

## **COOP E-CLIL**

### **Collaboration between language teachers and subject teachers**

by Keith Kelly ([keithpkelly@yahoo.co.uk](mailto:keithpkelly@yahoo.co.uk))

#### **Background**

I was asked to prepare input for a teacher development event in Salzburg, Austria (10-12.11.2014) which was entitled 'COOP E-CLIL', where my role would be working on how English teachers can collaborate effectively with subject teachers from a range of technical high schools and vocational high schools in Austria. The educational context to this training is legislation from the Austrian government which has made it compulsory for these schools to provide some of their curriculum through the medium of English since September 2013. Any development in getting English language teachers cooperating on CLIL in schools can only contribute to the success of the initiative more generally.

I don't speak on behalf of the government in this respect, and don't claim to have any magic recipes. However, at the time of writing, I have worked with approximately 300 teachers in Austria over a period of 5 years from a wide range of subject areas from these technical and vocational schools. Additionally, I've been privileged to pay visits to many of the schools for small scale in-service development meetings for teachers around the country. I also contribute to the ongoing coordination of an electronic group of over 200 Austrian teachers interested in CLIL. All of this as part of a programme of training to prepare the teachers for working through the medium of English.

This is the first event in Austria that I have contributed to where language teachers (LTs) and subject teachers (STs) were brought together in school pairs with a view to exploring how they might work together most effectively. This paper came from the desire to share and report on the event so other colleagues in similar situations might benefit. The paper includes stories told by colleagues from the event and from the HTL CLIL context.

90 teachers came to the training to take place over three days. The group was divided into three groups of pairs of LTs and STs. These groups of pairs were given sessions with other colleagues on management questions to do with HTL CLIL in Austria and also on materials development for HTL CLIL.

The agenda I set was based on the description above, i.e. that the session should grow as the teachers shared their own perceptions on collaboration for CLIL and I presented my own ideas and experiences. This paper is a description of the training offered and insights gained from the event with a view to presenting one approach to CLIL training which combines English language teachers paired with subject teachers from the same school.

#### **Structure**

I based the afternoon sessions on the following structure:

Warm-up – teacher views on language teacher roles and responsibilities

- 1 The subject curriculum content and language curriculum content. Are there any overlaps?
- 2 Working with subject thinking and language in the English lesson.
- 3 Co-preparation and co-teaching, who does what?
- 4 Observation and feedback
- 5 Other important questions

I'd prepared a number of resources and activities based on the points in the agenda, but was aware, and quite happy, that the teachers bring their own agenda with them and so knew that my own preparation would need to be flexible enough to move and adapt with the discussion among the teachers. What the aspects of the agenda offer are *points of contact* for discussing collaboration between STs and LTs.

## Andreas' story – background to HTL CLIL

"Hmmm, CLIL, what's this all about ... actually?" was probably the core question of the first part of my session which I called "How to kick-off CLIL". It was to present all the basic ideas, intentions and aims of CLIL on the one hand and curriculum-related rules and regulations on the other hand, legal matters to be taken into account as well as practical tips and hints on how to introduce and implement CLIL in individual technical colleges. Much had to be said about challenges, both on (language and subject) teachers' and students' side, and about responsibilities, school board's as well as school management's. Using both working languages, i.e. German and English, more or less at the same time offered valuable and hands-on insights into a bilingual classroom, quick and easy CLIL-related tasks for the seminar participants illustrated clearly what the main differences between a more traditional use of English as a working language and true CLIL (with genuine language learning elements embedded) are.

Warming-up and letting off steam, complaining about the extra workload with (almost) no extra time and money given, too much red tape and the need to leave a routine-led comfort zone were (intended and most welcome) by-products of this first part. "Hey, Andreas ..." a group of engineering teachers said to me about 15 years ago, "we want you to be our language trainer." "Okay, fine, what do you want me to do then?" was my answer which soon became a core ingredient for success.

"How to SCHILF CLIL" was the second part of my session presenting means and methods to support subject teachers who intend to apply the CLIL approach within their own technical and vocational colleges. The title of this session as such, a rather weird combination of acronyms, I admit, implies customizing INSETT to specific on-site requirements. Asking my colleagues what they want and providing them with what they need have since then become the main ingredients for an ongoing series of INSETTs at my own college too. Of a total of about 100 teaching staff, most of them from the fields of engineering and science, a group of 10-12 might be called "regulars" participating in early evening meetings almost every four weeks with another 5-7 popping in from time to time. The principal, the heads of the informatics and electronics departments on board as well? For sure, most appreciated and powerful engines for team spirit and group dynamics. Teacher development, i.e. language and grammar work (on demand), materials development and micro-teaching and didactics are on the program regularly with colleagues bringing their drafted teaching and study materials to the meetings and expecting feedback and guidance both in terms of content and language. On-site testing, evaluation and improvement in a safe and trusted environment is what these colleagues come for. And some of them even stay for a pint of beer in the nearby restaurant afterwards.

The CLIL INSETT as a social event to bond people who have often been working in the same college building for ages, not aware of who is who and who does what. CLIL is what makes them connect – improving our students' language skills, preparing them for job lives in a globalized economy and fostering employability and active citizenship is what makes these people succeed.

Andreas Bärnthaler teaches at a technical and vocational college. He is on the board of IATET and heads the CLIL department at CEBS, a national in-service teacher training center specializing in vocationally oriented language education. Andreas works as a CLIL coach and consultant and has been a driving force behind the implementation of CLIL in Austrian colleges of engineering. He loves being with his family, walking his dog and riding his MTB.

## Warm-up

Language teachers were grouped together, subject teachers were grouped together and everyone was put into small groups of 4 or 5 colleagues. They were asked to discuss in their groups what their perception was of the role of the language teacher in supporting CLIL.

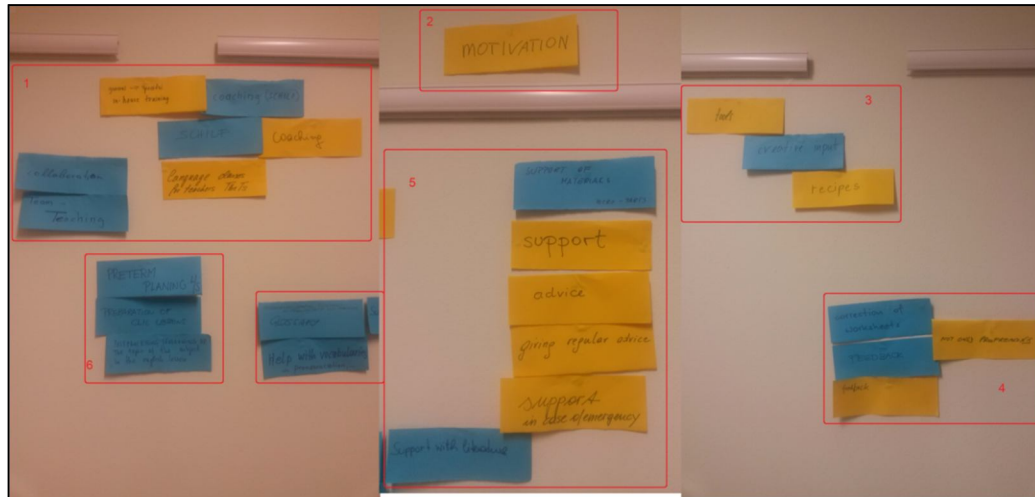


Figure 1 – Group 1: Post-its on role of language teachers in HTL CLIL

The colleagues discussed what is happening in their schools, and what they think should be happening in their schools. They were asked to write down one or two words on post-it cards in large letters. The only condition placed on the groups was that they should all have one different idea each in their group. In other words, a group of 4 teachers would have four different post-it cards to present. The groups were then asked to post their ideas on the wall group by group and each person explaining in one or two sentences what their key words represent. As the posts grew more numerous there was an initial attempt to cluster them into related areas. Yellow cards were handed out to language teachers, and blue cards were given to subject teachers. The results are numbered and grouped in the image below:

A few words on the cluster post-its for group 1:

1 – Coaching                      There was a balanced request from both language teachers and subject teachers alike for collaborative teaching and training. A suggestion in the post-its is for in-house training through SCHILFs (funded INSETT). One colleague requests 'team teaching' in this cluster.

6 – Preparation                      Preparation is related to coaching. This cluster reflects a desire for time and opportunity to sit down in subject-language pairs or groups with the school calendar and schemes of work (guidelines, textbooks) for planning areas for collaboration throughout the year. There was a suggestion that this should happen before / at the start of the school year in September. This small cluster also suggests that there should be organization of classes so that when a CLIL subject lesson is given, there can be follow-up in the language lesson.

5 – Support                      This is the largest cluster and represents a real desire for contact and communication between both subject and language teachers. On the one hand, subject teachers request help with subject literature and vocabulary, on the other, language teachers offer advice and support. This raised the question of 'how and when' this support can be made to happen in school.

4 – Feedback                      There was a request for and offer of feedback in both groups. This is feedback not just on materials (not just proofreading) but also on lessons. This suggests a place for classroom observation.

3 – Tools                      Creative input, recipes and tools were all mentioned here. These points refer to the pedagogy of language teaching and learning - working with the 4

language skills, setting up different dynamics in the classroom, finding techniques for learning moments.

2 – Motivation                      One language colleague also offered ‘motivation’ as a resource from the language department.

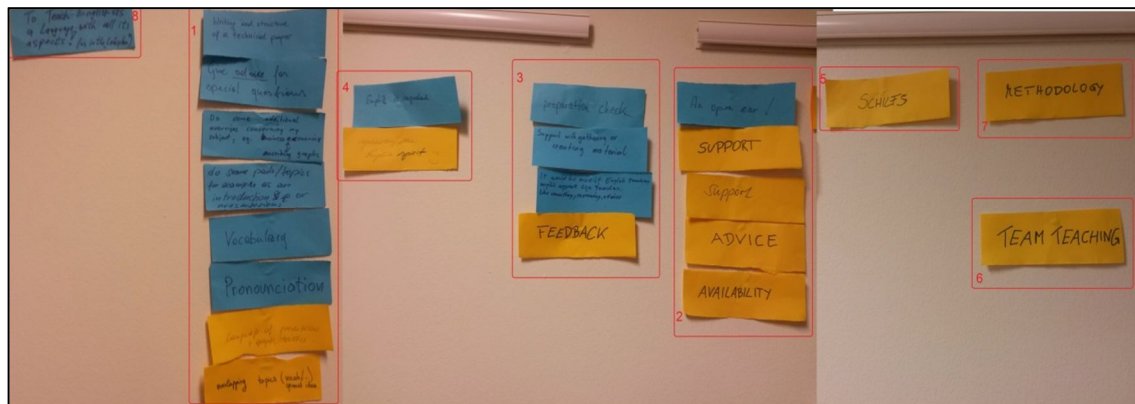


Figure 2 – Group 2: Post-its on role of language teachers in HTL CLIL

A few words on the cluster post-its for group 2:

2 – Support and advice                      The language teacher is seen as offering advice and support and simply being available when the need arises.

1 – Specific help                      This particular group focused on a number of specific areas for help. These included very concrete suggestions: preparing students for writing lab reports and abstracts in English; doing extra work on specific subject topics such as ‘describing graphs’; training students to give presentations, the skill and the language; vocabulary practice and pronunciation.

3 – Preparation                      A cluster group focused on giving feedback, helping prepare and checking materials, reviewing materials.

4 – Motivation                      Two colleagues highlight the role of the English teacher in getting the message across that English is important.

5 – Coaching                      One colleague asks for English teacher help in preparing and running SCHILFs on CLIL.

6 – Team teaching                      There was one request for the opportunity to team teach with the English teacher. This question was then put to the group to poll the interest in this role. When asked ‘How many of you would like the opportunity to team teach?’ Half the group, 13 colleagues, raised their hand.

7 – Methodology                      One colleague suggested that the role of the English teacher is in providing ideas on methodology in the CLIL classroom.

8 – Student language                      One colleague highlighted the role of the English teacher as preparing the language of the students to a sufficient level so CLIL teachers can then do their job.

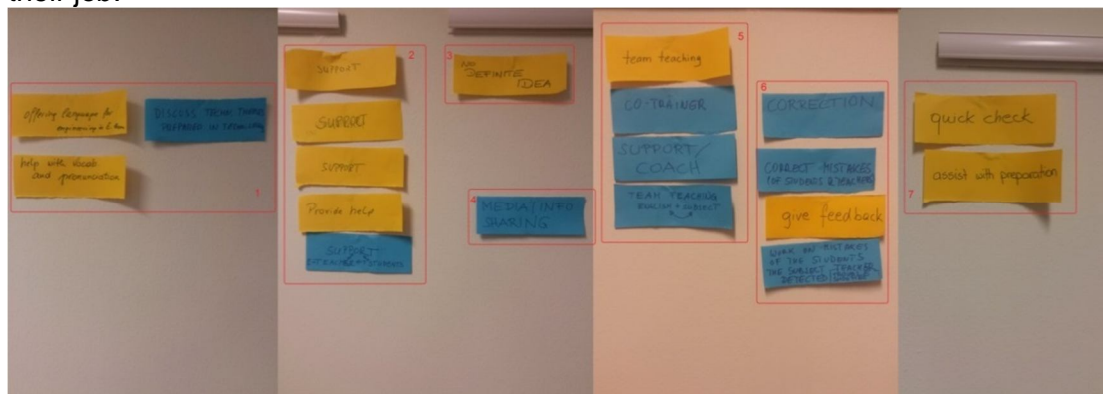


Figure 3 – Group 3: Post-its on role of language teachers in HTL CLIL

Some comments on the cluster post-its for group 3:

- 1 – Vocabulary                      There were three suggestions related to help with subject specific terminology, its preparation, and pronunciation.
- 2 – Support                            The largest cluster was a general view that the language teacher's role be to lend support to the CLIL teacher, but also to the students and it was stressed that this is not a one-way support. A relationship was suggested which has ST (subject teacher), LT (language teacher) helping each other.
- 3 – No ideas                            One colleague admitted to not having any ideas.
- 4 – Sharing                             It was suggested that the English teacher has a role in offering information on resources and media.
- 5 – Team teaching / training    A significant cluster grew around the role of team teacher and trainer.
- 6 – Feedback and correction    There is also a clear role for the language teacher in offering feedback, correcting errors of teachers and students.
- 7 – Preparation                        It was suggested that the language teacher has a role in the preparation stage of teaching where they can do a quick check of resources written. It was also suggested that the relationship becomes more meaningful if the language teacher is involved in the very preparation of the lessons, as opposed to being asked to proofread already written materials.

The most impressive conclusion to be drawn from the suggestions above is that there is a wide-ranging eagerness and willingness to get involved in cooperation. This is true both for LTs (yellow cards) and STs (blue cards). 31 of the cards above suggest 'coaching', and 'support' as roles for the language teacher. There are many very concrete suggestions for what this support might entail, including 'presentation skills', 'language for describing graphs', 'writing lab reports'. An action point we can identify from this is that schools need to give LTs and STs time and opportunity to get together to identify these 'contact points', in other words what LTs can *specifically* do to support the work of the STs.

The above clusters of perspectives on language teacher roles in HTL CLIL was then exploited as a backdrop for the discussion to come over the course of the rest of the afternoon's training. We took as our focus further investigation of similar 'contact points' for CLIL cooperation back in schools.

## **1 Overlaps in subject and language curricula**

There are many overlaps. It's not a widely recognised fact. The first step is encouraging teachers to explore and find out where the points of contact are. Different curriculum subjects can share common areas for teaching and learning in any of three clear areas: concepts, language or skills. These three 'dimensions' are described in detail in 'Putting CLIL into Practice' (Ball, Clegg, Kelly, OUP forthcoming).

A very simple example can be found in the topic of global warming. Global warming is a topic covered in both the science curriculum and many language curricula today. We can easily examine how the topic is covered in the science classroom and the language classroom and highlight areas of overlap and for collaboration. The first dimension the colleagues were asked to consider was the area of 'skills' in their respective curriculum guidelines (they were asked to think about their textbooks as well as curriculum guidelines).

Teachers get their learners to do very different things in their classrooms. Colleagues were asked to work in pairs to think about global warming and match factors of life that will be affected by global warming with the possible consequences for these factors (adapted from onestopenglish/yourclil/globalwarming).

Match the factors with the consequences:

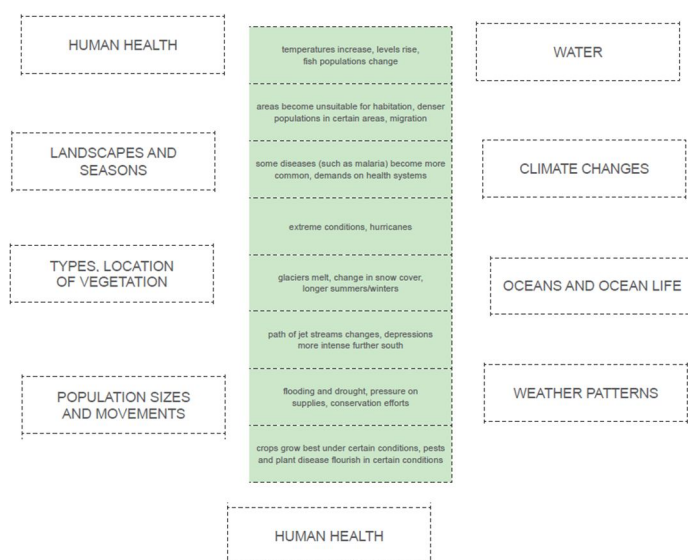


Figure 4 – Factors of life affected by global warming and consequences adapted from onestopenglish.com

### Global Warming – Consequences

There are a number of ways in which we can see now, and might see more often in future, the effects of global warming.

Water will become an issue, as floods and droughts might become more common in some areas. This will increase pressure on supplies of drinking water. However, this could lead to improved efforts to conserve water, as people attempt to save water and use their supply more carefully.

Global warming also affects the water in oceans and the ocean life within them. As temperatures increase, the temperature of the oceans and seas also increases. Warmer seas raise sea levels, as the warmer water expands. The changing conditions bring changes in fish populations and ocean life. Human populations are also affected. Higher temperatures mean some places may become unsuitable for human habitation, leading to an increase in migration and increased populations in habitable areas.

Plants and crops will also change. Certain crops will only grow in specific conditions, as local conditions change, so will the crops. Related to this is the movement of pests and plant diseases, which also flourish in specific conditions. Rising global temperatures also affect human health. Some diseases, such as malaria, flourish in warmer climates. As the temperature changes, the places where these diseases are found will change. Demands on health systems will thus change, for better or for worse.

The patterns of weather with which we are familiar will change. Some regions are likely to experience more extreme weather conditions, for example experiencing more hurricanes, than they have been used to. Climates around the world will change, as ocean currents and the jet streams alter their courses and strength. Atmospheric depressions could become much more intense further south.

We will also see a marked difference in some landscapes and in the seasons. As glaciers melt and ice clears, landscapes will look very different. The same thing will happen as snow cover changes or disappears. Some parts of the world could see much longer summers or winters than normal.

Figure 5 – Reading text on Global Warming - Consequences

Extract from: www.onestopenglish.com © Macmillan Publishers Limited 2014, Published by Macmillan Publishers Limited. Used by Permission. All Rights Reserved.

Once the colleagues had had chance to talk and match the cards, they were given a text to read and then check their matched cards with what they found in the text.

At this point, the colleagues were asked to report back in plenary to questions from the trainer along the lines of ‘... what will the consequences of global warming be for water on Earth?, or ‘Can you tell me what will be the result of global warming for vegetation on Earth?’ Phrasing the questions in this way encouraged the teachers to produce a specific type of answer, namely making predictions about consequences of global warming for the different factors of life on Earth. The next slide showed the ‘correct’ matchings of the cards.

Here, colleagues were asked to consider what language they used to feedback their answers to the questions from the trainer. A brief discussion revealed that this was the language of 'cause-effect' and colleagues were asked to enumerate more of this cause-effect language in plenary. This aspect of the discussion was led by the question of how much of this language our learners need to be able to do this activity and colleagues were given a handout of the language of cause and effect to discuss in their pairs. The colleagues were asked specifically, how much of this language they would expect their learners to know, to learn in the handout (see appendix 1). It's quite clear from the language in appendix 1 that cause-effect language is rich and varied and an area for collaboration between language and subject teacher is identifying and then making decisions about what language their students need to talk/write using cause-effect language in topics like global warming.

Another clear aspect of this section of the discussion relates to 'skills'. So far, colleagues had been asked to read cards, discuss then and match factors with consequences; they had to then read a text and check their matching of factors with consequences. Following this, colleagues were asked to describe their matched cards in full sentences. There are all kinds of dynamics happening in these activities. Not least, colleagues are asked to agree / disagree / compromise about matching, and they are also asked to produce considered 'full sentence' to express to the whole group.

There are two very important aspects of the above which are revealing to pairs of subject and language teachers brought together to share ideas on each other's work. These two aspects are quite clearly *language* and *activity (skills/procedures)*. Language and activity (skills/procedures) are both clear points of contact for exploring collaboration between language and subject teachers. We might argue that the third dimension of 'concepts' from the subject curriculum could prove challenging for many language teachers to bring into their language classroom. However, language and communication *skills* are at the heart of of the language teacher's work and they are prime for collaboration work in the curriculum.

## **2 Subject thinking and language in the English lesson**

The work on global warming shows us that learners need a range of phrases for talking/writing about the causes and consequences of global warming for life on Earth. English classes which practise the language of thinking skills like cause-effect (hypothesis, comparison, pros and cons, defining, giving explanations and others) will be supporting the work of the subject teacher. Here, colleagues were asked to investigate in their pairs other thinking skills in the content curriculum. At the same time colleagues had to consider what (textbooks) and when (calendar) this area could be practised in the language lesson. The simple process of identifying thinking going on in subject lessons, seeing when this is being taught in the curriculum calendar, and seeing when there is overlap in the language teaching calendar, is a great step for collaboration in CLIL.

The time available to us was only three hours. I had a feeling at this point in our agenda that certain pairs of colleagues had already begun talking together about their work back in school. They had their notebooks out and were looking at teaching materials, curriculum documents which they'd been asked to bring along to the meeting. The idea occurred to me that the time could be best spent giving the pairs time to talk together. I had to move more quickly!

To set this into context, colleagues were asked to carry out another activity in their pairs doubled up into 4s. They were given a reading text (appendix 3 – diet and disease) from a science background and asked to identify the thinking skills being exploited in the text. At the same time, colleagues were asked to identify a diagrammatical structure for the text. Because of the time issue, we did this together in plenary and I basically drew the answer up on the flipchart as colleagues took in the text in appendix 2 – diet and disease.

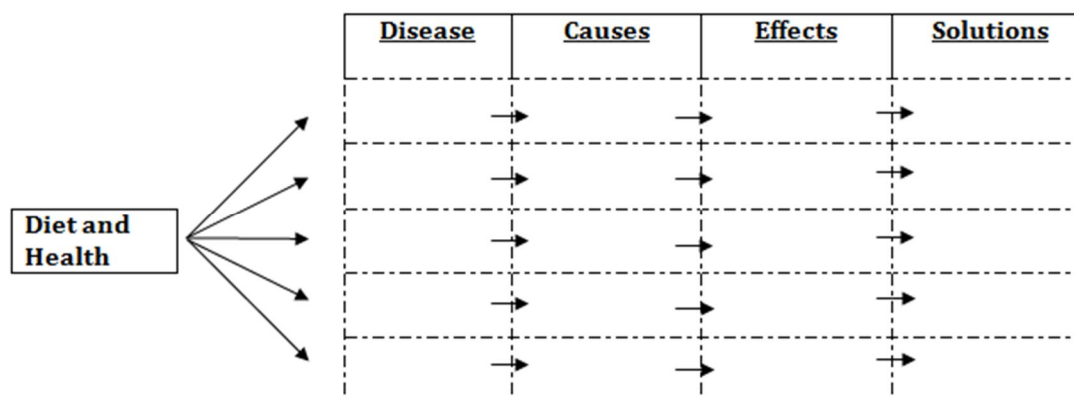
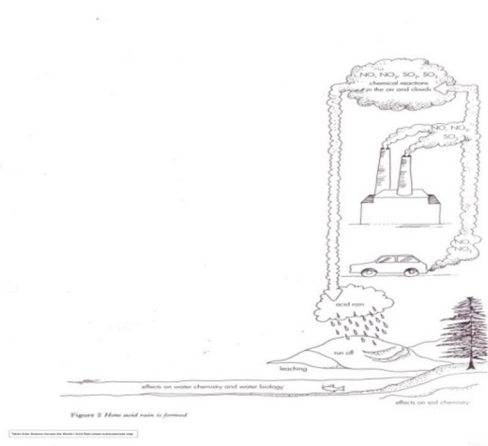


Figure 6 - Diagrammatical structure of *Diet and disease* text

The text clearly represents cause-effect-solution thinking. The key idea I wanted to get across is that if colleagues are able to identify 'shapes' of content in their subjects like the table of flow diagrams above, this will show them the kind of thinking and hence the language functions learners need. The step to take from here in terms of collaboration with a language teacher is to ask the language teacher to help with a) identifying useful cause-effect language and b) help make decisions about how to embed this language in classroom activities (a question of procedure and skills).

From seeing flow diagrams and cause-effect thinking in a text, we moved on to talking about other shapes of content. See Ball, Clegg & Kelly (OUP, forthcoming) for a detailed discussion of 'shapes in content'. We looked at tabular diagrams representing language of characteristics, tree diagrams representing classification and grouping language (Burgess 1994). We then looked at illustrations and diagrams in textbooks and how they can be exploited to focus on thinking skills and necessary language.



Illustrations like 'How acid rain is formed' (Science Across the World) can be exploited to highlight cause-effect language and process language. Students are given the illustration as a handout and they are instructed to watch and listen to the teacher give a monologue about how acid rain is formed using the illustration on the screen. As the students watch, they must label the diagram with key process verbs used during the description. Colleagues were asked to explore their curriculum materials and textbooks to look for similar illustrations and diagrams.

Figure 7 – How acid rain is formed

Lastly, slideshows also lend themselves to supported listening and watching activities. Key language can be highlighted and noted on a handout of adapted slides. During this part of the workshop I surveyed the teachers who regularly use slideshows in their classes. It was the majority. Working on slideshow scaffolds is a clear *point of contact* between content and language teachers and a focus for cooperation. Colleagues can work cooperatively on the language within presentations, but also on the very skills needed for giving presentations.



### 3 Co-preparation and co-teaching

At this stage, I made a decision to alter the agenda slightly. There was a lot of enthusiasm in the group for getting together with designated partners in order to discuss CLIL work in school. For this reason, I asked colleagues to pair up and take the following 45 minutes to work together.

We came back together for the last 15 minutes to tie up and conclude the meeting.

There isn't really an answer to the question in this point of the agenda about who should do what in terms of preparation and teaching. There certainly is no single answer which fits all of the pairs in the group. In pairing up and taking time to investigate the points on the post-its together with the ideas from my input, the *points of contact* (concepts, language, skills), the colleagues had the opportunity to begin their cooperation. I visited 5 or 6 pairs in the time available and much of the discussion was very concrete around specific lesson materials and processes and the preparation was actually happening on the spot. Some of the discussion related to point 5 in our agenda Any other business, largely questions to do with time and money! We didn't cover observation and feedback as there was no time.

#### Workshop story from Brigitte Gottinger and Petra Pargfrieder:

The main aim of our purely practical part of COOP E-CLIL was to first get a representative picture of the mood and experience among the subject teachers concerning the implementation of CLIL in their subject lessons. Another focus of our workshop was to show and illustrate to the English teachers what their practical role in the cooperation with the subject teachers was and to take away their worries and "fears".

In the first half of our workshop we introduced a lot of different approved CLIL-methods to the participants which they all tried out with their tandem partners (language teachers) and which should also help the tandems (each consisting of a subject and an English teacher) to successfully design their own CLIL-lessons for their particular subjects in the second half of our workshop.

Our major aim was to motivate subject teachers to implement CLIL in their content subjects and provide them with a set of different methods and strategies on how to use CLIL appropriately and meaningfully. We also tried to show them ways on how to prepare these CLIL tasks as time-efficiently and effectively as possible. In the afternoon each tandem pair prepared a CLIL lesson using as many methods as possible from the ones they have heard in the first part of the workshop earlier in the day. The language teachers were supporting the subject teachers with their language skills and their expert knowledge and experience in methodology and language teaching.

Finally, we can conclude that we had the impression that the vast majority of CLIL teachers is highly motivated to implement CLIL in their lessons but that there are still some issues to be solved (e.g. one CLIL teacher having to do all the 72 hours in his/her subject, more time, resources and more possibilities for a useful collaboration between subject and language teachers at the particular schools, teachers want to have a say when it comes to the allocation of the 72 hours at the particular HTLs,...) by the *Ministry of Education* and also by the schools themselves.

According to the feedback forms this bringing together of subject and language teachers was warmly welcomed and highly appreciated and could clarify their different roles, tasks and duties in the CLIL policy at Austrian HTLs. Many of them suggested that further seminars and events should be planned and organised where subject and language teachers can meet and collaborate on behalf of CLIL.

## 4 Observation and feedback

I decided not to spend any time on this aspect of my original agenda and give the time over to colleagues to brainstorm in pairs on their CLIL cooperation.

Had we worked on this issue, I would have talked about the role of the language teacher as 'observer' and provider of 'feedback'. I shall long remember the presentation from an Irish colleague I met at an ETAS conference in Switzerland who had created a job for himself by visiting Swiss schools offering CLIL and visiting CLIL lessons by invitation with a view to recording the whole lesson, transcribing the speech recorded, making suggestions for improvement both on language and methodology observed. There is a clear role for language teachers in giving feedback on lessons from a language and methodology perspective and where possible this should be encouraged and supported.

## 5 Other important questions

Networking I help coordinate the HTL-CLIL Google group (200 Austrian teachers) and the FACTWorld Yahoo group (3500 teachers worldwide). Networking is a clear need for subject teachers like the construction engineer in the group who asked for help in finding technical schools in English-speaking countries so they could exchange ideas on 'heating systems' in English, to take a recent example. It's perhaps even more important within Austria so that such subject teachers are *by default* in contact with similar teachers around the country. These teachers need to be in touch with each other to share ideas and resources. This helps teachers avoid having to take on too much extra work by 'reinventing the wheel' each new lesson.

I promised to invite all the 90 teachers to join the two groups. There was a strong desire in the group to be connected this way and it should be encouraged as much as possible.

## Conclusions

It struck me that there was so much willingness to get sat down together and begin the dialogue that was necessary for this cooperation to begin. I think the main success of the 'COOP E-CLIL' meeting in Salzburg for me personally is that it has brought two groups of teachers together who are crucial for the sustainable future that HTL CLIL needs. The one glaringly obvious conclusion I would make from the successful meeting is that colleagues need opportunities like these, moreover they need these opportunities in school. We did begin discussion about the very mechanics of making cooperation happen in school. The reality in some schools is that STs and LTs are paired up without actually teaching the same groups of students. They are also frequently housed in different parts of the school. Their department rooms are not in the same place. Their paths may never cross. Though we didn't come up with a list of practical suggestions for schools on how to make cooperation more effective, this is precisely what is now needed. Schools need a list of practical organizational suggestions to do with cooperation between language teacher and subject teachers in CLIL. We did start to identify some suggestions:

### Timetabling

- It's not realistic to expect cooperation to occur where teachers aren't working with the same students, ST and LT pairs need at the very least to be teaching the same year group of CLIL students;
- A content lesson by the CLIL ST could be timetabled to be followed / preceded (closely) by an English lesson with the partner LT to facilitate 'preparation' / 'follow-up' work.
- Where possible LTs should be timetabled with a lesson for working with the CLIL STs. This may be in order to co-teach, facilitate lessons, or for preparation.

### **Preparation**

- Teachers need time. STs and LTs need time simply to sit down with their subject and language curriculum documents, materials and the school calendar so that they can identify where they can cooperate on delivering the curriculum through English.

- Pre-term prep

It may be wise to make this time available at or before the beginning of the teaching school year so that the colleagues draw up a CLIL cooperation year plan for their work.

- Prep during term

Where possible, school managers should identify blocks of time earmarked for CLIL cooperation throughout the school year (an afternoon per week, per month, per term) and make STs and LTs free for these blocks.

### **Training**

- SCHILFs in the school calendar should be geared to working on CLIL with pairs of STs and LTs participating

- Pedagogische Tage should be used for working on CLIL with pairs of STs and LTs participating

The points above are all school managerial questions. School department heads, principles need to find ways and means (and possible funds) to make paired cooperation for investigation, preparation, co-teaching work in the timetable. The good will is there among the teaching colleagues. Managers now need to see this opportunity to make it part of the mechanics of running a school, and not rely solely on the good will of colleagues.

### **Bibliography:**

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Science Across the World Topics: Acid Rain, What did you eat? [www.scienceacross.org](http://www.scienceacross.org)

Global Warming, Your CLIL, [www.onestopenglish.com](http://www.onestopenglish.com)

## Appendices

### appendix 1 - What is the language of 'cause-effect'?

- 'cause-effect' adverbs and conjunctions

As		, ___y___ happens
If		, then ___y___ happens
	x happens x is _____	because of ___y___ owing to ___y___ due to ___y___
		because ___y___ happens since ___y___ happens
		and therefore ___y___ happens is therefore ___y___ thereby ___y___ happens x is thus ___y___ thus has ___y___

X will happen, as \_\_\_y\_\_\_ happens.

- 'cause-effect' verb phrases

x	causes	y to be _____-ed y to + infinitive verb a (noun phrase) of y a (noun phrase)
	results in	a (noun phrase) a / the (verb+ing) of y y being / getting _____-ed
	leads to triggers (off) creates generates	(change in) y (noun phrase)

X will cause y to be \_\_\_ -ed.

X will result in a (noun phrase)

- 'cause-effect' noun phrases

A reason for		of	x x happening	is y
A / An	consequence result cause source effect			
A reason why			x / this happens	

The language of cause-effect (Ball, Clegg, Kelly forthcoming)

## appendix 2 – Diet and disease

### Part 6 Information section

#### *Diet and disease*

Certain diseases, such as coronary heart disease, breast cancer and bowel cancer are more common in some countries than in others. It is thought that some of these diseases may be linked to diet. Below is some information about them.

#### *Obesity*

People who weigh 20% more than the ideal are overweight. They have a shorter life expectancy and are more likely to suffer from diseases that include heart disease, diabetes, gallstone, high blood pressure, arthritis and varicose veins.

Some people put on weight easily. The reasons are not understood. They do not necessarily eat more than other people, but they eat more than they need and lay down the excess as fat.

#### *Tooth decay*

Tooth decay (dental caries) has been linked to diets high in sugars. Your mouth contains bacteria that break down sugars to make acids.

Acids attack tooth enamel, making it more porous. Tooth decay begins as the enamel wears away.

#### *Heart disease*

Death rates from coronary heart disease are often higher in countries where people eat diets high in 'saturated' fats such as butter, red meat, milk and cheese (see figure 2). A high fat diet can

raise the level of cholesterol, a fat-like substance in the blood. Your body needs cholesterol, but when it collects on the inside of blood vessels you have a greater risk of heart attacks.

#### *High blood pressure*

High blood pressure is a condition that may lead to ill health. Doctors may advise patients to eat food without added salt, and avoid processed foods and ready meals which tend to be high in salt.

#### *Cancer*

People in different countries tend to suffer from different types of cancer. Scientists think that diet could be a major factor. It is difficult to be sure, because countries collect their statistics in different ways, so that the figures given here may not represent exactly the same thing. New studies should give more reliable statistics by the mid-1990s. Breast cancer is increasing in many countries. Its cause is not known, but in figure 3 cancer rates are compared with how much fat people eat in different countries. Some scientists suspect that many people could avoid getting stomach cancer if they ate fruit and vegetables every day. Cancer of the bowel may also be linked to a diet high in fat. Eating enough dietary fibre may help to reduce the risk of bowel cancer. Alcoholic drinks may be linked to cancers of the mouth and gullet (oesophagus) as well as to cirrhosis of the liver and high blood pressure.