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**NEURODIDACTICS: THE SELECTION OF TEACHING  
MATERIALS FOR GERMAN AS A FOREIGN LANGUAGE**

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*Abstract*

The article sets out to investigate to what extent do teachers apply, and initiate practices discovered at teacher seminars and how these can be linked to the field of neuroscience and didactics. Moreover, I will make use of the term “Neurodidaktik” (En. neurodidactics), as it refers to how learning processes and learning difficulties (in this case learning German as a foreign language) can be interpreted and understood through current findings in neuroscience. Starting from a practical framework (the classroom), the article attempts to fill in a gap on a topic seldom talked about: didactic materials presented at workshops for teachers and their usefulness. Moreover, what motivates their usage? The first part of the paper examines the need for neurodidactics and its definitions. The second part explores some principles of neurodidactics that can be applied in classroom and examples of relevant classroom activities. The third part brings the findings of a questionnaire applied to teachers of German foreign language who participated in teacher seminars organized by the Goethe-Institute Bucharest and its partner institutions. Focusing on the use of certain materials (presented in seminars and their usefulness in percentages), the questionnaire examines which principles of neurodidactics are applied in class and some corresponding activities offered as examples in teacher seminars and trainings. The working hypothesis starts from the idea that teachers are motivated to use brain-stimulating exercises in order to create and impact the classroom atmosphere and less for their learning content.

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**Keywords:** Neurodidactics, German as a foreign language, teacher training, didactic material.



## 1. Introduction

A link between learning and the brain is inextricable. It took humanity quite a few years to explore the brain from a different perspective than from a mere material and structural one. In other words, the exploration of the outside of the brain, with all its physical traits, has been replaced by an explosion of findings in the field of neuroscience. In her book *Neurodidaktik. Grundlagen für Sprachlehrende* Marion Grein summarizes for teachers of foreign languages essential findings in neuroscience and why we should explore such a topic. At the centre is the learner and his or her need for information, approval or dismissal of learning content. The brain stores and docks new information, while neurotransmitters either inhibit, or fuel our desire and capacity to stay in a learning mode. Moreover, the book is a survival guide for teachers (and even parents) teaching teenagers. Puberty and the massive loss (and new formation) of neuronal connections takes a tremendous toll on a teenage body and learning disposition. Her endeavour also covers a soon-to-be reality for foreign language teachers: aging language learners. In short, understanding the brain in a learning (a foreign language) context, can help both teachers and students. The first part of my article deals with the term of neurodidactics, its gains and limitations, in order to introduce some classroom tasks and activities linked to the principles of neurodidactics and how they can be applied in teaching sequences. Often presented in teacher trainings, interactive and activating tasks and exercises are delivered to teachers. The transition from the training room to one's classroom is seldom discussed. What are the selection criteria teachers apply for the further usage of materials, methods and tasks observed in seminars? What justifies the choice? Content (focus on grammar, vocabulary, reading and writing) or how such activities can influence the learning disposition, interaction or learner output? A less explored topic in current didactical approaches gaps out the teacher as a trainee in teacher seminars. Hence, another important research hypothesis should focus on what motivates teachers to attend such seminars, what percentage of tips, tricks and materials are useful to them and what kind of material do they prefer (content focused or learning context focused).

### 1.1. Neurodidactics For a definition

I define neurodidactics as a possible didactical method that makes usage of certain classroom activities, in order to stimulate neuronal connections and prepare the brain for learning. Neurodidactics finds its roots in neuroscience and the study of the brain in specific contexts: stress situations, image recognition, social interaction etc. Neurodidactics is based on the study of the brain in different life stages, in order to explain how and why learning changes throughout one's life. This didactical method implies tasks, activities and exercises in class, but also finds its way in the conception of textbooks for all learners' groups (the publishing house Hueber in Germany).

My proposed definition cannot be exhaustive, as it is not the case. Usually, with any teaching method there is no absolute functional and perfect one. Neurodidactics implies a mix of methods, resorting to student-centred approaches, while sufficiently documenting and including the brain in organizing classroom activities. The learner stops being a neutral container of information and shifts towards the centre of learning context. Neurodidactics implies the creation of this context, turning the classroom into a learning landscape, in which individuality finds the right place

## **1.2. Neurodidactics and its Gains for Foreign Language Teaching**

The first reaction a teacher of German gets from learners/beginners is that German is just too difficult. It sounds unfair to most of us, but it has a real substratum. Language is a complex system and how we acquire, for e.g. our first language, still puzzles scientists. It has also become clear that the learner nowadays has subtly changed: from digital natives to fast-on-track millennials, learning (a foreign language) has become a life skill. Going back to the early stages of a human life (childhood), one can easily discover how effortless children learn to speak their language. It is also clear that the stages of developing speaking a language are identical in all languages on our planet (Frederici, 2011). In the case of learning a new language, stages run similarly, children turn out to be linguistic geniuses, navigating through languages and switching effortless. But after a certain age (4-7) there will be a dominant language, the scaffold for learning systematically other languages.

Teaching adults and young adults a foreign language is based, in modern approaches for teaching languages, on the Common European Framework for Languages. This level standardization has been useful, but unfortunately the CEFL is twenty years old. There have been several attempts to adjust certain level descriptions, but efforts are made in dealing with the four to five competences: reading, writing, listening/listening-seeing and speaking. Each competence has also other categories/contexts: speaking – spoken interaction and monolog, listening – listening and seeing. The existence of the levels and competences has also helped modern approaches to teaching foreign languages reconsider how we actually teach and train these skills. One relevant conclusion would be that these competences do not emerge in isolated modes and that, at some point during the learning stages, differences between the productive and receptive part can grow. The key question in the discussion at hand resides in how a learning context can be created, in order for all four to five competences to be trained. This is somehow different to classical teaching methods that have also influenced foreign language teaching: behaviourism, constructivism and the grammar-translation method. Firstly, having a framework with levels, each student is picked up at his or her level and can progress. Secondly, creating a context means that there will be a lot of authentic linguistic input and thirdly, the teacher becomes a guide to efficient learning, convincing his/her pupils to take the language and learning strategies outside the classroom.

## **1.3. Neurodidactics in class: activities, tasks, examples**

Before giving some examples of classroom tasks and activities designed to prepare the brain for learning, I will provide a small detour and reveal the current teacher training programmes of the Goethe-Institute München in collaboration with several German universities. The Goethe-Institute is the main provider for German courses and teacher training programmes worldwide. It has also reformed the teacher training materials in the past six years, adjusting the principles of teaching from competence-focused to the multi-layered perspective on teaching. The series *Deutsch Lehren Lernen* (Learning to Teach German) focuses more on intersections between creating the proper learning context to what sets German from other languages apart. Moreover, the series explores, for e.g. the importance of social forms, project-based learning and new media. Competences are all integrated in the provided examples for activities and work-sheets. After the implementation of the new programme, the Goethe-Institute

Bucharest has created a national network of teacher trainers in Romania and my research is based on the findings from teacher seminars I provided and their connection to neurodidactics.

In her book *Neurodidaktik. GrundlagenfürSprachlehrende* Marion Grein sums up the role neurotransmitters take up during learning phases. These chemical messengers are essential in enabling neurotransmission and have great influence on our daily activities, hence also on learning. Synapses release these chemicals and target certain cells in the brain. What is truly interesting is the way a too high or too low amount of neurotransmitters released, can have negative and positive consequences for both learning and brain. Grein focuses on the main chemicals released by our brain and explains how a perfect cocktail of neurotransmitters can support the learning process:

Neurotransmitters are divided into inhibiting or stimulating, but many neurotransmitters, through their concentration, can show both features [...] The biochemical interplay can deeply influence fear and stress, but also prompt a happy and stress resistant disposition. Memory, concentration and creativity depend on neurotransmitters. (Grein, 2013, p. 23).

The author explains how memory, concentration and creativity depend on the release of neurotransmitters, as she points out that each learner learns differently, hence needs an individual neurotransmitter-cocktail to be in balance. Grein discusses Acetylcholine and its positive effect on concentration (in the right amount), Noradrenalin (a stimulant and how, if in the right amount, it can increase motivation), Dopamine (a stimulant that influences concentration, curiosity and motivation), GABA (*gamma*-Aminobutyric acid) and its inhibiting effect, Serotonin (mostly inhibiting fear and supporting the storage of information into our long-term memory) and Glutamate (a stimulant helping our senses and our motoric system). She also elaborates the role of the cortex and of the entire limbic system during learning. This important area of the brain either will dismiss new information as irrelevant, or it will permit its transition and enable its storage. This is the key moment for the learning process and the creation of a proper learning context. For me activities that activate and prepare the brain for learning, activities of cooperative learning and sequences enabling movement in classroom, but also sequences of positive feedback, make up a proper learning context.

To further elaborate on what creating a learning context means, I will start with detailing the central relationships that are active in a classroom: teacher – learning possibilities (social forms, learning materials, media, tasks etc.) – learner. Scharf and Legutke (2012, p. 65) explore in *Lehrkompetenz und Unterrichtsgestaltung* (Teaching Competence and Instruction Design) four sides of this apparent triangle and elaborate on relationship A between teacher and learners, relationship B between teacher and learning possibilities, relationship C between learners and learning possibilities and relationship D emerging between the learners themselves. For me the learning context develops on this structure and is supported by several active steps in teaching German as a foreign language. Firstly, a proper placement test (if the class is not for beginners) is necessary. Then a needs analysis that should identify the main reasons for learning German. Secondly, the teacher should also discover the language biography of each student and know exactly which languages are spoken in class, because it will allow students to compare certain linguistic phenomena found in German to other languages they speak. Next to investigating what types of learners sit in one's class, learning goals and rules should be transparent and constantly communicated (Bizuleanu, 2016). If the learning context is built on the principle of transparency, then students should

also know how mistakes during written or oral production will be treated by the teacher. Positive feedback, even if mistakes are present during, for example speaking, should always be given to pupils. It allows the student to actively communicate and not fear mistakes. It is better to integrate small sequences during class, when errors are collected by the teacher or even other pupils and discussed at the end of the class/sequence. Moreover, next to a mix of methods, teachers should also use different media and diverse social forms (pair and group work).

The list below provides two examples of classroom activities linked to how I understand neurodidactics can improve the learning context. I will give the example in German and provide a short description in English.

- Preparing the brain for learning: Klassenspaziergang (classroom walk, fig. 1) for levels A1-C2. The teacher provides a set of questions (8-12), on paper strips. The latter are hanged, at a certain distance from each other, on the classroom walls. Students walk with a partner to each question and discuss it. The questions can be related to the class topic or not. Positive effects: students acknowledge that they are in the German class, make use of the language and interact.
- Activities of cooperative learning: KooperativesLesen/ Hören (cooperative reading and listening) for levels A1-C2. Texts or audios can be long, boring and sometimes difficult. Divide the class into groups of 4 or pair the students. Each student receives a different part of the text or has to focus on listening to a certain part of the track, with different tasks (either to select certain information or to answer questions). At the end of the sequence the groups and pairs work together and inform each other. Positive effects: students make use of the language and interact. During cooperation with another peer making mistakes becomes irrelevant.

Was hast du als Kind sehr schnell gelernt? Warum?
Was verstehst du unter Freizeitstress?
Würdest du deinen Urlaub in einem Luxushotel verbringen oder eher auf dem Land irgendwo?
Hast du Online-Kurse gemacht? Welche? Wie war das?
Was würdest du noch gerne lernen? Eine neue Sprache? Web-Design? ...

**Figure 01.** Klassenspaziergang, classroom walk, examples of questions, levels B1-B2

## 2. Problem Statement

Research has not yet focused on what motivates the selection of teaching materials provided in seminars for teachers. Moreover, if there is no follow-up after the seminar, the percentage of materials delivered in the training sessions that are actually applied in class remains unknown. Through a questionnaire I attempted to discover what drives and determines the usage of activities, exercises and tasks explored in the teacher training sessions. The main reason for such an endeavour aims at improving

the quality of the seminar, but also to explore the link between neurodidactics and the delivered materials during the training sessions. The questionnaire was applied over a period of three months, March to June 2018 and sent to thirty teachers of German as a foreign language.

### **2.1. Bridging the gap between theory and practice**

As I described in section 1.3 the new teacher training programme DLL (Deutsch Lehren Lernen) is based on the intersections between the process of teaching and learning. That is why, as an attempt to bridge the gap between theory and practice, at the end of each unit the readers and participants in the programme have the chance to run a Praxiserkundungsprojekt (PEP) – a practical didactical project specific for each unit and apply it in class. Starting with a research question that can be observed and registered, teachers document (in a specific format) their endeavour. Such a project aims at diagnosing a “before” and “after” situation, but also enables an objective outlook on the classroom reality, by offering a glimpse into both the learning and teaching process. My research focuses on what determines teacher of German as a foreign language to choose certain materials provided in seminars over others. The primary axes of the applied questionnaire revolve around gathering background information (teaching experience spoken languages, training timeline), reasons for participating in teacher training seminars, likes and dislikes regarding the last attended seminar, the percentage of useful materials, and types of activities already used in class. The section regarding types of activities teachers have already put into practice had also a column, in which the responded could suggest their own activities and motivate their usefulness.

## **3. Research Questions**

The main research question aims at exploring the reasons teachers select certain materials provided in trainings. Do they choose materials based on their content (for e.g. grammar focused) or they prefer materials that stimulate interaction and help create a positive learning atmosphere? Does the actual experimentation with the teaching materials during the training session influence their decision? Before describing the purpose of the study, there are two relevant aspects I would like to discuss: content-based materials and the usage of adapted ones (for stimulating interaction in classroom). Textbooks usually include all language phenomena and cultural elements the learner needs to acquire in order to be proficient in a certain language. But textbooks are only a part of the learning material and all teachers include supplementary and adapted materials to achieve the learning goals set by the curricula or the learners' own personal targets.

### **3.1. Materials based on content in teaching German as a foreign language**

Didactic materials in teaching German as a foreign language include textbooks/workbooks and supplementary teaching and learning materials. Moreover, I see textbooks as media in the teaching and learning process. Rösler and Würfeldefine media in teaching as instruments through which content, exercises, tasks etc. are conveyed, facilitating the acquiring of knowledge and competences (Rösler & Würfeldefine 2012, p. 12). This also means that at the basis of teaching materials (including textbooks) we find authentic texts (for training reading, seeing/listening and adjacent competences) adapted to a proper language level. Content based materials refer to supplementary teaching materials and have a

precise focus: for example, worksheets that train the relative pronoun in German. Usually content-based materials are linked to certain language phenomena (from grammar, vocabulary to pronunciation) and are used to train or fill in knowledge gaps on a particular topic.

### **3.2. Adapted materials focused on interaction and cooperation.**

The supplementary adapted materials intended to stimulate interaction can also centre on particular topics, but as a general learning goal they are meant to prepare the brain for learning and support cooperative activities in the classroom. Adapted materials that focus on student interaction and cooperative learning can be used at the beginning of a lesson (as a warm-up), in the middle (to support the understanding of texts) and at the end of a sequence.

- Classroom walk (as described in section 1.3)
- Cooperative reading and listening (as described in section 1.3)
- Partner interview (Partner A and Partner B have different questions on certain topics, for example housing or living in the city)
- The Hot Seat: a fun way to revise vocabulary from the previous lesson and a good warmer): Divide the class into two teams. Place a seat in front of the board. A learner sitting with the back to the board will have to guess the word the teacher writes on it, by listening to the definitions offered by the team.

The list provided above is incomplete, but is relevant for the purpose of study, as these are some examples provided in teacher training seminars to illustrate interaction and cooperation.

## **4. Purpose of the Study**

This paper will describe what materials linked to neurodidactics are known to teachers, what are the most used materials provided in teacher seminars and based on what the selection is made by teachers. My endeavour starts with the interpretation of a questionnaire applied to teachers of German as a foreign language, who attended at least one teacher training session in the past year. The questionnaire explores what motivates their participation, how many teaching materials (in percentages) were useful and what motivates usage in class. The questionnaire included an open question where teachers were able to suggest other high impact activities they do and explain why they think these are successful.

## **5. Research Methods**

The main research method used is the survey. Having a descriptive purpose the questionnaire collected data on personal background (from teaching experience to the number of attended seminars in the past two years), factors that influence participation to a teacher training session, preferred teaching materials (designed for a certain level, grammar focused etc.) and on the impact, on a scale from 1 (very good) to 5 (poor), certain activities presented in seminars had in classroom.

## **6. Findings**

After analysing the provided set of answers the survey showed that all teachers attended at least 2 seminars in the past two years. Moreover, 90% of answers had as top selection criteria for attendance:

topic, materials provided and trainer. One of the answers gave additional criteria of choice: certificate of attendance and prior knowledge on the topic. A section of the survey, which had an informative purpose and will be subject to further investigation, aimed at revealing what steps teachers undertake in creating a learning context.

### **6.1. Materials delivered in teacher training sessions**

The percentage of didactic materials provided in teacher training sessions varied between a low of 20% to a high of 70%. In the section of the survey in which the teachers were asked to evaluate the impact the proposed activity, task or exercise had in the classroom the highest scores were given to activities that stimulate interaction, like the hot seat or the classroom walk, and the materials based on cooperation were also evaluated positively. The teachers' own proposals for activities that have a positive impact on classroom were project-based learning, portfolios and classroom learning stations.

### **6.2. Criteria for selecting materials**

The section of the survey focused on nine criteria for selecting teaching materials received during teacher training sessions and demanded yes and no answers. Extracted from the questionnaire, the section included the following: During a teacher training session I prefer to receive didactic material that:

- Can be used directly and does not require adaptation.
- Has been designed for a certain language level.
- Trains grammar.
- Focuses on interaction between students.
- That helps students communicate (speaking or writing).
- I have experimented with.
- Others have experimented with.
- The trainer recommends.
- Can be used during an entire lesson (similar to a ready-made lesson).

All respondents of the survey have chosen materials that focus on interaction and help students communicate (speaking and writing). Two respondents pointed to the criteria that do not influence their choice for implementing the delivered teaching materials are the ones designed for a certain language level, train grammar and that can be used during an entire lesson. The designed activities during the teacher training seminars take into consideration the following aspects (corresponding to the criteria above): didactic materials are experimented by participants and during the training session there are sequences, in which teachers can share their experience with certain activities they use in class. Secondly, all delivered materials can be adapted to a certain language level or an age group. Moreover, most didactic materials focus on production, activation and cooperation. The last section of the survey investigated, which tasks, activities and proposed exercises have been successful in class.

## 7. Conclusion

The last part of the survey investigated which tasks and activities were useful on a scale from 1 to 5. The answers also included a column with the title “not used”. The end of the survey offered respondents the possibility to enter their own suggestions for useful activities and explain why they think these can have a positive outcome on the class. The list included a majority of didactic materials offered during training sessions. In order to better describe the results, I grouped the activities into two categories: (brain) activating exercises and warm-ups, cooperative learning and communicative tasks (stimulating spoken interaction).

### 7.1. Brain activating exercises and warm-ups. Preparing the brain for learning.

Brain activating exercises and warm-ups play a decisive role in the sequences of any lesson. They are beneficial, because they allow a playful and subtle crossing into another learning sequence. Moreover, when placed at the beginning of a lesson, they signalize to students that the German class has started and that they are required to make use of the language and interact. From the list provided to teachers, there were some activities that implied movement inside the classroom (see section 1.3 in this paper). All of them scored on the scale of 1 to 5, a maximum of 5 and a minimum of 3.

### 7.2. Cooperative learning activities.

In the teacher training session there were examples of how texts or audio texts can be used to improve cooperation in a group. Not having to read entire texts, but given different approaches to the text, students in a group could focus on extracting, for example, information on a certain topic during reading, while others can identify unknown words or difficult ones. At the end of the reading time, students have to discuss their results. This sort of activity scored either a 1 or a 3.

From the answers provided through the survey, there are several conclusions that can be drawn from it.

- Teachers prefer to select activities that impact the atmosphere in class and help students communicate.
- Teachers prefer didactical materials that can be adapted.
- Teachers prefer to experiment with the didactic materials during a training session.
- Teacher also can make use of activities that require movement in class.
- Teachers have mentioned other tasks they use in class and argued for their utility, underlining that most of them spark curiosity and interest among students and not necessary train a certain language phenomena.

At the basis of selecting teaching materials from training sessions we find not necessarily the need for improvement certain competences in students (topic-based, vocabulary, pronunciation, grammar etc.), but rather a need for materials that engage and activate students, enabling cooperation and communication. Moreover, teachers make use of supplementary didactic materials, in order to integrate all language skills during class: reading, writing, listening-seeing and speaking. This also showcases that a “mix of methods “and different media are required to train these skills. Activities that actually prepare

the brain for learning and stimulate cooperation also improve the overall learning context. And this is also a reason why teachers opt for the transition of such didactical materials from the training room into their own classroom.

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