

# Learning in Two Languages: A Long-Term Study at Bavarian Bilingual Elementary Schools

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## ABSTRACT

*In the school years 2015/2016 and 2018/2019, the authors accompanied and evaluated 21 public elementary schools in Bavaria, Germany, in a research collaboration with the Bildungspakt Bayern Foundation about bilingual (German/English) instruction in German elementary schools. The goal was to investigate how high the potential of implicit teaching and learning in a bilingual primary context is. Altogether, over 900 students, parents, and 42 teachers participated in the empirical long-term study (over 5 years) Learning in Two Languages – Bilingual Elementary School English. The findings not only show that students taught in the bilingual classes have a foreign language advantage and perform at least as well in mathematics and German as students in regular classes do, but also that they have a very positive attitude towards learning English in elementary school. These findings, the study, and its theoretical background are aimed to be portrayed in short in this chapter.*

Keywords: Bilingual Education, Learning in Two Languages, Elementary School, English, Language Development, Language Acquisition, Immersion, Implicit Learning and Teaching

## INTRODUCTION

Current research results prove that children and adolescents growing up bilingual or multilingual have considerable competence advantages compared to their peers with regard to concentration, complex thinking and linguistic creativity (Festman & Schwieter, 2019; Franceschini, 2016)

In 2015, the Bildungspakt Bayern Foundation, together with the Bavarian State Ministry of Education and Cultural Affairs, initiated the school experiment *Learning in Two Languages – Bilingual Elementary School English*. One bilingual class per grade was gradually established at 21 participating model schools. From grades 1 to 4, students receive instruction in the subjects of local history and general studies, mathematics, art, music, and physical education in two languages (Bayerisches Staatsministerium für Unterricht und Kultus, 2021).

The lessons in the bilingual classes are based on the competency expectations formulated in the subject curricula of the LehrplanPLUS Grundschule, the German curriculum in place (Staatsinstitut für Schulqualität und Bildungsforschung, n.d.). When suitable topics and occasions such as e.g. intercultural learning or creative task formats arise, teaching units or lessons in the above-mentioned subjects are conducted in English. The specific thematic selection for the English language phases is made by the respective teachers based their knowledge of the learning group and is their pedagogical responsibility. The teaching of the English language is implicit. The assurance of the German technical terms as stated in the LehrplanPLUS is guaranteed. The lessons in the bilingual classes are taught according to the given timetable, i.e. without additional time quotas or afternoon classes. Admission to a bilingual class is voluntary upon application by the parent or guardian in accordance with the applicable class formation guidelines.

The first cohort was scientifically monitored from the beginning to the end of primary school (grades 1 to 4), the second cohort from grades 1 to 3. The scientific, comprehensive evaluation included annual surveys with questionnaires (students, teachers, parents, school administrators), standardized tests in English, mathematics and German, classroom documentation, observations and guided interviews.

The main goal of the project was to investigate how high the potential of implicit teaching and learning in a bilingual primary context is. The subgoals can shortly be outlined as follows:

1. Enhanced foreign language learning without compromising learning success in German and in subject matter:
  - a. English proficiency at the end of grade 4 at least at level A1 of the Common European Framework of Reference for Languages (CEFR)
  - b. Competencies in German and mathematics that are at least equivalent to the level of students in regular classes
2. Developing a concept of Learning in Two Languages in elementary school:
  - a. Development and testing of a suitable concept for bilingual instruction (German/English) in grades 1 to 4, based on the LehrplanPLUS elementary school curriculum
  - b. Empowering teachers to design appropriate instructional implementations
  - c. Development of suitable profile-building measures for the design of a school profile *Bilingual Elementary School English*
  - d. Acceptance of the school profile in the school family (students, parents, school management, teachers)

The school experiment *Bilingual Elementary School English* is unique and not comparable with any research in Germany or pan-European countries as it takes into account the importance of English as an international lingua franca in business and science. In addition to the early promotion of the kids' multilingualism, primary school pupils are supported in the development of their intercultural competence.

Thus, the main focus of this chapter is to present an overview of the school experiment and its results and to introduce the related didactic principles, as these serve as a basis for teacher training regarding bilingual education. The subsequent objectives of this chapter are the elaboration of the didactic concept of Learning in Two Languages against the background of the discussion about bilingual teaching in elementary school, the presentation of the school experiment and the empirical long-term study over 5 years as well as the summary of the most important results and findings with regard to the further development of a general language continuum in elementary school.

## **BACKGROUND**

### **Concepts of Bilingual Education**

The identification of a suitable concept of bilingualism in the school context is significant as a first step. The next step is to develop educational policy standards that define the mandatory framework for bilingual learning.

Currently, bilingual concepts across grades are still characterized by inconsistent terminology and differing didactic procedures as well as varying proportions of the two languages in the classroom. The four main orientations of so-called bilingual learning include:

1. Content and Language Integrated Learning (CLIL),
2. Bilingual Subject Teaching,
3. Immersion as well as
4. Learning in Two Languages.

A close analysis of the definitions of these concepts in the relevant literature reveals that they show clear overlaps in the essential aspects.

In the following, relevant definitions as well as the description of the essential focuses of the mentioned concepts will serve to identify and locate the concept of *Bilingual Elementary School* in Bavaria.

### ***CLIL and Bilingual Subject Teaching***

A special form of foreign language learning at the secondary level in German schools is "bilingual teaching" (Bili, BIU) or "subject teaching in a foreign language". On a European and international level, the term CLIL – Content and Language Integrated Learning – has become established, marking the two reference poles of subject content and foreign language competence (BIG-Kreis, 2011, p. 9).

CLIL stands out as the overarching concept of a flexible interplay between language and subject teaching:

*CLIL is an umbrella term adopted by the European Network of Administrators, Researchers and Practitioners (EUROCLIC) in the mid 1990s. It encompasses any activity in which a foreign language is used as a tool in the learning of a non-language subject in which both language and subject have a joint role. (Marsh, 2002, p. 58)*

The aspect of the lifelong, dynamic language continuum plays a crucial role in CLIL:

*CLIL is a lifelong concept that embraces all sectors of education from primary to adults, from a few hours per week to intensive modules lasting several months. [...] In short, CLIL is flexible and dynamic, where topics and subjects – foreign languages and non-language subjects – are integrated in some kind of mutually beneficial way so as to provide value-added educational outcomes for the widest possible range of learners. (Coyle et al., 2010, p. 3)*

CLIL does not simply mean teaching a subject in a foreign language, but requires its own didactics:

*It is obvious that teaching a subject in a foreign language is not the same as an integration of language and content... language teachers and subject teachers need to work together... [to] formulate the new didactics needed for a real integration of form and function in language teaching. (Marsh, 2002, p. 32)*

The "new" CLIL didactics works against a paradox: The students usually do not have sufficient knowledge of the foreign language, which would be necessary for a productive examination of the respective subject content.

*[CLIL is] ... an approach to bilingual education in which both curriculum content (such as science or geography) and English are taught together. It differs from simple English-medium education in that the learner is not necessarily expected to have the English proficiency required to cope with the subject before beginning study. (Graddol, 2006, p. 86).*

In the native language, however, the subject content can be imparted and processed at a high level appropriate to the age. In relation to early bilingual instruction, such an effect is reinforced.

To counter this, various slightly modified and less time-consuming and less didactically complex concepts have already been proposed, for example, so-called "CLIL showers" (Ioannou-Georgiou, 2011, p. 16): these are temporary (up to 50% of the teaching time in the subject) teaching units in the CLIL target language, based on the immersion concept or the idea of a language bath, which includes authentic,

but manageable language situations. Since other contents of the same subject are taught in another language, the basic bilingual idea is still visible here.

Bilingual teaching, or so-called Bilingual Subject Teaching, is an established concept at the national level in Germany, especially in high schools:

*In German states, bilingual instruction is basically understood as subject instruction in the non-language subjects in which a foreign language is predominantly used for the subject discourse. (Kultusministerkonferenz [KMK], 2006, p. 3)*

Bilingual Subject Teaching excludes the explicit teaching of the foreign language:

*Bilingual teaching refers to a form of second language teaching in the school environment in which the subjects are taught in the foreign language (L2) as the language of instruction [...]. In concrete terms, this means that subjects such as mathematics, subject teaching, music, etc. are taught exclusively in the foreign language. The foreign language itself is no longer the subject of the instruction. (Kersten, 2005, p. 22)*

The foreign language serves as the working language in Bilingual Subject Teaching:

*Bilingual education means the use of foreign languages as working languages in non-language subjects. (Christ, 2003, p. 108)*

In some cases, the terms CLIL and Bilingual Subject Teaching are also used synonymously in academic discourse, although the acronym CLIL is broader in scope and more common internationally. In CLIL models, the emphasis is placed on application and the teaching of intercultural competencies.

In elementary school, for example, topics are dealt with in foreign language lessons that do not exclusively serve language acquisition, but at the same time aim at the acquisition of knowledge and skills in non-language teaching areas. This can be supplemented and deepened in German-language lessons.

Both concepts, CLIL and Bilingual Subject Teaching, contain not insignificant structural weaknesses. Although language acquisition is a completely individual, non-linear and a largely uncontrollable process, the CLIL concept is based on a static theoretical framework. The basic principle for any language teaching is to teach language with authentic and relevant content. A contentless language or language use is meaningless. The artificial separation of content and language (Content/Language) in the term CLIL is therefore illogical and not remedied by the fact that the term seems to actively connect two concepts that relate to each other anyway and quite naturally. An artificial separation of language and content is also inaccurate from the point of view of language acquisition theory; it cannot be automatically generalized and is unnecessary. The so-called Bilingual Subject Teaching, too, is inconsistent and contradictory conceptually; however, it is usually conducted monolingually in English or in the respective foreign language.

## **Immersion**

Following the Canadian model of immersion education, all subjects, except the mother tongue, are taught in the foreign language for four years. In a weakened form, there is the so-called "parity model", half of all subjects are offered in the native language and half in the foreign language.

The mental image associated with immersion is usually that of the language bath:

*'Immersion' has its origin in the word 'to immerse', such that this concept is generally understood as a 'language bath' in which the children are immersed. (Kersten, 2010, p. 4)*

Immersion is often described as a form of bilingual education, e.g.:

*[Immersion is] a form of bilingual education that aims for additive bilingualism by providing students with a sheltered classroom environment in which they receive at least half of their subject-matter instruction through the medium of a language that they are learning as a second, foreign, heritage, or indigenous language. In addition, they receive some instruction through the medium of... [the majority language] in the community. (Lyster, 2007, p. 8)*

It is precisely the image of the language bath that mistakenly leads one to view the concept as monolingual instruction in the foreign language. Viewed in a more differentiated way, it reads as follows:

*The term immersion is used as a subcategory of bilingual education in Canadian literature. A concept is called immersion when at least 50% of the instruction is in the second language (Genesee 1987: 1). This therefore corresponds to a particularly intensive form of bilingual education. Immersion [...] is used in this context as 'immersion in the language bath of the foreign language'. In this context, the lessons follow exactly the curriculum of the respective mainstream school (Zydati 2000: 27 f.). (Kersten, 2005, p. 22)*

The immersion concept is based on intuitive, implicit foreign language learning:

*In practice, immersion means that as many subjects as possible are taught in the target language in order to generate an approximately natural language acquisition of an L2 'along the way', so to speak. (Burmeister, 2006, p. 197)*

Immersion programs, similar to CLIL programs, are flexible:

*On the one hand, there are programs in which sporadic foreign language units, called CLIL modules, are taught in subject teaching. On the other hand, there are programs with immersion, in which a substantial part of the subject lessons is taught in a foreign language during the entire elementary school period. (Massler & Burmeister, 2010, p. 7-8)*

There are positive findings from accompanying scientific research on immersive English instruction in elementary schools (cf. Kersten, 2010, p. 6). Nevertheless, immersion teaching in its fully comprehensive form is not feasible in Germany at present or will be in the near future, whether looking at day care centers or elementary schools. Among other things, this is because of a lack of institutionalized follow-ups in secondary schools and the shortage of trained educators or teachers. Less dogmatic immersion approaches, especially with targeted explicit inclusion of systematically taught literacy, are also significant in developing bilingualism in the school classroom (cf. Pliatsikas et al., 2014).

The concept "Learning in Two Languages" (BIG-Kreis, 2011), which is also the name giver and first concept template for the school experiment *Learning in Two Languages - Bilingual Elementary School English* on which this article is based, has a much lower threshold than CLIL, Bilingual Subject Teaching and Immersion. However, combines important, age-appropriate aspects of these approaches: Here, subject content is identified that is appropriate for the target group as well as in accordance with the subject-specific training of the teachers. This can, on the one hand, be taught concretely and can thus also be easily visualized, and on the other hand, it can be taught implicitly in the foreign language with little language capabilities needed. The concept is not only suitable for the primary level, but also as a basis for a bilingual program in preschool institutions.

This approach is often implemented across all types of schools, even without comprehensive conceptual support, since it is open and overall has a low threshold didactically: the only foreign language didactic requirement is the implicit approach without explicit teaching of linguistic content, such as vocabulary and grammar. The didactic focus is on the following aspects, among others:

- Explicit explanations move into the background, while independent and individual meaning identifications of facts and linguistic rules move into the foreground
- In particular, vocabulary and grammatical structures are taught implicitly
- Relevant content that can be implemented in foreign languages is specifically selected
- Targeted feedback and feedforward is included to support language development
- Language activation and language reception are balanced, communicative competencies that develop in parallel manners
- Native/first languages are specifically promoted and developed

At its core, the Learning in Two Languages concept is about designing modularized foreign language learning opportunities that take individual circumstances into account and are tailored to local conditions.

The teachers decide in which phases of the lesson they will teach in English and in which phases in German. In doing so, they can always keep the individual framework conditions of the class in mind.

## **A Brief Overview of the State of Research**

The state of research on bilingual learning and its impact in elementary school is generally deficient. However, representative studies from secondary school support the assumption that students who participate in bilingual subject instruction generally have a demonstrably better foreign language proficiency level than their peers who did not attend bilingual subject instruction (cf. Bredenbröker, 2002; Burmeister, 1998; Wode et al., 1996; Zydati, 2004). The largest study to date in this area is the DESI study (Deutsch-Englische Schülerleistungen International, translated: German-English Student Achievement International) from 2006, which certified that ninth graders in the bilingual classes examined were up to one and a half years ahead of those taught monolingually regarding communicative competence (cf. Deutsches Institut für Internationale Pädagogische Forschung [DIPF], 2006, p. 60). The result of the study is summed up in the report of the German Institute for International Educational Research: "Students in bilingual classes have a very clear competence advantage in all areas. In particular, they progress almost twice as fast as other classes in listening comprehension" (DIPF, 2006, p. 60).

Similar evidence is available for the pilot project *Bilinguale Züge* at Bavarian secondary schools: The students in the bilingual classes acquired significant gains in knowledge and competence in English as a foreign language compared to their regularly taught peers. In a comparison of performance, the bilingual classes were even able to recall knowledge content in the subject areas more soundly and over a longer period of time. In addition, the bilingual classes performed significantly better in English than their Bavarian peers in the centrally set final exams (cf. Böttger & Rischawy, 2016; Rischawy, 2016). Considering a language acquisition perspective, significant assertions regarding growing up bilingual are available (cf. Böttger, 2017). In summary, the picture is positive:

Two languages can be efficiently processed by the child's brain at an early age (cf. Pierce et al., 2014). In particular, measurably increased and faster partial brain maturation and early cognitive decision-making abilities (Poulin-Dubois et al., 2011) show this. In addition, significantly higher concentration abilities when blocking out interfering factors are, too, particularly pronounced and consequently (cf. Antón et al., 2014). In addition, rapidly developing, clear advantages in school performance, more precisely in linguistic learning performance, emerge in 8- to 11-year-old multilingual school children compared to monolingual peers (Poarch & Bialystock, 2015). Another added value of early bilingualism for further language learning in higher grades is: Newly added foreign languages are processed at the same neural location in the brain and thus arguably seem to be integrated and learned more easily, quickly, and efficiently (Nitsch, 2007; Wattendorf et al., 2001).

Learning in two languages is therefore possible and advantageous for elementary school students and takes into account important child potentials and predispositions (cf. Franceschini, 2008). These lie in cognitive potentials such as early learning strategies, also in other learning areas such as mathematics, early parallel alphabetization even at preschool age (cf. Böttger, 2013), as well as early language awareness and the associated qualitative processing of language in pronunciation and sentence structure.

## **Didactical Project Principles**

The following principles form the basis of the Learning in Two Languages teaching concept and form both an elementary basis for teacher training. The didactic principles were presented, explained and supported with practical examples within regular training sessions for teachers at all model schools participating in order to establish a comparable teaching concept and to create the prerequisites for fulfilling the goals of the school experiment as well as for the comparability and validity of the results. In order to ensure that the study is comprehensible and that the principles can also be used in future teacher training courses, they are described in more detail below.

### ***Contextualization and Scaffolding Support Independent Understanding and Meaning Identification***

The contextualization of content through extensive use of gestures, facial expressions, and body language leads to implicit, independent identification of semantic content when, for example, absorbing and processing vocabulary and structures. Such "Negotiation of Meaning" is also supported by child-friendly media, such as realia, picture books, films or the activation of the students' background knowledge in German or English.

Contextualization is supported by targeted scaffolding. This can, for example, be realized through linguistic redundancies and many repetitions in the subject lessons in English. In addition, this can be supported by repetition of certain routines in specific subjects as well as the structuring of everyday school life in English.

### ***Aesthetics Increase Linguistic Receptive Capacities***

Multisensory learning or learning with all senses has been known as a concept for a long time. Successful learning in two languages goes beyond this: The identification of subject content is not only done with a view to linguistic "feasibility", but via possible positive sensory experiences. Such an aesthetic is created through constant exposure to things relevant to the subject that can be discovered, labeled, and commented upon. Things that are perceived as "beautiful" are interesting, motivating, and easier or longer to retain.

### ***Positive Feedback / Feedforward Sustainably Supports Individual Language Development***

The psychological-pedagogical concept of positive reinforcement through feedback is supplemented by a targeted feedforward. This is realized through indirect but concrete and constructive corrections and additions to children's speech production. This is preferably done using the correct speech model in comments on the content of the utterances or through paraphrasing.

### ***Differentiate, Individualize, Include Means Cooperate and Participate***

Participation in *Learning in Two Languages – Bilingual Elementary School English* is best realized through inclusive, cooperative, and skill-balancing forms of learning. Tutoring and peer-teaching, for example, are efficient differentiation methods.

### ***A Balance Between Language Activation and Language Reception Requires New Foreign Language Didactic Planning Patterns***

An overriding goal of *Learning in Two Languages – Bilingual Elementary School English* is learner activation. Progression in this regard is made possible primarily by providing enriched foreign language input with a great deal of linguistic redundancy and repetition.

Subject-specific authentic but manageable language situations (an "educational language bath") as well as diverse classroom situations with intensive communication in and about the subject form the basis for interactions, linguistic actions and an orientation towards the learning product.

The language requirements are ideally just above the individual language ability of the students ( $N + 1$ ), a quasi-calculated challenge. Task formats and learning level assessments are based on this.

As many language aids (scaffolding; method tools) are correct as are needed for the endeavor for successful, but not necessarily error-free, mastery of the language situations.

### ***Teaching Vocabulary and Grammar Implicitly is Natural Language Acquisition***

Targeted language work with explicit vocabulary work (e.g., pronunciation practice and correction) and grammar explanations remains the domain of regular English classes beginning in grade 3. When learning in two languages, the acquisition of linguistic competence happens implicitly, quasi "in passing". For an increasingly communicative orientation, verb forms in particular are necessary for intuitive sentence

formation. Special technical terms from the subject content are processed more effectively in English if the meaning or the accompanying concept has been grasped in the school language German. This means that the English-language part of learning in two languages should be located primarily in immersion phases. Introductory phases are appropriate when the concept formation can be extraordinarily "supported". As a general rule, unknown vocabulary is taught when the content is known.

### ***Communicative Competencies Develop in Parallel, Do Not Form a Separate Focus***

Linguistic and intercultural competencies develop naturally and implicitly when learning in two languages. The strong progression of listening comprehension makes clearly challenging texts possible, including, for example, communicative, less order-oriented classroom management.

In interactive task formats based on dialogization, reproductive and increasingly "free" speech develops rapidly beyond language switching and interlanguage.

Reading and writing form an important area of competence for subject teaching. The transition from *learning to read* to *reading to learn* is pointedly developed through reading and writing exercises beginning in grade 3. For grades 1 and 2, examples include labeling, concrete poetry, hand-eye coordination exercises, or fine motor skills exercises. Students quickly form their own hypotheses regarding linguistic orthography. These are best countered by offering correct writing implicitly or with individual, targeted cues as needed. Intercultural learning is implicit in the choice of topics and texts, as well as in the specific choice of language (e.g., forms of politeness). In addition, communicating in a foreign language offers an implicit intercultural learning situation as students need to rightly decode the language input and apply their knowledge of or experience with cultural features themselves (e.g. directness).

### ***An English-language Subject Lesson is Language-sensitive***

The goal of teaching subject matter in English is to understand concepts of subject content. In order to create authentic language situations at the appropriate language and subject level for these learning situations, which at the same time promote the acquisition of subject-specific and linguistic competence, tasks are designed and learning materials or methodological procedures are created (e.g. change of presentation forms, standard language situations, language aids).

Educational language, technical language and everyday language form the language(s) of instruction. The students' formulations are to be evaluated primarily as the language of the comprehension process, not of what is understood. An understood statement cannot be formulated more precisely than the respective linguistic competence of the speaker allows (bilingual paradox). The formulations become more technical with increasing expertise (also via meta-reflection).

### ***Gamification is Not Language-oriented, but Subject-oriented***

When learning in two languages, playing is not done for the sake of playing, but serves the acquisition of subject-specific, linguistic competencies. The focus is on subject-specific content. Especially when speaking about the subject matter in playful forms of dialogue, role plays, discussions, expressions of opinion, etc., the subject matter is effectively processed.

### ***Learning in Two Languages Requires the Full Development of the Native / First Languages***

Learning in two languages takes place with the school language German, which is also usually the mother tongue, and the English language. Other first/native/second and, if necessary, other languages are taken into account in an appropriate form depending on the individual context. Cooperation in lesson planning, involvement of parents, etc. ensures that the bilingual students have further access to possible, already developed linguistic references. If these are missing, for example, in the case of students with a migration background, an important cognitive basis for the acquisition of further languages is missing.



## **METHODS**

The evaluation measures described below were implemented in different formats and rhythms during the first 4 years of the project (school year 2015/2016 to school year 2018/2019):

### **Documentation of the English-language Proportion of Instruction by Teachers**

Teachers volunteered to document the proportion (minutes) of English-language instruction over several weeks. The implementation took place annually.

### **Observations/Work Shadowing**

Classroom visits were conducted by the Catholic University of Eichstaett-Ingolstadt in the first and second year of the project and were carried out with the help of already validated questionnaires for classroom observation and input quality of instruction (ELIAS study 2008-2010) (Kersten, 2010).

### **Reflective Conversation**

Qualitative interviews were conducted, in conjunction with the above observations: Teachers were interviewed regarding their experiences in the classroom; students, parents and principals were also interviewed with regard to their experiences. The interviews were conducted by the Catholic University of Eichstaett-Ingolstadt in the first and second year of the project.

### **Written Language Tests**

The areas tested were listening comprehension, reading comprehension, communicative competence (speaking) and writing (only from grade 2). The test formats show progressions in the requirements. Selected parts of the *Cambridge English Tests For Young Learners* (STARTERS, adapted) were used to test English language skills in Year 1; these have already been validated and thus offer the possibility of comparison with students outside the school experiment. In grades 2 and 3, an adapted form of the BIG test (ELEK 4) was used, which has been validated several times and offers nationwide comparative data (BIG-Kreis, 2015).

The test areas of listening comprehension and reading comprehension were taken in abbreviated form from the EVENING study (Engel, 2009), which has also been validated several times, while the tasks in the subareas writing and speaking were newly constructed for the BIG test. The BIG test is based on the language competence level A1, which should be reached by all students by the end of primary school. For the school experiment, the test had already been used two and one year earlier (in grades 2 and 3, respectively); it provides evidence that the relevant competency targets have been met. At the end of the project, an adapted Cambridge test was used again in grade 4, consisting of the MOVERS and FLYERS test formats. Thus, at the end of grade 4, the test was taken at the A1 to A2 competence level, which exceeds the competence target to be achieved in elementary school.

### **Oral Language Tests**

Five pairs of students per class, which were chosen randomly, took part in the communicative competence (speaking) tests, what amounts to a total of approximately 200 children per school year or approximately 100 pairs. The survey took place in grades 1, 2, and 4 in the first cohort and in grade 1 in the second cohort. Testing was done using an adaptation of the BIG tests and the *Cambridge* tests for each grade.

### **Elicitation of Competencies in the Subjects German and Mathematics**

Tests in German (VERA 3, Hamburger Schreib-Probe 4/5) and Mathematics (VERA 3, DEMAT 2 and 4) were conducted with all students, which were made available to the university for the evaluation of the school experiment. All students completed these tests. The VERA data were provided to the Catholic University of Eichstaett-Ingolstadt by the State Institute for School Quality and Educational Research

(ISB) for evaluation. The DEMAT 2 and 4 surveys and the Hamburg Schreib-Probe (writing test) were conducted separately and submitted to the university by the schools in the form of anonymized results.

### **Surveys (Quantitative)**

In addition, surveys of all groups of people involved (teachers, parents, students and school administrators) were conducted at annual intervals. These were conducted as online surveys (teachers and school administrators) or as pen & paper surveys (parents, children). The number of subjects varied by group and by project year. The content and objectives of the surveys depended on the particular group of people. On the one hand, the questionnaire for students included questions about teaching in general, questions about bilingual teaching, questions about English teaching, and questions about family background. The questionnaire for teachers, on the other hand, dealt with experiences from the school trial in general, didactic experiences, or suggestions for optimization, and the questionnaire for school administrators covered experiences from the school trial (implementation, realization, reactions). Finally, the questionnaire for parents addressed experiences from the school experiment in general, experiences with learning in two languages, experiences from teaching English, conclusions about the school experiment as well as background of the parents (language use, English skills).

### **MAIN FINDINGS**

In the following, the most important research results of the accompanying evaluation of the school experiment are presented. A large part of the data, its analysis and interpretation must remain unmentioned at this point due to the available space.

### **The Foreign Language Advantage of Bilingually Taught Students IN ENGLISH is Comparatively Very Clear**

In the competence areas listening comprehension English, reading comprehension English and writing English, the students examined already show impressive performances at the end of grade 3, which corresponds to or even exceeds those of non-bilingually taught students in a nationwide comparison at the end of grade 4 (c.f. results of BIG test, BIG-Kreis, 2015). At the top, we can speak of performance competencies of the 6<sup>th</sup> grade of secondary schools, especially in listening comprehension and reading comprehension (receptive competencies).

Across all project years, the students' performance in the English language tests – especially in the receptive areas – exceeded the expected targets. Two particularly outstanding results in listening comprehension tasks at the end of grade 4 serve as examples here. Both tasks test at CEFR language proficiency level A2 and thus exceed the requirements of elementary school. Figure 1 and 2 show a right-skewed distribution and illustrate that the majority of the students mastered the tasks well to very well. In addition, a so-called ceiling effect occurred among the very good students, who could have handled even more challenging tasks. Some tasks were unexpectedly too easy for them despite the standardized specifications.

Figure 1. Listening comprehension part 4 (total score)

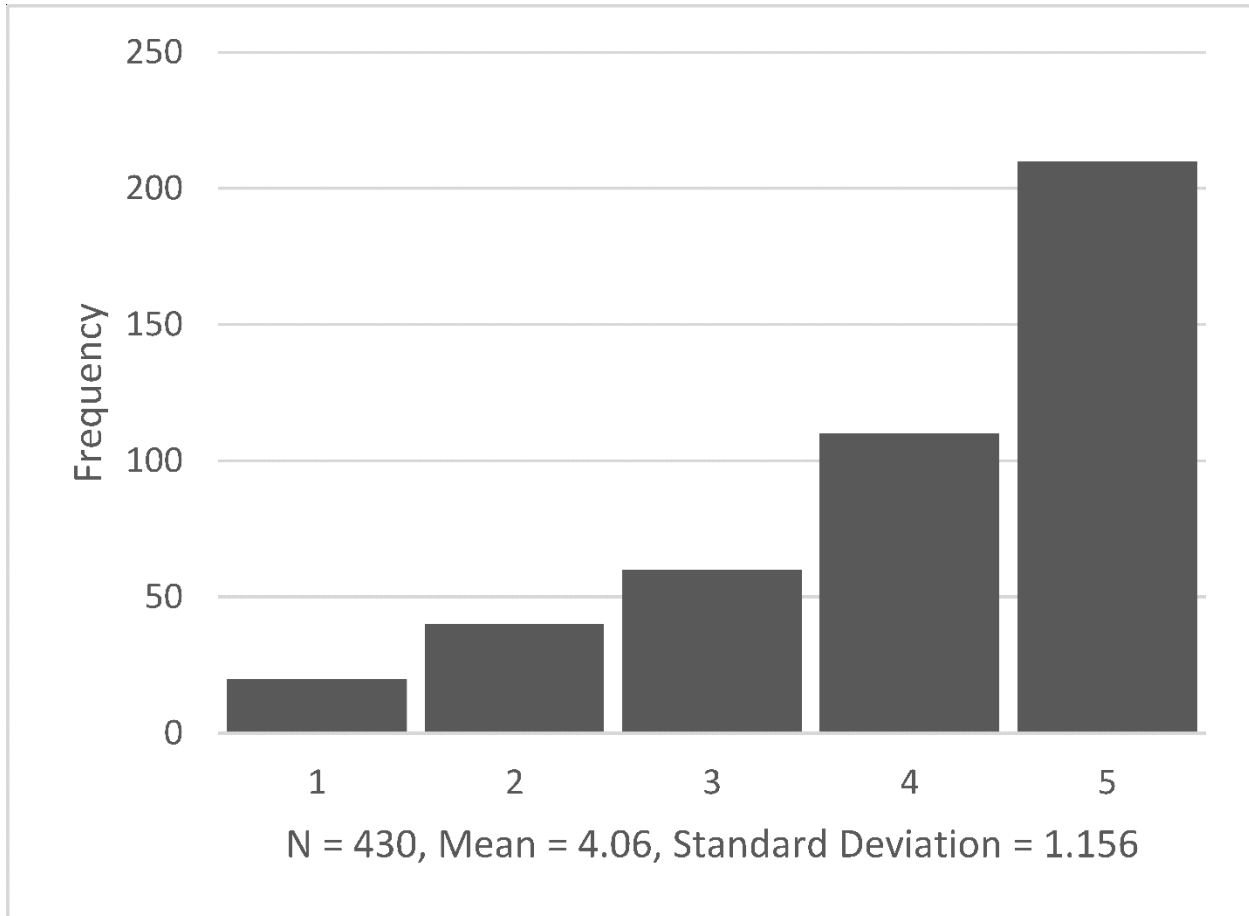
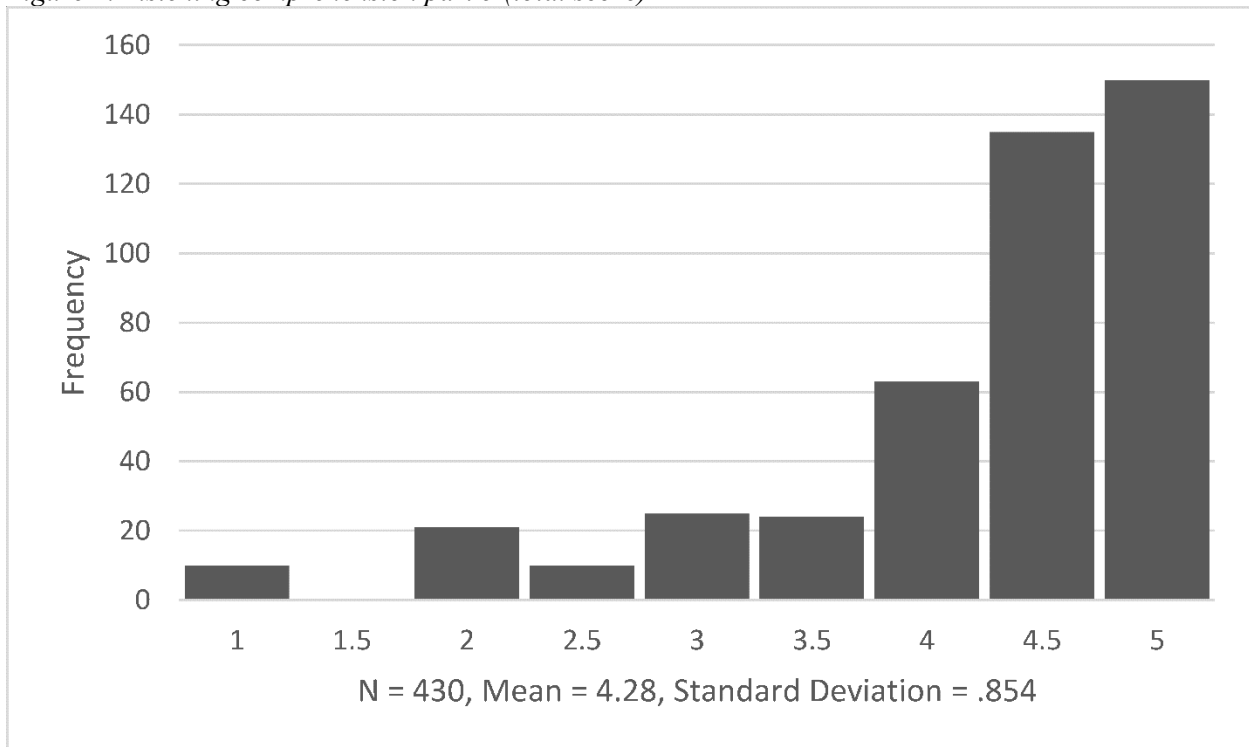


Figure 2. Listening comprehension part 5 (total score)



On a very positive note, it did not matter how well the guardians/parents mastered the German language in any area for the results in the English test (no significant values).

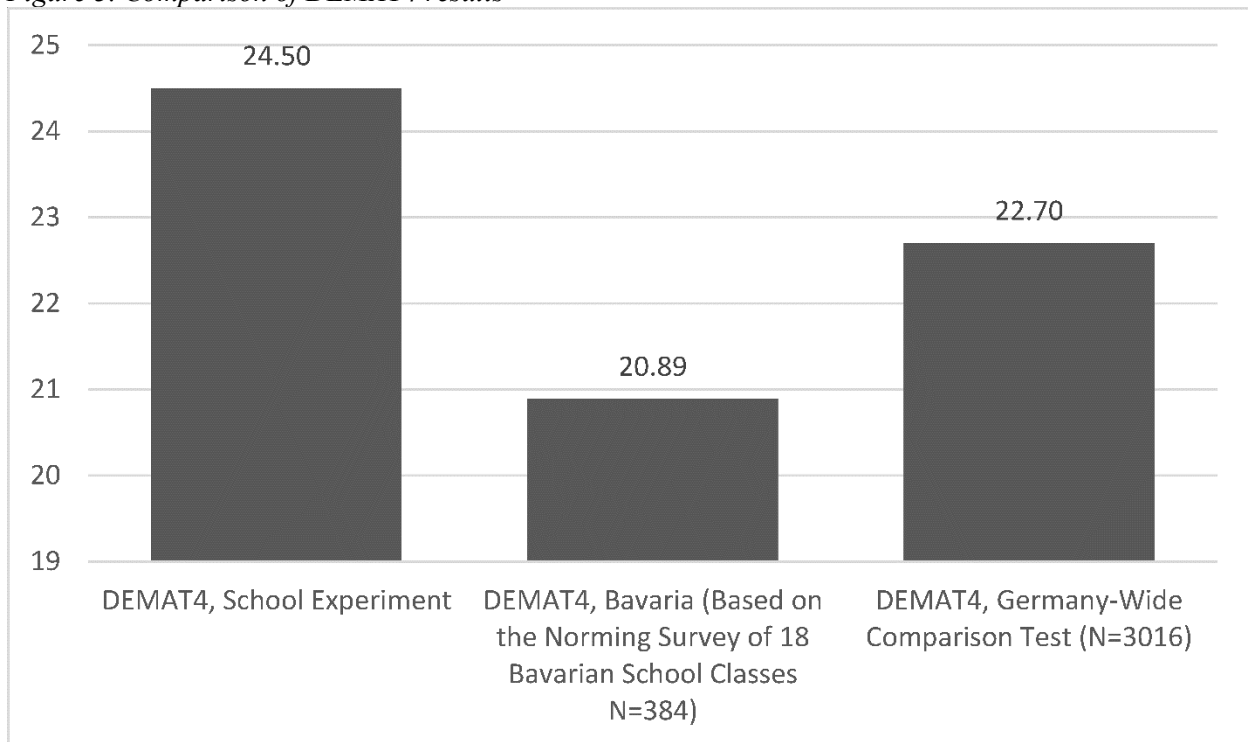
All the same, the educational level of the guardians/parents seems to have a minimally greater influence on the students' performance in English. The higher the educational level of the respondents, the better the children perform in writing. However, the correlation is only weak, as can be seen in the detailed final report of the study (Böttger & Müller, 2020).

### **Students in Bilingual Classes Perform at Least as Well in Mathematics and German as Students in Regular Classes**

The results of the Hamburger Schreib-Probe (HSP) do not show any disadvantages for the students in the area of German: All schools are in the average range with percentile ranks between 39 and 78. No class shows below-average performance, all classes reach the required level of competence in German at the end of grade 4. Around 25% of the students show above-average knowledge, and another 5.5% even show well above-average knowledge of German (correctly spelled words according to the HSP standard at the end of grade 4).

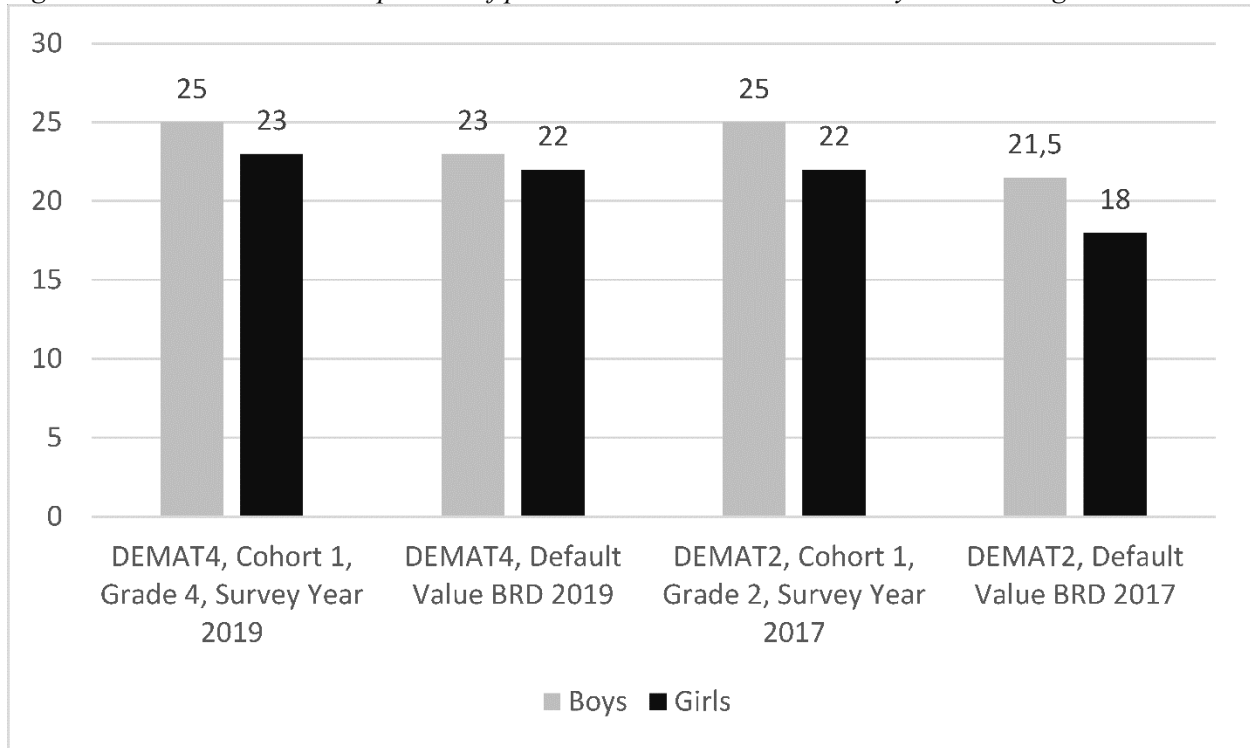
The DEMAT 2 and 4 tests were used to assess the mathematics performance of the students in the bilingual classes. Figure 3 shows the performance (average values) of the students in grade 4 from the project in comparison to average performance in Bavaria and Germany as a whole: The average value of all students in the model classes in DEMAT 4 is 24.50 points with a dispersion of 6.9 points. The comparative value (norm value Germany) is 22.70 points (almost 2 points less). In comparison with the 18 Bavarian school classes, which achieve an average of 20.89 points, the students from the project classes actually score more than 3 points higher.

*Figure 3. Comparison of DEMAT4 results*



Already in DEMAT 2 at the end of grade 2, the students from the school experiment performed significantly better than the Germany-wide comparison group (federal republic of Germany, BRD). In grade 4, the girls in the project again outperform the boys from the Germany-wide comparison and come even closer to the boys in the project classes; the latter also again perform better in DEMAT 4 than the boys in the Germany-wide comparison group (cf. Figure 4).

Figure 4. DEMAT results: Comparison of points achieved in mathematics by cohort and gender



The quality agency at ISB (State Institute for School Quality and Educational Research) draws the following conclusions from the comparison of the model classes with the Bavarian data from the standardized Germany-wide school achievement tests VERA (IQB, 2019):

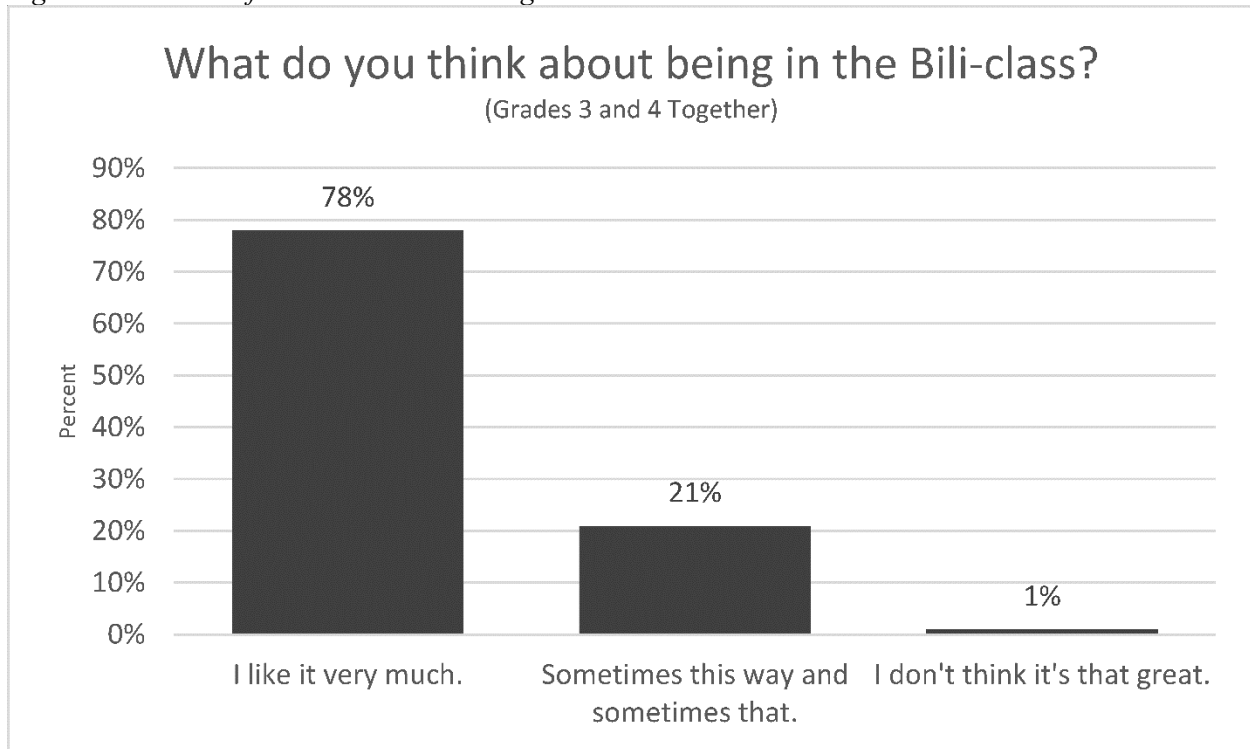
*The results of the comparison in the school year 2018/19 provide no indication that students are disadvantaged by participating in the bilingual instruction. This finding also emerged from the analysis of the data for the 2017/18 school year. Similarly, there is no evidence of performance superiority in the model classes. Overall, therefore, there is no evidence for the 2018/19 school year that the performance of students in model and regular classes differs significantly from one another in the third grade (in the subject areas of German and mathematics).*

### **The Students Participating in the Project have a Very Positive Attitude toward Learning English in Elementary School**

Students are, for the most part, very satisfied with being able to learn in the bilingual classes and consider themselves as having an advantage over learners in parallel classes or their own siblings without bilingual education. All of the students in grade 4 (ten per school) interviewed consider English from grade 1 to be very useful and are convinced of the project and bilingual classes. The majority of the students think that English from grade 1 is suitable for all children. The questionnaire survey, in which over 800 students

from the bilingual classes (grades 3 and 4) participated in the 2018/2019 school year, also paints an extremely positive picture in this regard (cf. Figure 5).

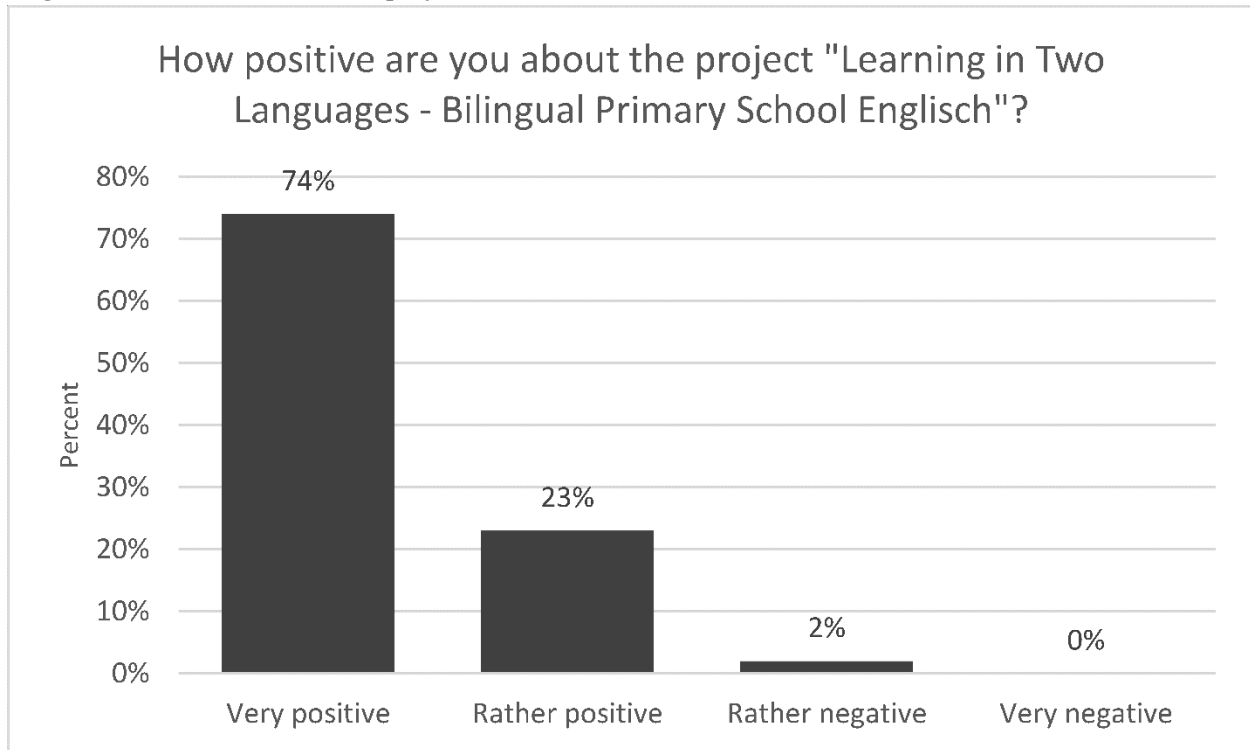
Figure 5. Attitudes of students towards being in the Bili-class



### Parents Want Their Children to Attend a Bilingual Elementary School

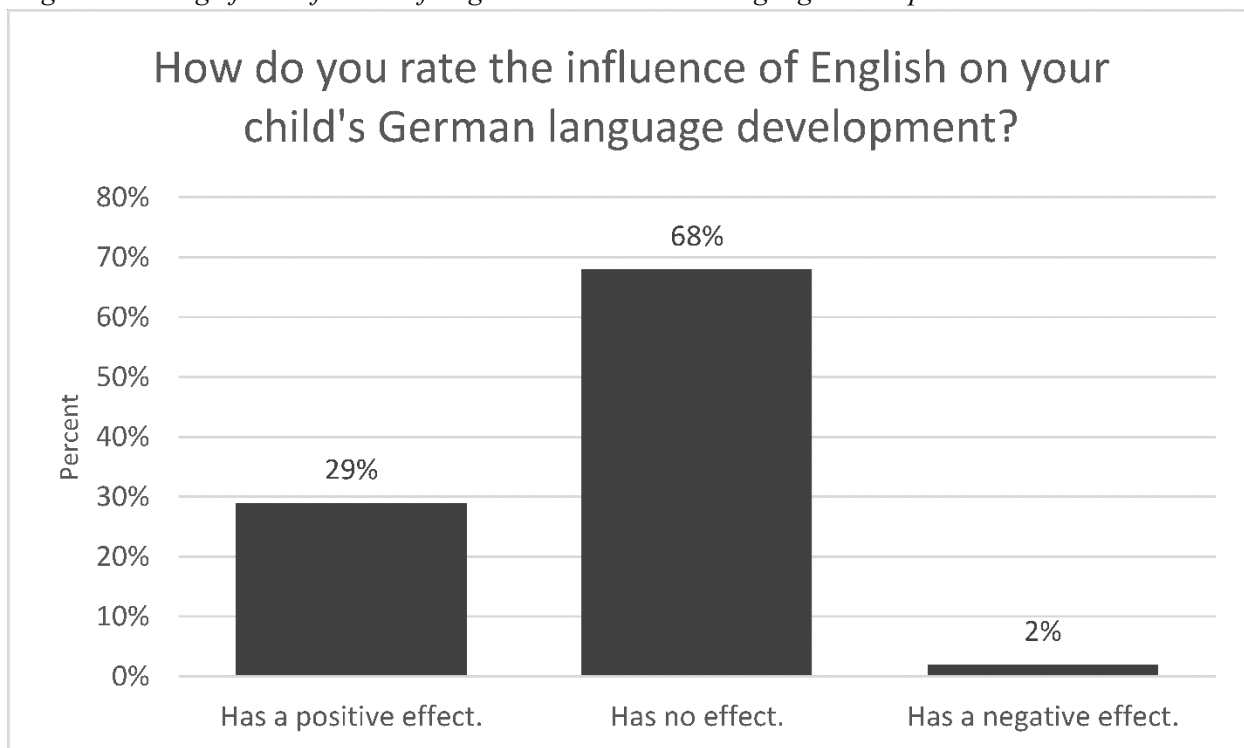
95% of the parents surveyed who participated in the 2018/2019 school year would continue to have their children taught bilingually if they had the choice in the future. Approximately 800 guardians participated in the survey. In addition, 97% were found to have a very positive or positive attitude towards the project (cf. Figure 6).

Figure 6. Attitudes towards the project



According to statements by parents, students, and school administrators at the bilingual elementary schools, a continuation of bilingual instruction is definitely desired. The justifications reflect the project's results: The performance of the students in English is above the language competence level A1 of the CEFR and thus exceeds the target competence level of the elementary school. The performance in German and mathematics is at least at the level of the regular classes and, in the opinion of those involved, is not harmed by learning in two languages (cf. Figure 7).

Figure 7. Rating of the influence of English on the German language development



According to the parents, the English language in the classroom tends not to have an impact on German: 68% see no influence of the English language of instruction on the German language. 29% note a positive influence, only 2% a negative one.

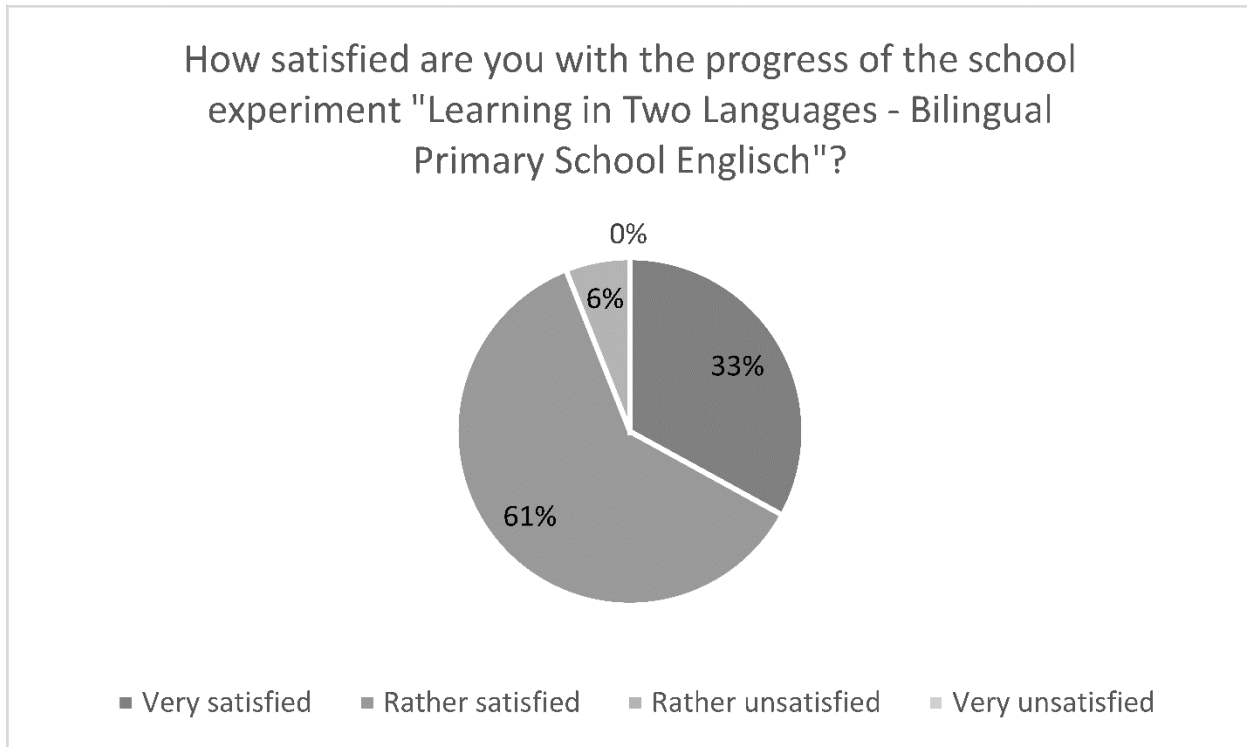
### **A Meaningful Continuation of the Project is Desired and Considered Necessary by All Sides**

100% of the school administrators are satisfied with the school trial. All school administrators note that many parents of new children request enrollment in the bilingual project class. At some schools, an additional bilingual class could be created in view of the enrollment figures. In addition, many schools have received an increasing number of applications from other schools with the aim of being accepted into the bilingual class. A continuation of the bilingual elementary school is strongly desired by the principals of the model schools.

School administrators and teachers have a very positive attitude to the project overall and are very satisfied with its progress and results, as Figure 8.



Figure 8. Satisfaction with the progress of the school experiment



## DISCUSSION

### English Language Development

The expectations were exceeded in the receptive competence areas listening comprehension and reading comprehension. In the absence of comparisons with similar research projects in bilingual learning, the selected task formats were tested in advance in all competence areas and found to be adequate. According to the test results, the listening comprehension development in the real test context is in a much more positive range than could be presented. The increased English language input (e.g. vocabulary, phrases) is efficiently implicitly received, processed and memorized. This logically leads to higher comprehension performance.

The structure of reading comprehension in English follows the general literacy development of first graders in German. It can be observed that the early development of reading literacy in English does not fundamentally differ from that in German for the students tested. However, dealing with the written word has to be learned explicitly. Unlike in listening comprehension, intuitive learning processes are possible only to a limited extent. The selected test formats were on average again mastered well by the students, a clear indication of the early cognitive potential of the first graders in this respect; this was also considered to be likely in advance.

The development of elementary speaking is individually rapid and an unexpectedly steep progression was observable especially in the first two years of the project. Already after a short time - normally still in the course of grade 1 - the one-word stage is left (similar to the development of the mother tongue). The well-developed imitation potential for short dialogic utterances, applied in the right situational context, was to be expected. Further information on this can be found in the detailed final report of the study (Böttger & Müller, 2020)

Only the best-performing students usually make their first longer free speech attempts at such an early stage; at the lower end of the performance spectrum, "*language switching*" into English is often still blocked by a lack of language self-confidence. The project classes, however, showed a willingness to experiment in communication and English from Year 1 onwards. Fluent, coherent utterances were

consistently observable from the end of grade 1, with a steep, positive development curve in the further course (c.f. Böttger & Müller, 2020).

In direct comparison with regular classes, speaking readiness, speaking ability and speaking competence are on average significantly increased in the bilingual classes from grade 3 onwards.

## **Acceptance**

The positive attitude toward the English language was to be expected. As an omnipresent lingua franca with many high-frequency words and a genuine component of everyday and youth culture, English is accepted as a "natural" language of instruction. This correlates strongly with extensive experience at bilingual schools in Vienna. The students are aware of the special situation due to comparison with non-bilingual parallel classes and recognize the attractive added value for themselves early on. Therefore, initial comprehension difficulties do not seem to be significant on average. This needs to be followed up when the subject content becomes more complicated and abstract.

## **Trilingualism**

At the same time, the, at least systematically, new access to the English language for all students in the project means a new opportunity for all and to the same extent – regardless of mother tongues. This is especially true for learners with a migration background: the fact that an integrative element based on the early access to the acquisition of knowledge and skills in subject areas with the help of English and German is not only significant in terms of language policy.

Pupils with a migrant background also seem to develop their cognitive potential advantageously by processing three or more languages. This must be explicitly addressed again in further tests. This evaluation could not prove this but could hypothetically state it on the basis of the results.

## **Language Learning Strategies**

Building initial conscious language learning strategies of inquiry supports the assumption that much of language learning involves self-construction. The students in the project wanted to learn and acquire knowledge. This argues against excessive explication, e.g., in establishing semantic knowledge. 75 % of the learners eliminate possible comprehension difficulties on their own, a highly remarkable finding, as can be seen in the detailed final report of the study (Böttger & Müller, 2020). It goes hand in hand with the comparatively faster cognitive development of the students in the project due to the processing of at least two or more languages.

## **Self-assessment**

The students' self-assessments of their own language competence in grade 4, which were obtained by means of the aforementioned surveys, indirectly but clearly lean towards the CEFR language competence level A2. Whereas, this still needs to be verified by further tests, simple self-evaluations already make sense at school entry age. Thus, the results can be taken as a serious indication of early cognitive development.

## **Methodology**

Systematic language work is usually occasion-oriented – especially in pronunciation and literacy – and is practiced as such by teachers. This does not contradict the concept of implicit, intuitive learning; it additionally takes highly professional cognitive needs of students into account. For the further development of reading and writing skills, a balance between implicit and explicit task formats are still needed to be defined. This is especially true from Year 3 onwards, with the start of regular English lessons in German elementary schools as well as the fact that writing skills largely need to be developed systematically.

However, language teaching patterns appear to be questionable in case vocabulary is explicitly introduced or language content, rather than subject content, is preserved in writing (on worksheets or

similar). This aspect must be readjusted in the future: According to their own statements, an alarming percentage of teachers still fall into patterns of a standard English instruction. Among others, this is one reason why, especially in the evaluation of year 3 and 4, when teacher turnover increased in the project classes, the students' development curve flattened visibly in almost all measured areas after an initially steep progression. In contrast, scaffolding measures and associated professional, comprehensive visualization (including through extralinguistic signs) significantly enable students' comprehension, bilingual semantic knowledge, and language production. Conscious, targeted language switching also has a constructive effect. Taken together, the findings point to a need for a bilingual teacher training manual.

## **Advanced Training**

In the future, there will be an increasing proportion of bilingual or multilingual children in Bavaria and Germany in a united Europe. With the *Bilingual Elementary School English*, English-speaking children are provided with a state school offer and German-speaking children are in turn provided with a bilingual learning offer. Thus, the authors of this paper see the implementation of bilingual instruction as a promising solution and therefore, future training needs of teachers participating in bilingual instruction in elementary and secondary schools are necessary: The focal points must be collegial exchange in terms of content and media, reflection of teaching best/good practice, as well as further conceptual control. In particular, the concept of implicit Learning in Two Languages requires permanent, sustainable and continuous professionalization. The success of the *Bilingual Elementary School English* in Bavaria depends on it to a large extent.

## **FUTURE RESEARCH DIRECTIONS**

A first, obvious need for research arises from the discussion about the transition from preprimary to primary schools. The transition to the primary level usually remains unstructured in the case of preschool bilingual programs. Examples of mutual preparatory visits of kindergarten groups to elementary school with the aim of getting to know each other beyond temporary shadowing remain singular, not institutionalized and dependent on the commitment of local and regional institutions. The same applies to the teachers involved in elementary schools. An exchange at the conceptual, didactic and pedagogical level is therefore still usually arbitrary and subject to the discretion of the individual institutions involved. Then, however, it is highly intensive and successful.

A second, future area of research is the acceptance of multilingualism. "Multilingualism is an enrichment for society and for every individual. There is no reason to fear, to fear loss of language and identity" (Ehlich, 2015). All collected and evaluated data of the school experiment *Learning in Two Languages - Bilingual Elementary School English* show very clearly that Learning in Two Languages means a win-win situation for all involved, for the children, the parents, the teachers, the schools as well as for science.

Early education in bilingualism brings decisive economic, social and professional advantages for children. In addition, there are considerable cognitive advantages (cf. Böttger, 2016), which are, for example, particularly evident in comparative tests in mathematics. Nevertheless, the concerns of teachers' associations and parents must be taken seriously. Convincing, comprehensible evaluation results are the first duty in the development of an early bilingual education concept. So far, the school infrastructure is not yet sufficient for a comprehensive offer and a seamless transition and continuation in secondary schools. In the future, bilingual teacher training and continuing education must be promoted in order to develop sustainable, easily communicable and "natural" learning in two languages from a language acquisition point of view. In addition, steps towards a continuous language continuum must be taken (cf. BIG-Kreis, 2009).

In the federalist education system of the Federal Republic of Germany, the transition from primary school to secondary schools in particular remains an unresolved need for nationwide coordination and harmonization, with a focus on transition phases and the development of a language teaching and learning continuum.

A neuralgic point for the educational biography of students, who were taught according to the Learning in Two Languages concept during their primary school years, is the transition to secondary school. The Bavarian State Ministry of Education and Cultural Affairs has commissioned a follow-up study to the *Learning in Two Languages - Bilingual Elementary School English* school experiment in order to gain scientific insights into how the transition can be optimally organized and how the foreign language skills of the learners concerned develop further at middle schools, intermediate schools and high schools. The results, which are expected to be available by the end of 2022, can provide further impetus for shaping the Bavarian educational landscape.

## CONCLUSION

After five years of intensive work, all those involved in the project have successfully completed the *Bilingual Elementary School English* school experiment, according to the preliminary objectives. The concept is well received by school authorities, primary schools, parents, teachers and the pupils. The scientific evaluation has shown that children can successfully learn in two languages from the first grade onwards and acquire more languages easily and implicitly. At the same time, they perform just as well in other subjects as pupils in comparison to regular classes without bilingual instruction. Therefore, the *Bilingual Elementary School English* as an official concept has been and will be continued as a regular offer from the school year 2020/2021 onwards. The school experiment further provides an insight into what is possible when teachers are trained to teach bilingually. The didactic principles that played a key role within this trial have been the focus of this chapter and offer starting points for further practical applications.

## ACKNOWLEDGMENT

This research was supported by the Bildungspakt Bayern Foundation.

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## KEYTERMS AND DEFINITIONS

**Bilingual Education:** Bilingual education involves two languages as a means of instruction for students, either embedded in individual subjects or the entire school curriculum. The respective subjects, however, are taught monolingually in one of these languages.

**Learning in Two Languages:** In dual-language education, subjects are taught in two languages during one lesson.



**Language Development:** The developmental process through which children acquire the ability to communicate in a language.

**Language Acquisition:** The process by which humans acquire (their native) language(s). It occurs naturally and differs from most institutionalized language education due to implicit learning processes.

**Immersion:** The process of learning a language implicitly by being surrounded by the foreign language itself.

**Implicit Learning and Teaching:** A natural and unconscious form of learning in which students are exposed to a large amount of highly comprehensible and compelling input as well as respective teaching approaches.