pedagogical teacher studies. The multidisciplinary subject, didactic studies (60 ECTS), is a minor subject required for the qualification of class teachers who go on to work in Finnish primary education (grades 1-6). Those students who want to specialise in a subject like L1, which in Finland contains both mother tongue and literature, can study it as a minor subject with the minimum of 60 ECTS (Malinen, Väisänen & Savolainen, 2012).

The obligatory multidisciplinary subject, didactic studies, includes all subjects that are taught in the comprehensive school, but the courses are limited in scope. These courses are scheduled for the first and second year of studies, before pre-service teaching practice. The content of the L1 courses, which class-teacher students have to take before entering the schools, are limited. Only 8 or 9 ECTS (European Credit Transfer and Accumulation System) credits of mother tongue and literature courses are obligatory in students' curricula at different Finnish universities. According to my teaching experiences in three teacher-education departments, the L1 courses and their contents are roughly the same in all of them. The following paragraph takes a closer look at the L1 courses in teacher education at the University of Eastern Finland, where the latter part of my research project was done.

In the curriculum for the years 2012-2013[1], Pedagogy of Finnish language and literature (8 credits) consists of just two courses: Knowledge of Languages and Literacy Skills (5 credits) and Approaches to Literature (3 credits). Besides literacy skills, the former deals with the structure and special features of the Finnish language, metalanguage and the structural knowledge of the Finnish language as aids for observing language and explaining linguistic phenomena. After completing this part of the course, the students should be able to analyse the different meanings and functions of a language in general. The students should be able to recognise the special features of Finnish language structure and analyse them by applying pedagogical perspectives. The course consists of lectures (40 h), exercises (14 h), an examination (2 h) and independent work (74 h). 6 hours of the lectures and 4 hours of the exercises are reserved for teaching linguistic knowledge (Filosofinen tiedekunta, 2012).

RESEARCH DESIGN, STRATEGY AND MATERIAL

The background for this project is a broader development project, which was started in the Department of Class-Teacher Education at the university of Tampere. In 2008, teacher-researchers Jorma Joutsenlahti and Pirjo Kulju launched the project "Sanan lasku" ("Word Count"), which aimed to create new teaching methods for mathematics and mother tongue and literature. Their framework was in socio-constructivist theory and their focus was on problem-solving teaching practices and methods. Since it was an open development project, teacher-students had the possibility to participate in the project, for example with their theses (Joutsenlahti & Rättyä, 2011).

When teaching the courses of L1 at the same department, I was invited to participate in the "Sanan lasku" project in 2010. I first acted as a supervisor of students in thesis seminars but soon I was caught up in the experiments inspired by the problem-solving teaching methods. After writing some research and conference papers, I started my own research project, which aimed to improve teaching methods of grammar teaching. The research problems the research project examined were the following: 1) What areas of grammatical knowledge cause problems for students at different school levels? 2) What are the possible reasons for these problems? 3) How can learning in

[1] School of Applied Educational Science and Teacher Education www.uef.fi/en/filtdk/luokanopettajakoulutus-joensuu.

teaching practice be made more meaningful? During the research process, the questions focused on the effect of learning theories in developing new teaching methods.

This research follows the generic model of educational design research (EDR) (McKenney & Reeves, 2012; Reeves 2006).

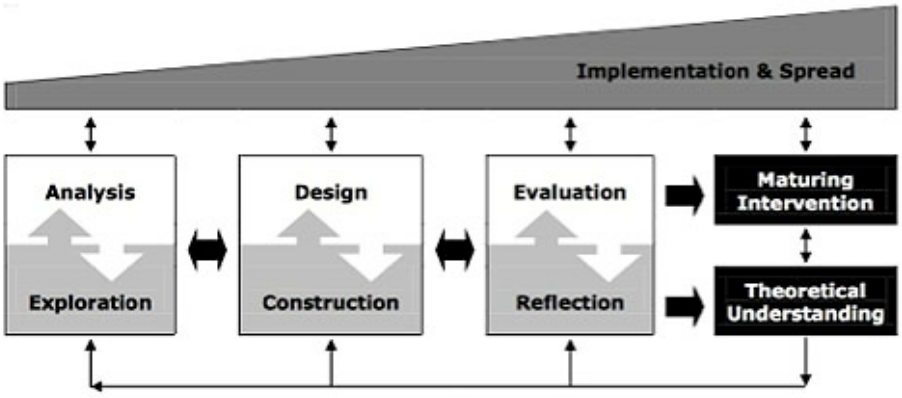

Figure 1. Generic model for conducting design research in education (McKenney & Reeves, 2012).

My research consisted of different iterative phases of analysis and exploration, design and construction as well as evaluation and reflection (figure 1). The project was carried out in several cycles, which each included at least one sub-study. The cycles (see Figure 2) were carried out in 2010-2013 in two, class-teacher education programmes at the University of Tampere (the Department of Teacher Education in Hämeenlinna = HOKL) and at the University of Eastern Finland (the School of Applied Educational Science and Teacher Education = SKOPE). Cycle 4 remains to be done in the spring of 2014.

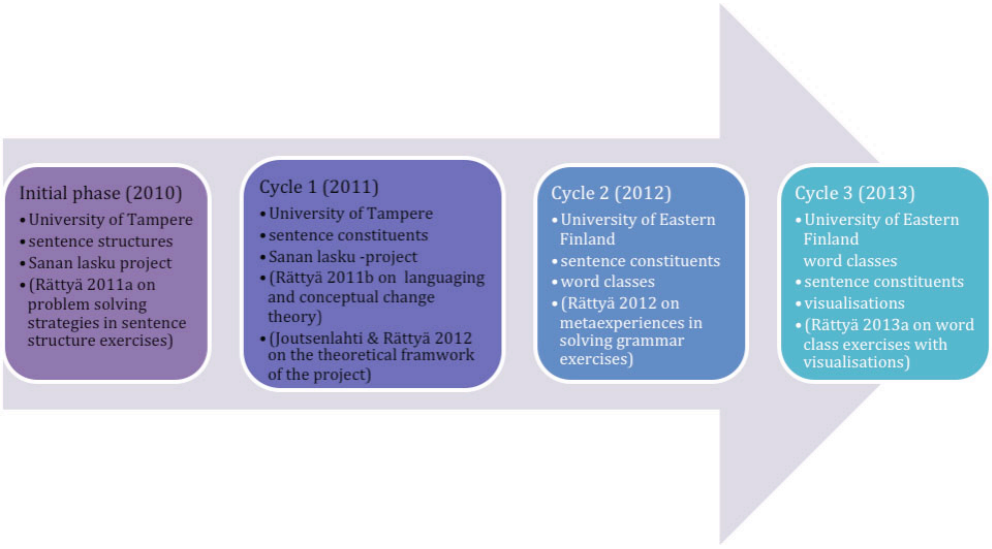

Figure 2. Research cycles of the project

The project was started as a teaching experiment and an exploration of students' conceptual grammatical knowledge before the courses (Initial phase and cycle 1). That is the reason why no pre- and post-tests were conducted. When I was teaching the same courses at two universities, the research interest began to take the shape of a broader research project.

The collection of research material followed the principles of triangulation. The data were collected from different class-teacher student groups and included both verbal and visual exercises. This data consisted of three exercises for the first-year students at the beginning of their L1 courses (cycle 1: HOKL2011 n=64; cycle 2: SKOPE2012 n=75; cycle 3: SKOPE2013 n=90) [n = number of answers]. In addition, the course plans, the exercise material and the observations of teaching sessions were used as research material. The exercises were such that they could have been solved with the linguistic knowledge gained in the 9 years of the comprehensive school. Extracts of students' answers during the teaching sessions in different phases provided additional data.

The first data collection took place in my own course at the University of Tampere (= UTA), the following two in my lecture course at the University of Eastern Finland (= UEF). In both exercises, the students were given sentences to analyse, the first of which were taken from a primary school student's text. They were asked to explain the sentence constituents or word classes of the given sentences. Content analysis was used to analyse the data, which were organised according to the concepts and the definitions the students gave to the concepts. The notions of meta-experiences were also organised in different subcategories. (More detailed descriptions of the analysis method are included in Rättyä, 2011a and 2013a.)

On the basis of the data analysis in cycles 1 and 2, a new exercise type was formulated for the L1 course in 2013. An exercise prototype was developed according to the deepened theoretical understanding gained during the evaluation and reflection stages of EDR. The students should present their knowledge of word classes and sentence constituents in two different ways. At the beginning of the course, the lecture audience was divided into four big groups (A, B, C, D). Two of the groups (A, B) were supposed to work individually and two (C, D) in pairs. Groups A and C got an exercise in which they were to produce a written text and explain which word classes could be found in an example sentence and which sentence constituents in another sentence. Groups B and D got the same exercise, but there was a visual exercise added to it. They were asked to draw models, figures or visual representations of the divisions of word classes and sentence constituents.

The different cycles of my educational design research have been reported in national and international conferences and in Finnish journals (Rättyä, 2011a, 2011b, 2012, 2013a & 2013b). The reports have shed light on several aspects of the conceptual grammatical knowledge of teacher students (sentence constituents in cycle 1; word classes in cycle 2) as well as on the theoretical background of the teaching method. (The data, methods and results of various cycles will not be described in detail in this paper.) The main outcomes of the research have been theoretical and practical contributions to L1 grammar teaching. In this project, the main focus has been on the concepts used in traditional grammar, because the students will operate with these

concepts in their pre-service teaching practice and because they are used in second language education at Finnish schools.

LANGUAGING METHOD IN THE FINNISH TEACHER EDUCATION

The first collection of material for this research was carried out making use of small exercises in which the students named the sentence constituents and explained their thinking during the problem-solving process. The idea of including the thinking procedure in the exercise was based on a teaching method called "languaging". The method was originally used in the teacher students' mathematics courses at the same department. I had tried out the same kinds of exercises to bring out the students' problem-solving strategies earlier with my students who were specialising in L1 as a minor subject. Their written answers showed that this method revealed much more for a teacher-researcher than a routine answer could have done. The following paragraphs describe in more detail the languaging method and its development in two different subjects almost simultaneously.

Docent Jorma Joutsenlahti of the University of Tampere has created and coined the term "languaging" for a teaching method in the context of mathematics (languaging in mathematics) (Joutsenlahti, 2003, 2009, 2010; Silius, Pohjolainen, Kangas, Miilumäki, & Joutsenlahti, 2011). Languaging is a teaching method in which pupils or students express their thinking by speaking or writing. When they find a solution to a problem, they present the process of problem-solving to the teacher and co-students by using their own words and expressions. Among sociocultural and constructivist learning theories and problem-solving references, Joutsenlahti also refers to Norwegian studies in mathematics education, which discuss the variation in children's use of language when solving mathematical problems at school (Joutsenlahti, 2003, 2010).

Joutsenlahti has researched different uses of the languaging mathematics method at all stages of education (comprehensive school, general upper secondary school, university) and found three factors which support the use of the method: growth of a learner's own understanding, social factors and pedagogical factors. Verbalisation in solving mathematical problems has been found previously to produce a deeper understanding, improved attitudes and clarification of the thinking process. Joutsenlahti (2010) presents students' different languaging processes, in which the mathematical symbol language varies with written standard language and mathematical conceptual language. In his article on written languaging, Joutsenlahti (2010) presents the profits of written languaging exercises and the combinations of natural language, mathematical language and mathematical symbol language that appear in students' written languaging.

In the project "Sanan lasku", Joutsenlahti has developed theoretical grounds for the languaging mathematics method and Pirjo Kulju and I have been developing the languaging grammar method. Teacher-students have participated in the developing project by elaborating the languaging grammar method for teaching sentence constituents and creating problem-based grammar exercises (Kulju, 2012). Different forms of social interactions combined with languaging have been elaborated. The languaging exercises can be done solo or in pairs. The possibilities of the languaging

method in both L1 and other subjects have been researched in recent years (Joutsenlahti & Rättyä, 2011; Kulju & Joutsenlahti, 2010).

Merrill Swain, professor of second language education at the University of Toronto, has introduced the same concept of languaging to L1 and L2 teaching. Her definition of languaging is nearly the same as Joutsenlahti's definition described above: "Languaging, as I am using the term, refers to the process of making meaning and shaping knowledge and experience through language" (Swain, 2006b, p. 98). Her terminology follows the same learning theories as Joutsenlahti's, namely Vygotsky's philosophy of language and sociocultural theories. For Swain, the think-aloud-method, "talking-it-through", and verbalisation are tools for second-language teaching. Swain (2006a) likens the languaging method to the "talking-it-through" method, which arises from cognitive psychology and has been frequently used as a data collection tool. Joutsenlahti and Swain reach similar conclusions independently. Joutsenlahti puts more emphasis on the problem-solving process and also takes into consideration the metacognitive elements of students' thinking protocols. In his research, the possibility to use different types of languages (natural language, mathematical symbol language and mathematical language) is a clear advantage. Languaging as a teaching method reveals not only gaps in conceptual knowledge but also provides explanations and reasons for failed performances (Joutsenlahti, 2003, 2010).

RESULTS

The main findings of my earlier research concerning teacher students' conceptual knowledge of sentence constituents and word classes have been explained in the research papers on different cycles. Students' conceptual knowledge of sentence constituents is often narrowed to the three main constituents (subject, predicate and object). The strategic knowledge of analysing sentences fails when an exercise is started by looking for the subject instead of a predicate. Additionally, strategic knowledge is seldom described in the students' texts except in reduced definitions, for example, "a subject is an agent", "an object is a target". The conceptual knowledge of word classes is also narrow. It mainly consists of four concepts: noun, numeral, verb and adjective. Adverb as a word class is unknown. Applying or explaining concepts is difficult for students.

When students analyse the given sentences, the concepts from different categories are blended (case concepts even appear among the word class concepts). In many cases, the use of abbreviations is frequent and includes several mistakes and misconceptions. Applying rules of thumb leads students to wrong answers.

The findings from the data analysis show that students know the concepts which figure in the basic education curricula for grades 1-5. A more detailed knowledge of grammar concepts included in the curricula for grades 6-9 and presented in the textbooks is not frequent in the data. The use of concepts varies and definitions of concepts are mainly rule-of-thumb (cf. Negueruela & Lantolf, 2006). That makes it difficult to apply them in the analysis of the sentences. The following section gives examples and reasons for the results (Rättyä, 2011a, 2011b, 2012, 2013a & 2013b).

DISCUSSION

The written texts produced by the languaging method show that the process of making meaning was surprisingly difficult for some of the teacher students. Those ones who were familiar with "languaging mathematics" were experienced in explaining their thinking by writing. The conclusion drawn from the research cycles is that students need more exercise in metalinguistic thinking.

Notions like naming and labelling the words in the behaviouristic exercises of Finnish schoolbooks and teaching materials (Savolainen, 1998; Kulju, 2010) and the languaging exercises at cycle 1 and 2 raise the question of how grammatical concepts have been taught and used before the students' university years. The use and application of the concepts seem to be difficult for teacher students. For some students, the metalinguistic concepts were familiar and they knew when and how to use them, and they also knew their content. For others, it was impossible to recall even a single concept. There were also those who knew some concepts (3 sentence constituents or 4-5 word classes) and those who knew abbreviations or character symbols for them but could not explain in which way they actually related to the words (Rättyä, 2013a).

The conceptual grammatical knowledge which teacher students have varied from zero to an advanced L1 minor's linguistic knowledge. Unfortunately, students in teacher education have very limited opportunity to deepen their metalinguistic knowledge, on which they should be able to depend in their future teacher careers. The course content and curricula have been designed with the idea of a higher level of conceptual grammatical knowledge. The reason for this is the curricula and content for the comprehensive school and its teaching material, which both operate using metalanguage. The researchers of the unofficial network of grammar teaching have paid attention to this and several research projects, one of them nationwide, are either in progress or in preparation. The purpose is to get a nationwide perspective on students' knowledge of grammar. My own research project shows that there are serious reasons to rethink the curriculum of the L1 courses in teacher education. These findings should also be taken into consideration in the on-going renewal of the Finnish national core curriculum for pre-primary and basic education.[2]

Languaging reveals misconceptions

One of the interesting findings from the teacher students' answers was that they had adopted a kind of symbol language system for recognising the sentence constituents or word classes. Instead of complete sentences with the concepts, they used characters (A, V, S) or abbreviations (adj., num., PR.) above or underneath the word. When producing the written verbal explanation by languaging, the misconceptions were revealed. Students were confused between adjectives and adverbs or they selected a concept from the wrong linguistic category (subject instead of noun, for example). Most often this occurred between adverb (as a word class) and adverbial modifier (as a sentence constituent). The reason for this could be caused by the habit of using

[2] http://www.oph.fi/english/current_issues/101/0/ops2016_renewal_of_the_core_curriculum_for_pre-primary_and_basic_education)

similar symbols in different categories (in Finnish "S" can be used to refer both to noun/substantive and subject). This relates to the behaviouristic nature of of textbook exercises, which ask students only to recognise or name the words with abbreviations in sentences instead of giving explanations.

When analysing sentences and applying sentence constituent concepts, the students used a reduced explanation for object as a sentence constituent. For the students, the concept of object is familiar from grade 5. In Finnish, the object has to appear in certain case forms in order to be considered as an object. If it is another case form, it is categorised as an adverbial. The semantic explanation as "target" is not enough to define an object. Nevertheless, out of more than 200 answers from the data, only a few mentioned the required case form. In a like manner, the students defined the subject as a person, or a maker, and neglected syntactic elements. In the case of subject, the explanations referred very often to concrete subjects ("a person", "a thing"). These explanations indicate that they tend to think of grammatical concepts as synonyms of standard language words, not as scientific, linguistic concepts. The explanations of the sentence constituents show that most students do not make a distinction between standard language and linguistic concepts. The notion of metalanguage does not appear in the answers where the sentences are described using standard language words.

The sociolinguistic concept of code switch refers to changes between different languages or language variants in speech. When the distinction between scientific language and standard language is applied and they are understood as different variants of language, code-switching occurs when one uses a linguistic concept (metalanguage) in the speech or text, which does not adequately suit the scientific function of speech. The notion of different languages and awareness of the use of metalanguage is important when learning new languages and their vocabulary. If teaching material consists of short descriptions of concepts and rules of thumb in standard language (cf. Negueruela & Lantolf, 2006; Leiwo, 2003; Savolainen, 2004), learning will be difficult. The teaching of concepts should include the notion of different languages (codes) and exercises of code-switching. The students' misuse of concepts, blending categories and lack of code-switching open a new theoretical angle for the languaging method: conceptual change theory.

Conceptual changes

The students' mixed categories and reduced explanations in the data from cycle 1 and 2 (Rättyä 2011a, 2013a) lead me to think about the learning of conceptual hierarchies and the theoretical grounds for the teaching of concepts. This research project has applied conceptual change theory to deepen the understanding of students' conceptual knowledge and metalinguistic awareness. In their seminal article examining conceptual change, Posner, Strike, Hewson and Gertzog (1982) point out that under the impact of new ideas or new information there occurs a change in concepts. Posner & al. (1982) also present educational implications, which the notion of conceptual change has. The origins of the conceptual change theory are to be found in the philosophy of science, and the theory has been applied to educational science for over 30 years. From the educational point of view, the added value of new discussions derives from socio-constructivist ideas.

Since the publication of the Posner et al. article, the theory has had many implications for educational solutions. In their article, they focus on questions like teaching strategies, the teacher's role, and evaluation techniques, by which the teacher can track the process of conceptual change. They also emphasise code-switching between different modes: "Help students make sense of science content by representing content in multiple modes (for example, verbal, mathematical, concrete-practical, pictorial) and by helping students translate from one mode of representation to another..." (1982, pp. 225-226).

This research applies Michelene Chi and Rod Roscoe's argument for conceptual change as changing ontological categories. According to them, incoherent models are built up when the earlier knowledge does not fit together with new information. For them misconceptions are concepts categorized into an ontologically inappropriate category. The challenge for students is to become aware of their misconceptions. (Chi, 1992; Chi & Roscoe, 2002.)

In all the research data gathered at the beginning of the teacher students' courses, several examples of misconceptions can be found. Mainly they occur in sentence constituent analysis (Rättyä, 2011a), in which "noun" is used for the subject and "adverb" for an adverbial modifier. When languaging the concepts, students do not seem to be aware of miscategorised concepts. In the data, there is seldom any hesitation or doubt about the answers (Rättyä, 2012). Similarly, when students place the partitive case or participle among word classes, there is reason to have a closer look at the ontological category levels. Is the student making miscategorisations of hierarchies or ontological categories? And with which code is she or he marking the solutions – with whole words, abbreviations or just characters as symbols for concepts? Through languaging, instead of naming, labelling, and underlining, teachers can evaluate the level of conceptual grammatical knowledge and students' awareness of their misconceptions or lack of alternative categories. On the other hand, it also reveals performances with highly developed conceptual grammatical knowledge and problem-solving skills. However, such answers are rare in the data, but when they occur, they show the importance of strategic knowledge (Rättyä, 2011a, 2011b).

Awareness of grammatical categories described with visualisations

After analysing the data from the conceptual change point of view, the benefits of the languaging method became clear. For me, it revealed different kinds of problems which students had in their conceptual and strategic knowledge. Students' conceptual knowledge had flaws in understanding the different categories of grammatical concepts. This may be due to memory, to earlier learning experiences or other factors. (Rättyä, 2011a, 2012.) In the Finnish educational literature, there are no studies which focus on this question of learning grammatical concepts. With languaging as the teaching method, students' awareness can be directed to this. The emphasis on different linguistic registers should be noticed too.

The third cycle of this research focused on the recognition of categories (SKOPE2012). The exercise with languaging was combined with an exercise in visualisation. This idea came from conceptual change and socio-constructivist theories. Visual representations in the context of contextual change have been the focus in studies of mathematics and the virtual learning environment. These studies

(for example, Arcavi, 2003; Parnafes, 2007) show that by using different representations, it is possible to facilitate the process of developing conceptual understanding and organising information.

The motive for my visualisation exercise was to find out what categories the students (alone or in pairs) used to solve a problem and if they could apply the concepts they presented visually. The students used diagrams, charts and tables, but most often with a one-step hierarchy, which resembled a mind map. The students used two-step hierarchy only in some cases: the main categories of nouns (subcategories: substantives, adjectives, pronouns and numerals) and particles or adverbs.

The results of cycle 3 showed that students in groups (B & D) mainly applied a category of 6 word classes (substantives, adjectives, pronouns, numerals, verbs and particles) instead of 8 (added with pre- and post-positions, adverbs and particles) and a category of 3 sentence constituents (subject, predicate, object). The categories were applied to the clauses but students had problems with finding and giving explanations for objects and adverbials or particles and even adjectives. (Rättyä, 2013b.) This result confirms the results of the earlier cycles. The possibility to use multiple modes and pair work to solve an exercise seemed to help students. The number of correctly used concepts was bigger in the visualisation groups B and D. The visualisation part of the exercise before a languaging session might remind students of existing categories and the differences between them.

The final data with visualisations revealed the reduction of the number of word classes from 8 to 6. This explains the confusion with adverbs and adverbial modifiers. Besides word classes like verbs and nouns which conjugate in their own ways, there are particles which do not. The main explanation for this word class was “a not conjugating extra word”. By adapting this kind of categorisation (apparently from textbooks) the students ignored other non-conjugating word classes like pre- or post-positions, adverbs and conjunctions. In Finnish traditional grammar, sentence constituents include predicators, subjects, objects, predicates, attributes and adverbials. Because the word class concept “adverb” was not presented in either written or drawn answers, it was taken in use as a sentence constituent.

Knowledge building in L1 classrooms should be reviewed also with regard to changes in linguistic theories. The grammatical concepts deriving from different theories (like traditional grammar, systemic-functional grammar, cognitive grammar) build different conceptual systems, although they often use the same type of terminology. If teachers and teaching materials in different grades and in different language subjects base the learning processes on various linguistic theories, learners need to become aware of the systems used.

CONCLUSIONS

My research project shows that the metalinguistic concepts which are best known and used in the exercises are included in the curriculum for the first 6 years of the primary school. These concepts appear in the textbooks in simplified and reduced forms, for example, “subject is a person”, “verb describes doing”, which produce misunderstandings and a failure to learn “difficult words”. These kinds of

misconceptions seem to be difficult to repair. The reformers of the core curriculum for basic education, which is going on in Finland at the moment, and the publishers of textbook materials should take this into account this when deciding the content to be learned. My conclusion is that conceptual change is difficult if, instead of accurate knowledge of the existing categories as a whole, pupils are taught just portions of linguistic categories with vague definitions of concepts.

In my research project, I have focused on creating a theoretical basis on which to build methods for grammar teaching. The interventionist solution that is designed in this research is the combination of languaging and the visualisation method for grammar teaching, combining metalinguistic, verbal and visual elements.

The method of languaging and visualisation has been designed and trialled during the years 2010-2013. This method combines concepts from constructivism, socio-cultural learning theories, metacognition and metacognitive experiences as well as conceptual change theory. Further research is necessary to confirm the results with other kinds of texts as well as with longer textual exercises, which apply multiple, conceptual grammatical and textual knowledge.

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