Language Across the Curriculum: A didaktic perspective

Helmut J. Vollmer
University of Osnabrueck, Germany
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Goals and Structure of Presentation

1. I will claim that language is an integral part of subject learning + subject competence
2. I will look at different models and examples
3. I will indicate how subject-specific language skills and competences can be elicited, assessed and supported (scaffolding)
4. I will distinguish between language of subject, language for learning and l. for participation
First Example of Elication Tasks

1. Describe Kisangani’s climate in detail with the help of Fig. 2.

Figure 2: Climate graph of Kisangani
2030:
It’s very hot and wet. I can imagine that the air is very dry and humid.

4006:
The temperatures in this area are quite constant about 26°C. The precipitation is rather different and. At the beginning the precipitation is low and rises up to a high point in April, before it goes down again (???) to a low point in July. It starts to rise again rapidly till August, sinks down a bit and reaches it peak maximum in October. After this it falls down very fast. The Kisangani climate is simultan to a climate in the rainforest, as there the “durchschnittliche” temperature is quite high and a lot of rainfall is given.

5006:
The climate in Kisangani is very humid throughout the whole year. The precipitation line is almost never under 100mm. The climax of the precipitation line lies above 220mm.
The temperature is through constantly 25°C throughout the year.

3013
Kisangani has continuous high temperatures of 25°C through the whole year. There are high precipitation in the month from February to June and from August to November, so there is less precipitation in January, June, July and December. So Kisangani has got a tropical climate (???) with hot and wet month.
Levels of competence

• Need for Descriptors of Competence Levels
• Tool/Operationalisat.: CAN DO-Statements
• Scales covering life-long development
• From Low to Highest degree: 6-point scale
• Definition of Educational Competence

Standards to be reached by a certain point in time/to be assured by the school for all:
Difference: Ideal, Regular, Minimal Standards
Definition of Competence

- Broad understanding of competence (not only cognitive) comprising 7 aspects (Weinert 1999, 2001): Knowledge, Abilities, Skills, Experience, Motivation, Volition, Action

- Competence is a mental disposition enabling learners to master successfully variable demands and requirements within a certain area of learning or domain of action

- Functional definition: Competence shows in task performance: wide variety of tasks, repeated assessment

- Perspective of life-long use, learning and development
Example 2. The ecosystem in the tropical rain forest

Characterise the living conditions in the three layers of the tropical rain forest with the help of Figure 3. Start with the giant trees.
If you stand on the earth of the tropical rain forest, the incidence of light is very low, because the trees catch it. The temperature decreases also, but it is already very hot. The air humidity is very high and number of animals seems to be very high. This wet and hot air can cause a high variety of plants and animals, but if you live there, it is very difficult to live there. (Learner 3008)

The Ecosystem of the tropical rain forest is divided into three parts: giant trees, tree top layer and bush and shrub layer.

The giant trees are about 60 m high. The incidence of light is 100%, the maximum temperature is about 35°C, the air humidity is very low and the number of animals is very low, too. When the leaves of the giant trees fall down and “die” they give up their nutrients to the soil so that the giant trees can prove of this system take the nutrients out of the soil.

In the tree top layer with the other trees, which formed a closed canopy there are trees with a height of 20 to 40 m. This area has a maximum temperature of about 20°C, a higher air humidity than the giant trees and there live a lot of many animals.

In the lowest layer with shrubs and bushes there is the incidence of light lower than 20%, the maximum temperature is around 25°C and lower, the air humidity is very high and there live many animals. (Learner 3018)
Part 2: Modelling Subject-Specific Competence
A Simplified Model of Subject-Specific Competence

Knowledge/ Meaning

Cognition/Proc. Comp.

Language/ Communic. Competence
Subject-Specific Competence

- (1) Knowledge, Meaning, Basic Concepts + Structures
- (2) Procedural Competence/Methods Competence
- (3) Linguistic /Communicative Competence

ADDITIONAL CONSIDERATIONS FOR REMODELING:
- Subject Competence as a whole expresses itself in the processing and solving of problems or tasks (Coetzee 2007):
  - *Volition/readiness* leads to the acceptance/definition of task
  - *Methods competence*/Mental activities govern all processes
MODEL 2: SUBJECT-SPECIFIC COMPETENCE

Volition/Motivation/Curiosity:
Willingness to accept a task + to follow the conventions

Methodological Competence:
Identify demands of the task, activate and select relevant knowledge, combine with meanings constructed

Subject-matter Knowledge:
Knowledge of (standardised) thematic items (concepts) and their semantic relations (patterns)

Communicative Competence:
Knowledge of social semiotic systems: linguistic, visual and mathematical forms of representation, and their conventional uses=rhetorical struct.

Solving of Task:
Communicating the Results
Based on considerations of context of discourse ‘culture’
Components of Subject-Specific Communicative Competence

- *Identifying, comprehending*, and analysing given meaning/information, (re)structuring+integrating it into already existing concepts/knowledgestructures
- *Constructing+expressing* new meaning in a cohesive+coherent way, producing linguistic, visual and mathematical forms of representation=“texts“
- *Exchanging+negotiating* perceptions, meanings, positions, incl. argumentation in *extended speech*
Linguistic Indicators of Subject-Specific Communicative or Text Competence

• Expressing subject-specific concepts in the right terminology (register: single+ multi-word express.)
• Using a rational, formal, explicit academic or (pre-) scientific style of expression (CALP Cummins 1979)
• Logical structuring of sentences/utterances/texts
• Observing the rules of the L1/L2, supporting findings/views, using argumentative structures (speech acts)
• Forming/realizing the right discourse types / genres
Subjectivity vs. Expectations in Text Production

- Goal: to be clear, understood, relevant, functional
- Requires understanding of the functions and uses of certain conventions, rules, formats, frames, structures etc.
- *Danger of teaching assimilation to acad. cultures* (Johns, 1997) vs. becoming initiated into the practices of a discourse community+their language use-BUT *critically so!*
- CONTEXT of task, „discourse culture“+ the language system: NARROWING or GUIDING/EMPOWERMENT?
Redefinition: Subject Competence as Subject-Based *Discourse* Competence

- Without exchange, without *discoursing*, knowledge stays „dead“, the dispositions can reduce or dry out
- *Discourse Competence* = Ability to understand and follow the subject-specific ways of thinking and communicating, their questions posed and answers given; ability to participate actively + critically in the relevant discourses + in developing decisions
- Language learning is no luxury, no addition to subject l., it is *essential* for s-s learning+participation
- Goal:Content+Language Integrated Learning (CLIL)
Language as the base for the construction of Meaning and Thinking

• In our modelling so far *language* was only *one* component, but at the same time and in reality it is *constitutive for all areas of subject-specific competence*

• In other words, there is a dynamic interrelationship between language and the other components of subject-specific discourse competence

• More specifically so:
Meaning, Language and Thinking

Language is a tool for conceptualizing and structuring meaning, for constructing and linking information. Language is the basis of the thinking process/much used in it. Language is main socio-semiotic system for expressing meaning. Meaning, language + cognition materializes in different text types (genres) + rhetorical structures (“mini-genres”): e.g. describing, explaining, concluding, evaluating.

Only verbalisation leads to mental clarity + stimulation: the construction of meaning is only completed in expressing it!!! This dynamic interrelationship becomes integrated into the perception, definition, processing + solving of problems/tasks.
Language Across the Curriculum

• Extending skills and competences from L1/LS
• Defining a reliable basis of comp. on which to build
• Specifically new language requirements
  1. Acquiring/Using Subject-specific terminology
  2. Learning new ways of looking at the world, of thinking and of communicating about it
  3. Observing specific thematic patterns, rhetorical structures+comm.conventions of discourse commun.
• Widening the concept of communication into the whole range of semiotic modes+discourse genres
Subject-Specific Communicative Competences Across Subjects

- Anchored in L1/LS competences, now applied to cognitively more demanding tasks and situations
- Widening/Differentiating/Adding to these
- Learning new discourse varieties: Initiation into a formal, scientific, context-reduced language use
- Empowering students to participate (citizenship)
- Limited no. of rhetorical structures/discourse types
- BUT: infinite no. of new thematic patterns to be learned
Part 3: Some Research Results

My own research project: „Subject-Specific Learning and Language Use“ - Comparison of bilingual + monolingual geography learners (grade 10 in the German Gymnasium) (see www.biforsch.uos.de)

Four types of data elicited
1. Thinking Aloud Protocols (while solving tasks)
2. Collaborative Task Solutions (pairs/joint construction)
3. Written products from indiv. students (rated in 10 ways)
4. Editing of products (one week after the first version)
Provisonal Findings

- The knowledge of the relevant concepts and their logical/semantic relationship is highly deficient: consequently the textual representation of meaning
- The ability to (fully) understand and exploit the potentials of texts/(input) materials is deficient
- The use of subject-specific terminology, of succinct, formal, academic language is underdeveloped (no „feeling“ for the requirements of register + style)
EXAMPLE 3. Destruction of the tropical rain forest
In the last decades the destruction of the tropical rain forest has continuously increased. The following two figures show the extent
of this destruction.
According two Figure 4, the destruction of the tropical rain forest is highest in Asia. Comment critically on this statement by
relating it to the information presented in Table 1.

<table>
<thead>
<tr>
<th>Countries</th>
<th>Forest area in km²: 1990</th>
<th>Forest area in km²: 2000</th>
<th>Annual changes of forest area in km²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angola (Africa)</td>
<td>709 980</td>
<td>697 560</td>
<td>-1 240</td>
</tr>
<tr>
<td>Bolivia (America)</td>
<td>546 790</td>
<td>530 680</td>
<td>-1 610</td>
</tr>
<tr>
<td>Brazil (America)</td>
<td>5 669 980</td>
<td>5 439 050</td>
<td>-23 090</td>
</tr>
<tr>
<td>Indonesia (Asia)</td>
<td>1 181 100</td>
<td>1 049 860</td>
<td>-13 120</td>
</tr>
<tr>
<td>Columbia (America)</td>
<td>515 060</td>
<td>496 010</td>
<td>-1 900</td>
</tr>
<tr>
<td>Malaysia (Asia)</td>
<td>216 610</td>
<td>192 920</td>
<td>-2 370</td>
</tr>
<tr>
<td>Mexico (America)</td>
<td>615 110</td>
<td>552 050</td>
<td>-6 310</td>
</tr>
<tr>
<td>Myanmar (formerly Birma) (Asia)</td>
<td>395 880</td>
<td>344 190</td>
<td>-5 170</td>
</tr>
<tr>
<td>Peru (America)</td>
<td>679 030</td>
<td>652 150</td>
<td>-2 690</td>
</tr>
<tr>
<td>Zambia (Africa)</td>
<td>397 755</td>
<td>312 460</td>
<td>-8 510</td>
</tr>
<tr>
<td>Venezuela (America)</td>
<td>516 810</td>
<td>495 060</td>
<td>-2 180</td>
</tr>
</tbody>
</table>

Table 1: Decline of forest in countries with big forest areas 1990–2000
Student Response to Task 3:

According to that table America has the largest changes per year. That would mean that Figure 4 [is correct] is right in as far as in Asia there was most destruction at the end of the 80s, but in the future America would have most destruction / in America most rainforest would become destroyed.
Example 4: Sustainability

Since the world summit of Rio de Janeiro in 1992 (Agenda 21) the principle of sustainability has been globally accepted. This principle means that in terms of the use of natural resources, ecological, social and economic goals should be treated as equally important. At the same time, the rights and needs of future generations should be respected, so that they are not disadvantaged in any way through the exploitation of the resources.

Against the background of the aims of Agenda 21, how do you evaluate the following suggestion for a solution? Support your answer.

One possible way of protecting the tropical rain forest would be to turn the remaining forests into conservation areas or national parks. This would mean that nature would be left to itself again, untouched by mankind. Only a limited number of people would then be allowed to enter restricted areas in the parks along specials trails and accompanied by a ranger.
Benchmark 1 (2018):
I think it’s a great idea because the nature that is left should be kept and protected for the next generations.

Benchmark 2 (3025):
I think this suggestion for a solution is the best. Therefore only a few enterprises, which are also interested in the forest itself and not only in money would be allowed to enter this national park. Moreover than the forest can regenerate itself. He will grow as he did it no in foreign times and then, I think, that the tropical rain forest will get bigger again and a lot of animals are saved!

Benchmark 3 (5006):
I think the suggestion to solve the problem is a good idea. The forest could grow again and would be safe. The government (needs) makes money with the po people who visit the national parks and the Indians had a place to live.

Benchmark 4 (3017)
The aims of Agenda 21 are to use natural resources ecological and social and economic goals should be treated as equal important. In addition to this, rights and needs of future generations should be respected and not disadvantaged. So I think, that the suggested solution is a good one, because if saves the forest and does not disadvantage following generations. So the aims of Agenda 21 are reached. The only thing is, that they can't use the wood of the rainforests any longer to earn money, so that they have to keep their economy in mind.
Assessment of Subject Competence

(Details: see references of my project homepage)

• One holistic scale: degree of realisation in the required discourse function of task (meaning, methods, communication integrated)
• One holistic scale for assessing methodol. comp.
• Several (mostly dichotomous scales) for assessing the expected meaning constructed (content)
• Seven qualitative, analytical scales for measuring competence in subject-specific communication
Analytical Scales for Assessing Subject-Specific Comm. Competence (examples)

Organisation of content/ordering + structuring text as a whole

Logical organisation of ideas into different structural units

Cohesiveness (effective linking of sentences and parts of it)

Sufficient+correct use of subject-specific register (terms/expressions)

Sufficient use of formal language (style, clear+succinct formulations)

Appropriate use of lexical-grammatical conventions /suff. variation

Correctness/accuracy of grammar, vocabulary, punctuation.
Part 4
Outlook: Supporting Language Learning as Subject Learning

We have to distinguish *three different uses of language*:
1. Language of the subject itself
2. Language for effective (classroom) learning of the subject
3. Language for (democratic) participation
All types of communication are closely linked to one another
Lang.of the Subject: Support Systems

1. Word level (Subject-specific terms, expressions)
2. Semantic/syntactic embedding or contextualisation
3. Structuring: Linking ideas and sentences (cohesion)
4. Reading Comprehension: Exploiting verbal texts
5. Comprehending/Producing info in non-verbal texts
6. Handling combinations of text+non-verbal images
7. Talking „subject“: Occasions for extended speech
8. Writing: Diff. frames, text types/genres, addressees
Language for teaching and learning: A social constructivist approach

• Gap between students‘ existing + „scientific“ ideas
• Students are supported in constructing their own scientific explanation which they can understand
• “talking the science into existence” (Ogdon, 1996).
• “The approach as a whole is supportive of students from disadvantaged backgrounds, including those working in another language, since it uses students’ existing ideas (however acquired) and preferred vocabulary as the starting point” (Jenny Lewis, 2007: examples/methods see slide 32).
• “The use of diagnostic tasks or questions to assess the students’ existing ideas; these can take a variety of forms – oral, visual or paper based; using words or pictures or practical demonstrations - but they all encourage students to express their own ideas, in their own way or words;
• Focussed small group work which encourages students to articulate and justify their ideas; in the process they become more aware of the range of ideas within the classroom and are encouraged to justify their own ideas, question the ideas of others and re-evaluate their own thinking;
• Whole class discussion which might typically draw together the different ideas arising from the small group work and consider them systematically, with the aim of achieving some consensus about the science explanation;
• Activities which set up cognitive conflict; exposing the flaws in the students’ existing ideas, so making them more receptive to the scientific explanation;
• Providing students with opportunities to use or apply the science idea so they can see the advantages;
• Breaking big ideas down into smaller and more accessible ideas and presenting these in ways that help students to build up the bigger picture”. (Jenny Lewis, 2007)
Language for Participation

- Support students as *active doers/learners* through interactive teaching: „talking“ history, geo, science
- Many occasions to build on that knowledge base for personal development („*Bildung*“) + empowerment
- Identifying the subject base in everyday problems
- Engaging into subject-related social issues and processes: Communication towards participation as democratic citizenship
- The language of critical participation has still to be developed largely by us as teachers and teacher trainers, per subject + across all subjects alike.
Basic Insights

• *Language competence* in subject-specific contexts cannot be taken for granted, it does not develop all by itself, it needs *systematic support/guidance*

• The *new meanings/thematic patterns* should be expressed in *as many forms/text types as possible*

• The teacher is a *mediator*, but *not* the only addressee

• *Students have to* „*discourse“* with themselves, the immediate environment, the disc. comm./society*
Provisional Summary

• Learning the *language of a subject* is a major part (if not *the* major part) of subject-specific education. Every subject lesson is also a language lesson.

• Language is a major barrier (if not *the* major barrier) to most pupils in *learning a new subject*, especially for at-risk learners in maths + science.

• There are many practical strategies (*scaffolding*) which can help to overcome these barriers between students’ everyday lang./ideas+more scientific ones.
Institutional obstacles to be overcome

(1) Lack of (precise) understanding what LAC means and requires and why it is enabling participation

(2) Attitudes of teachers as mere „subject“ teachers: Lack of insight into lang. learn. as part of subject l.

(3) Absence of an institutionalized agent for LAC, esp. for cross-curricular planning and coordination

Consequences for T.E.: Every learning is language learning, every teaching is also language teaching, every subject teacher is (also) a language specialist
A Whole School Language Policy

- Relating language education in L1/LS to subject-specific language learning and competencies across all subjects
- Relating content and language integrated learning (CLIL) within different subjects to one another cross-curricularly
- Relating education in L1/LS + LAC to foreign or second language learning (cf. new project of Council of Europe)
- Relating the learning of the first foreign language to that of other foreign languages (cf. *Mehrsprachigkeitsdidaktik*)
- Relating language education in school to heritage or minority languages and education/socialisation in them.
Materials/References (see homepage)

Further Information/Contact

My personal homepage:
http://www.anglistik.uos.de/vollmer

Homepage of my research project:
http://www.biforsch.uos.de

(here you will find the exact bibliogr. information of the references quoted)

Link to the Language Policy Division of the Council of Europe:
http://www.coe.int/lang

See Intergovernmental Conference on „Languages of schooling“
THANK YOU, DANKE, TAK, MERCI

… and sorry for the density of information …