Dipping into the art of writing science -
Is Task-based Language Teaching a key to success?

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1. Research Project

"for many pupils the greatest obstacle in learning science – and also the most important achievement – is to learn its language."

(Wellington & Osborne 2001, p. 3)

Rincke (2010) assumes that students develop a *Scientific Interlanguage*

- ➡cf. Interlanguage Hypothesis in Second Language Acquisition (SLA) (Selinker 1972)
- ➡subject-specific language acquisition and SLA can be compared (Rincke 2010)
- ➡interdisciplinary approach of the research project

Aim of the PhD study

Development & empirical assessment of tasks created in a novel interdisciplinary way: Transfer of Task-based Language Teaching (TBLT), a well-established methodology from foreign language education to biology education

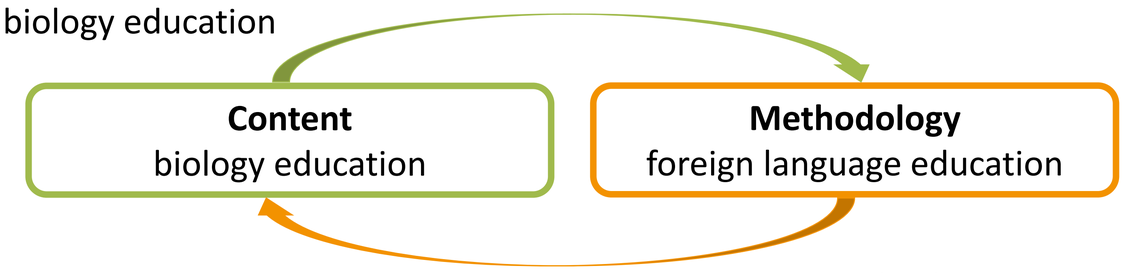

Figure 1: Interdicsiplinary Approach

Overall Research Question: Does TBLT show positive effects on the Scientific Interlanguage of Austrian high school students in biology education?

1 **Needs Analysis** (Serafini et al. 2015) → 2 **Task Design** (Ellis 2003) → 3 **Task Implementation**

Figure 2: Overall Research Design

2. Aims of the Needs Analysis (NA)

Pre-scientific papers (psp) as part of the Austrian final K12 exam:

- students have to demonstrate their scientific language proficiency (BMB, 2016, p. 13)
- empirically tested teaching materials for subject-specific linguistic preparation are rare

Research Questions of the NA

RQ1 What linguistic tasks do students complete when writing their psp?

RQ2 What linguistic challenges do students face when writing their psp?

RQ3 How are students currently prepared for pre-scientific writing?

3. Design of the NA

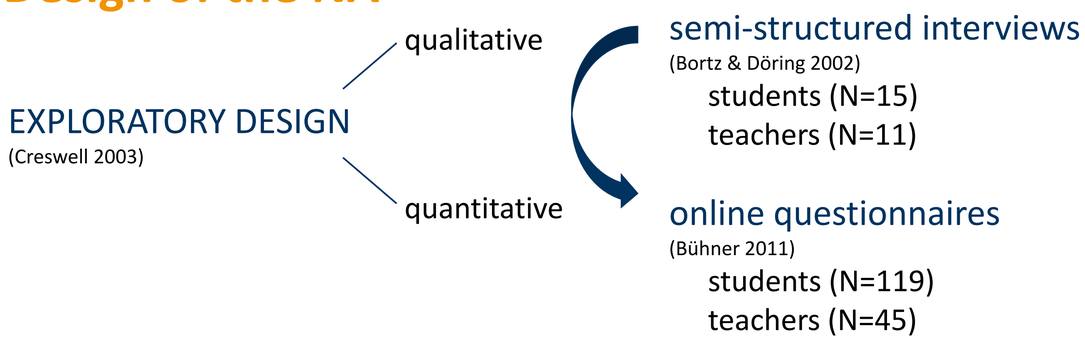

Figure 3: Research Design - NA

Semi-structured interviews: Qualitative content analysis

- Inductive category formation (Mayring 2014)

Online questionnaires on …

- difficulty of linguistic tasks (4pt. Likert-Scale): self-assessment
- frequency of preparation in science (4pt. Likert-Scale)
- personal data

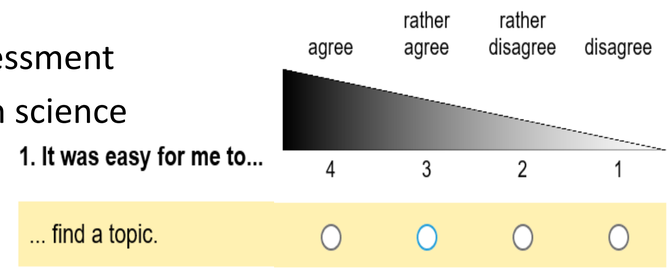

Figure 4: Questionnaire – Difficulty of linguistic tasks

4. Results of the NA

Target Task	Target Task Types	mean difficulty (Students α=,89)	mean difficulty (Teachers α=,87)
find a topic	formulate the title	$\bar{x}$ = 3,31	$\bar{x}$ = 3,09
	formulate research questions	$\bar{x}$ = 3,15	$\bar{x}$ = 2,87
	write a draft	$\bar{x}$ = 2,97	$\bar{x}$ = 3,05
	pre-structure the paper	$\bar{x}$ = 3,09	$\bar{x}$ = 3,00
search for literature	choose (adequate) sources	$\bar{x}$ = 3,15	$\bar{x}$ = 3,02
	choose information from a source	$\bar{x}$ = 3,34	$\bar{x}$ = 2,98
	understand content when reading	$\bar{x}$ = 3,25	$\bar{x}$ = 3,11
	summarize information	$\bar{x}$ = 3,36	$\bar{x}$ = 3,18
	link information from different sources	$\bar{x}$ = 3,39	$\bar{x}$ = 3,07
	link information from literature with own research	$\bar{x}$ = 3,35	$\bar{x}$ = 3,07
do research	describe own research	$\bar{x}$ = 3,30	$\bar{x}$ = 3,13
	plot own research findings	$\bar{x}$ = 3,33	$\bar{x}$ = 3,27
write	paraphrase	$\bar{x}$ = 3,20	$\bar{x}$ = 2,98
	explain scientific content in written form	$\bar{x}$ = 3,26	$\bar{x}$ = 3,09
	use scientific phrasing	$\bar{x}$ = 3,10	$\bar{x}$ = 2,80
	choose the language register	$\bar{x}$ = 3,17	$\bar{x}$ = 3,16
	use scientific terms correctly	$\bar{x}$ = 3,42	$\bar{x}$ = 3,24
	make a distinction between abstract, introduction, etc.	$\bar{x}$ = 2,96	$\bar{x}$ = 3,24
	describe figures	$\bar{x}$ = 3,27	$\bar{x}$ = 3,32
revise	conduct content-related correction loops	$\bar{x}$ = 3,08	$\bar{x}$ = 3,31
	revise the linguistic correctness of the text	$\bar{x}$ = 3,16	$\bar{x}$ = 3,00
	revise the phrasing of the text	$\bar{x}$ = 3,07	$\bar{x}$ = 3,11

Table 1: Examples of Linguistic tasks (interviews) & Linguistic difficultiy (questionnaires)

In contrast to findings in Table 1, according to students …

- 79,6% were not prepared for their psp in science education
- 42,1% did not feel sufficiently prepared for pre-scientific writing

In addition …

- students' self-assessment of their psp was good ($\bar{x}$ =1,73; scale 1-5)
- teachers reported that primarily „good students" write psps in science

5. Outlook

Task Design: Focus on one Target Task Type

➡Analysis of the Target Task Type

➡Design of Pedagogic Tasks with respect to language & content

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