

Goethe's "Elective Affinities" as E-Learning: Developing Exercises for German Classes in the Secondary School Level 2

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Abstract: Even today, humanities and related school classes still hesitate to apply e-learning. One reason is the difficulty to develop standardized exercises for these professions. However, findings of practical didactical research can be used to improve the development of exercises for e-learning systems. Based on related theory, we present a case study, developed for literature lessons in German classes in the secondary school level 2. Using this case study, we show how exercises for this field can be developed.

1 Introduction

Implementing e-learning in school classes is enforced since several years by governmental initiatives. However, esp. the humanities and related school classes still hesitate to apply e-learning. As reason, [DL05] point out that it is not easy to implement visualizations, standardized exercises or formula in professions where knowledge is mediated by reading literature, writing texts and engaging in dialogical and discursive forms of communication. This problem gets worse by the fact that even today most teacher trainees in the humanities do not get a proper education neither for an efficient application of e-learning at school nor for exercise development in general. Two seminars, held by us at Rostock University in summer 2008, were an approach to change this. In one seminar, teacher trainees in the field of German language and literature learned the didactical and pedagogical basics of e-learning. The other seminar dealt with exercise development for German classes.

Students of the e-learning seminar developed a concept for mediating J. W. Goethe's novel "Elective Affinities" ("Die Wahlverwandtschaften") in German classes¹ in the secondary school level 2. This novel was chosen because it is relevant for the university-entrance diploma ("Abitur") in Mecklenburg-Western Pomerania. The development of this system created both technical and pedagogical challenges. The technical side was solved by using interactive fiction as basis. The pedagogical challenge is affected strongly by the linguistic form of the exercises offered by the system. Often, this problem is approached rather intuitively. However, because of partly negative PISA results of German pupils, the performance of pupils is assessed on a regular basis. This creates a need for intense engagement with learning and assessment situations. Thus, a new field of practical didactical research is established in Germany, concerned with the development of scientifically backed exercises for German classes, in learning, test and exam situations.

In this paper, we use concepts of this research field to show how exercises can be developed for e-learning systems targeted at German classes. We will concentrate on the pedagogical and linguistic conception of these exercises. We will only touch on technical implementation.

This paper is structured as follows: In section 2, we will refer to related work. In section 3, we will summarize basic theories of exercise development, esp. in regard of reading exercises. Section 4 presents a case study, taken from the aforementioned e-learning system. Section 5 concludes this paper by presenting an outlook, pointing out open tasks and future possibilities.

2 Related Work

Exercise development is of course related to metadata standards, question standards or (technical) communication standards [AGH09]. All these problems relate to software and technology. As this paper is written from a humanist's perspective, it is not our intention to discuss these questions here. We do not discuss the representation of exercises in e-assessment systems, but reflect on linguistic forms of exercises visible for the learner. Refer to [Cu08] and [CCB05] for an overview on technology.

¹ The English term "German class" is ambiguous. It can be used for the general school subject "German", but also for German language courses. In this paper, we always refer to the school subject. This implies certain structural conditions, such as a fixed timing for lessons (45 or 90 minutes), fixed requirements in curricula or even social diversity of pupils.

PISA tests confront teachers and pupils with different and new exercise types and functions. Interdisciplinary researchers try to find ways to determine the difficulty level of exercises [Kö08], to differentiate “good” from “bad” exercises, to choose the best exercise type for certain situations [Kö07, Schä06, Fr03, Wi03, JS08] and to differentiate learning exercises from exercises used in tests and exams [Kö03, Kö08, JS08]. Until now, the development of exercises in e-learning is approached from a psychological point of view [NBL04; SBL04]. Psychological findings are in turn relevant for the aforementioned research, but to be enhanced by linguistics and communication sciences, as carried out in projects e.g. at Rostock University (VERA6). This paper is a step to draw this connection.

3 Theoretical Basics

3.1 Exercise Types

We have to distinguish between three different types of exercises, targeted for different situations of application:

- a) **Test exercises.** Test exercises have to be reliable, objective and valid. Single exercises must not be dependent on each other: A learner has to be able to solve the 2nd exercise, even if he failed in the 1st one.
- b) **Exam exercises.** Exam exercises are used at a defined point in time to evaluate competencies which should have been obtained over a longer period.
- c) **Learning exercises.** Learning exercises are developed for learning situations and claim to support learners in obtaining competencies. While mistakes should be avoided during tests and exams, mistakes while solving learning exercises should be evaluated in a productive way. Thus, learning exercises create pre-requisites for solving test and exam exercises [Kö08].

3.2 Exercise Designs

Exercises have to respect the situation, the medium and the learning goal. This leads to basically three exercise designs (table 1; [JS08]).

	Examples	This design supports ...
Closed	<ul style="list-style-type: none"> multiple choice right/wrong matching 	Test Situations <ul style="list-style-type: none"> search for information inside or outside the text (ref. to text specific knowledge vs. general knowledge) orientation on reading competencies to lower the writing barrier motivation of learners: most learners <i>like</i> to solve closed exercises evaluation of reading achievements both by the teacher and the learner
Half-open	<ul style="list-style-type: none"> cloze texts tasks that require short phrases as answer 	Exams and Test Situations <ul style="list-style-type: none"> applied mixture of reading and writing competencies learner's autonomous interpretation of read texts evaluation of reading achievements by the teacher analysis of central topics and coherence in parts larger than one sentence
Open	<ul style="list-style-type: none"> standardized operators [SN07], such as <i>interpret, analyze, discuss</i> etc. 	Learning Situations <ul style="list-style-type: none"> open, but topic-related association in regard of text open interpretation of the read text discussion & development of new topics in a group development & application of individual reading strategies embodiment of the text (creative writing, drama etc.) learner's motivation to be allowed to be creative

Table 1: Overview on Exercise Designs

4 Exercises for E-Learning in German Classes

4.1 J. W. Goethe's "Elective Affinities" as Virtual Environment

Students of Rostock University created the concept for an e-learning system that provides an additional perspective on J. W. Goethe's novel "Elective Affinities". The system allows exploring different internal and external topics, such as marriage and society, arts and education, the development of a civil society in the 18th/19th century etc. It can be used along with classical teaching material, but is not intended as replacement.

Technically, the system is a variant of interactive fiction (IF). IF and MUDs are in use for educational purposes since the 1980's [Br97; KHK06].

Despite today's availability of multimedia environments, such systems are still valuable. This is esp. true for classes in which reading and writing texts are in the center of interest. Thus, we intentionally decided for IF, although we have to admit that this also facilitates the development of the system (which happens on a voluntary basis).

IF systems offer a virtual environment which is described using short texts. The user interacts with that environment by textual commands and, partly, menu selections. If possible, the textual descriptions of our system are taken from the novel: „*Das Dorf ist ziemlich regelmäßig im Halbzirkel gegenüber gebaut: dazwischen fließt der Bach, gegen dessen Anschwellen sich der eine mit Steinen, der andre mit Pfählen, wieder einer mit Balken, und der Nachbar sodann mit Planken verwahren will*“.² Pupils can interact with the environment, while at the same time not being forced to engage with visual representations created by other persons. The pupil's imaginative abilities are not as disturbed as in graphical environments. Instead, the textual representations support the further development of these abilities. During the stay in the virtual environment, a virtual guide supports the pupils. This guide offers exercises which are, on a surface level, related to the environment itself, but have a deeper relation to problems related to Goethe's novel.

The system is developed using an unofficial German beta version of Inform 7, allowing to create environment, characters and interaction using nearly natural language. This facilitates development even for non-programmers. More important than the technical implementation is the underlying concept. Exercises offered by a system have to be developed according didactical research, as the next section points out.

4.2 Example Exercise

The development of exercises depends on the learning goal. The whole e-learning system implements several exercises, related to various topics and in various difficulties. In this example we show the learning goal of just one exercise. The pupil has to discover the attitudes of the protagonists of the novel in regard of the topics marriage & society.

Exercise Type and Exercise Design

The chosen learning goal belongs to text external perspectives offered by our system and defines the exercise type which becomes manifests in the linguistic form of the exercise design.

² “The village, you see, is built in a semicircle, regularly enough, just opposite to it. The brook runs between. It is liable to floods ; and do observe the way the people set about protecting themselves from them; one with stones, another with stakes ; the next puts up a boarding, and a fourth tries beams and planks” The translation is cited from the copy found at University of St. Michael's College, p. 74. Via <http://www.archive.org/details/electiveaffiniti00goetuoft> [translation is not in copyright anymore].

The text of our exercise is: „Überprüfe, wer diesen Brief verfasst hat und an wen er adressiert ist. Dazu kannst du die anwesenden Personen befragen und überprüfen, welche Gegenstände in diesem Raum dir Informationen liefern könnten.“³

The letter which is referenced in the exercise is a virtual object which can be picked up by the pupil. After picking it up, the virtual guide offers the exercise. The text of the letter is: „Ich wünschte, ich könnte offen zu meinen Gefühlen stehen. Ich liebe dich aus tiefster Seele. Es macht mich glücklich, dass du meine Gefühle erwidert, doch bin ich gleichzeitig der unglücklichste Mensch auf dieser Erde, denn das einzige, was zählt, ist, dass du verheiratet bist. Ich möchte nicht der Grund sein, aus dem deine Ehe scheitert! Ich könnte mit diesen Schuldgefühlen nicht leben. Daher werden wir nie zusammen sein können!“⁴

By asking the pupil to check who has written the letter and who is the letter's receiver, the exercise requests the pupil to recognize and interpret the letter's textual thematic coherence. Thus, it is an open learning exercise, using the operators „überprüfen“ (check) and „(jmd.) befragen“ (survey someone). Both operators define a certain solving algorithm: **(1)** read the original text which is referenced by the virtual environment (thus: Goethe's novel); **(2)** create a mental list of protagonists of the original text, to be able to identify related persons in the virtual environment; **(3)** relate properties to the protagonists; **(4)** differentiate persons and properties; **(5)** exclude all persons from the list who did not write or should not receive the letter, using arguments of the novel, the letter and the virtual environment. The steps 1 and 2 can become optional if the pupil already had sufficient mental representations of the novel's protagonists.

Our exercise addresses reading comprehension as well as the situational environment. Reading comprehension is guided by top-down and bottom-up processes [CG01] and requires a mental construction on a local, global and situational level [Schn96; RS99]. These levels can be transformed to the following reading requirements defined by [DLA08]:

³ „Check who has written this letter and who the letter's addressee is. You can interview the persons and check the items in this room for information.“

⁴ Note that this letter is not taken from the novel, but created for the exercise. English translation: „I wish I could be overt about my feelings. I love you from the deepest of my soul. It makes me happy that you feel the same, but at the same time I am the unhappiest person on this Earth, because the only thing that counts is your marriage. I do not want to be the reason for your marriage to fail! I could not live with this feeling of guilt. Thus, we can never be together!“

Reading A:	textual close 1: recognizing essential elements of a text; target-oriented extraction of information
Reading B	textual close 2: recognizing and interpreting thematic coherence
Reading C	textual distant: developing individual interpretations of the text, drawing reasonable conclusions

According to the described goal, type, design and solving algorithm, our example exercise belongs to requirement Reading B.

Using the Exercise in Class

So far, a similar exercise could also be included in a printed school book. What makes it special – and what creates special demands on the exercise developer – is the virtual setting. The exercise is embedded in a rich ensemble of stimuli which are mentally represented and thus working as a context [DDT09] for interpreting and solving the exercise.

Media psychology points out that the cognitive load [Co98] of e-learning systems can be higher than in classical learning scenarios. The pupils as well as the teachers have to be aware of the multiple relations of an exercise offered in the e-learning system, and they have to be able to operate the system efficiently. This may be difficult for the pupils because of two reasons: **(1)** interaction is carried out by typing German sentences instead of using a simple GUI; **(2)** The amount of topics offered by the system in a textual form can overstrain the pupils.

Accordingly, the system should be used with guidance of the teacher. The teacher should be able to choose certain topics out of the topics covered by the system, inviting the pupils to explore the virtual environment, but without being overstrained by too much content. It is the teacher's decision how to embed the e-learning system into a teaching concept.

One way could be as follows: **(1)** Lead the pupil's attention to the topic "marriage and society"; **(2)** Send pupils to the virtual environment, in order to find the letter and solve the related exercise; **(3)** Discuss the attitudes uttered by the virtual characters in class. Here, the exercise offered in the virtual environment works as initiation and prerequisite for a new exercise, carried out face-to-face in class.

4.3 Summary of Development Process

The shown aspects of exercise development can be broken down to a structured algorithm (fig. 1):

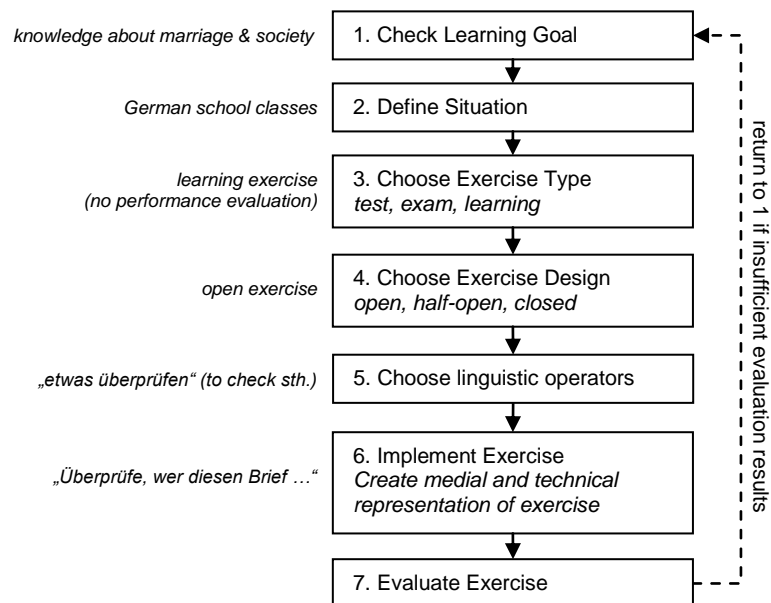


Figure 1: Structured Model of Exercise Development (with example)

Every exercise can be developed according this algorithm. Developing exercises for e-learning systems in such a reflected way supports a deeper understanding of learning goals, their transformation into an actual exercise and their application in a learning situation.

5 Conclusions and Outlook

We presented an approach for developing exercises for an e-learning-system. Currently, there exist just a few publications about the development of exercises for German classes and none of them draws a connection to e-learning. The conceptual development of exercises includes the handling of operators, the knowledge and handling of different types of exercises and the knowledge about situations where exercises can be used.

Developing exercises is an intense process and part of an overall goal to enhance current practical teaching. Research on exercise development wants to create awareness about the related challenges: Teachers should be able to reflect and solve these challenges, both in classical and in electronic learning scenarios. This also affects the education of teacher trainees.

The next step will be the evaluation of effects of different exercise types used in e-learning systems by isolating factors that support and constrain learning processes. A pilot phase will be initiated in which the system and its exercises will be tested and evaluated in an actual school context.

Another important step is the extension to additional competence areas of German classes (Hearing, Writing, Language and Language Use) as well as more professions. This also includes natural sciences. Which requirements, for example, are needed for an exercise in physics classes in order to make the pupil use a computer simulation of a physical phenomenon properly and with a high learning outcome?

Research in exercise development can help to answer this and similar questions, stimulating teachers to enhance their intuition by scientific methods.

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