



Explaining: a central discourse function for CLIL instruction

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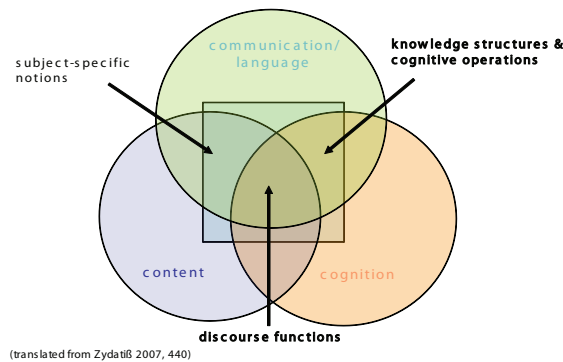
1. Introduction

It is a striking and characteristic side-effect of learning curricular content through the medium of a foreign language (i.e., 'doing CLIL'), that this teaching approach awakens language awareness in all participants concerned (cf. Coyle, Marsh, Hood 2010). It seems that the fact that all CLIL learners and often also CLIL teachers are non-native users of the language of instruction (frequently at no more than intermediate levels of competence) throws into relief the significance which language has for learning in most school subjects. Language, which is always a key factor in school education without usually being overtly recognized as such, is suddenly experienced as 'the life-blood of learning'. Thus, CLIL tends to change perceptions quite dramatically and serves as a catalyst for language awareness.

If we take it as a given that learning is essentially a process of establishing connections between existing knowledge and new knowledge, incorporating what is 'new' into existing structures which thereby evolve, then the role of instruction is to continuously mediate between these two levels in order to make this evolution and restructuring possible. Coyle's influential conceptualization of CLIL instruction, the 4 C's Framework (*Communication-Content-Culture-Cognition*, e.g., Coyle et al. 2010, 41) makes provision for these multiple interrelations, but I would here like to draw on Zydatiss (2007), whose visualization gives a more elaborate rendering of the complexity of this undertaking even though the notion of culture remains excluded. For the purposes of this paper this model will allow us to home in more precisely on the area where language, content and cognition overlap. This effectively must be the actual space of content-and-language-integration that is regularly invoked in the CLIL literature (e.g., Mehisto, Marsh, Frigols 2008).

In my reading of Zydatiss's model the central square symbolizes not only an abstract zone of overlap but actually stands for a concrete and central event in institutional learning – the lesson. The timetabled lesson is the space designated for transforming specific curricular content into cognitive structures through communication (which is in large measure face-to-face linguistic, but also uses other





modes, such as visual or manipulative forms of experience, as in experiments). It is, then, the area of overlap labelled “discourse functions” where the concern of the current paper is located. This is the area that is so often experienced as problematic by CLIL teachers because not only all their students but also they themselves are operating in an imperfectly known language: in other words, what language do the students need in order to effect the desired integration of new knowledge? And what language do the teachers themselves need in order to mediate this integration?

Significantly, I think, CLIL classrooms are not the only context where this tends to be experienced as problematic nowadays. The other is classroom situations with large numbers of second language students in the classroom, as is regularly the case in modern western societies. Despite the shared feature of an imperfectly known language of instruction, a radical difference of CLIL contexts lies in the fact that in the latter the feature which is experienced as problematic (the imperfectly known language) is constructed as an in-group problem (a problem of ‘us’, normally even including the teacher) rather than a problem of ‘theirs’ (the immigrant minority who should learn the majority language better, ideally before entering school). Such an out-group can of course also consist of first language speakers from educationally disadvantaged backgrounds, but this issue has moved into the background somewhat in face of the more pressing problem represented by second language speakers. For our present concerns this means, however, that the large body of research which has developed in the context of second language speaker education is also highly relevant for the study of CLIL education (e.g., Cummins 1991, Gibbons 2003, Mohan, Leung & Davison 2001, Mohan & Slater 2005).

I will not be able in this chapter to discuss academic language needs in the desirable breadth and detail, but will pursue the global questions formulated above by focusing on a specific, but, in my view, central, aspect of “language for learn-

ing” (Coyle et al 2010, 36f), namely explanations. After a brief conceptual discussion on what we mean by language for learning or academic language, I will argue for the centrality of explaining as a discourse function in instruction. This will be followed by an attempt to approach a definition or at least a closer understanding of what explaining in instruction means. Based on a working model of explaining (section 2.2), a number of derived questions will be checked against the practice of actual CLIL classrooms. I will conclude by showing a first core inventory of structures that are frequent in English CLIL classroom explanations, though more research in this area is clearly called for.

2. Conceptual background – towards an understanding of explaining in instruction

2.1 Explaining as an academic discourse function

The discourse functions which we have located in the central area in Illustration 1 above can be said to arise in response to repeated situational demands and recurring purposes in communication. This is not specific to formal education but a general phenomenon in linguistic interaction, and the default patterns which speakers develop for dealing with these demands in their totality make up the routines of day-to-day face-to-face interaction. In educational contexts it is the recurring purpose of ‘learning new knowledge and skills’ that fosters a particular set of language functions. Exactly what these functions are and how many of them exist is rather difficult to determine, as this area has not been subjected to a great deal of systematic study, certainly not from a linguistic point of view.¹

An important angle under which the issue has been approached is actually to think of these functions less in terms of linguistic entities but as thinking skills which have linguistic correlates or expressions (O’Malley & Chamot 1987, Suhor 1984, Bloom’s Taxonomy). Educational research thus regards these functions as cognitive entities or processes which in sum make up the cognitive toolkit that allows us to create understanding from the world around us and in collaboration with our fellow human beings. However, these cognitive tools are accessible and observable only via their linguistic expressions for the time being. As we cannot (yet?) determine their ‘essence’ over and beyond their observable form I think it is preferable to refer to them as what they materially are, i.e., academic language functions. List 1 will serve as a starting point: it is important to note, however, that

1 There is a relevant a research tradition in educational linguistics that is based on Halliday’s systemic functional theory of language, but it is strongly focused on writing, and has dealt with the development of textual genres in education from secondary to tertiary level (e.g., Halliday and Martin 1993, Unsworth 2000, Flowerdew 2002, also Bhatia 2002).

List 1 does not represent a closed inventory, nor is it composed of clearly delineated categories: it is a working taxonomy of academic language functions.

List 1. Academic language functions: a working taxonomy

Assessing	Explaining
Analyzing	Giving information
Classifying	Hypothesizing
Comparing	Informing
Defining	Narrating
Describing	Persuading
Drawing conclusions	Predicting
Evaluating	Requesting information

Although all of the functions mentioned are typical of classroom talk, it is easy to see that explaining occupies a special position among them. If one uses a test-frame of the kind “X is a really good teacher, s/he can *function* ever so well,” it is obvious that none fits the frame quite as well as *explain*: “X is a really good teacher, s/he can explain ever so well” (cf. in contrast “X is a really good teacher, s/he can hypothesize, compare ever so well”). Even though the centrality of explaining in instruction may be easy to argue, it is less straightforward to spell out what explaining actually implies. An impressionistic survey of the verb *explain* in the *British National Corpus* (<http://www.natcorp.ox.ac.uk/>) shows that in general language use it typically appears with some partner verb that foregrounds one particular aspect of its semantics and intentionality (e.g. *describe and explain*, *explain and understand*, *explain and justify*, *explain and illustrate*). Taken together, this indicates that the notion of explaining seems to implicate activities like describing, illustrating, exemplifying, justifying, correlating and showing understanding. More generally then, explaining has to do with spelling out details that are beyond what can be immediately perceived about some entity or process.

Interestingly, taken such an understanding of explaining, it follows that scientific explanations also fall into this sphere because they are “statements made in an attempt to account for, or show the cause of, a state of affairs” (Govier 1987, 159). In a sense, then, scientific explanations are a special case of explanations at large. Ehlich and Rehbein (1986) have classified the latter kind of explanation to the sphere of academic literacy in the ‘narrow sense’ because such linguistic moves are specifically designed to show reasons and relations of causality and are typically tied to generalized and decontextualized uses of language. However, even though scientific-academic literacy is rightly regarded as a mainstay of upper-level formal education, to limit our view to purely scientific explanations would fall short of

the necessities of educational contexts. In the pedagogical sphere we need to operate with a wider understanding of explanations while staying aware of the fact that this understanding includes scientific explanations in the intension of pedagogical explanations. Smit (2008) has described pedagogical explanations as

Statements made in an attempt to make certain objects or facts (explanandum) more easily comprehensible by connecting them with one or more familiar object(s) or fact(s) (explanans/explanantia).(p.277)

This is the definition I would like to base my further deliberations on.

2.2 Modelling pedagogical explanations

As a result of a study conducted in a cognitive-psychological paradigm, Gaulmyn (1986) suggested a model of explanations that will also serve us well as a working model of explaining in instruction: as shown in Illustration 2, the model consists of three main elements: the explanandum, an explicator and addressees. The explicator is typically the teacher, whose role it is to facilitate knowledge construction by making new cognitive content accessible, while the students are in the role of addressees of the explanation. In pedagogical explanations we can conceive of the explanandum as an element from the curriculum, a subject-specific concept or fact which needs to be understood by the learners in order to be integrated into their knowledge structures.

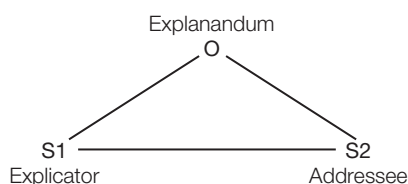


Illustration 2. Explanation schema by Gaulmyn (1986)

What is crucial about this model is the fact that it implies a strong orientation towards interactants in talk: the basic orientation of explanations is from S1 to S2 with reference to O, the object of the explanation, or explanandum. An explanation in the classroom thus is not ‘an explanation of something per se’ but an explanation of something for someone. In Gaulmyn’s terms: “dire ce que toi tu ne sais pas” and not “dire ce que je sais moi” (1986, 125). The latter, ‘telling you what I know’, is directly linked to other academic language functions, like exposition, description or narration, and functions as a unifying element among them. What, on the other hand, distinguishes them from one another would be an interesting area for scrutiny.

Central to the concept of explanation, then, is the existence of a knowledge gap or a comprehension problem which is openly sanctioned *qua* the explanation. Explanations are thus seen as intimately related to learning. As indicated by the word *familiar* in Smit's definition of pedagogical explanations quoted above, what characterizes classroom explanations beyond more narrowly scientific ones, is the fact that they are not necessarily (though can be) about absolute causalities, but incorporate a sense of personalized knowledge. Because the knowledge states of different groups of people vary, the 'same' explanation can therefore be expected to vary depending on who it is for, because existing knowledge states that the new content can be linked to need to be taken into account. There is clearly a degree of tension between absolute, scientific explanations and the more relative pedagogical ones, a tension that could probably be best understood in terms of different orders of discourse:² the language of the school curriculum and the language of scientific knowledge. There is no doubt that it is necessary for students, especially at upper secondary level, to develop a degree of competence in the more narrowly scientific order of discourse.³

Our model shows classroom explanations as linguistic acts that are two-pronged activities directed at explananda and addressees simultaneously. Such an understanding actually throws into relief the role of teachers as mediators between learners' world knowledge-experience and the academic knowledge or curricular content these students are required to learn: explaining in the classroom clearly encompasses processes of transforming and translating (cf. Gibbons 2003, 2006). To the extent that formal education as a whole is a process of knowledge appropriation helped along by the teacher as a mediator or facilitator, teaching per se, or at least 'the lesson', might be construed as one global act of explaining. While this has a certain theoretical attractiveness, it does not carry a great deal of heuristic value with regard to specific actions undertaken by the participants at specific points in time. If our aim is, therefore, to make explanations accessible to meta-thought on the part of the teachers, it is necessary to develop a more fine-grained view of explaining activities during school-lessons.

For the other participant in the educational dialogue, the student, matters are more confused in terms of the communicative orientation of explanations they (have to) give. Teachers regularly demand explanations of things which they actu-

2 For ideas in this direction see Ehlich and Rehbein (1986), who differentiate between "Begründen 1" and "Begründen 2".

3 I will not go into a fuller discussion of this point here, but it merits attention from educational linguists, not only but specifically with regard to CLIL education. Cf. Gibbons' 2003 study of mediation in Australian ESL content-classrooms. Studies by Zydatis (2007), Vollmer et al (2006), and Coetzee-Lachmann (2009) in Germany have shown that upper secondary students' productive academic literacy remains below expectation levels not only in CLIL but also in the first language.

ally know very well, so that in this sense the student's communicative intent must be informative rather than explanatory, since the student basically tells the teacher whether he or she knows what the teacher knows already. If students show pragmatic awareness and orient towards the knowledge state of S2 in realistic terms (S2=Teacher, the primary knower), then it is actually sufficient to use triggers that will activate the right schemata or concepts in the teacher. Such triggers might be individual specialist terms, for instance. From the point of view of pragmatic competence (with regard to addressee-orientation and knowledge distribution), then, minimalist student utterances make perfect sense and are communicatively effective. Usually, however, when teachers demand explanations from students, the intention is a different one. Teachers would like students to demonstrate their understanding and this basically means setting out details of the explanandum (O) and putting them into overt relation with one another by giving them linguistic expression. In other words, students are required to suspend part of their contextual and situational knowledge in such tasks and to operate linguistically within a different order of discourse, namely the scientific one. Clearly this is an instance of what is meant by 'decontextualized language' in accounts of language use in academic and educational contexts (e.g. Snow 1987, Snow, Met & Genesee 1989, Cummins 1991, Portmann & Schmölzer-Eibinger 2008).

For both participants, then, teachers as well as students, it is desirable to be able to manipulate a variety of semantic and linguistic strategies capable of expressing concept relations in order to make knowledge structures explicit. For this purpose, then, students and teachers can be treated as one, as will be done in the next section.

Aside from the communicative and pragmatic orientation of explanations as they are embedded in the social and discursive context, it is also of interest whether explanations dispose of any *internal structures* that can be said to characterise them and thus make them distinguishable from other academic discourse functions. Exploring such internal structures, aiming to identify recurring semantic and formal-linguistic elements would make explanations accessible to explicit scrutiny. The resulting meta-language of explaining would make it possible to explicitly talk about the activity in detail and so make it teachable and learnable, rather than only acquirable through osmosis.

A first approximation to finding structure in explanations is discussed in Gaulmyn's already-mentioned study (1986). According to this author explanation is a process consisting of three phases (1.-3.) amenable to recursion:

1. proper identification of the object (explanandum) and distribution of roles S1 and S2,
2. a recursive explaining text which orients towards S2,
3. sanctioning of the explanation.

Even though derived from an experimental cognitive-psychological study working with individual subjects, Gaulmyn's suggestion (as her model discussed above) is clearly interactively oriented and thus has potential also for the study of classroom discourse. It is at points a. and c. that the explanation links up to the surrounding discourse and to the other interactants involved. Several empirical questions, then, arise in conjunction with the three phases:⁴

1. How is explaining embedded in the flow of classroom talk? How are explananda identified? By whom?
2. In the explaining text, can one identify linguistic characteristics (formal or semantic) that recur in larger numbers of explanations?
3. What counts as sanctioning? Does teacher feedback to student explanations represent such sanctioning? What of teacher explanations? Do teachers sanction their own explanations? Who else does? Is student uptake a sanctioning of teacher explanations?

In the remainder of this paper I will focus on phase 2, that is, on what might be regarded as the core of an explanation, the actual explaining text.

3. Explanations in CLIL lessons

3.1. Educational setting

The data with which we will pursue research question 2 outlined above consist of a collection of 40 CLIL-lessons recorded in Austrian secondary schools. All schools were part of the state education system and implemented CLIL to varying degrees and with different models. Ten teachers and two native-speaker assistant teachers participated in the study. Seven teachers possessed a double certification in a content subject and English as a foreign language, the remaining three in one or two content subjects. The latter, however, had expanded their knowledge of English through extended stays abroad. The school subjects represented are geography and economics, history and social studies, biology, physics, music, accounting, business studies, tourism management and international marketing. The students attended grades 6-7 (part of lower secondary) or grades 10-13. Most of them were native speakers of German but there is also a

4 A model of interactive explaining (INTEX), which integrates the three phases has been suggested by Smit (2010). Smit's understanding of explanations is more radically distributed and dialogic than Gaulmyn's. While this ultimately reflects classroom realities more truly, I am for my present purposes treating explaining texts as if they were monologues in order to enable me to apply my heuristic (see below) for identifying structures and strategies.

strong group of speakers of other first languages, who use their second language (German) as their main medium of education outside CLIL lessons. The mother tongues represented were: Bosnian/Croatian/Serbian, Turkish, Albanian, Polish, and Russian.

The lessons were audio-recorded and transcribed using simplified conversation-analysis-type conventions; they are accompanied by extensive field-notes as the researcher was present at all recordings. The whole corpus comprises ca 260.000 words (29 hours) of natural classroom discourse.

3.2 Classroom explanation data

Here are five examples of classroom explanations produced by teachers and students that will serve me as material for further analysis in this chapter. All examples chosen stem from upper secondary lessons (grades 11-13.) It should perhaps be pointed out that these extracts were not randomly selected from a large body of similar ones but represent virtually all coherent elaborate explanations found in the classroom data. A much larger share of explanations tends to be distributed among several participants, but this is not the topic of the present paper.

Example 1: Diarrhoea

T: a diar-diarrhoea this is ..if you if you empty the .. your bowels .. very rapidly ...you can throw up like that if you're very thick-sick but it could also go the other way. so it's durchfall, and dysentery is an extreme case of durchfall, of diarrhea it's very extreme and many people die from that because they .. ja they become dehydrated. .. sind zu sehr entwässert in the book you find a translation for that ah .. f- ruhr, ja? the word would be ruhr.

Example 2: Early Adopters

S: early adopters they tend to buy new products quite early, then only few people have it and so they can buy the new things and that they have enough money and i think my aunt is an early adopter and for example she really like to watch videos and when the dvd players er went er were put on the market she was er she first waited some time and then she said i really want to have such a dvd player and also only few people have one and the dvd players are very expensive she she said she wanted to try it and so she bought the dvd player er but it was still more expensive than nowadays but she was really satisfied with it and she always told her family and all her friends that she has a dvd player and that its really super and that everybody must have one.

Example 3: Mobile Parenting

S: erm mobile parenting is when erm the parents can control their kids even if they are not with them so when parents are in wor in work they phone them and they know what children are doing and

Example 4: Comecon

T: ja ja comecon was some kind of ah an economic cooperation between the soviet union and the other ah so-called east block countries ...so while the the western countries ah formed the the european union or the forerunners of the european union which was the so-called ah ah european community ah the east block countries together with the soviet union formed the so-called comecon.

Example 5: Market Growth

S: how fast a market grows erm that is how fast it extend yeah, how fast consumers are buying it, how quickly more buyers are come coming and so on. so market growth is not the only measure.

3.3 The internal structure of classroom explaining texts

It was pointed out earlier that explaining is an activity that makes explicit the relationships between concepts and terms and that in their totality these relationships make up what we call knowledge structures, that is, the conceptual structures which characterise a specific area of specialist subject knowledge (cf. Lemke 1990). While cognitive structures or the “architecture of thought” is clearly an important and ‘hot’ topic in cognitive psychology and neuroscience at the moment (cf. e.g., Snyder et al 2004), I will not go down this avenue here. For the purposes of this paper we can simply state that as long as we remain within the theoretical and methodological boundaries of (applied) linguistics, language is the only way we have to access this area and so the language produced by the participants in the classroom is our object of analysis.

Step 1: meaning relations and macro-structures in explaining texts

A stretch of classroom talk which has been identified as an explanation, then, should contain elements that express the said relations between concepts. Essentially what we are talking about are meaning relations as they are realized in texts in order to ensure that what is said is intelligible, reasonable and logical.

The items in need of being related with each other are either subject-specific concepts or things that are said about them (i.e., propositions). So, what we will be looking for in the classroom explanations are “explicit or inferred coherence relation[s] between propositions or groups of propositions that are typically expressed by clauses or larger portions of text.”⁵ These relations may not always be ‘logical’ in the narrow sense of the word (truth conditions) but they do answer to

5 Quoted from <http://www.sil.org/linguistics/GlossaryOfLinguisticTerms/WhatIsAnInterpropositional-Rela.htm>. Main sources cited in this web-article are Mann and Thompson 1985, Halliday and Hasan 1976.

a somewhat wider definition of Logical Relations as “those relations between the elements of discourse or thought that constitute its rationality, in the sense either of (1) reasonableness or (2) intelligibility”⁶.

A tricky question that needs to be dealt with in this connection is whether an established inventory of logical relations in the wider sense actually exists. While Kidd (1996) derived a small inventory from selected textbook explanations (*comparing, contrasting, generalizing, cause and effect, and exemplifying relations* (1996, 302-307), Mann and Thompson (1985) suggested a large number of inter-propositional relations (e.g. internal, external, additive, alternative, causal, contradiction, contrast, dismissive, elaboration, enablement, evaluation, interpretation, justification, and many more). For reasons of operationalizability I will here use Lemke’s less elaborate scheme (Lemke 1990, Appendix C) but expanded by a further category, namely analogy:

Relation Type	Brief Description	Subtypes
Elaboration	A, i.e., B - A, e.g. B - A, viz. B	exposition, exemplification, clarification
Addition	A and B - not A, nor B - A, but B”	conjunctive, negative, adversative
Variation	not A, but B - A but not B - A or B	replacive, exceptive, alternative
Connection	relations of the parts of various forms of argument	cause/consequence, evidence/conclusion, problem/solution, action/motivation
Analogy	transfer from one particular to another particular	structure, surface, effect...

Table 1. Logical Relations Summary (cf. Lemke 1990, **Appendix C**; adapted by CDP)

Equipped with this set of relations let us now turn to our first example. In this lesson on trench warfare during World War I the class had been working on different aspects of the terrible conditions experienced by the soldiers on the battlefields of Western Europe; at this point the teacher explains the term *diarrhoea*.

6 <http://www.britannica.com/EBchecked/topic/346378/logical-relation>

Explaining text 1 Diarrhoea

EXPOSITION

- 1 a diar-diarrhea this is ..if you if you empty the .. your bowels .. very rapidly ...you can throw
 2 up like that if you're very sick but it could also go the other way. so it's durchfall,

EXEMPLIFICATION

- 3 and dysentery is an extreme case of durchfall, of diarrhea. it's very extreme and many

CONSEQUENCE 1

CONSEQUENCE 2

- 4 people die from that because they.. ja they become dehydrated .. sind zu sehr entwässert.
 5 in the book you find a translation for that ah f- ruhr, ja? the word would be ruhr
-

As we can see, the explanandum *diarrhoea* is dealt with first by Exposition (line 1-2), linguistically expressed by apposition (A is a B), and then by Exemplification (ll.3-5, “an extreme case of”), both of which are subcategories of Elaboration. Embedded in the exemplification we also find a chain of consequences of the disease (people become dehydrated and die). A similar structure can be found in extract 2:

Explaining text 2 Early Adopters

EXPOSITION

- 1 early adopters they tend to buy new products quite early, then only few people have it
 2 and so they can buy the new things and that they have enough money

EXEMPLIFICATION

- 3 and i think my aunt is an early adopter and for example she really like to watch videos and
 4 when the dvd players er went er were put on the market she was er she first waited some
 5 time and then she said i really want to have such a dvd player and also only few people
 6 have one and the dvd players are very expensive she said she wanted to try it and so
 7 she bought the dvd player er but it was still more expensive than nowadays but she was
 8 really satisfied with it and she always told her family and all her friends that she has a dvd
 9 player and that its really super and that everybody must have one
-

Again, we have a sequence of exposition and exemplification; in the latter we find embedded a series of additions (“she waited...and then she said...but it was still more expensive etc.”) that arise from the typically paratactic structure of oral syntax.



Other macro-structures are, however, also in evidence, although they do not, in my opinion, constitute a radical departure from the two above. Text 3 consists of an exposition with an embedded action-motivation connection (“they phone them and they know what the children are doing”):

Explaining text 3 Mobile Parenting

EXPOSITION

- 1 erm mobile parenting is when erm the parents can control their kids even if they are
- 2 not with them so when parents are in work they phone them and they know
- 3 what the children are doing and...

Explaining text 4 Comecon

Exposition

- 1 ja ja comecon was some kind of ah ah an economic cooperation between the
- 2 soviet union and the other ah so-called east block countries ...

VARIATION

- 3 so while the the western countries ah formed the the european union or the forerunners of
- 4 the european union which was the so-called ah ah european community ah the east block
- 5 countries together with the soviet union formed the so-called comecon

In the second part of Text 4, the two economic blocks are constructed as alternatives of each other and, at this level of granularity, are regarded as parallel. The simplest structure among the present examples is shown by Text 5.

Explaining text 5 Market Growth

EXPOSITION

- 1 how fast a market grows erm that is how fast it extend yeah, how fast consumers are buying it,
- 2 how quickly more buyers are come coming and so on. so market growth is not the only measure.

One thus finds that the relationship between the explanandum and the explanans can indeed be captured in terms of Logical Relations given in Table 1.



These relations are summarized for our data in Table 2: it can be observed that the one relation which is always realized is ELABORATION.

Extract	Explanandum	Logical Relations
1	Diarrhoea	ELABORATION : EXPOSITION + EXEMPLIFICATION CONNECTION
2	Early Adopters	ELABORATION : EXPOSITION + EXEMPLIFICATION CONNECTION
3	Mobile Parenting	ELABORATION : EXPOSITION CONNECTION
4	Comecon	ELABORATION : EXPOSITION (DEFINITION) + VARIATION
5	Market Growth	ELABORATION : EXPOSITION

Table 2 Logical Macro-Structure of Explanations

Based on this small set of examples I hypothesize that the prototypical relation between an explanandum and the explanans is ELABORATION and that this really is the essence of explaining. Further research is needed to support this hypothesis. On the next level of specificity we find that in all five cases the ELABORATION relation is realized by EXPOSITION either on its own (5) or followed by EXEMPLIFICATION (1,2), and/or CONNECTION (1,2,3) or VARIATION (4). This first round of analysis, then, has yielded something like a macro-structure within the middle phase of classroom explanations, and we have seen that the recursiveness of these explaining text allows internal variation. However, the resulting sub-divisions or episodes of the middle phase, as I would like to call them, are still complex in themselves.

Step 2: meaning relations and micro-structures

We now turn to look ‘inside’, as it were, the exposition and exemplification episodes of the five explaining texts. In order to accomplish this task our repertory of meaning relations needs to be expanded, as both grammar and the lexicon provide mechanisms for expressing meaning relations. Systemic Functional Linguistics (SFL; Halliday 1994 [1985]) seems uniquely suited as a theoretical framework for such an undertaking as it is based on the understanding that the basis of grammar is semiotic rather than formal. Lemke (1990) has provided a useful summary of such lexical and grammatical means within the framework of SFL with a view to using it in what he calls “thematic analysis” of the construction of subject-specific knowledge. It is reproduced in Table 3.

TAXONOMIC RELATIONS	TOKEN, HYPONYM, MERONYM, SYNONYM, ANTONYM; TRANSLATION, GLOSSING
NOMINAL RELATIONS	CLASSIFIER, QUANTIFIER, ATTRIBUTIVE/MODIFICATION
TRANSITIVITY RELATIONS	AGENT, TARGET, MEDIUM, BENEFICIARY, RANGE, IDENTIFICATION, POSSESSION ETC.
CIRCUMSTANTIAL RELATIONS	LOCATION, TIME, MATERIAL, MANNER, REASON

Table 3. Semantic Relations Summary part 2 (cf. Lemke 1990, Appendix C)

Taxonomic relations are expressed by the sense relations commonly assumed to hold in the lexicon (e.g. antonymy, synonymy) and studied in lexical semantics. Given that we are dealing with a context where more than one language is present, these relations may also operate across language boundaries, and I have therefore included translation and glossing in this category (cf. Smit 2010). The remaining relations are expressed via morphology and syntax; in English predominantly the latter, of course.

Let us turn once again to our first example, trying to see which matches can be found between the relations set out in Table 3 and the explaining text on *diarrhoea*:

Text 1. Micro-Structure of explanation Diarrhea

EXPOSITION:	AGENT	PROCESS0	POSS. MEDIUM	MANNER	PROCESS1
1	a diar-diarrhoea this is ..if you if you empty the .. your bowels .. very rapidly ...you can throw up				
	AGENT	ATTRIBUTE	PROCESS2	TOKEN/IDENTITY	
2	like that if you're very sick but it could also go the other way. so it's durchfall,				
	Exemplification				
	IDENTIFICATION	ATTRIBUTE	CONSEQUENCE		
3	and dysentery is an extreme case of durchfall, of diarrhea. it's very extreme and many people die				
	REASON		TRANSLATION		
4	from that because they.. ja they become dehydrated .. sind zu sehr entwässert.				
	TRANSLATION		TRANSLATION		
5	in the book you find a translation for that ah f- ruhr, ja?			the word would be ruhr	

The EXPOSITION part of this explaining text appears to be realized entirely by way of TRANSITIVITY and CIRCUMSTANTIAL RELATIONS: there is a participant

subject (EXPERIENCER) who is pragmatically equated with the addressee of the explanation by the use of personal deixis (*you*); PROCESSES (*to empty, throw up*) are shown to take place in a certain MANNER (*rapidly*) in which the EXPERIENCER is cast as a potential participant. The episode is concluded by a TOKEN relation in the shape of the German translation equivalent *Durchfall*.

The exemplification episode of Text 1 is introduced by an IDENTIFICATION relation (1.3: *is an extreme case of*). Dying is mentioned as the CONSEQUENCE of dysentery as an extreme form of diarrhoea (1.3) and the immediate REASON of death is given (*dehydrated*). An analysis of the episode on the transitivity level shows that the addressees are no longer in the role of “experiencer” but that this role has been taken over by an indefinite third person subject *people*. Interspersed in this episode are three TRANSLATION RELATIONS realized by L1 equivalents.

In the previous example transitivity and circumstantial relations were shown to be doing the work of making explicit meaning relations that hold on the conceptual level. In other exposition episodes taxonomic relations seem to be more prominent. These are mostly realized by lexical means, by way of synonyms, hyponyms, or meronyms.⁷ In the explaining text on *Market Growth*, for example, we find the synonyms *grow/extend, fast/quickly, consumers/buyers* the latter also as partial synonyms of *market*.

Text 5 Micro-structure of explaining text *Market Growth*

	EXPOSITION	SYNONYM1	SYN2	SYN1
1	erm how fast a market erm grows	erm that is	how fast it	extend
	SYN 2	SYN3	SYN2	SYN3
2	yeah, how fast	consumers are buying it,	how quickly more buyers are	come coming
	IDENTIFICATION			
3	and so on. so market growth is not the only measure ..			

In the text on the *Comecon* (Text 4) the speaker weaves a net of hyperonym (*economic cooperation*), co-hyponyms (*European Union, Comecon*), synonyms (*European Union, European Community*) and antonyms (*eastern – western*), implying that the listeners know one part of the contrasting pair (*European Union*) and can by implication derive the meaning of the other.

7 Hyponym: a subordinate term, e.g., rose is a hyponym of flower. Meronym: expresses a part-of relationship; e.g. finger is a meronym of hand, Tuesday is a meronym of week.

Text 4 Micro-structure of explaining text *Comecon*

	EXPOSITION		
	WHOLE	IDENTIFICATION	HYPERONYM 0
1	ja ja comecon was some kind of ah ah an economic cooperation between the		
	PART 1 OF WHOLE	PART 2 OF WHOLE	
2	soviet union and the other ah so-called east block countries ...		
	VARIATION		
	ANTONYM 1/PART OF		WHOLE
3	so while the the western countries ah formed the the european union or the forerunners of		
	HYPONYM 1		HYPONYM 1
4	the european union which was the so-called ah ah european community ah the		
	ANTONYM 1 HYPONYM 2		
5	east block countries together with the soviet union formed the so-called comecon		

A rather different strategy is employed by the speaker in the exemplification episode of the *Early Adopters* text: this example is elaborated by way of narrative with a third-person agent protagonist, the speaker's aunt:

Text 2. Micro-structure of explaining text *Early adopters*

and so she [the speaker's aunt] bought the dvd player er but it was still more expensive than nowadays but she was really satisfied with it and she always told her family and all her friends that she has a dvd player and that its really super and that everybody must have one.

While the taxonomic relations, then, have direct links with traditional activities employed in building vocabularies in specific and/or foreign languages, other formal features of the micro-structure of explanations are commensurate with syntax and phraseology and tend to receive little explicit attention outside linguistic analysis.

4. Conclusion

In this article I have attempted to demonstrate that a detailed analysis of classroom explanations is necessary in order to make constructs like academic language or academic discourse functions (cf. Cummins 1991, Zydatiss 2007, Kidd 1996, Dalton-Puffer 2007) more tangible. I have done this with a two-pronged interest:

in order to contribute to the conceptual refinement of this research interest but also in order to progress towards an understanding of the activity of explaining in a foreign language that can be cast into terms translatable into pedagogical action by CLIL classroom teachers.

It was noted that extended explaining texts are rare in CLIL classrooms. One important reason for this is the frequency with which translation equivalents are employed in lieu of explanations and are taken to be sufficiently explicit in themselves, as if conceptual items were sufficiently explained by lexical items. It would be highly interesting to study the ways in which such cases are handled in monolingual L1 classrooms by comparison.

The analysis carried out in this chapter has shown that explanations employ a wide range of semantic relations which can be expressed by an even larger number of grammatical and/or lexical relationships. The fact that we find such relationships being expressed explicitly so rarely, especially by students, might therefore be explained through pointing out that the linguistic competence required to do this outstrips the students' resources in the L2. However, this argument does not hold across the board as some of the expressions needed are very basic in terms of morpho-syntactic structure. The *TOKEN* relation, for instance, is realised by "A is a B"; one can hardly get more basic than this. Equally, the Transitivity Relations are embodied in patterns of basic syntax as subjects, predicates and objects, and Circumstantial relations are not much further beyond. Of course some relations are tied to more complex grammatical structures, and there are also complex stylistic variants for many of the simple patterns, but on the whole even students at lower secondary level do possess a morpho-syntactic repertoire in their L2 which enables them in principle to express all these relations. They may not be able to express them with a great deal of stylistic variation, but express them they can. What is so intriguing, therefore, is why they do not do this more often. The answer, in my view, lies in the special discourse conditions of the classroom, the roles of teachers and students and, above all, the assumptions about the distribution of knowledge tied to them. The answer also lies in the tension inherent in having to produce a fairly decontextualized piece of language (the explanation) in a highly contextualized situation (face-to-face interaction in the here and now); cf. Portmann and Schmölder-Eibinger 2008. Apart from these factors, however, I think a further cause lies in a lack of awareness of levels of linguistic organisation beyond the sentence level as well as the fact that grammar primarily encodes semantic relations. While teachers generally possess the procedural knowledge to produce explanations, few of them would be able to teach their students explicitly how to go about giving one. It seems, though, that many students would need to be made aware of how to build explanations before they can be expected to build them. However, as pointed out above, an equally fundamental factor for generating explanations

is the appropriateness of the pragmatic situation which is not given in traditional whole-class discussion.

What I have demonstrated in this contribution merely scratches the surface of explanations in CLIL classrooms. A good deal of further work, conceptual-theoretical as well as empirical, is clearly needed before we can be confident that we have understood the business of explaining. A further dimension would be opened up by an in-depth analysis of classroom talk in conjunction with written (text-book) materials: comparisons across age-groups and subjects might provide highly interesting insights on how subject-specific concepts get written (or rather talked!) into the minds of learners. Another avenue of inquiry would be to identify task types which are appropriate for casting learners into the roles of true explainers.

References

- BHATIA, V. K. (2002). Applied genre analysis: analytical advances and pedagogical procedures. In A.M. JOHNS, ed., *Genre in the classroom. Multiple perspectives*. Mahwah, NJ; London: Lawrence Erlbaum. 279-
- COETZEE-LACHMANN, D. (2009). Assessment of subject specific task performance of bilingual geography learners. PhD Thesis, University of Osnabrück.
- COYLE, D., P. HOOD and D. MARSH (2010). *CLIL: Content and Language Integrated Learning*. New York: CUP.
- CUMMINS, J. (1991). Conversational and academic language proficiency in bilingual context. *AILA Review* 8: 75-89.
- DALTON-PUFFER, C. (2007). Academic language functions in a CLIL environment. In D. MARSH and D. WOLFF, eds., *Diverse Contexts – Converging Goals*. Frankfurt: Peter Lang. 201-210.
- EHLICH, K. and J. REHBEIN (1986). *Muster und Institution. Untersuchungen zur schulischen Kommunikation*. Tübingen: Narr.
- FLOWERDEW, J. (2002). Genre in the classroom: a linguistic approach. In A.M. JOHNS, ed., *Genre in the classroom. Multiple perspectives*. Mahwah, NJ; London: Lawrence Erlbaum. 91-102.
- GAULMYN, M.M. de. (1986). Learning to explain; Apprendre a expliquer. *Travaux-neuchatoise-de-linguistique (TRANEL)* 11: 119-139.
- GIBBONS, P. (2006). *Bridging discourses in the ESL classroom*. London: Continuum.
- GIBBONS, P. (2003). Mediating language learning: teacher interactions with ESL students in a content-based classroom. *TESOL Quarterly* 27(2): 247-273.
- GOVIER, T. (1987). *Problems in argument analysis and evaluation*. Dordrecht, Holland: Foris Publications.

- HALLIDAY, M.A.K. (1993). Towards a language-based theory of learning. *Linguistics and Education* 5: 93-116.
- HALLIDAY, M. A. K. (1994). *An Introduction to Functional Grammar*. 2nd ed. London: Arnold.
- HALLIDAY, M. A. K. and R. HASAN (1976). *Cohesion in English*. London: Longman.
- HALLIDAY, M. A. K. and J.R. MARTIN (1993). *Writing science: literacy and discursive power (Critical perspectives on literacy and education)*. London: Falmer Press.
- JOHNS, A., ed. (2002). *Genre in the classroom. Multiple perspectives*. Mahwah, London: Lawrence Erlbaum.
- KIDD, R. (1996). Teaching academic language functions at the secondary level. *Canadian Modern Language Review* 52: 285-307.
- LEMKE, J.L. (1990). *Talking science: language, learning, and values*. Norwood, NJ: Ablex.
- MANN, W.C. and S.A. THOMPSON (1985). *Assertions from discourse structure*. Marina del Rey, CA: Information Sciences Institute.
- MEHISTO, P., M.J. FRIGOLS and D. MARSH (2008). *Uncovering CLIL: Content and language integration in bilingual and multilingual education*. London: MacMillan.
- MOHAN, B., C. LEUNG and C. DAVISON, eds. (2001). *English as a second language in the mainstream. Teaching, learning and identity*. Harlow etc.: Longman.
- MOHAN, B. and T. SLATER (2005). A functional perspective on the critical 'theory/practice' relation in teaching language and science. *Linguistics and Education* 16: 151-172.
- O'Malley, J.M. and A.Uhl Chamot (1990). *Learning strategies in second language acquisition* Cambridge: Cambridge University Press .
- PORTMANN-TSELIKAS, P.R. and S. SCHMÖLZER-EIBINGER (2008). *Textkompetenz*. In *Fremdsprache Deutsch*. München: Klett. 5-16.
- SMIT, U. (2010). *English as a lingua franca in the classroom. A discourse pragmatic ethnography*. Berlin etc: Mouton de Gruyter. [An earlier version appeared as Smit, U. (2008). *Classroom interaction in English as a lingua franca*. Postdoctoral thesis. University of Vienna].
- SNOW, C.E. (1987). Beyond conversation: second language learners' acquisition of description and explanation. In J.P. LANTOLF and A. LABARCA, eds., *Research in second language learning: focus on the classroom*. Proceedings of the 6th Delaware Symposium on Language Studies, October 1984. Norwood: Ablex. 3-16.
- SNOW, M.A., M. MET and F. GENESEE (1989). A conceptual framework for the integration of language and content in second/foreign language instruction. *TESOL Quarterly* 23: 201-217.



- SNYDER, A.W., T. BOSSOMAIER, and D.J. MITCHELL (2004). Concept formation: 'object' attributes dynamically inhibited from conscious awareness. *Journal of Integrative Neuroscience* 3: 31-46.
- SUHOR, C. (1984). Thinking skills in English and across the Curriculum. ERIC Digest. ERIC Clearinghouse on Reading and Communication Skills. Urbana IL: ERIC No. ED 250 693.
- UNSWORTH, L. (2000). Investigating subject-specific literacies in school learning. In L. UNSWORTH, ed., *Researching language in schools and communities. Functional linguistics perspectives*. London & Washington: Cassell. 245-274.
- VOLLMER, H.J., L. HEINE, R. TROSCHKE, D. COETZEE and V. KÜTTEL (2006). Subject-specific competence and language use of CLIL learners: The case of geography in grade 10 of secondary schools in Germany. Paper presented at the ESSE8 Conference in London, 29 August 2006.
- ZYDATISS, W. (2007). *Deutsch-Englische Züge in Berlin (DEZIBEL). Eine Evaluation des bilingualen Sachfachunterrichts an Gymnasien. (Mehrsprachigkeit in Schule und Unterricht 7)*. Frankfurt etc.: Peter Lang.

