

The Influence of Content-learning on the Integration Perspectives of International Students in Germany

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Abstract

New students arriving from different countries present a challenge to school systems as language barriers prevent them from being placed in regular classes immediately. In Germany, these students are often enrolled in “international classes” before being placed with their fellow classmates. The project “Biology for Everyone” teaches science to secondary students entering the German school system using action-oriented learning, which helps to increase content-knowledge and develop language ability. The concomitant research examines this process in international classes using 17 interviews, which focus on the students’ transition using Mayring’s qualitative content analysis. Results show that students value the help of content-learning material as it encourages them to participate. Moreover, action-oriented tasks help them understand science before learning the specific vocabulary that is needed to talk about science. Additionally, the importance of providing a safe environment with a good support structure is crucial as students often describe language-use anxiety and negative experiences in their regular class.

Keywords

Immigrant students, integration, science education, “Biology for Everyone”, preparation classes, content-learning, CLIL, second language learning, second language motivation, Germany, secondary school

Introduction

In recent years, the number of immigrant students entering the German school system has increased tremendously. Especially, with the rise in asylum requests, schools face the challenge of educating a large number of students who do not speak German, or at least not well enough to participate in the regular classroom immediately (Meisterfeld, 2016, p. 1; Bundesamt für Migration und Flüchtlinge, 2017, p. 3).

Educational programs for these students vary depending on the federal state and the school.

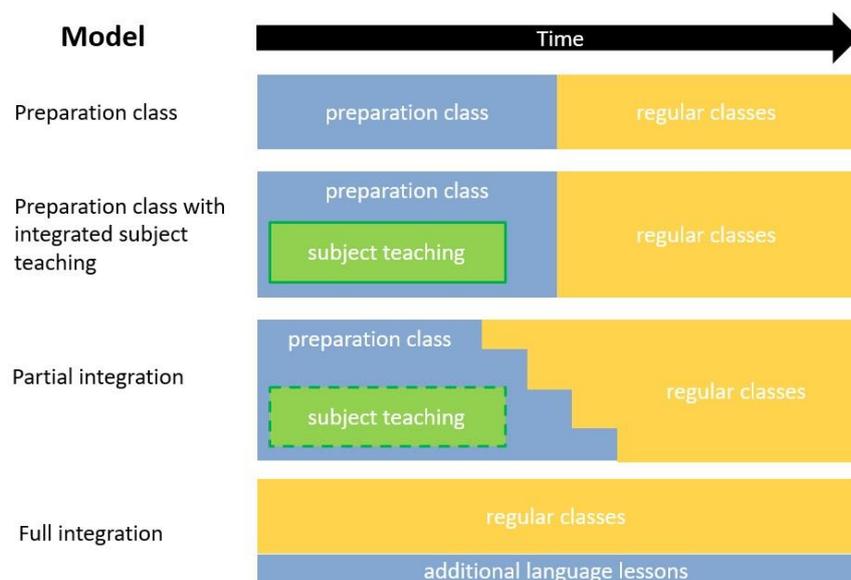
These students are commonly educated in

separate classes, which are often called *international classes*, *welcome classes*, or *preparation classes* which help foster language acquisition before full integration into regular classes with German students takes place (Mercator-Institut, 2015, p. 12). Ahrenholz, Fuchs and Birnbaum (2016) portray different models of educating newly arrived students

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Figure 1. *Models to educate and integrate international students*

Based on Ahrenholz et al., 2016.

which differ in two aspects: the time needed to integrate into regular classes and the number of subjects taught in international classes (cf. figure 1).

Preparatory classes may be offered for students to attend before they are transferred into regular classes. The transfer takes place usually after two years of learning German¹. Preparatory classes may also include both language lessons and subject content. Content varies depending on the school and the teachers, as no mandatory curriculum is available. The last two models suggest that integration into regular classes should take place directly after a period of time. However, a partial integration model may be initiated by gradually starting with subjects like physical education, art, and music in the regular classes, and adding additional subjects over time. The full integration model involves integration from the start, where new students are placed in regular classes but receive additional language lessons. This model is usually only found in primary schools (Ahrenholz et al., 2016, pp. 2-3).

The integration of content learning and language acquisition can often be found in bilingual programs (e.g., teaching Biology in English or French) using the acronym CLIL².

Current CLIL projects usually focus on teaching foreign languages but not on second language acquisition³. The most significant characteristic of CLIL is a dual-focused approach on content and language. The eligibility of science as a CLIL subject has been highlighted by previous research, as science can be experienced in an approachable manner and therefore limits the obstacle of language barriers (Bohn, 2013, p. 287). Science education research has shown that hands-on activities accelerate the learning process (Fries & Rosenberger, 1973, p. 12) and that experimenting creates conversation as students interact with each other to discuss hypotheses and explain observations. Social and communicative skills are positively influenced not only by the use of experiments but by working with animals as well (Gropengießer, 2006; Wagener, 1992, p. 122). Furthermore, previous studies have shown that working with animals has a beneficial effect on intuitive, emotional, and reflexive processes (e.g., Schröder et al., 2009; Gebhard, 2013, p. 133). Using an action-oriented approach, language acquisition can easily be integrated and promoted. To evaluate the potential of CLIL in second language learning, our research looks at students' motivation in science and German

using guideline-based interviews in a gradual integration model.

Science Education for Newly Arrived Students

Dressler and Gereluke (2017) provide an extensive literature review about the educational situation of refugee students. Factors such as background context, community and partnership support, and various international school systems and their responses all contribute to suggestions facilitating refugee student support (Dressler & Gereluk, 2017, p. 9). Keeping these in mind, we aim to discuss how science education in the project “Biology for Everyone” affects new students.

The Project “Biology for Everyone”

The project “Biology for Everyone” was established in the summer of 2016 by the Biology Didactic Department at Bielefeld University. It reinforced the importance of teaching science in preparation classes for new students using active learning to help foster language acquisition. It is currently in use at two partner schools in the East Westphalia-Lippe region in Germany. Mario Schmiedebach developed the teaching materials and provided training for teachers to teach science education in these classes. With the assistance of a master’s student, he investigated the success of this pilot project to create a set of field-tested teaching units for other schools. Since a mandatory science curriculum for international classes does not exist, the teachers chose the topics of the

science lessons, often using the national science curriculum to allow newly arrived students to become familiar with the topics in the regular classes. Topics that included hands-on tasks were preferred as they increase motivation and foster language acquisition (Schmiedebach & Wegner, 2018b). However, one major obstacle was that international classes are heterogeneous in age, often including students from 11 to 17 years of age. Therefore, it was impossible to teach age-appropriate topics from the science curriculum to an entire class.

Action-Oriented Tasks Ease Integration

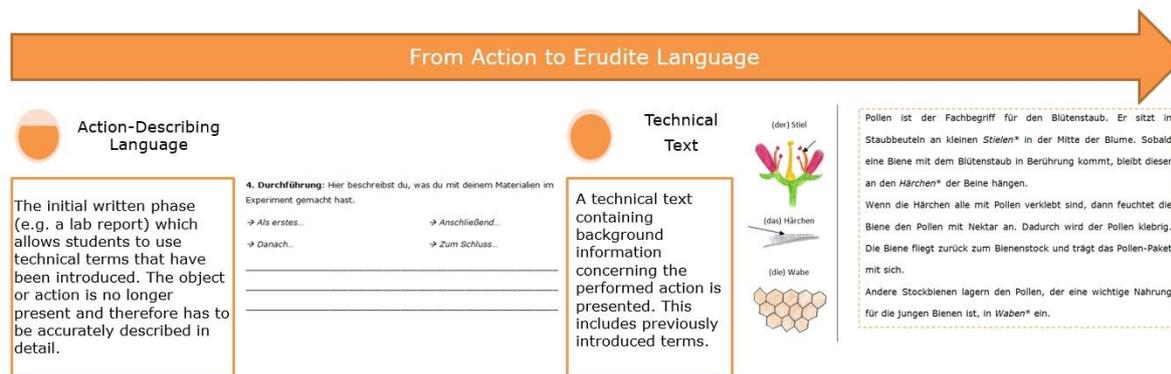
Leisen (2015) postulates four levels of language-use based on Gibbon’s model (2006) and describes how language can transition from “action” to “erudite” in the classroom. Both linguistic and content complexity increase throughout the task, which gradually leads students to a higher level of abstraction⁴. Students encounter an interactive scientific phenomenon, use group-work to discuss the subject using their own words (which can either be in their native language or in German), and often point directly to the object. Using action-associated language, they do not need technical terms as they are able to talk with their peers using the linguistic resources they already feel comfortable with (Leisen, 2015, p. 132; cf. Figure 2). Since they can physically show what they are referring to, they do not need to include correct terms or full sentences (Gibbons, 2006, p. 272).

Figure 2. From action to erudite language (part I)



Based on Leisen, 2015, pp. 132.

Figure 3. From action to erudite language (part II)



Based on Leisen 2015, p. 132.

Action-reporting language allows the entire class to describe the observed phenomenon in a discussion. During this phase, phrases like “and then... and then... and then...” are distinctive and students are not able to refer to the materials as the materials may no longer be present. With the help of the teacher, important phrases and technical terms can be introduced to describe the prior action properly (Leisen, 2015, pp. 132). This allows them to take the next step into converting the prior experience into writing (cf. Figure 3).

The final step involves reading a technical text about the observed phenomenon (Leisen, 2015, pp. 132). As the students have already learned the language behind the scientific concept, they should now be able to understand the essentials from a textbook by associating the text with their observations. Throughout this process, students’ vocabulary and linguistic register build up until they use erudite language (e.g., using technical terms after they have encountered them in person).

Motivation in Second Language Acquisition: The Learning Situation

Within the realm of second language acquisition, researchers concentrate on aspects such as developmental routes of grammatical structures

(Diehl et al., 2000), typical errors (Bialystok & Hakuta, 1994), the influence of the first language (e.g., Müller, Kupisch, Schmitz & Cantone, 2011), and some “big hypotheses” surrounding second language acquisition (Fischer, 2014, pp. 14-19). Although it is controversial that these serve as a “solitary solution,” they still form the basis of second language acquisition theories.

The contrastive analysis hypothesis (initiated by Fries 1945, developed further by Lado 1957) is one of the first theories about second language acquisition. The key aspect is that the first language (L1) influences the second language (L2) acquisition in terms of acquiring similar rules and structures (Lado, 1957, pp. 2). However, Klein (1984) postulates an opposing statement, as predictions of learning difficulties are not always accurate; it is possible for divergent structures to be easily acquired (Klein, 1984, p. 38; Meisel, 2000, p. 187). Although there is no theory that is consistently agreed on, it is known that learners use their linguistic resources when learning a new language.

The L2 acquisition = L1 acquisition hypothesis (Dulay & Burt, 1972, 1974) suggests that a small amount of L2 errors derive from contrasts between the L1 and L2. Moreover, they argue that the L2 acquisition is determined by the L2 itself; learning a language as a L1 or a L2 does not influence the sequence of acquiring

certain syntactic structures. Fischer (2014) points out a problem of this theory; the basic assumption of similarities between L1 and L2 learners concerning specific acquisition areas may facilitate language learning nearly, however, the strong emphasis on “universal regularities” does not seem appropriate.

Selinker’s interlanguage hypothesis (Selinker, 1972) states that

Second language speech rarely conforms to what one expects native speakers of the [target language] to produce, that it is not an exact translation of the [native language], that it differs from the [target language] in systematic ways, and that that the forms of utterances produced in second language by a learner are *not* random.

(Selinker, Swain & Dumas, 1975, pp. 140).

This hypothesis combines with the previous one as it acknowledges the influence of the L1 on the L2 (contrastive analysis hypothesis) and on errors arising from the L2 (L2 acquisition = L1 acquisition hypothesis). Furthermore, it places an emphasis on aspects developed by learners that are both dependent and independent on the L1 and L2. In this case, the five major processes important for second language acquisition are language transfer, transfer-of-training, strategies of second-language learning, strategies of second-language communication, and overgeneralization of target language linguistic material (Selinker, 1972, p. 215).

Nowadays, researchers tend to focus on single factors and their role on second language acquisition. When taken from a practical perspective, one notices individual successes which cannot be solely explained by the “big

hypotheses”, but instead may be described by external and internal factors. External factors include the age and the timespan of language learning, whereas internal factors consist of motivation and cognitive abilities. These have an impact on language learning and can reinforce language acquisition (Dörnyei, 2005, pp. 7-8; Riemer, 2010, p. 168; Fischer, 2014, p. 13). Motivational aspects have been highly researched in this field; however, the focus has been on systematic language acquisition in foreign language classes and largely neglects motivation concerning migration⁵ (Fischer, 2014, p. 3). Our project focuses on motivational aspects concerning the effects of CLIL on the transition of the international class into the regular school system.

Our qualitative research consists of guideline-based interviews using the theoretical framework of Dörnyei’s second language acquisition motivation theory (1994). His theory covers basic components influencing language acquisition motivation on the following levels (Dörnyei, 1994, p. 279):

- *Language level*: the language with its specific structures (e.g., (dis)liking the language, interest in foreign cultures)
- *Learner level*: the individual with their own characteristics (e.g., self-confidence, self-efficacy)
- *Learning Situation level*: the learning environment (e.g., teacher, syllabus)

As our project creates a learning situation, the third level is of utmost interest and is depicted in more depth. This level is divided into three different parts: the course-specific, the teacher-specific, and the group-specific motivational component (Dörnyei, 1994, p. 277).

The course-specific motivational component concerns the curriculum, teaching materials, exercises, and methods. Dörnyei

integrated findings of Crookes and Schmidt (1991) to create four subcategories of interest, relevance, expectancy, and satisfaction. The subcategory *interest* describes the individual's intrinsic motivation to find out more about his surroundings. *Relevance* highlights perceived benefits to achieve individual goals and needs. In order to achieve a high level of relevance, student's preconceptions and a focus on scientific explanations in daily life needs to be included. The third subcategory (*expectancy*) describes the perceived probability of success in tasks and understanding the content. By working from an action-oriented approach, it is assumed that the students understand scientific concepts first before being exposed to technical terms and complex texts. Furthermore, support from the teacher and fellow classmates can increase the expectancy to succeed. The last subcategory of the course-specific motivational component is *satisfaction*. The satisfaction in succeeding can consist of both intrinsic (e.g., the joy of experimenting) or extrinsic (e.g., working hard to get good grades) motives (Dörnyei, 1994, pp. 277-278).

The teacher-specific motivational component takes the teacher's personality, teaching style, relationship towards the students, and feedback into account. This component consists of the three subcategories of *affiliative drive*, *authority type*, and the *direct socialization of motivation* (Dörnyei, 1994, p. 277). Although this component is crucial to consider when looking at motivation, our article does not focus on specific actions of the teacher in detail (see Montalvo, Mansfield & Miller, 2007 for the motivational impact of teachers).

The last component of the learning situation level is the group-specific motivational component, which consists of the subcategories *goal-orientedness*, *norm and reward system*, *group cohesion*, and *classroom goal structure*

(Dörnyei, 1994, p. 278). *Goal-orientedness* describes the extent a group will go to achieve the same goal (e.g., learning a foreign language). If the group has a common goal they can identify with, orientedness has a positive effect on foreign language motivation (Schlak et al., 2002, p. 3). The *norm and reward system* describes to what extent certain behaviors have been established as accepted norms in a class (e.g., doing homework). The factor *group cohesion* describes the strength of the link between the group members to each other and towards the group as a whole (Dörnyei, 1994, pp. 279). Strong group cohesion has a positive influence on motivation since each group member feels responsible for the group's success. *Classroom goal structure* can either be competitive (the students work against each other and only the best ones are rewarded), cooperative (students share the work and each member is responsible and therefore, benefits from the group's success) or individualistic (students work separately, and other students' performances does not affect an individual's success) (Dörnyei, 1994, p. 278). Several studies have shown that cooperative goal structures are more beneficial for motivation than the other two (e.g., Johnson et al., 1981; Slavin, 1988; Julkunen, 1989).

The learning situation in international science classes is our leverage point. Results from previous interviews reveal positive evaluations and an increase in motivation (Schmiedebach & Wegner, 2018b). However, since international class students in the two partner schools gradually transition into the regular school system, they experience two different learning situation levels. They are placed in international classes with other new students studying German and in the "Biology for Everyone" program, but they are also interacting with German students in regular classes and do not have lessons exclusively

tailored to their needs. Therefore, this study puts an emphasis on the student's perception of both learning situations.

Method – Research in “Biology for Everyone”

Research Questions

The sample of students to be interviewed was intentionally selected to reflect the heterogeneity of international students regarding age, country of origin, and language competency (Nilsson & Axelsson, 2013, p. 142). Teachers in the international classes consider the student diversity while teaching and many have additional qualifications. There may not be as much language awareness in regular classes. Teachers have to teach the curriculum and prepare their students for exams during the school year. Therefore, recently immigrated students might not receive as much help in the regular classes as they would need; moreover, some students might not be able to understand the content as they may not have had continuous prior schooling, and thus lack prerequisite knowledge in comparison to their German classmates. As a consequence, the following research questions were formulated:

- How do the students perceive the different learning situations in the international and the regular class in regard to content learning and integration by the teacher and the classmates?
- How do the students evaluate the CLIL-concept of the science lessons?
- How do the students evaluate the concept of transitioning from action language to erudite language?
- How do the students value their transition into the regular class?

Data Collection

The project currently takes place in two classes at two secondary schools in Bielefeld (with 16 and 18 students, respectively) and is part of a larger longitudinal study (Schmiedebach & Wegner, 2018b). Initial interviews focused on a general evaluation of the science lessons, whereas the interviews depicted in this article concentrate on how the different learning situations affect international students.

The students were selected for the study were because of their level of language competence. Consent to participate was obtained for all students from a legal guardian. As language competence improved over time, more students were added to participate in this study. Since the interviews were conducted in German, the interviewees had to be able to communicate in German at a basic level in order to understand the questions and answer properly. The heterogeneity of the group, concerning age, country of origin, language proficiency, prior schooling, and enrollment in the German school system, was displayed by the selection of the participants as far as possible (cf. table 1). As it is a longitudinal study and the results presented in this article consist of the second interview survey, some students were interviewed for the first time since they had not fulfilled the requirements at the time of the first interviews.

Table 1

Gender, age, country of origin, native language (L1) and date of enrollment of participants.

Participant	Gender	Age	Country of origin	L1	Enrollment in the German school system	CEFR	Survey 1 (Dec./Nov. 2016)	Survey 2 (June/July 2017)
1	m	12	Iraq	Kurdish	May 2016	B1	Y	Y
2	f	14	Kazakhstan	Russian	May 2016	B1	Y	Y
3	m	16	Syria	Kurdish	November 2015	A2	Y	Y
4	f	14	Iraq	Kurdish	March 2016	B1	Y	Y
5	m	13	Croatia	Croatian	March 2016	A2	Y	Y
6	f	14	Iraq	Kurdish	Not specified	B1	Y	Y
7	f	12	Iraq	Kurdish	Not specified	A2	Y	Y
8	m	16	Syria	Arabic	November 2015	B1	Y	Y
9	f	13	Iraq	Kurdish	April 2016	A2	Y	N
10	f	14	Iraq	Kurdish	May 2016	B1	Y	Y
11	f	16	Iraq	Kurdish	May 2016	B1	Y	Y
12	f	17	Kenia	Swahili	May 2016	A2	Y	Y
13	m	13	Russia	Russian	May 2016	A2	Y	Y
14	f	16	Croatia	Croatian, Albanian, Serbian	March 2016	A2	N	Y
15	m	16	Iraq/ Kurdistan	Kurdish	May 2016	A2	N	Y
16	f	11	Iraq	Arabic	March 2016	A1	N	Y
17	f	15	Iraq	Kurdish	April 2016	A2	N	Y
18	m	17	Iraq	Kurdish	February 2016	A1	N	Y

Note: Language level refers to the Common European Framework of Reference for Languages (CEFR); A1 is the lowest level, C2 refers to a native speaker. Participation in the first and second interview survey is indicated by "Y".

The research questions were examined using guideline-based interviews from ten female and seven male students. One trial-interview was conducted beforehand to test the narrating impulses of the interview guideline for linguistic and content-based intelligibility; the student used for the trial-interview was used for the trial-interview of the first survey as well. All interviews took place in a private room in the school by the same interviewer in both interview studies to ensure comparability. During the interviews, students had access to dictionaries in their native language and questions could be repeated, paraphrased, or skipped if necessary.

Of particular analytical interest were the following guiding questions: *During the week you are sometimes in a German class. How is the education in the German class? What tasks do you get in the regular class? Do you prefer the regular or the international class and why? What do you think about having science in the international class? Should that be mandatory for all international classes and why?*

Interviews were recorded with an Olympus LS-14 recorder as *.mp3-files lasting between 16min, 54sec and 30min, 46sec. Afterwards, they were anonymously transcribed with the program f4 according to standards

described by Kuckartz et al. (2008). The transcribed interviews were analyzed by Mayring's qualitative content analysis using the method of summarizing (Mayring, 2010, pp. 65-68), which looks at each case separately using three main steps of paraphrasing, generalizing, and categorizing. The interview guideline categories were formed inductively from the interview data, but they were influenced by Dörnyei's second language motivation theory. Therefore, the analysis covers general aspects from Dörnyei's model (e.g., group-specific motivational component) but links them to the specific setting of our research project (e.g., comparing the international and regular class as two different learning groups the students encounter with).

Results and Discussion

Perspectives on learning in the international class

Since the international classes consist of a variety of students with different backgrounds, cognitive abilities, and language competencies, the perspectives of the learning situations within the class is broad. The heterogeneity of the class can cause boredom as participant 2 describes. Since she was able to quickly pick up German and knows a lot of Math due to her previous education, she feels bored:

P2 *Ehm (...) for me eh some [...] German lessons [...] is (then?) a bit easy, because I finished A1, A1, A3// eh no B1 in the first year [...] but [other classmates, MS] finished only eh A2 half and for me (it was?) too easy because (...) I already knew too much and ehm (...) the same with Math.*

Heterogeneity is obvious when looking at the participant's background; students from Eastern Europe had a steady education and are pretty much equivalent (or better) to the German students concerning content-knowledge. Refugee children could not attend school for a certain time period and, therefore,

lag behind in content-knowledge. Moreover, it is not surprising that students with a large age range do not have the same content knowledge in math. The participants have interesting views on content-learning in the international class. Participant 3 suggests that students should know some basic German before being taught subjects other than German in the international class. However, he agrees that it is beneficial to have content-learning as a preparation tool before getting transferred to a regular class. Participant 7 adds that you learn German throughout the biology lessons; moreover, she talks about being like "other kids". Although the students depict the international class as a relaxing learning environment where they have a common goal and a safe place to learn, most students have the desire to transition into the regular class (Nilsson & Axelsson, 2013, pp. 152). By having biology in the international class, they have one subject "like the German kids" in common, which can cause them to feel like a regular student:

I *And why (...) is it important to have biology lessons?*

P7 *In biology on// one can learn more German because normal class goes (...) then they can do biology like the other kids, the German kids (...) and math as well but (...) I don't like math (laughs)*

Participant 4 explains the advantages of content-learning in the international class; she is already partially integrated into the regular class and has science lessons with her German classmates. Since topics from the national science curriculum have been chosen, the students learn the concepts, words, and content they need once they have integrated. She already knows scientific words like carbon dioxide from the international class and this helps her follow lessons in the regular class:

P4 *Ehm (...) the ehm (...) the good thing is, here in biology we learn many, many words, which*

are useful for other eh (.) eh subjects (.) and eh (.) for example will I have done [in my regular science class, MS] something about trees and carbon dioxide and oxygen and then have I// I have eh learned more in the// in the international class as well.

Furthermore, it is helpful to have similar tasks in the international and the regular class. Participant 2 explained this when writing a lab report in “Biology for Everyone.” Although it was difficult, she liked it because she had to do it in her German chemistry class as well; she stated that it helps to do it in the international class beforehand, so she knows what she has to expect and, therefore, might feel more comfortable.

The students know that having science lessons in the international class is rare. Participant 13 argued that “many schools [...] think eh biology is not as important (.) as (.) languages (.) as the German language for the international class”. However, the students in the project describe the advantage of learning science and language at the same time. They learn a lot of words that they probably would not have with their German textbook and, therefore, the project prepares them for the regular classes. When asking the students if they want to have more subjects in the international class, a lot of them wished to have English. Despite the fact that one might argue that arts, music and P.E. are eligible subjects for the international class since they might not require as much language-use as others, participant 2 summed up why the international class does not need those subjects:

P2 [...] I don't need art and P.E., which we already had in the international class, because I can do those subjects in the normal class and eh (.) I have difficulties with physics in the normal class now [...]

Subjects that might be easy to teach in the international class should not be considered just because they simplify the teacher's work. P.E., arts, and music might be a good starting point to

help transition students into the regular class as they are easier to follow and have a lot of practical work. However, subjects like (social) science also offer the chance to prepare students for the regular classroom with not only content but also specific linguistic structures needed for different subjects (e.g., writing a lab report, talking about diagrams, etc.).

Language Barrier as an Obstacle to Students' Potential

Content-learning in the international class is evaluated positively as it increases participation in the regular classroom. Nevertheless, language is still seen as a barrier. It might be frustrating for students with a decent educational background as they already know the content; however, they may not be able to express it in German yet. They recognize the topics, they might even know the experiments and the answers to the tasks, but the lack of German hinders them (P12's interview was conducted partly in English).

P12 #Oh# it's not that difficult. (4) They only thing// the only thing that make it difficult is (.) language. [...]

I So if they would be in English (...) how about then? Are they then// (.) would #it be more easier?#

P12 #Yeah it will be//# yes

Most students are eager to show what they know and understand but they often see their linguistic diversity as a barrier. Moreover, students with prior science education experiences felt that their lessons were harder in their previous schools than in the international class. Participant 3 understands that they do not speak German well enough to understand very complex scientific content, so they have to stick to basic lessons. Therefore, his prior science education is evaluated as having been more difficult:

I *Did you have biology lessons in Syria as well?*

P3 *Of course, but it was very dif// more difficult [...] here (.) eh (.) the problem is we don't cover the (.) very (.) not so difficult things [...] because we not German can and there is// well we can speak German but there are some words yet we cannot*

Veil of Oblivion

Language is not the only aspect that makes it difficult for students to reveal their full potential. Another factor is migration background, as they have experienced difficult and horrific situations in the previous months and years. A “veil of oblivion” prevents them from remembering prior experiences:

P4 *Yes of course. In Iraq I don't have// eh to memory [...] that is (.) what (we?) learned// well what (.) happened with us wasn't easy [...] and eh I have forgotten everything, I was from four years not in the biology lessons as well [...] and then I have everything/// (.) eh (.) eh repeated [...] so this makes me happy (laughs)*

She explains that she did not have biology for four years but that she is happy to repeat everything now. She forgot everything she had learned in Iraq due to experiences that were not “easy.” Similar descriptions can be found in the interview with participant 11. She wants to repeat and re-learn the content she has forgotten. Although the psychological state of participants is confidential and therefore unknown, it is often the case that many refugee students have experienced traumatic events, causing impaired memory (cf. Beers & De Bellis, 2002; Toth & Cicchetti, 1998).

Learning by Action

The central concept of “Biology for Everyone” is its action-oriented approach designed to build up scholarly language step by step. Many

students have not experienced science education with the same kind of tasks and feel that they learn more about science by getting actively involved instead of reading, rehearsing, and reciting texts:

P15 *Yes, because eh [with experiments] you can learn better (about?) it [...] you can (.) remember better (.) yes not only (.) learn, learn, read and then (.) tell the teacher (.) 'you have to do it like this, like this' without mistakes and [...] like eh (.) from (.) the book says (.) you have to say too.*

Working in pairs or groups is another new learning experience for many students. Participant 17 stated that she did not understand how to create an electric circuit, but with the help of her partner she finally understood. Participant 10 described another innovative teaching method she did not experience before:

P10 *And [the teacher, MS] (.) takes from us the snail with because when maybe we have the snail, then one can see (.) how is it and which color it has, which foot (.) because we cannot speak German so well. [...] Then one can see, how it is, but in Iraq, we don't take the snail. [...] #But here# that done. That is #difference.#*

I *Hence# in Iraq you have only the book to learn and #here//#*

P10 *#//and then# [...] one has to explain, and we read, but here (.) we take the snail and then we look on our arm.*

The encounter with the snail was impressive and helpful to many students since they did not speak fluent German yet. Using this approach to foster language acquisition and content learning was judged positively and described as an innovative teaching technique since nothing comparable had happened in her prior schooling. Participant 12 underlines the

previous statements when she explains that you have to see and understand the content first before learning the language. This highlights our approach as the students encounter scientific content first before learning the appropriate language; they then start to understand it before putting it into words.

P12 *So, you see. You have to understand it.*

I *And then you can learn the language?*

P12 *Ja.*

Education in the Regular Classes: Boredom, Motivation, and Language-use Anxiety

Although most of the students have had experience in the regular classroom, the degree of education and knowledge varies within the regular classes. Some students try hard and participate whenever they can even if it is just copying notes from the blackboard. However, this depends on motivation; students often work on their German homework because they feel frustrated when trying to understand the instructions in the regular class and do not succeed. Many claim to be bored because they do not understand the language and cannot follow the lessons. The teachers tend to speak fast because they are not used to implementing any measures to support international students.

I *And how is it for you to be in the regular class?*

P5 *Good but sometimes is boring, because (.) eh they speak fast (.) and they don't understand about what (.) they speak (.) some eh (.) a few words I understand but some not (..) and (.) then is boring then I do (.) Homework from German (.) or from science or so.*

Participant 5 wants to participate, but instead, he does his homework whenever the lesson gets too hard. This feeling is expressed by

many others; participant 11 says that the regular class is “a bit difficult but (.) if you want to, one can accomplish everything.” The students show a strong desire to participate in the regular classroom despite possible obstacles. Being in the regular classroom is generally seen as something good and valuable; none of the participants said that they did not want to be integrated into the regular school system.

It is hard for many students to be integrated into the regular classes because they feel that their German is not sufficient enough. They want to learn German first before getting placed into the regular classroom: “it is so difficult, I rather want to learn German” (P7). It is important that the teachers support the students' effort and make them feel comfortable using the foreign language. Otherwise, the students might hesitate to participate, as described by participant 6:

I *Okay (.) you've just said that it is sometimes hard to put your hands up in the (.) regular class. (.) Can you explain why it is that way?*

P6 *Yes, because I think my German is not so good [...] with me is I had said something, they don't understand me I have to explain hundred times (.) and when they have understood not the problem. [...] They say, that I say wrong or something I say “Whatever” (.) I don't put my hands up now but when I have (.) learned German well (.) yes of course I will put my hands up and [...] like Germans and certainly also better, because (.) I am in Iraq was better too.*

She had negative experiences participating in class because the others could not understand her properly. As a result, they told her she was wrong and now she no longer wants to say anything. Once she learns more German, she wants to participate because she is confident that she will be better than some German students since she was a good student in her

home country. Problems like this have been described by several students and can be summarized as language use anxiety, however, the cause for each case may be different (e.g., negative experience before or low self-confidence in general).

P2 *Yes, I am (.) frightened to (.) go further, because I eh make many mistakes when I (.) speak and eh (.) for me that is not so (...) me don't know how I can say that.*

I *Are you afraid to do mistakes concerning the content, thus saying something #biologically# wrong?*

P2 *#Yes# (.) no nothing #that I//#*

I *#That you# are not able to say it in German correctly?*

P2 *Yes, for I ehm always doing grammatical mistakes.*

Participant 2 clearly states that she is not afraid to make mistakes concerning content but afraid of making grammatical errors. Speaking in front of native speakers may cause language-use anxiety because in comparison, she is not afraid of speaking German in the international class. Participant 4 thinks that her classmates are “Germans, which can speak German better than her” and does not want to raise her hand in class at all.

Working For a Future

As mentioned before, the students value the help to integrate into regular classes. They want to resume their educational career and need to be integrated into the regular school. In order to receive the Abitur⁶, students need to learn English. Therefore, many would like to have English lessons in the international class to catch up with their classmates who have already had some years of English education.

Furthermore, English is seen as a useful language to know:

P4 *Yes eh (.) because our problem is, when I// I have still one years (.) and then I have to eh (.) if I don't know English and German well, I have to a// go maybe some in a trading school or (.) somewhere else and I need English in any case for the Abitur degree [...] and therefore, when we learn a little bit [English, MS] here, we can better when we on eh (.) th// eh go better regular class (.) understand, knowing a bit more.*

Participant 4 states that her goal is to be fully integrated into the regular classes as soon as possible. She is motivated and wants to work hard to get the Abitur instead of leaving the current school for an apprenticeship. Participant 2 wants to stay at her academic secondary school since it offers some difficult topics that she wants to learn. Her goal is to get the Abitur as well because it offers more opportunities and she wants to later attend university.

Depending on age and language skills, some students get transferred to a trade school after the summer break. They hope to get a degree there in order to find work afterwards. The importance of learning German and finding a job eventually is portrayed by participant 15, an unaccompanied minor who received a suspension of deportation, but not an asylum yet:

P15 *[...] I// I want to study Ge// only German here [...] I always have to go to school here (.) (unc., 1) (came?) be punctual (.) I've got bad asylum// asylum.*

He desperately wants to improve his German and continue his education in order to get a job here. He does not want to speak Kurdish in his international class because he wants to concentrate on learning German.

Social Interactions in the International Class

Social interactions in the international class are depicted positively. The students like their classmates and get along well. However, different cultures and languages can cause other problems, more specifically, the usage of the L1 (native language). Participant 15 does not want to use his L1 because he focuses on German, although most students use their L1 frequently to help each other. The majority of the class speaks Kurdish; however, it is not always clear if they use Kurdish just to help each other:

P12 *[...] when they want to gossip, they gossip in Kurdish [...] maybe they are talking about you and äh laughin there. (..) It's not good.*

Participant 12 believes that the other children use Kurdish whenever they want to gossip. Therefore, she does not like them to use their L1 and argues that Kurdish is not a foreign language offered in school. She explains that she speaks English every once in a while, as teachers understand what she says, and this is an important subject in school. Participant 12 complains about the noise in the international class since a lot of her classmates talk during the lessons and it is hard for her to concentrate on the exercises. Participant 14 reports about an incident in the international class when it was really loud in the German class:

P14 *[Our IK-teacher, MS] is very nice and she speaks with eh (..) the class nice and so and they make it ugly and (..) and then I have// I have thinked and I have said "Oh God, what are they doing?" [...] "Why they make sad [our teacher, MS]?"*

Some students cause a lot of trouble which disappoints the German teacher; participant 14 reflects on the behavior of her classmates and she does not understand why the other ones behave in this manner since the teacher is nice

and well-liked by the students. Trouble often arises due to cultural differences; the students often see each other as "Kurds", "Yazidis" or "Russians" as noticed by participant 13:

P13 *They want// they don't have to be mean [...] and be (.) very (.) nice [...] the students from international class no matter what school [...] Russia or Ku// Kurdish (.) it doesn't matter all nations same.*

He would like the students to understand each other better, despite different backgrounds or beliefs. The diversity in background not only increases multiculturalism in the international class, but the entire school as well. The current thinking of "nations" or "ethnic groups" in the international class seems to impede group cohesion. By internalizing the concept at everyone is the "same" (P13) the students may change their behavior and become friendlier to each other.

Being Part of a Regular Class

A feeling of how easily one can integrate depends on the individual, the teacher, and the fellow students in the regular class. On one hand, participant 10 loves her regular class. She likes to be there and feels accepted even though her German is not perfect. That feeling is caused by her German classmates who see her as a normal member of the class:

P10 *[...] I have one friend// many friends, all are very nice, and we make come together [...] I am a student as well they say, "no you're a student too, no matter of you can't speak German, just try it."*

She feels supported by her class because they encourage her to speak German. This might have a positive effect on language-use anxiety. On the other hand, participant 14 describes a negative experience. In the beginning she had a nice German class where they talked to her and she felt welcomed. However, another

international student did not get along with their class, so they were forced to switch classes:

P14 *Yes, I think [the regular class, MS] a bit good, a bit not, because eh (.) the kids don't speak eh (.) I was in a different class once and the class was very nice [...] and eh they speak with me and so, but [another student, MS] said "I don't want that class, the class speaks out// not with me and I want another class" (.) and then [the teacher, MS] di// did say "okay, we make it different [...] [You, MS] go in that class and you go from [her, MS] class." [...] and that was not good for me because eh she took my class [...] and the kids were very, very nice with me, they had spoken and so [...] and the oth// other class doesn't speak with me. [...] Yes and that is a pity [...] and that is a bit (.) was// I was sad a bit, because that [the teacher, MS] cannot do [...] if that was my class [...] and now is [the other student, MS] happy and I am sad, because the kids don't speak with me and I cannot learn, but my// the other class, the kids have spoken to me, for example I didn't understand, they explained [...] and in this class they are not like this.*

The situation described above is not common, and the actions of the teacher can be criticized. However, it is hard being in a German class with children who do not speak or support a new student, especially if you are transferred to a class knowing that a previous student had the same problems. Participant 14 felt so uncomfortable, that skipping is the only option she saw:

P14 *I want to do the German, but to (.) sometimes I just go home [...] and I know that [the principal, MS] and [the teacher, MS] know [...] when I go home, but (.) I say (.) 'Whatever' because they did it (.) I didn't do it, because first time my class was very nice [...] and I always have gone in that class but this class is not very nice [...] and eh I don't go.*

She blames her teacher for her situation and still leaves school even when she knows that everyone is aware she is skipping class. It is a frustrating situation, since she wants to learn German and generally evaluated the regular class as positive.

Conclusion

The aim of the study was to explore the different learning situations of recently immigrated students in the international class and in the regular class. These learning situations are complex and influenced by the learner, the other students, and the teacher. Our first research question examined how the international students perceive the different learning situations. Many enjoyed the international class while the other students worked towards the same goal. This shows that the students were goal oriented and that the majority of students were willing to improve their German. Many students talked about their future goal being to either find work or receive a good degree. Furthermore, the students enjoyed learning content in their international class because they felt free to participate as the teachers and fellow classmates might be more accepting of grammatical errors since they have established a common norm system. Nilsson & Axelsson (2013) presented similar findings in their study; the international classes "provide for language and academic development" (Nilsson & Axelsson, 2013, pp. 158). Nevertheless, students with a decent level of prior schooling noticed that the content in the international class covered relatively easy topics due to insufficient language skills. Language competency influences topic choice; heterogeneity in age and prior schooling background forces the teacher to teach certain topics, although the level of foreknowledge is often diverse (Nilsson & Axelsson, 2013, pp. 158). This causes boredom for some students, however they still value German with content-learning since it helps them prepare for the regular class and therefore has relevance to reach their goal. Moreover, the

students appreciate to be taught like “normal students” in terms of covering topics from the national science curriculum.

Students positively evaluate the concept of action-oriented tasks. Some contrast it with their schooling experience in their home country since they have not experienced some of these teaching methods before. Furthermore, they say that it helps them understand science before learning the specific language; this approach of developing academic language through action language increases the likelihood of success in the science lessons. Moreover, working in groups or pairs is seen as positive by the students because they can explain and help each other (even using their native language if possible) in their group. The students describe cooperative goal structures in the international class since they help each other. Therefore, both the second and third research questions revealed that action-orientated tasks are suitable to understanding scientific content and build up language structures. Diehr (2016) established the Integrated Dynamic Model (IDM) describing language learning in combination with content learning. Lexical representations in the L1 and L2 interact with each other in terms of translating words from the one language into the other one; since some international students learn German terms in science that they have not encountered in their native language (e.g., microscope), they cannot resort to their L1 lexical representations. Furthermore, both linguistic resources interact with conceptual components as well. For example, when studying cell biology, students become familiar with how to use a microscope. This knowledge and the experiences the students have are now linked to the word “microscope”. Taking all these results into consideration, one can assume that Leisen’s model and action-orientated tasks help to build a conceptual component linked to lexical representation.

The fourth research question takes a look at the transition into the regular class. At the time of the interviews, no student was fully

integrated into the regular class; however, it is planned to place the students into the regular classes after the summer break. Most of the students participate in the regular class for at least a few hours every week. Some students sit in the regular class and work on their homework because they feel unable to participate, or cannot follow the lessons and get bored. There might be little to no satisfaction in the transition process for these students; moreover, they might have a feeling of low expectancy since they already experience how hard it is to follow the lessons in the regular class. However, many students are still eager to be part of a regular class and have the feeling that they can do it if they work hard enough. There were other negative experiences due to misunderstandings or an uncomfortable atmosphere created in the regular class. They were either caused by the teacher or the classmates. Teachers might have to work on their direct socialization of motivation (e.g., concerning how to give feedback). Participant 7 especially missed motivating feedback from the teacher. Goal orientation of the German students may cause problems as those in the upper regular classes have to study for exams, and feel pressure concerning their educational career. This could trigger unwelcoming behavior as they might see international students as a hindrance because they require more support and slow the pace of the class. This displays the extent of how great an impact other students and the teachers might have on international students to create a pleasant atmosphere; since immigrants have gone through many hardships in the last few years, it is important for German students to be aware of this.

Integrating into regular classes is seen as positive by students, but they want to reach a decent level of language competency before being transferred. Facing content-learning in a foreign language can be frustrating and boring if the teachers do not provide linguistic help for international students. However, most teachers are not trained for “German as a second language” students and might not feel like they

have time to provide special support. Since the project “Biology for Everyone” has been evaluated positively, it is of great interest to publish the teaching materials (e.g., Schmiedebach & Wegner, 2018a) in order to help other teachers. Moreover, we can only encourage other practitioners to start content-learning in international classes to provide a wider range of subjects and to help students integrate into the regular system. Concerning further research, it is of interest to investigate the language levels students from international classes with content-learning achieve in comparison to classes with only language learning. Therefore, a questionnaire deriving from these predefined categories is currently being developed and will be used in local schools. We would like to investigate the extent to which certain aspects are a broad phenomenon (e.g., language-use anxiety in the regular classroom) and if there are differences in new students depending on if they have content learning in the international class or not.

Notes

1. The German school system is divided into different secondary schools with different levels (e.g., certain schools allow students to attend university). Newly arrived students are not assigned to schools according to prior schooling and content knowledge, but rather due to space availability. Therefore, students might have to change schools after full-integration as they may not fit in the school of their preparation class.
2. **Content and Language Integrated Learning** (Breibach, 2013, pp. 11).
3. Foreign language means a language one learns in school, whereas a second language is learned in the speaking country and is used in everyday life.
4. The integration of content and language learning is summarized using the acronym CLIL (content and language integrated learning). The implementation of CLIL within the project is described in Schmiedebach & Wegner (2018b).
5. In discussing migration as a motivational factor in foreign language classes, Fischer (2014) refers to the entire spectrum from working to forced migration.
6. The Abitur is the highest secondary school exit examination; with the Abitur, students are able to go on to university. There are certain requirements to be able to take the Abitur (e.g., studying two foreign languages, usually one of them is English).

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References

- Ahrenholz, B., Fuchs, I., & Birnbaum, T. (2016). “dann haben wir natürlich gemerkt der übergang ist der knackpunkt” - Modelle der Beschulung von Seiteneinsteigern in der Praxis [“then we have obviously noticed that the transition is the crucial point” - Models of education newly arrived students in the praxis]. *BiSS-Journal*, 5. Retrieved from http://www.biss-prachbildung.de/pdf/Evaluation_Sekundarstufe.pdf
- Beers, S. R., & De Bellis, M. D. (2002). Neuropsychological function in children with maltreatment-related posttraumatic stress disorder. *American Journal of Psychiatry*, 159(3), 483–486.
- Bialystok, E., & Hakuta, K. (1994). *In Other*

- Words. New York: Basic Books.
- Breidbach, S. (2013). Geschichte und Entstehung des Bilingualen Unterrichts in Deutschland: Bilingualer Unterricht und Gesellschaftspolitik [History and emergence of bilingual education in Germany: bilingual education and social policy]. In W. Hallet, & F. G. Königs (Eds.), *Handbuch Bilingualer Unterricht* (pp. 11–17). Seelze: Friedrich Verlag GmbH.
- Bundesamt für Migration und Flüchtlinge [Federal Office for Migration and Refugees]. (11. Januar 2017). *Aktuelle Zahlen zu Asyl [Current numbers on asylum]*. Retrieved from [http://www.bamf.de/SharedDocs/Anlagen/DE/Downloads/Infothek/Statistik/Asyl/aktuelle-zahlen-zu-asyl-dezember-2016.pdf? blob=publicationFile](http://www.bamf.de/SharedDocs/Anlagen/DE/Downloads/Infothek/Statistik/Asyl/aktuelle-zahlen-zu-asyl-dezember-2016.pdf?blob=publicationFile)
- Crookes, G., & Schmidt, R. W. (1991). Motivation: Reopening the Research Agenda. *Language Learning*, 41(4), 469–512.
- Deci, E., & Ryan, R. (1993). Die Selbstbestimmungstheorie der Motivation und ihre Bedeutung für die Pädagogik [Self-determination theory of motivation and its significance for pedagogy]. *Zeitschrift für Pädagogik*, 39, 223–238.
- Diehl, E., Christen, H., Leuenberger, S., Pelvat, I., & Studer, T. (2000). *Grammatikunterricht: Alles für die Katz? [Grammarlessons: All a waste of time?]* Tübingen: Narr.
- Dörnyei, Z. (1994). Motivation and Motivating in the Foreign Language Classroom. *The Modern Language Journal*, 78(3), 273–284.
- Dörnyei, Z. (2005). *The Psychology of the Language Learner. Individual Differences in Second Language Acquisition*. Mahwah, NJ: Erlbaum.
- Dressler, A., & Gereluk, D. (2017). *A review of the literature on the educational situation of Syrian refugee students with a focus on refugee education best practices*. Von Calgary: University of Calgary, Retrieved from <http://hdl.handle.net/1880/52145>
- Dulay, H., & Burt, M. (1972). *You Can't Learn without Goofing: An Analysis of Children's Second Language "Errors"*, Retrieved from <https://files.eric.ed.gov/fulltext/ED066981.pdf>
- Dulay, H., & Burt, M. (1974). You Can't Learn without Goofing. In J. Richards (Ed.), *Error Analysis. Perspectives on Second Language Acquisition* (pp. 95–123). London: Longman.
- Fischer, A. (2014). *Motivationen im frühen Zweitspracherwerb [Motivation in early second language acquisition]*. Tübingen: Narr Francke Attempto Verlag GmbH + Co. KG.
- Fries, C. (1945). *Teaching and Learning English as a Foreign Language*. Ann Arbor: MI: University of Michigan Press.
- Gebhard, U. (2013). *Kind und Natur: Die Bedeutung der Natur für die psychische Entwicklung [Children and nature: the relevance of nature für psychological development]*. Wiesbaden: Springer.
- Gibbons, P. (2006). Unterrichtsgespräche und das Erlernen neuer Register in der Zweitsprache [Classroom talks and the acquisition of new registers in the second language]. In P. Mecheril, & T. Quehl (Eds.), *Die Macht der Sprachen. Englische Perspektiven auf die mehrsprachige Schule* (pp. 269–290). Münster u.a.: Waxmann.
- Gropengießer, H. (2006). Erkunden und Erkennen [Exploring and discovering]. In D. Eschenhagen, U. Kattmann, & D. Rodi (Eds.), *Fachdidaktik Biologie* (pp. 239–270). Köln: Aulis Verlag Deubner.
- Johnson, D. W., Maruyama, G., Johnson, R. T., Nelson, D., & Skon, L. (1981). Effects of cooperative, competitive and individualistic goal structures on achievement: A meta-analysis. *Psychological Bulletin*, 89(1), 47–62.
- Julkunen, K. (1989). *Situation- and task-specific motivation in foreign-language learning*

- and teaching. Joensuu: University of Joensuu publications in education.
- Klein, W. (1984). *Zweitspracherwerb* [second language acquisition]. Königstein: Athenäum.
- Kuckartz, U., Dresing, T., Rädiker, S., & Stefer, C. (2008). *Qualitative Evaluation. Der Einstieg in die Praxis* [Qualitative evaluations: first steps into practice]. Wiesbaden: VS Verlag für Sozialwissenschaften.
- Lado, R. (1957). *Linguistics Across Cultures*. Ann Arbor: University of Michigan Press.
- Mayring, P. (2010). *Qualitative Inhaltsanalyse* [Qualitative content analysis]. Weinheim: Beltz.
- Meisel, J. (2000). On Transfer at the Initial State of L2 Acquisition. In C. Riemer (Eds.), *Kognitive Aspekte des Lehrens und Lernes von Fremdsprachen. Festschrift für Willis J. Edmondson zum 60. Geburtstag* (pp. 186–206). Tübingen: Narr.
- Meisterfeld, B. (2016). Schule, Flüchtlinge und Deutsch als Fremdsprache [School, refugees and German as a second language]. *Schulpädagogik heute*, 7(13), 202–207.
- Mercator-Institut für Sprachförderung und Deutsch als Zweitsprache und vom Zentrum für LehrerInnenbildung der Universität zu Köln. (2015). Neu zugewanderte Kinder und Jugendliche im deutschen Bildungssystem [Newly arrived children and teenagers in the German education system]. Retrieved from http://www.mercator-institut-sprachfoerderung.de/fileadmin/Redaktion/PDF/Publikationen/MI_ZfL_Studie_Zugewanderte_im_deutschen_Schulsystem_final_screen.pdf
- Montalvo, G. P., Mansfield, E. A., & Miller, R. B. (2007). Liking or Disliking the Teacher: Student Motivation, Engagement and Achievement. *Evaluation and Research in Education*, 20(3), 144–158.
- Müller, N., Kupisch, T., Schmitz, K., & Cantone, K. (2011). *Einführung in die Mehrsprachigkeitsforschung* [introduction to multilingualism research]. Tübingen: Narr.
- Nilsson, J., & Axelsson, M. (2013). “Welcome to Sweden”: Newly Arrived Students’ Experiences of Pedagogical and Social Provision in Introductory and Regular Classes. *International Electronic Journal of Elementary Education*, 6(1), 137–164.
- Odlin, T. (1989). *Language Transfer: Cross-linguistic Influence in Language Learning*. Cambridge: Cambridge University Press.
- Riemer, C. (2010). Motivation. In W. Hallet, & F. Königs (Eds.), *Handbuch Fremdsprachendidaktik* (pp. 168–172). Stuttgart: Klett - Seelz: Kallmeyer.
- Schlak, T., Banze, K., Haida, J., Kilinc, T., Kirchner, K., & Yilmaz, T. (2002). Die Motivation von DaF-Lernenden an Sprachlehrinstituten im Bielefelder Raum: Projektbeschreibung und erste Ergebnisse [Motivation of GSL-Learners in language learning centers in Bielefeld: Project description and first results]. Retrieved from *Zeitschrift für Interkulturellen Fremdsprachenunterricht*: <http://tujournals.ulb.tu-darmstadt.de/index.php/zif/article/view/572/548>
- Schmiedebach, M., & Wegner, C. (2018). Pflege für unsere Lippen - Sprachsensibler naturwissenschaftlicher Unterricht [Care for our lips - language sensitive science education]. *Schulmagazin 5-10*, 86(2), 17–22.
- Schmiedebach, M., & Wegner, C. (2018, submitted). Hands-on science projects increase language acquisition and motivation in recently immigrated students. *Nordic Studies in Science Education*.
- Selinker, L. (1972). Interlanguage. *International Review of Applied Linguistics in Language Teaching (IRAL)*, 10(3), 209–231.
- Selinker, L., Swain, M., & Dumas, G. (1975). *The*

Interlanguage Hypothesis Extended to Children. Language Learning, 25, 139–152.

Slavin, R. (1988). Cooperative Learning and Student Achievement. *Educational Leadership, 47(4)*, 31–33.

Toth, S. L., & Cicchetti, D. (1998). Remembering, forgetting, and the effects of trauma on memory: A developmental psychopathology perspective. *Development and Psychopathology, 10(4)*, 589–605.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Wagener, A. (1992). *Biologie unterrichten* [Teaching biology]. Heidelberg Wiesbaden: Quelle & Meyer Verlag.

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