

EUCIM-TE = European Core Curriculum for Mainstreamed Second Language Teacher Education

Final Report

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Module 2 – Methodology for Inclusive Academic Language Teaching

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Module 2 – Methodology for Inclusive Academic Language Teaching

1. Bridge to language model – objectives

Several objectives for the integrated teaching and learning of language and content derive from the proposed language model. Therefore, a teacher of integrated academic language should:

1) Discuss how *language register* varies with context and say how this applies to your own teaching (register covers Field, Tenor, Mode and ideational, interpersonal and textual meaning).

2) Identify *main features of the register* of the teaching subject (e.g. the language of math, the language of science, the language of history).

3) Identify examples of the main *genres of schooling* (Recount, Narrative, Procedure, Report, Account, Explanation, Exposition (see Schleppegrell 2004: 85).

4) Identify the *genres of schooling important in the teaching subject*, and be able to give some examples of their register language features.

5) Identify *ways to teach the genres* important in your teaching subject (see Gibbons 2002).

6) Identify the main *knowledge structures* (semantic structures) (description, classification, time sequence, principles such as cause-effect, decisions, evaluation), and some of their ideational language features, and find examples of them in textbook material from the teaching subject.

7) Relate knowledge structures to *thinking processes* (describing, classifying, arranging in time sequence etc.) and identify thinking processes in student tasks in the teaching subject area.

8) Relate *knowledge structures to graphic representations* and other multi-modal representations (e.g. time sequence to action strips, classification to classification trees etc.).

9) Give examples of how to use graphic representations to *scaffold thinking skills* in the teaching subject area.

10) *Multiliteracies*: Use structured overviews/concept maps and graphic outlines to develop multiliteracies in curriculum reading in your content area (see Unsworth 2001).

11) *Critical discourse analysis*: identify contrasting examples of texts on opposite sides of controversial issues in the subject area (e.g. climate change, two different points of

view on a historical event), and analyse some of the ways that ideologies are constructed through the discourse.

2. General approach to instruction of integral academic language

Integrating academic language teaching into content subjects is a task that requires general planning at a vertical (throughout school years and forms) and horizontal (across school subjects) levels. Our general approach to methods of instruction in integral academic language follows from the language model section, which has described a 'register and genre' model for the description and analysis of academic discourse. In our description of a method for supporting academic discourse, we will typically say how a method relates to the language model, and we will mainly use the concepts of genre and register to do so. This is important because we need to include methods that explicitly develop academic registers and genres. In addition, we need to show how a method develops features of academic discourse and language, and register and genre are excellent tools for this. However, this is not to suggest that we will discuss *only* methods that relate clearly to register and genre. There may well be other methods that contribute valuably to the development of academic discourse in other ways. But it is to say that we will include methods that develop academic registers and genres.

3. How methods of supporting academic discourse development are presented

Suggested methods will be presented in a similar format. First a small description will be provided and the aims for the implementation of the method will be presented. An overview of implementation possibilities will then be outlined. Subsequently an example with discussion follows. Lastly, suggestions and recommendations for further reading will be given.

4. Methods and activities

This chapter looks at the teaching of subjects, disciplines or content area from the point of view of learning academic language and learning through language. Learning is usually viewed from the perspective of cognitive psychology in terms of concepts and of cognitive processes of thinking. This chapter looks at learning from a different perspective and takes a linguistic view of learning, seeing it as a process of making meaning. A great advantage of taking a linguistic view is that we can look for the evidence of cognitive processes in the words and meanings that learners speak and write.

4.1. Genre in learning and teaching

The term 'genre' can be associated with both literary forms, such as novels, plays or poems (which can be further distinguished into, for example, detective or historic novels), as

well as with social or cultural communication forms, such as TV news, conversations among friends or a set of written instructions. Every genre has specific features which distinguish it from the others; they...

- are *goal-oriented* (for example, to provide information);
- have a *specific structure* (for example, news start with the most important events);
- have precise *linguistic features* (for example instructions often use the imperative form 'click', 'drag', 'insert');
- are shared by members of the same *culture or societal context* (for example writing a formal letter is done differently in different contexts).

When focusing on the scholastic context, researchers have identified a number of genres associated with learning at school (see the work of Martin, Rothery, Christie, Derewianka and Hammond). Examples of these are: narratives, reports, explanations, recounts, etc. Gibbons (2002: 54) refers to these genres as 'text types', as she wishes to 'differentiate them from the wider range of genres used outside school' (ibidem). A categorisation of the main school genres in families can be found below:



Figure 3 – Categorisation of genre families (Reading to Learn, Book 3: 3).

Below, an example of the narrative text type is provided in detail.

The Narrative Text Type – An Example

Narratives are a very common genre in a child's life and are expected to be produced, understood and analysed throughout school life. Furthermore, they are one of the most complex school genres. They mostly have the goal of entertaining the reader and they often follow a similar overall structure (below is an example from Gibbons 2002: 55f):

- orientation: setting the scene, introducing the characters, the places and the time;
- complication: events leading to the some kind of central problem;
- resolution: ending of the plot where the problem is solved.

Narratives also have particular linguistic features, among which the more common are: markers of temporal sequencing, past tense verb forms, particular 'action' verbs, dialogues or indirect speech. Below is an example of a narrative from Gibbons (2002: 55f):

Once upon a time there was a boy named Jack who lived with his mother in	Orientation:
a small village. They were very poor and their only possession was a cow,	
which gave them milk, and an old axe, which hung on the wall of their	sets the scene, gives details
house.	on who, when and where.
One day his mother said to Jack, 'We are so poor that we must sell the cow.	
You must take it to the market and sell it to buy food.'	Events:
So Jack took the cow and set off to market. On his way there he met an	
old man who offered to exchange Jack's cow for some beans. Jack said, 'My	relates a number of events
mother will be very angry with me if I don't take back money. We need to	in sequence.
buy food.'	
'Don't worry,' replied the old man. 'These are ordinary beans. They are	
magic beans, and they will bring you good luck!'	
Jack felt sorry for the old man, for he looked even poorer than Jack, and	
so he agreed to exchange the cow for the magic beans.	
'You are a kind boy,' said the old man, 'and you will be rewarded.'	
When he got home and told his mother what he had done, she was very	
angry.	
'You stupid boy,' she shouted. 'You have sold our most valuable posses-	
sion for a handful of beans.' And she threw the beans out if the window.	
The next day, when jack woke up, there, in the garden, where his mother	
had thrown the beans, was a huge beanstalk. It was thick as a tree and so tall	
it seemed to go right up into the sky. Jack stared and stared at the beanstalk,	
and remembered the old man's words. Taking his axe, he began to climb up	
the beanstalk. Up and up he climbed. For many hours he kept climbing	
until, at last, he could see the top of the beanstalk. Right at the top of the	
beanstalk, asleep on the ground, was a huge, ugly giant. And in front of him	
lay a heap of treasure. There were gold and silver coins, and piles of precious	
jewels. Very quietly, so as to not wake the giant, Jack started to fill his coat	
pockets with the giant's treasure.	
Just as Jack had taken all he could carry, the giant opened one eye and saw	Complication:
Jack. 'Who are you?' he roared. He opened the other eye and then he stood	
up. Jack could hardly see his head it was so far away. He turned and ran and	states the problem.
started to climb down the beanstalk as fast he could. The giant strode after	
him, and Jack felt sure he was about to die!	



But as the giant was about to reach down and grab Jack, Jack remembered	Resolution:
the axe. He swung it backwards and then, as hard as he could, he chopped	
into the beanstalk just above his head. Again and again he chopped until, at	relates how the problem is
last, the top of the beanstalk crashed down out of the sky, carrying the giant	solved.
with it. With a loud roar he disappeared and fell to earth. And Jack climbed	
safely down the beanstalk carrying enough jewels to look after his mother	
and himself for the rest of his life.	

Explicit teaching

In order to integrate the teaching of genres into a classroom, it is firstly required to discuss the necessity of explicit teaching. Generally speaking, students need to understand the goals, the structure, the linguistic features and the cultural or social context of their linguistic productions in order to be able to fulfil classroom tasks appropriately. According to Gibbons, students must explicitly be instructed to reflect upon these issues and to learn about the genre they are expected to write or talk about. Thus, 'pupils are encouraged to reflect on how language is used for a range of purposes and with a range of audiences. (...) It aims to foster active involvement in learning, independence in writing, and the ability to critique the ways that language is used in authentic contexts (...)' (Gibbons 2002: 60). How explicit teaching of genres can be integrated into classroom will be explained below.

The Curriculum Cycle

Based on Halliday's language model, Derewianka (1990) and others identified four curriculum stages which help specific text types to be made explicit to students:



This cycle will evidently take some time to complete and the aim is to learn about the topic as well as about the form of writing and the language used. Thus, the cycle, although focusing on writing as a final aim, offers many opportunities for reading, listening and speaking. Moreover, students may also learn how to evaluate and improve similar texts.

Cycles can also be repeated in order to consolidate knowledge or acquire additional information. As students become more familiar with it, teachers may choose to skip stages 2 and 3 or deal with them only generally.

This methodology is also appropriate for younger learners of the language, as one might vary the text type and the form of intended writing. In addition, it allows using scaffolding techniques which adjust to more or less experienced writers.

Type of text	Recount	Narrative	Reports	Procedure	Discussion (one
	What I did at	(story)	Insects	How to make a	side)
	the weekend	The elephant		healthy meal	Argument (two
		and the mouse			sides)
					(e.g., Should
					smoking be
					made illegal?)
Purpose	To tell what	To entertain, to	To give infor-	To tell how to	To persuade
	happened	teach	mation	do something	others, to take
					a position and
					justify it
Organisation	Orientation	Orientation	General state-	Goal	Personal state-

Examples of school text types (Gibbons, 2002: 58):

	(tells who,	(tells who,	ment	Steps in se-	ment of posi-
	where, when)	where, when)	Characteristic	quence	tion
	Series of events	Series of events	(e.g. habitat)		Argument(s)
	Personal com-	Problem	Characteristic		and supporting
	ment/ conclu-	Resolution	(e.g. appear-		evidence
	sion		ance)		Possibly
			Characteristic		counter-
			(e.g. food, etc.)		arguments and
			May have sub-		supporting
			headings		evidence
					Conclusion
Connectives	To do with	To do with	Not usually	first, second,	first, second, in
(Linking	time (<i>first,</i>	time (<i>one day,</i>	used	third, finally,	addition, there-
words)	then, next,	once upon a		etc.	fore, however,
	afterwards, at	time, later,			on the other
	the end of the	afterwards, in			hand
	day)	the end)			
Other language	Past tense tells	Past tense tells	Uses 'to be' and	Uses verbs to	May use per-
features	about what	about what	'to have' (e.g. A	give instruc-	suasive lan-
	happened	happened	fly <i>is</i> an insect.	tions (e.g., <i>take,</i>	guage (e.g., <i>it is</i>
	Describing	Action verbs	It <i>has</i> six legs.	mix, add, chop,	obviously
	words	Describing	Special vocabu-	<i>brake</i> , etc.)	wrong, it is
		words	lary		clearly stupid,
		May have dia-			<i>that</i>)
		logue and verbs			
		of 'saving'			

Schleppegrell (2004) gives more detail in Chapter 4 'Writing school genres', Chapter 3 'Linguistic Features of Academic Registers' and Chapter 5 'Functional Grammar in School Subjects'.

4.2 Reading to learn

Reading to learn is fundamental in both primary and secondary school. The literacy demands in general grow successively over school-years and for students with low levels of literacy achievement these demands are one important reason for not completing school. The support offered at school is often insufficient, and failures are instead attributed to individual deficits.

There are strategies to integrate skills in reading and writing with the normal curriculum, though. Acevedo and Rose (2007) describes a Reading to Learn programme developed in Australia for adolescent learners, '... an intensive approach to scaffolding student literacy using high quality, age appropriate, mainstream curriculum texts'. It is based on three core principles:

1. '... explicit teaching of reading needs to be integrated with teaching the curriculum at all levels, and all teachers need skills to teach reading and writing in their subject areas. 2. All students can and should be taught the same level of skills in reading and writing across the school curriculum so that the gap between more and less successful students narrows, instead of widening over the school years.

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3. Learning takes place when teachers support students to do learning tasks that are beyond their independent assessed abilities, thereby allowing for learning activities to be designed to support all students to succeed at the same high level.' (Acevedo and Rose 2007)

In this programme the students work at three levels: *the text, the sentence* and *the word*, both in reading and writing, and all the components of the reading and writing are worked on systematically from the top down. This principle can be used across the curriculum at all levels. The Reading to Learn lesson cycle consists of six stages:



Figure 4 – Reading to learn lesson cycle (Acevedo and Rose 2007).

These Reading to Learn strategies require high level skills in teaching and text analysis and therefore it is important that teachers get sufficient in-service training. Rose (2009) suggests a programme of eight days of training workshops with classroom practice and evaluation in-between. In developing these skills at least two teachers should participate from each school and also get maximum support from their colleagues, school executive and regional support staff.

4.3 Register in learning and teaching

The notions of field, tenor and mode (Halliday & Hasan 1985) are central to the concept of register and provide valuable insights into the role of language and the development of register in teaching and learning methods and activities. They are discussed below.

4.3.1 Classroom talk and cooperative learning

Both Vygotsky and Halliday view education as dialogue. When second language learners engage more in educational dialogue they have greater opportunities to learn both language and subject matter. In dialogue people take up different roles towards each other

Prepare

Elaborate

(tenor) and enact these roles through speech functions such as question and answer and other forms of interpersonal meaning. Dialogue between teacher and students is different from dialogue between students, and teacher-student dialogue differs according to the role that the teacher adopts e.g. lecturing to students is different from eliciting student talk and scaffolding it. One can become more aware of the quality of an education dialogue by tracing how the participants make interpersonal meanings.

Teachers who aim at dialogue support students to learn by using language in dialogue with others. This typically means creating possibilities for learners to engage in cooperative learning and to construct meaning together. In addition the teacher aims to interact with the learners in ways which support or 'scaffold' their meaning-making.

In most monolingual teaching contexts, classroom interaction still is very much directed by the teacher and follows the classical IRE (Initiation, Response Evaluation) pattern, as exemplified and displayed below (Gibbons 2002: 16; Lövestedt 2010):

Initiation TEACHER: What season comes after fall) Response STUDENT: Winter. Feedback TEACHER: Good girl.



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However, this interactional pattern deprives students of additional interactional situations which are particularly im-

> portant for second language learners. Thus, it is necessary to adjust classroom talk in order to create opportunities for dialogical interaction between the students and with the teacher. These would work in a different scaffolds cycle with three steps: preparation of the students to fulfil a task, followed by the task accomplishment and lastly by an elaboration of the

work done, as portrayed on the left hand side.

Task

Below two concrete methods to improve classroom talk will be described and illustrated with examples: cooperative leaning and scaffolding.

Cooperative learning as a starting point for meaningful classroom talk

WHY: Forms of group work offer second language learners the possibility to access increased input from different sources, to interact and produce output informally between peers rather than being exposed to the whole class and to use language in a contextualised situation. It thus offers opportunities for clarification and for more insecure learners to feel free to use the language.

HOW: Gibbons (2002) suggests several principles to make group work effective:

Provide clear and explicit instructions by using several means of both providing instruction and making sure students have understood it The following example exemplifies the implementation of clear and explicit instructions for group work. It is a part of a magnetism science experiment:

'First, she [the teacher] reads from written instruction:

Place a bar magnet into the cradle made by the paddle pop sticks. Place a second bar magnet on top. Observe and record what happens. Repeat alternating the poles. Observe and record what happens.

Then she explained the instructions, providing scaffolding (...). The right-hand column comments on what the teacher was doing physically and on the language she used:

Teacher's words	Commentary
You have to place a magnet, put a magnet, into the cradle, and place another magnet on top of the cradled magnet	Teacher refers to the written instructions, intro- duces less well-known word place alongside more familiar word put
So you've got one magnet in here	pointing
Then you have to put another magnet on top, right?	Holding the second magnet, indicating where it must be placed but not actually placing it
Then you have to alt-ern-ate the magnets.	Alternate is said slowly and with emphasis
It says 'alternating' the poles' changing the poles.	Models the more formal word (alternate) but uses this along with familiar 'everyday' word (change); also holds the second magnet and indicates how the magnet should be turned
So if you put it facing like this you've got it one way like this,	demonstrating
then you change the poles around	<i>indicating the movement by turning the second</i> <i>magnet in the air but not placing it</i>
change it to the other side, alternate the poles.	switches between more and less formal terms
So you're trying it each way.	summarizing what the children should do.

The teacher then went on to discuss what it means to observe, and the ways in which students could record what occurred' (Gibbons 2002: 21f).

The teacher used several strategies in order to make the required task clear and explicit to all students. In a traditional approach, students would be asked to read the instructions and accomplish the task. The explicit teaching approach introduces an additional step between these two activities: making meaning explicit. The teacher read the instructions and broke them down into small parts in order to explain and demonstrate these individually and step-by-step. Academic language was explained and synonyms were given.

Make talk essential for the performing of the task by defining clear goals and using pictures.

Gibbons suggests the use of so-called information gap tasks that she defines as follows: 'a situation whereby different members within a group, or individuals in a pair, hold different or incomplete information, so that the only way that the task can be completed is for this information to be shared' (2002: 23f). In addition, one may choose to organise the classroom in expert and home groups i.e. students form 'expert' groups which each study a different aspect of a topic and then regroup into 'home' groups where each student shares their knowledge of a different aspect of the topic.

Determine a clear outcome for the group work and make it clear to the students.

The group work activities should be designed to produce something as a result of joint language use. The outcome of the task must be made explicit to the students beforehand.

Establish a task which is cognitively appropriate for the learners.

In a linguistically heterogeneous group it is difficult to make a task match all development levels. Gibbons suggests that the teacher involves beginners in tasks which are less dependent on language proficiency (e.g. experiments), allows reading and discussing in the first language and then gradually raises expectations.

Integrate the task in a broader curriculum topic.

In an SFL approach language is always related to context, so a group work task must be related to a content topic. In this way, the students are using language as a medium to learn the curriculum, and it is possible to plan for both language and content objectives.

Assure that all students are involved in the group work.

Initially, students may not be comfortable and familiar with working in groups. So there may be a need to keep them involved in group work. It may help if each member of the group is given a role to play (e.g. timekeeper, recorder etc.). Furthermore, tasks can be designed to make sure that all group members participate (e.g. home/expert groups require all members to gather and share information).

Give students enough time to complete the task.

It is of course difficult to find the balance between too little and too much time for a task, however, second language learners may take a bit longer than experienced speakers to complete a language-based task. According to Gibbons (2002) it is worth preparing fewer tasks and exploiting them more fully than preparing too much and not leaving enough time. In addition, the time to give instructions should not be underestimated.

Make sure students know how to work in groups

Learn how to work in groups is a gradual process which requires practice. Group work is often based on 'unwritten' rules and not discussed openly, however, Gibbons suggests making such knowledge explicit. Below is an example of a teacher discussing how to work collaboratively in a successful way (Gibbons 2002: 27):

TEACHER: you're going to come up with *one* game.. OK... so you have to do a lot of negotiating, because you're going to have all lots of good ideas.. but if... is it going to be like this... get into the group ... and say, 'I know what we're doing, me me me, I've decided?' is that how we work in groups? STUDENTS: no.

TEACHER: what sorts of things can we remember? Simon?

SIMON: em... share your ideas?

TEACHER: good take turns share your ideas because four people's ideas or three people's idea have to be better than one person's ideas, don't they? We'll get a lot more.. Fabiola?

FABIOLA: like instead of.. em when you start with your group you don't em shout, and don't... 'I know what we should do and this is what we can do..' and if someone want to talk it over say 'no, *this* is what we're going to do.'

TEACHER: OK.. so it's a lot of ... first of all, turn taking, and quiet group-work voices, and maybe sharing your ideas.. certainly. 'oh, an idea I have' or 'one idea I have', or ' a suggestion that I have'.. put it forward as a suggestion or an idea.. people will be much more willing to listen to it than if you say.. 'this is what we're going to do'... so be careful with the sort of group-work language that you use.'

GINA: Miss how about if we like... you have four people in your group and want [sic] to do something and another one want to do something else and they all want to do different things?

TEACHER: they've all got different ideas? Good. Good question.. does anyone have any suggestions for Gina? If you get into your group and everyone says 'well this is my idea', 'this is my idea' 'this is my idea'. and no one wants to... move from their idea?

[Lots of students indicate they have ideas]

TEACHER: what could be some strategies? Duncan.

DUNCAN: wm, you could put them all together... like ... like make them one.

FABIOLA: make up into one game.

TEACHER: OK so maybe try to combine the ideas to make up one game, that could be one thing.. what if they don't go together, though? What if the ideas are very very different? How could you work with it then Anna?

ANNA: em you could em find a piece of paper and write it and scrunch up and put it into a hat.

TEACHER: OK choose it... maybe say 'Alright, we can't decide.. so that's the most fair way to do it..' that could be one way.. that's another suggestion. Yes, Charbel?

CHARBEL: do an arm wrestle [*laughing*]

TEACHER: oh probably not the most appropriate way. Certainly an idea. [*laughing*] yes. We might get ourselves into real trouble though... thank you, I don't think Mr. W. [*the principal*] would be too impressed if he walked in and saw us arm wrestling over what we decide to do. He probably wouldn't think that was appropriate group-work behaviour [*laughing*]. Robert?

ROBERT: miss if you can't think of one you can em... you can you can... play it? And see which one's a good one.

TEACHER: OK good suggestion.. yes Andre?

ANDRE: Oh miss like... you're going to vote for which one is the most fun

TEACHER: that's a good idea. Maybe you could say you can't vote for your own but you can vote for one of the others. Sometimes though it's just ... not being stubborn... you know. Thinking. Really trying to step back and think 'well, it doesn't matter whose idea it is, but what would be the best idea for the task we're trying to complete?'

Scaffolding classroom interaction

WHY: In addition to facilitating students to interact cooperatively with each other to learn language and content, teachers can help learners by supporting or 'scaffolding' them as they express their ideas, so that teacher and student collaboratively construct what the learner wants to say.

HOW: Sometimes the opportunity to support a student with scaffolding happens spontaneously. In other cases, it may be a planned part of teaching. After a group of students has worked together on a group work task, there is the opportunity for what Gibbons calls teacher-guided reporting and 'it refers to those times when a pupil is asked to report to the whole class about what he or she has done or learned' (2002: 34). The teacher's role is to act supportively in providing scaffolding for the learner by clarifying, questioning and providing models in a collaborative way. The example below shows how the teacher supports a learner in reporting to the class after a magnetism experiment (2002: 35f).

	Student	Teacher	Commentary
1		what did you find out?	T. opens with an open question
2	If you put a nail . onto a piece of foil and then pick it . pick it up the magnet will that if you put a . nail . under a piece of foil . and then pick . pick the foil up with the magnet still . still with the nail under it it won't		
3		It what?	<u>It what</u> ? = it does what? T. is looking for a verb
4	It won't/ it won't come out		
5		What won't come out?	<u>What</u> =what does it refer to?
6	It'll go up		
7		Wait just a minute can you explain that a bit more, Loretta?	T. asks L. to clarify
8	Like if you put a nail and then foil it over it and then put the nail on top . of the foil the nail underneath the foil . Miss, I can't say it		
9		No, you're doing fine. I. I can see	<i>T. encourages L. Affirms she understands what L. is trying to say.</i>

13



10	Miss, forget about the magnet/ em the		
	magnet holds it with the foil up the top and		
	the nail's underneath and the foil's on top		
	and put the magnet in it and you lift it up		
	and the nail will em hold it/ stick with		
	the magnet and the foil's in between		
11		Oh . so even with foil in	T. 'recasts' what L has said
		between . the – magnet will	
		still pick up the nail – alright	
		does the magnet pick up the	
		foil?	
12	no		

Loretta makes three attempts to explain what she had seen during the experiment and she becomes gradually less hesitant. The teacher starts with an open question and leaves enough time for Loretta to try and express herself. Then, the teacher provides specific scaffolding on difficult language items (the action and the object being referred to). Furthermore, she encourages the student and only recasts Loretta's report when Loretta has come to an end.

Notice how the teacher is not simply 'focusing on form' and correcting grammar and vocabulary, as might be done if this was only a grammar exercise. The teacher is aiming to help Loretta make meaning and express her report on what she has learned in an effective way, so that ultimately Loretta can explain her findings in a report in the register of science.

4.3.2 From talking to writing by using the mode continuum to make meaning explicit

The concept of register is particularly useful when considering the continuum oscillating between oral and written speech. As mentioned in the language model section, Halliday (1985) uses the term *mode* to address the channel of communication (i.e. spoken or written). Martin (1984) used the concept of the *mode continuum* to refer to the pathway between oral and written productions, as exemplified below in the four examples related to experiments done with magnetism (Gibbons 2002: 40):

- (1) Look, it's making them move. Those didn't stick.
- (2) We found out the pins stuck on the magnet.
- (3) Our experiment showed that magnets attract some metals.
- (4) Magnetic attraction occurs only between ferrous metals.

The first example is difficult to understand without contextual information and is typical of highly contextualised and oral face-to-face language interactions. The presence of reference words ('those') indicates that the speakers are pointing to the referents and thus have no need to explicitly mention them.

The second example is an oral report of the experiment conducted, where a reconstruction of past events has taken place. The 'pin' and the 'magnet' are not pointed at but are made explicit. However, the choice of the verb 'stuck' still indicates some presence of oral elements. The third example is drawn from a written report of the magnetism experiment and displays clear marks of written discourse, such as the verb 'attract', for example, instead of the more informal 'stuck' from the previous example. In addition, all referent words are explicitly specified.

In the last example, taken from a child's encyclopaedia, there is of course no mentioning of an experiment and the use of the nominalisation ('attraction') suggests a typical written academic language style. This sort of transformation of verbs ('to attract') into nouns is a common feature of impersonalised or abstract written language, focused on processes or concepts and not on the acting agents.

So what is the mode continuum and how can it be used in the classroom context?

WHY: Teachers can use the concept of the mode continuum as an underlying organising principle in the planning of the classes. Using the mode continuum as a linguistic framework, teachers can design teaching activities that are sequenced from the most situation-embedded, or most spoken-like (and thus for second language learners the most easily understood), to least situation-dependent, or most written-like (e.g. a written journal). A key focus for the teacher is the need to help students use spoken language in the way example (2) illustrates – that is, spoken language that is not dependent on the immediate situational context in which it occurs. This more written-like spoken language serves as a language bridge between the talk associated with experiential activities and the more formal – and often written – registers of the curriculum. Based on the science topic of magnetism, the teacher in the examples planned teaching and learning activities to reflect points along the mode continuum so as to offer a logical development in terms of language learning. The children moved through the stages of:

- 1. Doing an experiment (small groups).
- 2. Introducing key vocabulary (whole class).
- 3. Teacher guided reporting (whole-class).
- 4. Journal writing (individual).

Teaching registers aims at fostering the active involvement in acquiring autonomous learning forms and the ability to critically consider the ways that language is used in real situations. It is useful for introducing topics and specific skills, as it provides guided instruction in the basic understanding of required skills, which students can subsequently build on through practice, collaboration, repetition, hands on activities and developmental play.

HOW: Using the mode continuum to make meaning explicit implies planning classroom activities to follow a similar cycle and repeat it whenever necessary. The several stages of the cycle are described and exemplified below with greater detail.

The aim is to establish a genuine communicative situation where language is needed and authentic. Separating the class into different work groups increases the language differentiation, as each group may deal with different materials and has therefore to produce different language forms. The choice of the experiment must address a so-called 'information

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gap' in order to allow authentic language use during both group interaction and reporting phases. Students should be asked to attempt at explaining what they see and not just describe.

Below is the example taken from Gibbons (2004: 43ff) of the oral interaction between the group members during the magnetism experiment:

HANNAH:	try the other way
MARCO:	like that
HANNAH.	north pole facing down
JOANNA:	we tried that
DANIELA:	oh!
HANNAH:	it stays up!
MARCO:	magic!
DANIELA:	let's show the others
JOANNA:	mad!
DANIELA:	I'll put north pole facing north pole see what happen
MARCO:	that's what we just did
DANIELA:	yeah like this look

[The dialogue continues for several minutes longer as the students try different positions for the magnet, and then they begin to formulate an explanation]

HANNAH:	can I try that? I know why I know why that's like because the north pole is
	on one side and that north pole's there so they don't stick together
DANIELA:	what like this? yeah
HANNAH:	yeah see because the north pole on this side . but turn it on the other this side
	like that turn it that way yeah
DANIELA:	and it will stick
HANNAH:	and it will stick because . look the north pole's on that side because
DANIELA:	the north pole's on that side yeah

This fragment of group interaction offers evidence to support the idea that smallgroup work addressed at an information gap helps content and language learning. Students can jointly construct meaning while using contextualised oral language and not including more scientific or academic terminology (such as the verbs 'attract' and 'repel', whose concept were expressed here through 'stick' or 'not stick together'). Towards the end, students were producing longer utterances and attempting at producing an explanation for the events observed.

After the group experiment new vocabulary might be introduced by the teacher in order to enrich the oral reporting phase. The vocabulary should be directly related to the experiments conducted before, so that students have a chance to understand the concepts they are about to learn.

In the magnetism example, the teacher introduced the verbs attract and repel at this stage. Below the excerpt for the introduction of the latter (Gibbons 2004: 45):

now I'm going to give you another word for what Joseph was trying to say one more scientific word. some of you were saying it pushes away... or it slips off... so instead of saying the magnet pushes away from I'm going to give you a new word... *repel* [said with emphasis]. it actually means to push away from you [demonstrating with her arm]. *repel*.

Stage 1: Conducting an experiment

In this stage the teacher engages in a conversation with the students to support them in making sense of the activities conducted during stage 1. This phase is the attempt to combine acquired knowledge with appropriate wording, which, according to Wegerif and Mercer helps them to 'understand and gain access to educated discourse' (1996: 53).

The example below is an excerpt of the teacher-reported guiding referent to the magnetism experiment (Gibbons 2004: 46):

	Student	Teacher
1		try to tell them what you learned OK (<i>to Hannah</i>) yes?
2	<pre>when I put/ when you put when you put a magnet on top of a magnet and the north pole poles are (7-second pause, Hannnah is clearly having difficulty expressing what she wants to say)</pre>	
3		yes yes you're doing fine you put one magnet on top of another
4	and and the north poles are together ere m the mag- net repels the magnet er the magnet and the other magnet sort of floats in the air?	
5		I think that was very well told very well told do you have anything to add to that Charlene? (<i>The</i> <i>teacher invites other contributions, and then asks</i> <i>Hannah to explain again.</i>)
6		now listen now Hannah explain once more alright Hannah excuse me everybody <i>(regaining class's attention)</i> listen again to her explanation
7	the two north poles are leaning together and the mag- net on the bottom is repelling the magnet on top so that the magnet on top is sort of floating in the air	
8		So that these two magnets are repelling (<i>said with emphasis</i>) each other and (<i>demonstrating</i>) look at the force of it.

Teacher-guided reporting greatly differs from the typical Initiation-Response-Feedback (IRF) interaction; questions are open-formed and evaluation serves as encouragement. The student acts as an expert and has control of the knowledge he/she wishes to express. Teacher supports and guides the reporting phase and involves other students. In her second attempt Hannah is less hesitant and is thus able to produce longer and more complex sentences, while the teacher recasts her utterances and offers alternative language forms.

Therefore, this stage allows students to jointly construct knowledge and to produce longer chunks of written-like language, differing from those produced during the work group phase and supported by the teacher as well as by colleagues. This implies giving students a certain amount of time to rethink and reformulate.



Stage 2: Introducing key vocabulary

After the group experiment new vocabulary might be introduced by the teacher in order to enrich the oral reporting phase. The vocabulary should be directly related to the experiments conducted before, so that students have a chance to understand the concepts they are about to learn.

In the magnetism example, the teacher introduced the verbs attract and repel at this stage. Below the excerpt for the introduction of the latter (Gibbons 2004: 45):

now I'm going to give you another word for what Joseph was trying to say one more scientific word . some of you were saying it pushes away... or it slips off... so instead of saying the magnet pushes away from I'm going to give you a new word... *repel* [said with emphasis] . it actually means to push away from you [demonstrating with her arm] . *repel*.

Stage 3: Teacher-guided Reporting

The last phase in the operationalisation of the mode continuum consists of an individual written production. In the magnetism experiment, students were asked to write in their journals an answer to the question 'What have you learned?' These texts then served as a basis for more formal reports on magnetism. Their writing in the journals offers evidence for the relevance of the teacher-guided reporting phase, as their wording reflected influence from the oral interaction or the teacher's recasting. Below is the text from Hannah (Gibbons 2004: 49):

I found it very interesting that when you stuck at least 8 paddle pop sticks in a piece of polystyrene, and then put a magnet with the North and South pole in the oval and put another magnet with the north and south pole on top, the magnet on the bottom will repel the magnet on the top and the magnet on the top would look like it is floating in the air.

4.3.3. Field of discourse, ideational meaning and IALT methodology: knowledge framework and knowledge structures.

This section will focus within register on field of discourse and ideational meaning, and some of the implications for IALT methodology.

When SFL describes language use in social context, field of discourse is an aspect that refers to the social activity or topic of the discourse. "The FIELD OF DISCOURSE refers to what is happening, to the nature of the social action that is taking place: what is it that the participants are engaged in, in which language figures as some essential component? (Halliday and Hasan 1985:12). Field of discourse relates to the ideational component of the language system, the component of meaning that represents knowledge of the world. Ideational meaning constructs our knowledge of the world from our experience. It provides language resources to make sense of three main realms of experience: the identification and classification of things in terms of qualities or processes, the representation of events and activity sequences, and human consciousness, including mental and verbal processes. These three main realms correspond to three main types of transitivity: processes (verbs) of being and having, processes of doing and happening, and processes of sensing and saying, and are also reflected in lexical relations, conjunctive relations and in the structure of nominal and verbal groups (see Painter 1999: 74). Our knowledge of the world also includes our knowledge of particular things and events and of general classes of things and events, so it is also helpful to consider language resources for specific and generic reference (see Painter 1999:100). Table 1 relates the three realms of ideational meaning to specific and generic reference.

	Classification	Principles	Evaluation
Generic	classification		
Specific	Identification	Activity sequences	Human consciousness
	Description	Sequence	Choice

Table 1 - Knowledge framework for the social practice of "morning snack".

Here is an analysis of field and ideational meaning in an example of language use with young children. The example is an early education situation in a Benjamin Club in Luxembourg based on the social practice of morning snack time and aimed at developing bilingualism (example by courtesy of Dr. Nico Kneip). There are two educators and 12 children. The first educator, N.E., is speaking in Luxembourgish, which has been translated into English here. The second educator, M.E., repeats what is said in Portuguese which is understood by some of the children, to help them understand.

N.E (L).: Look, dear children ! all the good things, we have this morning. All good fruits!

M.E.(P): (repeats in Portuguese)

N.E. (L): (showing) Here we have pieces of apples, pears, bananas and oranges. But, look, Maria (m.e.) has also bread, butter, jam and cheese. Who wants some fruits: apples or bananas? Who wants bread with jam or cheese?

FIELD of Discourse: the social activity (or social practice) is morning snack time, which is a routine social practice that the students are familiar with; the topic is food. The familiarity of the social practice helps the Portuguese children understand the Luxembourgish which is used, which may be unfamiliar.

Ideational meaning in discourse:

1) the identification and classification of things: e.g. *we have pieces of apples..Maria* has also bread...

2) the representation of events and activity sequences: e.g. Look, dear children

3) human consciousness, including mental and verbal processes e.g. *Who wants some fruits*?

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Even in this very simple example, the three main realms of ideational meaning are used. So the children are being given an entry into talking about these three realms in Luxembourgish.

The distinction between the topic (what is talked about) and the social activity or social practice (what is done and understood) is of great importance in education. The children may say very little at first about the topic, but they know a great deal about the social practice of eating a snack or a meal, since they have been doing this daily for most of their lives. It is part of the skill of the educators to help them use this knowledge to make sense of what is said and to help them make some of this implicit knowledge explicit in words both in the first and the second language.

What kinds of implicit knowledge are the children likely to have that can be made explicit in words? A social practice can be seen as a 'knowledge framework' of ideational meanings, or knowledge structures, many of which are often implicit or communicated non-verbally. Table 2 shows this for the morning snack example. The children can identify the food that is being pointed out and described to them. They can follow the activity sequence steps of being shown the food, being offered the food (when it is their turn) and eating the food. And they can make choices between apples or bananas, or bread with jam or cheese. In addition they have relevant background knowledge of a general or generic kind. They know something about different kinds of food; they know something about principles of eating, like knowing that eating makes you less hungry, and something about their own food preferences and values. This type of analysis can be applied to many social practices and it suggests how a social practice can offer opportunities for the development of language and knowledge, and how the analysis and development of social practices can be an important part of IALT methodology.

	Classification	Principles	Evaluation
Generic	Kinds of food	Eating reduces hunger	Food preferences
Specific	Identify/describe food	Steps in having a snack	Choosing food
	Description	Sequence	Choice

Table 2 - Knowledge framework for the social practice of "morning snack".

Knowledge framework, knowledge structures and reading

The knowledge framework of ideational meanings, and its component knowledge structures, applies to IALT methodology in a range of different ways. In the following section we will describe how knowledge structures apply to reading textbooks.

In many school systems, young elementary students are expected to shift from learning to read to reading to learn from the fourth year of schooling. When studying content areas, such as science, history and social studies, students are required to read and understand their textbooks, which convey factual information organised in complex ways. But many students find this very difficult, particularly learners of English as a second language. U.S. research shows that twenty-six percent of eight graders and twenty-three percent of 12 graders are unable to demonstrate an overall understanding of what they read, and fewer than one-third of eighth and twelfth graders read at levels necessary for school success (Perie, Grigg & Donahue 2005). Teachers need to help these students learn how to extract information from a text.

Knowledge structures are one kind of information students need to extract, and graphic organisers help them do so. 'Aside from the genres that students must comprehend and learn from they must also interpret the abstract patterns of information organisation that underlies all types of prose and especially expository prose. These patterns of information organisation have been referred to as rhetorical patterns, knowledge structures, or discourse structures...They represent the ways that information is conveyed logically and coherently in texts. For expository prose, such structures generally include description, definition, sequence, procedure, cause-effect, classification, comparison-contrast, definition, classification, problem-solving and analysis'. (Grabe 2009: 251). Table 3 relates Grabe's examples of knowledge structures to the knowledge framework mentioned above. It can be seen how these knowledge structures fit within this framework. The framework suggests comparisons and contrasts between these knowledge structures and how they are related to patterns of ideational meaning.

	Classification	Principles	Evaluation
Generic	classification definition	cause-effect	
Specific	comparison-contrast description	sequence, procedure	Problem-solution
	Description	Sequence	Choice

Table 3 - Knowledge framework for knowledge structures in expository prose.

A wide range of research has shown that reading comprehension and the learning of new information are greatly enhanced for both L1 and L2 learners when they are consistently provided with discourse-based graphic organiser instruction, which presents explicit instruction to raise student awareness of the knowledge structures of texts, and how they are realised in language, and combines this with the creation of graphic organisers which visibly display the knowledge structures of texts.(See Grabe 2009: 259).

In discourse based graphic organiser instruction, then, teachers need to create appropriate graphic organisers that reflect the knowledge structures of the text and to provide students with explicit instruction of how the knowledge structures are realised in language.

Tang (2001: 127) presents a case study of an teacher using graphic organisers in a Grade 7 Social Studies class and making English as a Second Language students more aware of the knowledge structures of texts and how they were expressed in language. The class was working with Chapter 1 of Other Places, Other Times (Neering & Grant 1986), a

social studies textbook widely used in Canada. The teacher read the chapter to determine the top-level structure of the text, to analyse how the content was organised by knowledge structures and to design a graphic organiser or structured overview that best summarised the content of the chapter.

Chapter 1 'Early Peoples' is about the prehistory of Early Humans, divided into four main types: Homo habilis, Homo erectus, Neanderthal Man and Cro-Magnon Man. The teacher recognisd that the top level structure of the chapter was the temporal sequence of these four types of humans, and decided that the graphic organiser that best represented the chapter was a time line. She used the time line in two ways:to make the content of the chapter visible to the students, and to draw attention to the language of time sequence in the text e.g. 'homo habilis **lasted** for almost a **million years**', 'fossils **dated** between **1.25 and .75 million years ago**', '**by 250,000 years ago**', '**as early as 130,000 years ago**'. There were also more difficult examples using the metalanguage of time e.g. 'the graph shows the **alternating** cold and warm **periods** of the **Pleistocene era**'. She explicitly introduced the knowledge structure 'sequence' and discussed the language used in time sequence texts.

Chapter 1 has four main sections, each section describes one of the four main types of early people, their way of life, their development of tools, how they adapted to their environment and its resources, environmental change, and physical evolution. The teacher made a description graphic which listed the main categories of the section descriptions and contained the information for Homo Habilis (See Table 4). She showed it to the students on a projector and explained it orally, using the language of description. She then had them look at where this information appeared in the Homo Habilis section in Chapter one and explicitly drew their attention to the knowledge structure of description and the specific language of the knowledge structure.

	When	Where	Tools	Food	Shelter	Clothing	Art
Homo Habilis	1.75 million years ago	Eastern Africa, Southern Asia	Sharp stones, branches. No fire.	Birds' eggs, berries, raw meat	Shelters of branches	None	None

 Table 4 - Description graphic for Homo Habilis.

As she guided the class through the remaining sections of the chapter, she used a similar description graphic for each section to scaffold learners to finally read and summarise descriptions independently. She built up the description graphic for Homo Erectus progressively on the projector while presenting the section. With the Neanderthal section she worked cooperatively with the students, assigning them paragraphs to read and asking the questions When? Where? and What? and eliciting their answers. Then with the Cromagnon section she allowed the students to work in groups to construct the Cro-Magnon graphic and assemble its description.

Throughout all of this, she continued to draw their attention to the specific language features of description. The sections contained many examples of adjectives of physical description and comparatives in relatively complex nominal groups, and verbs of being and having, such as: "[Neanderthals] were, on the average about six centimetres taller than homo erectus. Neanderthal people still had thick eyebrow ridges, though less so than homo erectus. Descriptive statements of habitual action included: "Neanderthal people developed many tools...Animal hides were worn as clothes...Neanderthal people often lived in caves kept warm with fires." There were also more difficult examples using the metalanguage of description: "In appearance, the Neanderthals had characteristics similar to both homo erectus and ourselves.

Finally, to summarise the whole chapter, she asked the students to use the individual description graphics of each of the four human groups to construct one single comparison-contrast table which brought them all together.

However, as Tang (2001: 136 ff.) points out, students need explicit teaching and practice to learn how to use graphics to communicate academic discourse and content knowledge. Mere exposure to graphics is not enough, and students largely fail to take advantage of graphics in classrooms, tending to ignore them and finding it simpler to copy answers to questions from the textbook. Students typically do not know how to use graphics to explain, represent, organise or interpret knowledge. Even when they have gathered relevant data, they have difficulty organising and presenting it. They require systematic and sustained teaching to learn how to represent information graphically. Such teaching can also change their attitude towards graphics.

The teacher engaged students in various tasks where they constructed a graphic from expository discourse. After she had worked cooperatively with the students on the timeline in Chapter One, her students were able to construct a timeline independently when they came to Chapter Five. The teacher also had students construct expository discourse from a graphic, so that the students had to interpret the visual conventions of the graphic, the lines, arrows and spatial arrangements, and translate them into meanings in expository discourse.

One reason why students fail to take advantage of graphics is that schools often fail to emphasise the important connections between graphics, knowledge structures and student inquiry. Student inquiry plays a central role in Other Places, Other Times. According to the Teacher's Guide: "The students are actively involved through inquiry activities in learning ... the content in the text enables students to observe, evaluate, discuss, read, organize, synthesize, solve problems and make decisions." (Draper 1988: viii). Seen in this perspective, the time line and the table or chart do not simply represent meanings which are in the chapter. Rather, they are 'data displays', organised meaning patterns of data from which students can draw conclusions. They are visual tools for constructing knowledge which point toward the development of a common visual language for learning.

The Teacher's Guide makes clear that students should make time lines in order to develop an understanding of events as part of a chronological series (ibid. xxi). The time line of the series of early humans guides learners to think about how early humans evolved physically over time and why these evolutionary changes occurred. Without a time line, students would have great difficulty understanding the enormous stretches of time involved. The Teacher's Guide points out that students should recognise charts and tables as sources of information and should interpret and draw inferences from them (ibid.: xxii). The table of ways of life guides learners to think about how early peoples used their environment to provide the natural resources for food, shelter and clothing, and how and why this use changed. It provides evidence for students to argue that advances in human technology were the central causal factor. Learning to make fire, clothing and better tools and weapons meant that early people could hunt more effectively in a wider range of environments, including colder climates.

Or did they hunt too effectively? An issue which is not emphasised in the chapter but which is central to its topic is what impact early human beings had on their environment. A number of more recent researchers (e.g. Diamond 1992: 358) point to evidence that prehistoric humans probably exterminated species of large game by overhunting, thus depleting their own environment and resource base. This raises value questions of environmental depletion versus conservation and issues of human decision-making in particular situations (e.g. to overhunt or to hunt sustainably). Seen in this light, the history of early man has deep connections with questions of environmental conservation or depletion in the modern world. These wider themes are brought together in Table 5.

	Classification	Principles	Evaluation
Generic	Classification of early people	Improved technology changes ways of life	Values of environmental conservation or depletion.
Specific	Descriptions of ways of life	Ways of life change over time	Overhunt or hunt sustainably?
	Description	Sequence	Choice

Table 5 – Extended Knowledge Framework for 'Early Peoples'.

Knowledge structure graphics across languages

Is there academic graphic literacy across languages and cultures? If so, it could be a major resource for bilingual education. Can teachers support learners to build upon their know-ledge of academic discourse in their *first* language and transfer it to their *second* language? Can graphic representations of knowledge structures help in this process?, Gloria Tang, in a number of her studies, has shown that graphics representing knowledge structures are similar across both Canadian textbooks and materials (in English) and Hong Kong textbooks and materials (in Chinese). For example, the water cycle occurs in textbooks in both places. In addition found that students in Canada and Hong Kong encounter and interact with graphics representing knowledge structures in classroom tasks.

In Tang (1997), she studied early adolescent Hong Kong students in a prevocational school whose English proficiency ranged from zero to very limited. First she surveyed the

prevocational curriculum and materials, finding that graphics representing the knowledge structures of description, sequence, choice, classification, principles, and evaluation were found in HK prevocational curriculum and instruction, in much the same way as they were found in the curriculum and instruction of English-medium schools in Canada.

Then she explored whether they could identify unfamiliar graphics in English taken from Canadian textbooks representing these six major knowledge structures. Could they interpret and construct meaning from these graphics? The graphics included classification trees, webs, pictures and maps (classification and description); cycles and process charts (cause-effect and sequence); evaluation tables and decision diagrams (evaluation and choice). She tested students' ability to identify the knowledge structure that a graphic represented, and found that they could do so with more than 90% accuracy. She then interviewed students to see if they could discern the meaning of the graphics.

A thirteen-year-old girl described in Chinese how she interpreted unfamiliar graphics:

"I have never come across these graphics before. But I have seen similar ones in my own language. I recognise some words and symbols. I know some English. I make some guesses. And I don't make many mistakes."

Given a classification diagram, a thirteen-year old boy commented in Chinese:

It is a diagram for classifying or organizing. When one thing branches out and is divided into many things, it is classification. When many things are arranged to make one whole, it is organization. The diagram can be one or the other.

When shown a diagram of a causal cycle, one student described it in Chinese as follows:

"It is a principles or theory diagram. It shows the causes leading to a result. You can start from any place. In the direction of the arrow, this causes the next event. The second event causes the next one and the next one."

These students were able to use their knowledge of academic graphics in Chinese to interpret academic graphics in English. Thus there is evidence that academic graphic literacy occurs across languages and cultures. There are common knowledge structures and graphics across English and Chinese textbooks. Hong Kong students were aware of these knowledge structures and could interpret knowledge structure graphics presented in an unfamiliar language. Thus it is possible to use this awareness in Chinese-English bilingual education to build on students' familiarity with academic discourse structures in their first language and transfer it to their second language.

Connecting work with field and work with genre

How can working with field of discourse and knowledge structures support working with genre? Australian research on teaching the genres of writing has identified four stages through which a genre can be taught: Building the Field, Modelling the genre, Joint Construction, where teacher and students write a text together, and Independent writing, where students write their own text. In 'Building the Field' the aim is to build up the stu-

dents' background knowledge of a topic so that they have enough information to write about it. Martin & Rose (2008: 43-6) give an example where a teacher scaffolded a student to write a description of his dog by giving him a chart which listed headings such as colour and shape. The student filled in the headings in note form: Colour: reddy brown brown eyes. Shape: skinny. He then wrote a description:

"My dog Tammy has a lovely reddy brown furr, her eyes are brown too. The shape of my dog is skinny..."

Thus work with field, ideational meaning and knowledge structures can help learners assemble and organise the background knowledge necessary for writing and reading genres.