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**Multilingual Immersion in Education  
for a Multidimensional Conceptualization of Knowledge:  
A Case Study of Bilingual Montessori School of Lund**

*Språkbuds metod i utbildningen, för ett mångsiding begrepp*

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# Sammanfattning

I denna studie undersöks hur *Bilingual Montessori School of Lund* (BMSL):s språkbadsmetod kan ha en positiv påverkan på begreppsförståelse. Den fokuserar på det komplexa sambandet mellan flerspråkig pedagogik och dess inverkan på begreppsförvärv. Genom att använda exempel från språkbadsmetoden, testar denna studie hypotesen att språkbadspedagogik ger en icke försumbar effekt på kreativt tänkande, men viktigast av allt, på konceptualisering av ämnesmässiga innehåll. Genom en noggrann diskussion om vilken metod som används har en empirisk analys gjorts ur tre perspektiv: en teoretisk analys av litteraturen i ämnet, en intervjustudie med fyra semi-strukturerade lärarintervjuer och en enkätstudie där fler än 80 elever mellan årskurs 7 och 9 fick i uppdrag att besvara en enkät för att testa några av de iakttagelser som gjorts av de intervjuade. Syftet med denna forskning är att ta fram en empirisk kvalitativ innehållsanalys baserad på exempel från de intervjuades påståenden och därigenom utveckla en djupare förståelse om begreppsförvärv och hur detta yttrar sig i en stimulerande flerspråkig undervisningsmiljö. Vidare är syftet med denna studie att fastställa om BMSL okonventionella språkbadspedagogiks påverkan på begreppsförvärv kan vara orsaken till skolans höga poäng i de svenska nationella proven i matematik, engelska, svenska, NO och SO i årskurs 9 under de senaste åren. Analysen har lett till slutsatsen att flerspråkiga pedagogiska metoder som BMSL:s språkbadsmetod kan ha en mycket positiv inverkan på elevernas förmåga att tillgodogöra sig begrepp. Analysen har dessutom genererat nya hypoteser som kan utgöra grund för ytterligare fördjupande forskning inom specifika ämnen såsom språkbadsmetodens inverkan på elevens kreativitet, demokratisering av klassrummet, interkulturell medvetenhet och kognitiv utveckling. Den bidrar också till ett nytt kompetensutvecklingsperspektiv och samarbetsperspektiv för en positiv utveckling av svenska läroplanens pedagogiska lärandemål.

**Nyckelord:** Begrepp, Språkbad, Flerspråkigt, Tvåspråkigt, Pedagogik, Kompetensutveckling

# Abstract

This research focuses on the complex relationship between multilingual immersion pedagogy and its impact on concept acquisition (*begrepp*). By using the example of Bilingual Montessori School of Lund (BMSL)'s *språkbad* method, this study tests the hypothesis that multilingual immersion pedagogy produces a non-negligible impact on creative thinking, but most importantly, on the conceptualization of topic-specific content. With a careful reflection on the method used, an empirical analysis has been made from three perspectives: a theoretical analysis of the literature on the subject, an interview study with four semi-structured interviews with teachers, and a survey-based study where more than 80 students in grades 7 to 9 were given the task of answering a questionnaire to test some of the observations made by the interviewees. The purpose of this research is to produce an empirical qualitative content analysis based on examples taken from the interviewees' testimonies to develop a deeper understanding about concept acquisition and the way it manifests itself in a stimulating multilingual immersion teaching environment. Furthermore, the aim of this study is to establish if BMSL's unconventional multilingual immersion pedagogy's impact on concept acquisition can be the reason for the school's outstandingly high scores in the Swedish National Tests in Maths, English, Swedish, NO and SO in grade 9 over the past few years. Nevertheless, the analysis led to the conclusion that multilingual immersion methods like the BMSL *språkbad* method can have a very positive impact on students' ability to assimilate concepts, but also helped generate thesis-seeking rather than thesis-supporting observations about its impact on the students' creativity, classroom democratization, intercultural-awareness and cognitive development. It also highlights the pedagogical collaboration and competence development perspective promoted by the Swedish National Curriculum for Compulsory School Lgr 11.

**Keywords:** Conceptualization, Immersion, Multilingual, Bilingual, Polyglot, Pedagogy, Competence Development

## Introductory Remark

To begin with, I would like to thank my wife Lina for her tremendous patience and support during the whole process of my *VAL-utbildning*. I would also like to thank my employer and colleagues at Bilingual Montessori School of Lund for their flexibility and professional support during the completion of my studies. Without you, it would have been impossible to work full-time as a teacher and study full-time simultaneously (for extensive periods of time since 2012). I would also like to thank the copyeditor of this research Jennifer McCormack and express my gratitude to all the students I have taught and come to know during my 13 years as a teacher. Thank you to all the people who participated in this study, especially to my teachers, supervisor and examiner at Malmö University. Thanks for all the support and feedback; without you this work would not have come to fruition. Finally, I need to thank my parents in Québec, Canada, for everything they did for me and for igniting a passion for learning and for education.

I dedicate this work to my daughters Svea and Vega, who are profound sources of inspiration and valuable references in the field of research about multilingualism.

Merci beaucoup à vous tous,

Bonne lecture,

Philippe Longchamps

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# 1. Introduction

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Most people would agree that languages are much more than a simple means of communication. Indeed, languages offer ways of conceiving, inventing and contriving things, ideas and explanations, through the mental act of conceptualization. The idea that languages are essential to the development and formulation of ideas and concepts has provided fertile ground for debate and discussion in the past. This is why this research will try to contribute to this discussion by raising the following question: Can a multilingual immersion pedagogy, like the *språkbud* method used at my workplace, Bilingual Montessori School of Lund (BMSL), have a positive impact on concept acquisition, creative thinking and conceptualization of topic-specific content? By making a careful analysis and reflection on the method used at BMSL, I will address the relevance of this thesis by juxtaposing the theoretical aspects of multilingual immersion pedagogy to the empirical evidence I gathered through colleague interviews and student surveys. This research will look at the relationship between BMSL's multilingual immersion pedagogy (*språkbud*) and the development of concept acquisition abilities (what Skolverket is defining as “*begrepp*” in the curriculum for the compulsory school Lgr 11). This empirical research will try to contribute to the advancement of multidisciplinary education (*ämnesövergripande utbildning*) and school-development (*skolutveckling*), but it will not be an attempt to measure the impact of BMSL's cross-linguistic education on the students' syntax, vocabulary and grammar. In order to best defend the idea that multilingual immersion pedagogy has a positive impact on the acquisition of concepts, I made a case study with a clearly defined scope. To achieve that, I focused on a small group of non-Swedish colleagues and compared their observations with the data generated by the survey answered by the students in grade 7-9 at BMSL.

## 1.1. Background

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Working at Bilingual Montessori School of Lund (BMSL) provides a rich experience in the field of alternative pedagogy. What makes this school unique is the Montessori-inspired pedagogy, but most importantly, the amazing multilingual learning environment in which French, English and Swedish are used on a daily basis. Coming from Canada, where bilingualism has been institutionalized, the BMSL concept suits me perfectly. However, BMSL is much more than a Canadian-style bilingual immersion school like the experimental schools created in the 1960's by McGill University Professor Wallace Lambert (who is also known as the 'Father of bilingualism research in psychology'). This distinguished professor from McGill University imagined a different kind of system to teach the two official Canadian languages in a more integrative way, without resorting to the infamous imperialistic assimilation methods of the past.

Indeed, according to Comblain & Rondal (2001) the obsolete linguistic assimilation methods used by the different colonial powers around the world have been replaced by more integrative methods. In the case of Canada, the assimilation methods tended to marginalize and imperil the minority languages spoken in the different Provinces of Canada; especially in the French speaking Province of Québec, where previous attempts have been perceived as another intrusion from English, the dominant language of Canada (p.7-9). In contrast, the integrative immersion methods used around the world nowadays include foreign languages in their respective school curriculum as an added value, instead of using an imperialist approach where the foreign language serves as a means to suppress and replace the local language(s). This is why by adding French and English as complementary languages of instruction, BMSL offers a multilingual environment that respects the Swedish school curriculum Lgr11 and doesn't threaten the Swedish language as the official language of instruction.

The three founders of the school have called this method *spårkbad* (language bath), because it is more than a simple (Canadian-style) bilingual immersion. BMSL often produces polyglot students who tend to perform extremely well in all of the Swedish National Tests, including Swedish as a school subject. The School was ranked #3 in 2013 and #2 in 2014 in Sweden, based on the National Test results for grade 9. It was also ranked as high as #17 based on its overall scores for all 16 subjects (*meritvärde*) and a few times ranked #1 among

all the schools in Lund and in Skåne, based on the past few years 9<sup>th</sup> graders “*Nationella prov*” results (see Appendix 3 for sources<sup>1</sup>). Even if this is not the main focus of this study, it raises some questions about BMSL students’ outstanding academic achievements. Indeed, they may be attributed to many different factors, like the multicultural background and socio-economical affiliation of the families sending their children to BMSL, but this research study will focus mostly on the pedagogical aspects instead of focusing on hypothetical sociological factors. Because in agreement with Wallace Lambert (1963):

The parents of bilingual children are believed by their children to hold the same strongly sympathetic attitudes in contrast to the parents of monolingual children, as though the linguistics skills in a second language, extending to the point of bilingualism, are controlled by family-shared attitudes toward the other linguistic-cultural community (p.116).

Undoubtedly, these factors raise a few questions, but nevertheless, I would like to explore a new hypothesis in this research – that BMSL’s multilingual immersion pedagogy has a non-negligible impact on conceptualization (*begrepp*) and on concept acquisition of topic-specific content.

## 1.2. Purpose (Defining the Scope of the Thesis)

The purpose of this research is to produce an analysis of the empirical, observable and evidential methodologies for the hypothesis that BMSL’s *språkbad* method may have a positive effect on concept acquisition skills in a variety of school subjects. In an attempt to investigate the different factors, which may account for this hypothesis, this study raises three interrelated questions:

- What makes BMSL’s multilingual immersion pedagogy an unambiguous incentive to maximize concept acquisition (*begrepp*)?
- How do the creative, cross-linguistic and cross-cultural aspects of BMSL’s multilingual immersion pedagogy contribute to the promotions of Lgr 11’s broader definition of concept acquisition (*begrepp*)?
- Is the multilingual immersion pedagogy at BMSL one of the main reasons for the school’s high scores in the Swedish National Tests in Maths, English, Swedish, NO and SO in grade 9 over the past few years?

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<sup>1</sup> Raw data about ranking and *meritvärde* are also available on Skolverket’s Siris website:

Skolverket defines the word “*begrepp*” in general terms in the *Curriculum for the Compulsory School* (Lgr 11), but by addressing this specific research topic as part of a discussion for the advancement of knowledge in pedagogy, one could easily argue that the purpose of this research is clearly supported by Skolverket’s recommendations in Lgr 11. That’s why the main focus of this study will explore specific forms of competence like: concept acquisition and conceptualization of metalinguistic knowledge. Since “the school’s task to promote learning presupposes that there is an active discussion within the school about concepts of knowledge, and about what constitutes important knowledge today and in the future, as well as how learning and the acquisition of knowledge takes place. Different aspects of knowledge and learning are natural starting points for such a discussion” (Lgr 11, p.12). Through the interviews and the survey, this research will also consider some of the pros and cons of BMSL’s “*språkbad*” multilingual immersion pedagogy with a particular focus on the three questions mentioned above.

To better define the scope of this research I need to explain that throughout the years I have worked at BMSL, I have become an enthusiastic adept at the multilingual immersion method. Here are some concrete examples of how I connect the various policy documents to my teaching with the *språkbad* method. As a teacher in History, Geography and Languages at BMSL, I use my school's language immersion method during my lessons; I speak English (and sometimes I use some French to improve my students’ understanding) while my students use Swedish textbooks. This formative approach helps to strengthen the students' French and English vocabulary and concept acquisition, without sacrificing the quality of their Swedish, or native language(s). As we will discover in this research, numerous studies suggest that the quality of one’s native language often improves as a second or third language is learned. However, one of the goals of this research is to address an aspect of pedagogy that needs to be further explored, as Emeritus Professor in Psycholinguistic at McGill University Michel Paradis (2009) states: “How conscious metalinguistic knowledge interfaces with unconscious linguistic competence in consciousness remains to be explained.” (104)

Since one of the requirements of BMSL is that staff members speak their native language with the students on a daily basis, I am in a privileged situation: as I have the ability to speak both French and English, since I come from a bilingual region in Québec and because I have been educated within the Canadian school system. BMSL’s philosophy is very close to the type of school I experienced growing up in Canada and I am more familiar with the

challenges and benefits of bilingualism in education when compared to those who have attended regular monolingual public schools in their respective countries. I think that our students get a better chance to face the challenges of the age of information, as they are as comfortable in English as they are in Swedish (and to a lesser extent in French). In addition, their English skills in Mathematics, SO (Social Sciences / Humanities) and NO (Natural Sciences) makes it easier for them to learn a third or fourth language. Furthermore, this multilingual pedagogy gives our students an opportunity to develop a much broader worldview based on intercultural values. Once again, the Swedish curriculum supports this thesis because:

Language is the primary tool human beings use for thinking, communicating and learning. Having a knowledge of several languages can provide new perspectives on the surrounding world, enhanced opportunities to create contacts and greater understanding of different ways of living (Lgr 11, p.32).

Some parents might see their children's English skills as the main added value to their education at BMSL and that it is something that will help them be more competitive on the labour market of the future. However, with this research I will try to demonstrate that the BMSL *språkbad* method offers much more than just that. It has a significant impact on the students' ability to develop better conceptualization skills.

Furthermore, it is important to highlight the fact that this multidimensional method respects the Swedish Ministry of Education's policies and official documents guidelines. When I teach Geography and History, the BMSL immersion method definitely helps my students to develop their language(s) skills. However, this study suggests that it also increases their cross-cultural awareness and their concept acquisition simultaneously. I love to have the opportunity to use my native language (French) and English while teaching the Swedish curriculum. It feels like it contributes to substantiate some of the most important parts in the steering documents Lgr 11, namely language development. As I mentioned above, I think my students get more than a linguistic added value to their education. As stated in the Swedish steering document:

It is important to have an *international perspective*, to be able to understand one's own reality in a global context and to create international solidarity, as well as prepare for a society with close contacts across cultural and national borders. Having an international perspective also involves developing an understanding of cultural diversity within the country (Lgr 11, p.12).

I think this is one of the reasons why BMSL attracts many students of full or partial foreign origin. It is due to the immersion method, but also because BMSL is known to offer an open environment, where tolerance and diversity are cherished and promoted. This also contributes to the democratization process promoted by Lgr 11, and this empirical research will attempt to establish if this specific democratization process is also an integral part of the enhanced concept acquisition process derived from the BMSL multilingual pedagogy.

### 1.3. Democratization

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To teach students is to first understand purpose, subject structures and ideas within and outside the discipline. Every teacher needs to understand that the main task of education is to further the students' quest to become caring people who will thrive in a democratic system. This setting helps students develop the social skills and values they need to function in a free and fair society. As a teacher in a school like BMSL, the multilingual immersion method helps me to develop a knowledge-based teaching method that narrows the gap between content and pedagogy. That is to say that my ability to transform knowledge of my subjects into teaching methods and into formats that are pedagogically powerful, yet adaptable to different students' abilities and backgrounds is very important in a multilingual immersive learning environment. I do not believe that the concepts of knowledge, education and democracy have changed significantly in recent decades. However, the way the teachers appreciate these concepts and the way they promote them improved in recent years due to a more flexible and adaptable knowledge-based curriculum like Lgr11. I think this helps to develop democracy therefore one of our main objectives is to develop students' reflection and analytical skills. In the long run, this might help to create a more creative, egalitarian, tolerant and respectful society. Consequently, it will make the students more aware of sustainable development because these knowledge-based aspects of education are overlapping and interdependent.

## 2. Theory

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In this chapter, I will introduce different theories about bilingualism, multilingualism, language immersion and cross-cultural education. I will give an overview of the qualitative and quantitative approaches of scientific research in this field of research.

### 2.1. Scientific Research Approach

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First and foremost, this empirical research will take a closer look at different theories in order to explain and analyse the hypothesis from different angles while using what Professor of Organisational and Social Research at the University of Leicester Alan Bryman (2012) defined as a deductive research technique. Furthermore, in this study I will also approach the hypothesis generated by the students' surveys and teachers' interviews through what Professor Bryman calls an inductive perspective, in order to substantiate the analysis with my own personal experience and observations. When these two types of research techniques are combined it is called an abduction method. This mixed research approach gives me a broader observational perspective than with a simple empirical study. After completing the interviews and surveys, I supplemented my theoretical framework with new hypothesis to further elaborate. It is important to mention at this point that, despite the thesis presented in this research, my aim is not to draw a definitive conclusion on the topic. The questions raised by the findings should raise even more questions, thus transforming this research into some kind of thesis-seeking exercise for those interested in doing more research on related topics. In other words, my goal with this research is to make a contribution to educational science while finding enough empirical evidence to support my thesis. Simultaneously, I would like to inspire other people to undertake more research on this topic by generating new hypotheses and hopefully develop new areas of research in this field.

## 2.2. Qualitative and Quantitative Research

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A qualitative empirical study is usually best suited for that type of research because of its flexibility and openness. However, in order to substantiate the observations made during that process, I decided to do a survey with the students to provide an overview of quantitative elements in the evaluation of the quality of the comments and observations made during the teachers' interviews. Nevertheless, I did not think this research needed to follow a rigid format of structured stages and it was important for me not to guide the respondents into a certain type of answer.

The qualitative elements of this research are taken from four semi-structured interviews with fellow “non-Swedish” teachers of the Orange team at BMSL (*Högstadiet arbetslag åk7-9*). The respondents will be presented individually and their interviews will be analysed in the next chapters. I used primarily a qualitative research method with my co-workers because I needed to get some perspective and a deeper understanding of the phenomenon I personally observed in my classes. This cross-analytical abduction method and the data retrieved from the students' survey will help me compare and contrast the qualitative data emerging from the semi-structured interviews. Another reason for starting with a qualitative research method was to get a truly authentic perspective from the interviewees, uninfluenced by quantitative data. According to Holme & Solvang (1997) and Bryman (2012), qualitative research offers a way to collect and analyse data through words rather than with numbers. This way the respondents' answers become more insightful and honest. The flexibility of the qualitative research usually creates a deeper and more total understanding about the phenomenon being studied. On the other hand, by juxtaposing quantitative research methods to the qualitative research methods, I was able to test the claims and observations made during the interviews.

## 2.3 Immersion

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To provide the framework in which this research is being done, it's important to understand that in the past, a multitude of research studies have been conducted about similar topics. However, as a case study, BMSL is unique and no research has been previously made to demonstrate the effects of the multilingual immersion method (*språkbad*). At BMSL the children are exposed to French, English and Swedish from their first day at preschool and once they reach grade 7, two of the three 'core' subjects are taught in English, while a few other subjects are taught in French and English (including my classes in Geography and History). Furthermore, the BMSL immersion concept (*språkbad*) is juxtaposed to the Montessori pedagogy. This is an example of the thesis-seeking nature of this research. One could easily generate another hypothesis for the success of our students based on the Montessori aspect of BMSL. However, I will avoid broadening the scope of inquiry in this study, in order to focus on the hypothesis that concept acquisition is primarily enhanced by the multilingual pedagogy at BMSL.

The different theories about language acquisition in a multilingual environment tend to present this metaphorical 'Tower of Babel' as a blessing rather than as a curse. According to Swain and Johnson (1997), co-authors of the book *Immersion Education: International Perspectives*, immersion "has a strong record of research and evaluation that compares favourably with that of many other innovations in education" (p.13). Indeed, most authors seem to agree that bilingual and/or multilingual pedagogy are great innovations in education, but many studies also demonstrate that it also has a positive impact on the children's cognitive flexibility, as it increases their creative abilities by expanding their conceptual system. In addition, we will see that the development of cross-linguistic metaphors is essential to conceptualization and creativity. According to Professor in Experimental Psychology Anatoliy V. Kharkhurin (2012) from the American University of Sharjah:

The conceptualization process serves as a relay station that binds together the scattered thoughts conceived and elaborated during other phases of the intellectual sphere into a well-defined creative idea and forwards this idea to the emotive sphere and thereby brings the creative idea to reality (p.130).

In my opinion, these types of scattered thoughts can actually emerge through a cross-linguistic thought process. Some kind of lexical comparison process may lead to an increase in the cognitive abilities necessary for the development of concept acquisition, thus

contributing to some kind of meta-understanding of concepts. However, some research studies are more critical than others and they tend to minimize the importance of bilingual and multilingual education on the development of the children's cognitive abilities, creativity, cross-cultural awareness and conceptual systems. For example, according to Garrett and James (1991), "there have been various attempts to assess the cognitive impact of bilingualism and bilingual education. Numerous limitations and criticism of this research have been voiced: e.g. is the relationship between bilingualism and cognitive development a chicken and egg problem?" In contrast, scholars like Wren, Comblain & Rondal disagree with Garrett and James' statement. They claim that languages become conceptual resources that are greatly beneficial to the cognitive development of the multilingual child and regardless of the numerous obstacles they face, "bilingual children should not be considered to be disadvantaged in the development of their phonemic awareness skills compared to monolingual children and, indeed, may be advantaged over them" (Wren et al., 1999). In addition, according to Comblain & Rondal (2001), children attending a foreign language immersion program tend to become more curious and more interested in learning more languages. In countries where two or more languages are spoken by a large proportion of the population, the children attending immersion programs tend to describe school as an intellectually stimulating environment, one that raises their level of social awareness about their own culture, and about the different cultures and ethnicities that constitute it. Hoosain and Salili (2005) claim that it is also the case for children who are coming from other ethnic groups with different cultural backgrounds. They observed that when they are exposed to English as a language of instruction "non-English-speaking students are able to learn English in a relatively short time. These students are usually highly motivated and are taught English by qualified English (speaking) teachers, as well as being immersed in the language environment (p.154). Michel Paradis (2009) also seems to support Wren (1999) and, Comblain and Rondal's (2001) claims when he quotes Damasio (1989). It seems like multilingualism's high level of information processing increases the perceptual skills of the children, since, "a concept comprises all the knowledge that an individual possesses about a thing or event, and it is never activated in its entirety at any given time. Only those aspects that are relevant to the particular situation in which it is evoked are activated" (p.45). This also confirms Redlinger, Park, Volterra and Taeschner's observation that "bilingual children can make a unique contribution to our understanding of the sensitivity of language acquisition processes to specific-language input. Although it has been hypothesized that children acquiring two languages simultaneously have a unitary syntactic system" (as cited in

Paradis & Genesee, 1996, p.3). Nonetheless, I would like to add a nuance to these statements. There is a very important distinction to make between learning and acquiring a language. Acquisition is conscious language learning, while the term learning on its own, often refers to non-conscious learning. In that regard, Kharkhurin (2011) argues that the multilingual “thinking process involves simultaneous activation of various conceptual representations thereby establishing connections between different concepts” (p.2). This distinction is important in the context of internalization of new concepts through acquired language(s) because some researchers seem to suggest that the learned language may be affected negatively by the acquired one(s). According to Skutnabb-Kangas, Toukoma (1976) and Haugen (1977) “a limited kind of bilingualism - sometimes called "dual semilingualism"- has been observed in children with failed bilingual education. It manifests itself in a limited vocabulary, faulty grammar and an accumulation of hesitation phenomena in the production and the difficulties of expressing oneself in both languages.” However, other studies have shown that, when the exposure to foreign languages happens as early as in preschool, the acquisition of the first language, or mother tongue, is not affected (Comblain & Rondal, 2001, p.88). In addition, Michel Paradis (2009) seems to agree with Comblain and Rondal (2001), once again when he quotes Seidenberg and Zevin (2006) who suggest that “acquiring language early in life seems patently easier than learning it later” (Seidenberg and Zevin, p.595 & Paradis, p.133). This is also something described by Trask (1995), the children who use two (or more) different languages every day have remarkable syntax and grammar acquisition, even though they are exposed to languages with conflicting grammatical rules (p.87). This ease of learning an additional language at a young age is also supported by Kharkhurin’s (2011) observations. Kharkhurin states that in the context of early language acquisition, “the communication between concepts is assumed to be an unconscious process during which the activation is propagated throughout the conceptual network. This property constitutes a key mechanism of divergent thinking, which is perceived by many researchers as one of the major components of creativity” (p. 7).

### 2.3.1 Multilingual Immersion

Until the 1960's, bilingual and multilingual education was almost never encouraged and promoted in public education in most countries around the world. Edwards (1998) explains how most people seemed to suffer from “monolingual myopia” before Wallace’s experimental bilingual schools started to emerge in Canada. Indeed, Edwards claims “monolingual myopia detracted attention from the fact that in most parts of the world multilingualism is the norm” (p.77). Furthermore, according to Charlotte Burck (2005), nowadays “over half of the world’s population are thought to be either bilingual or multilingual” (p.1), therefore more and more children are being raised in a bilingual or multilingual environment. Growing up in a truly polyglot environment is slowly becoming the norm rather than the exception in many parts of the world. As a matter of fact, due to ever increasing migration in our contemporary societies, it is no longer rare to meet families where a child speaks one language with his/her mother and another with his/her father while attending school in a third language. Comblain & Rondal (2001) claim that a multitude of studies show that bilingual children tend to master their first language better than monolingual children, especially as regard to complex wordings (p.88). Furthermore, some children being raised in a bilingual home are introduced to a third, fourth or a fifth language before the age of ten in some schools. This leads to the following question: Can we observe if their acquisition of concepts is ultimately influenced by this type of cross-linguistic upbringing, the same way their syntax, vocabulary and grammar are? According to Paradis and Genesee (1996), bilingual and polyglot children demonstrate how two languages (or more) are acquired by one brain in one context (p.3). The process of language acquisition may vary considerably depending on the number of languages the children are exposed to, and furthermore, by the relative linguistic distance between the languages acquired. For instance, children exposed to a Germanic, a Slavic and a Latin based language simultaneously, will face different challenges than children exposed to languages that are located on distant branches of the language family tree (Paradis & Genesee, 1996, p.6). Hypothetically, a child exposed to an Indo-European, a Sino-Tibetan and a Dravidian language (English, Mandarin and Tamil, for example) will face different difficulties than a child exposed to three Latin/Romantic languages, like: Spanish, Italian and Portuguese.<sup>2</sup> Trask (1995) states that by the age of five, the average child is thought to have learned around

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<sup>2</sup> As stated in an essay I wrote in 2014 entitled: *Mjölks 'il vous please : Children Language Acquisition in a Polyglot Environment* for an English Grammar course at Malmö University.

10,000 words, which means that it must have been learning them at a rate of about 10 a day (p.170). This statement suggests that the vocabulary of an average bilingual child should be around 20,000 words and might be tripled or quadrupled in the case of a polyglot child. In comparison, Shapson & D'Oyley (1984), believe that a combination of core language teaching is the best approach because:

[It] typically involves the introduction at an early grade of the core program, followed by the use of the target language at a later grade level to teach a specific subject area (e.g. Geography or Social Studies). Underlying this approach is the assumption that the subject area will be mastered as well through the medium of the second language as it would have if taught in the student's first language. By studying the subject in the second language, the acquisition of the second language will be enhanced by the functional use to which it is being put (p.20).

In addition, Comblain & Rondal, (2001) observe that in the context of a multilingual education, one element that usually doesn't vary is the fact that the teachers must be native or very fluent in the language they speak to the children (p.86). Consequently, the children attending immersion schools where languages are used as an instruments through which the education is provided often learn these languages better than when they are learning them as school subjects (Comblain & Rondal, 2001, p.85). This debate about the impact(s) of multilingual immersion education thoroughly illustrates the pros and cons of BMSL's *språkbud*'s method. However, Dooly (2009) suggests that the success of such unconventional pedagogical methods depends greatly on the teachers involved. Their attitudes "towards linguistic diversity, especially towards languages which are valued differently will have repercussions in the teacher's behaviour and teaching schemes once they are inside the classroom" (p.148-149). Indeed, the dangers of cultural relativism and linguistic discrimination may become an obstacle to the integrative aspect of the multilingual immersion pedagogy. That is why the increased conceptualization process described by the authors above, depends on the multicultural approach to multilingual immersion pedagogy.

### 2.3.2 Multicultural Immersion

In order to create the right conditions for an increase concept acquisition in a *språkbad* environment like that of BMSL, the teachers need to transcend the language barriers and embrace a more holistic, cross-cultural approach called multicultural immersion. Boyd & Brock (2004) claim that “when educators better understand the cultural backgrounds of the children they serve, they can design classroom instruction that builds on and values these differences” (p.5). Furthermore, Hoosain & Salili (2005) state, “the valuable promotion of multicultural awareness and tolerance should become an inextricable part of the whole educational enterprise” (p. 25). On the other hand, the ability to speak multiple languages is not always perceived positively in some more homogenous societies. Indeed, Burck (2005) provides the example of London, where despite the fact that no other city in the world is more cosmopolitan, there is a strong resistance towards its minority languages and an assimilationist attitude from the majority (p.1). It seems like the old colonial super-power’s acculturation methods endured the fall of its imperial supremacy. Even though they may take many different shapes, similar assimilationist attitudes can be found in many other countries and according to Burck (2005) in the next century, this could lead to the disappearance of more than 90% of the 5,500 languages spoken in the world nowadays (p.1). The important distinction between assimilation and integration is a key component of the multicultural immersion. If the goal is to acculturate a minority, the idea of multilingualism as a mean of conceptual and cultural enrichment will never be achieved. Cultural integration as part of the school democratization’s process is rooted in openness. In order to increase the self-reflection abilities of the students, the teachers need to think innovatively and understand that multilingualism and multiculturalism go hand in hand. As Boyd & Brock (2004) state, “a multicultural perspective begins with an understanding of the importance of the role that teachers play in shaping students’ knowledge, self-concept, and worldview” (p. 132). Additionally, Hoosain & Salili (2005) concisely summarize how openness to multiculturalism in immersion programs is a prerequisite to the establishment of the conditions necessary to the development of the students ability to transform his/her attitude, because “immersion programs are designed to capitalize on young children’s abilities, relative unselfconsciousness and attitudinal openness” (p. 27). This aspect of openness is essential to the fruition of the abilities described above. The notion of tolerance, creativity and curiosity in a multicultural environment is essential to the success of multilingual immersion pedagogy.

## 2.4 Concept Acquisition

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In order to better illustrate the idea behind the mental representations defined as “*begrepp*” (in the Swedish Steering Document Lgr 11), let’s demonstrate how concept acquisition can emerge from the formative aspects of multilingual pedagogy. Before talking about the existing theories on the subject, I will give three different examples taken from my History and Geography classes, where abstract ideas or words may have been conceptualized more efficiently by my students because of the cross-linguistic added-value of BMSL *språkbad* immersion method.

### 2.4.1 First Example of Multilingual Conceptualization

In 8<sup>th</sup> grade History, my students use the book “*Levande historia 8 – SOL4000*” and they attend my lectures in English. The third chapter of the book “*Nya idéer och handelsvägar*” is mostly about the Renaissance and the Enlightenment. To begin with, many students seemed familiar with the term Renaissance when I mentioned it orally and when I wrote it on the whiteboard in class. Then, as usual, the students opened their history textbooks in Swedish and saw that it is spelled *Renässans* in Swedish. At first, I saw many of them writing the word down in their notebooks at the top of a blank page, but it felt as if my students did not necessarily reflect of the meaning of the historical concept of Renaissance. I had the impression that they were only writing a word without conceptualizing it. Then I said: “Renaissance is not only a word for a period of history that you need to memorize to get a good grade in a test.” My goal as a teacher is not only to teach facts; most importantly it is to help my students find ways and strategies to assimilate concepts that will be useful in the development of their reflection and analytical skills.

Indeed, my main goal is to help them achieve a higher level of understanding and to give them the opportunity to conceptualize this historical term, I asked the students to use their knowledge of French. Since the students are exposed to French on a daily basis at BMSL, it is giving them the ability to conceptualize the word differently. They soon realized they could have a deeper understanding of the meaning of the word Renaissance, because most of them understood the meaning of “*naissance*” which means “birth” in French. Less than a few seconds later many students raised their hands to share their newfound understanding of the word. They soon understood that *Renässans* was directly borrowed from French and that it meant “rebirth” in English. Consequently, my students started to extrapolate about the

meaning of this historical period before they have even begun the chapter. Questions and reflections quickly emerged in the class discussion. Students were making very interesting comments like: -“Can it be some kind of social rebirth after the black death?” -“Is it more a rebirth of old forgotten ideas?” – “No, I think it must be a kind of rebirth in art, literature and science because I know that Michelangelo, Da Vinci and Shakespeare lived at that time”. Needless to say that I was very proud of them, because they were taking risks by generating hypothesis based on their multilingual skills. Thanks to the added value of their three weekly hours of French immersion, they managed to develop their reflection skills as they conceptualized an important historical term.

Nevertheless, some students drew strange conclusions in their attempt to conceptualize other words associated with the Renaissance, but as we studied the chapter they self-corrected some of the assumptions made in their attempt to further conceptualize ideas and terms. However, as I mentioned previously, risk-taking in learning is a positive sign that demonstrates that the students are stimulated. This is another example showing how the *språkbad* multilingual pedagogy contributed to a better understanding of the historical concept we call the Renaissance. The students were independently able to conceptualize the idea that the Renaissance was a rather undefined time period of rebirth with a very logical and intuitive historical timeline based on their own cross-linguistic semantic analysis. Furthermore, by using the concepts of ‘darkness’ and ‘light’, they came to the conclusion that the Renaissance was a time period that roughly went from the time of the ‘Black Death’ at the end of the ‘Dark Ages’ (*Den mörka tiden / Âge sombre*) until the peak of ‘the Enlightenment’ (*Upplysningen / Siècle des Lumières*). I think that this multilingual approach contributes to my students’ ability to reach some of Skolverkets’s knowledge requirements for grade 9, such as: “Teaching should give pupils the opportunity to develop their knowledge of historical conditions, historical concepts and methods, and about how history can be used for different purposes” (Lgr 11, p.163).

## 2.4.2 Second Example of Multilingual Conceptualization

The second example has been included in my student survey (*om begrepp*). In 7<sup>th</sup> grade Geography we also use the textbook of the series *SOL4000* published by *Natur och Kultur* and the first few chapters deal with Physical Geography. For example, the multilingual immersion method provides an opportunity to enhance the students' concept acquisition in the subchapter about plate tectonics. As I was explaining the process of continental drift in English, my students were skim-reading the paragraphs about the tectonic forces and some were looking at illustrations and graphics. I was also using a video projector with different illustrations for the three main geological processes: divergent boundaries, fault lines and convergent boundaries. Then, a student raised his hand and took the risk of making an observation based on the Swedish words in the textbook. He said: -“The earth must be expanding!” I asked why he thought so. He answered: -“Well if the divergent zones are called *spridningzon* it means that the earth crust is spreading in those places, while in other places the continental plates are stopped by the *kollisionzon* (zone of collision). “That’s why the earth must be slowly expanding!” he said. In order to correct his false assumption about the geological process we were studying, I told him that I had never come across the Swedish term *kollisionzon* (zone of collision) before, because in French we call it *zone de subduction* and in English we call it a subduction zone. Then I asked the student to investigate independently on their tablets and phones and reflect on the ideas behind the terminology used to explain these geological processes. Less than a minute later someone said: -“*Subduktionszon* is also a Swedish word and there is even one more synonym called *neddykningszon*!” I congratulated her and asked the students to analyse the meaning of the word and see if they can generate a better hypothesis than the previous one. Very soon someone said: -“In English ‘sub’ means ‘under’ so one plate must go under another plate!” Then someone said: -“Well that explains the Swedish synonym *neddykningszon*, it’s as if the plate is diving under another plate.” The class discussion continued and many interesting comments emerged, proving that my multilingual concept acquisition hypothesis was helping the students develop their analytical skills while increasing their ‘*begrepp*’ (conceptualization). Comments like: -“It reminds me of the French and English word abduction or abducted, which mean to be taken away or to disappear, so the plate must disappear under the crust to become new magma.” -“Yeah, it’s just like a conveyer belt that goes very, very, very slow, so the earth cannot expand, because as soon as a divergent zone expands a subduction zone is diving under the crust!” Then as we looked at the map the

students continued to make observations that demonstrated their creative thinking, like: -“If India is going under the big Asian continental plate that must be the reason why it’s called a subcontinent.” or -“Why do we call the Pacific ocean *Stilla havet* if it’s surrounded by subduction zones that create big earthquakes and volcanoes?” For analytical purposes, I included the example of the words *kollisionzon* / *zone de subduction* / subduction zone in my student survey, in order to see if they agreed that these different concepts conveyed different conceptual meaning(s) when they are represented by words in different languages. This pedagogical approach definitely respects some of Skolverket’s most important knowledge requirements for grade 9, such as: “The pupils can use geographical concepts in a well-functioning way” (Lgr 11, p.158), and “teaching should also provide pupils with the preconditions to develop knowledge in making geographical analyses of the surrounding world and presenting results by means of geographical concepts” (Lgr 11, p.150).

### 2.4.3 Third Example of Multilingual Conceptualization

The third example is found in the literature I used for this research. Kharkhurin (2012) suggests that an “extensive cross-linguistic experience is believed to establish stronger and more efficient connections between conceptual and lexical representations” (p.42). However, it raises the question of conceptualization on the syntactic and grammatical levels. Since most of my students encountered the French and English *språkbad* method at a young age, some multilingual lexical concepts must be observable. As Jørgen Birch-Jensen (2007) points out in his book *Från rista till chatta*, acquiring Swedish and English simultaneously may lead to some grammatical anomalies in some cases. For example, the nouns taken from the English language are problematic when the Swedish plural form is used, because for most English words we only need to add an-s to the word to form the plural, but the common plural endings in Swedish are -or, -ar, -er, and they sound very strange when they are used with an English [or a French] noun (p.119). That’s why in a multilingual immersion environment we should sometimes expect to hear words like “bagar” instead of “bags” or “scisseauer” (saxar – scissors) instead of the French word ‘*sciseaux*’.<sup>3</sup> However, these small mistakes are extremely rare in grades 7-9. These mistakes are definitely more common in the early stages of the immersion program. Jasone Cenoz et al. (2001) refer to this period as the cutoff age. According to them, the most common challenge we observed during the cut-off age is the

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<sup>3</sup> As stated in an essay I wrote in 2014 entitled: *Mjölk s’il vous please : Children Language Acquisition in a Polyglot Environment*, for an English Grammar course at Malmö University.

proper use of the genitive form. The French genitive form is sometimes used while speaking Swedish or English: ‘Jenny is the friend of Johnny’, ‘Jenny är kompisen av Johnny’, because of the French grammar: ‘Jenny est l’ami de Johnny’. The opposite is true. Swedish or English genitive forms are used while speaking French: ‘Alice est Julia’s amie’. Instead of: ‘Alice est l’amie de Julia’.<sup>4</sup> This is something described by Trask (1995) as “an extreme in language variation... represented by communities and individuals who use two (or more) different languages every day” (p.87). Nevertheless, their syntax and grammar acquisition is remarkable, even though our students are exposed to languages with conflicting grammatical rules. According to Kharkhurin (2012), these examples of syntactic and grammatical variations can also be beneficial conceptual features, because the “newly developed conceptual representations may promote novel and creative ways of encoding experience, and subsequently increase the innovative capacity” (p 98). He also states that the types of difficulties mentioned by Birch-Jensen (2007) and Cenoz et al. (2001) are an essential part of a concept mediation model where “the representations of knowledge and meaning [is] stored in conceptual memory.” (Kharkhurin p.40)

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<sup>4</sup> As stated in an essay I wrote in 2014 entitled: *Mjök s’il vous please : Children Language Acquisition in a Polyglot Environment* for an English Grammar course at Malmö University.

## 3.Method

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In this chapter I will evaluate the validity and reliability of the sources employed in this empirical research. I will also explain the data collection process and describe how I led the teacher interviews and the survey of students.

### 3.1 Validity and Reliability

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#### 3.1.1 Validity

The validity of a qualitative research study is according to Holme and Solvang (1997) not the same as in a quantitative research method. The problem with qualitative interviews is the proximity between the interviewer and object of the research. The proximity can contribute to create a certain expectancy, which might create a theatrical interview where the interviewed person says what he thinks the researcher wants to hear (p.4-5).

#### 3.1.2 Reliability

Bryman (2012) is dividing reliability into two categories: external and an internal. The external reliability of this research is described by Bryman as the authenticity of the research, which is often measured by the degree that the study can be replicated with the same outcome as the first study. It is nearly impossible to thoroughly apply this on a qualitative study, because it is hard to get the respondent to talk about similar topics even though the questions are the same or very similar. However, to make sure that the research is as reliable as possible, I adopted the same approach and had the same question template in every interview I conducted.

## 3.2 Data Collection

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### 3.2.1 Primary Data: Semi-structured Teacher Interview

To get a deeper understanding of the things I observed about concept acquisition with the BMSL's multilingual immersion method, I came to the conclusion that semi-structured interviews were best suited to test my hypothesis. Furthermore, according to Kvale (1997) the purpose of the semi-structured interview is to find a valid qualitative description of an observation, with the intention of interpreting the interviewees' experiences, opinions and thoughts. This statement concord with Holme & Solvangs' (1997) observations concerning the benefits of semi-structured interview. They cite its potential to increase the overall understanding of the interviewees' thoughts.

In order to achieve my goals, I assembled a series of relevant, but simple, questions to help investigate the validity of my observations and those made by my colleagues at BMSL. I made sure to keep my questions short and simple, not to influence the respondent in any ways. Trost (2010) states that what verifies a qualitative interview is that you get deep and complex answers out of simple questions. Indeed, all the interviews I conducted for this research tend to confirm this theory. The respondents gave me elaborate answers to the simple pre-written questions I asked them. Subsequently, spontaneous follow-up questions emerged as I was trying to help the respondent clarify their observations, claims and statements. My intention was to keep the interviews as opened as possible, by not interrupting the respondents while speaking. I also made sure to give them time to take short pauses and reflect over their answers. Although, it is important to make sure the interviewees are factual and that they don't 'romanticize' or 'idealize' their answers. The best way to prevent these kinds of distorted perceptions is to ask questions such as "Can you provide an example of what you mean?" It is also important to make sure the respondents' answers are understood. In order to prevent misunderstanding the interviewer can reformulate the respondents' statements and initiate the following questions by saying: "In other words...[reformulate the statement made]... is that what you mean?" During the interviews, I had to take into consideration the background of each respondent, that's why one interview was done in French and later translated when transcribed.

### 3.2.2 Secondary data: Student survey

The survey was conducted on the 12<sup>th</sup> and 13<sup>th</sup> of May 2015 – a week after all the interviews had been transcribed. The questions asked were formulated to test some assumptions and comments made by the respondents during the interview and to gain a better idea of the students' background and linguistic competence and habits.

Every student from grades 7 to 9 (with the exception of 3 students who were sick) answered the survey anonymously. I distributed my survey entitled: Multidisciplinary Concept Acquisition in a Multilingual School Environment. (*Ämnesövergripande begrepp i en flerspråkig skolmiljö*). I asked the students to answer honestly and all the answers were carefully compiled without any alteration. As Yin (2003) observes: “Too many times, the case study materials may be deliberately altered to demonstrate a particular point more effectively [...] the investigator must work hard to report all evidence fairly” (p. 10). In this case, I had absolutely no reason to alter the data because the numbers compiled will only serve to demonstrate the validity of the observations made during the interview. The quantitative part of this research is not meant to be used to make a statistical analysis. In other words, the data will be used to validate or invalidate the statements made by the interviewees.

## 4. Analysis

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This analysis is based on three different perspectives: the students' survey, the interviews and the theories on this topic.

### 4.1 Interviews

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The interviewees were encouraged to elaborate as to why they respond in the manner they do. In addition, they were asked to provide practical examples to support their opinion, if possible. The interview questions were based on Pavlenko's (2000) model of conceptual development, in which the interaction of [different] languages and culture "may result in conceptual changes that may include the internalization of new concepts, convergence of the concepts and restructuring, but at the same time, attrition and/or substitution of previously learned concepts by new ones, and a shift from one conceptual domain to another." (Kharkhurin p.100)

#### 4.1.1 Respondents' Background

The four selected respondents and the interviewer are listed in *table 1* below, followed by a short background description. Please note that to make the respondents sufficiently anonymous, the second column has the respondents listed in three letter initials followed by a three-letter code for their country of origin. In addition, I would like you to note the subject(s) taught by each teacher and bear in mind that that with the exception of DBA-USA, all of the teachers uses Swedish textbooks while teaching their subject in another language. For example, WIB-ENG and GAD-AUS are using Swedish 'Formula' Mathematics textbooks, published by Gleerups, but only speak English in class. This would, in theory, make them potentially more aware of the advantages and disadvantages of the BMSL "*språkbad*" method. For practical reasons and for the purpose of the abduction method mentioned above, I included myself (Philippe Longchamps - Canada: PHL-CAN) in *Table 1*, since most of my previous observations will either be confirmed or dismissed by the interviewee or by the survey respondents. It also simplified the interview transcription process. In addition, it makes it easier to use the initials PHL-CAN in front of the relevant follow up questions in the interview transcriptions.

**Table 1: Interviews**

#	Interview	Meeting Date	Country of Origin	Class Subject(s)	Language(s) used in class
1	Interviewee WIB-ENG	2015-04-20	United Kingdom	Mathematics / Natural Sciences	English
2	Interviewee GBF-FRA	2015-04-22	France	French / <i>Modersmål</i> FR	French
3	Interviewee DAB-USA	2015-04-22	United States	English / <i>Modersmål</i> ENG	English
4	Interviewee GAD-AUS	2015-05-01	Australia	Mathematics / Natural Sciences	English
*	Interviewer / Observer /researcher PHL-CAN	-	Canada (Québec)	Geo / History English / French	English / French

## 4.2 Interview Analysis

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### 4.2.1 Interviewee 1

WIB-ENG worked for 15 years as a chemical engineer at different companies like Imperial Chemical Industries (ICI – now called Zeneca) in England for 2 years and at Tetra Pak in Sweden for about 13 years. 10 years ago she discovered an incredible passion for teaching, so she went back to university and got a Swedish teaching degree. She has been teaching for the last 8 years and 6 of these at BMSL. She is primarily a Mathematics teacher but also teaches Natural Sciences (NO) in English, while following the Swedish curriculum and using Swedish Maths textbooks for her classes.

Once WIB-ENG was done talking about her background, she said that she was aware of my research topic and had thought about my hypothesis before the interview. She said that she had heard me talk about my research in the staffroom a few days before I approached her regarding the interview. Therefore, she started to talk about BMSL's *språkbad* method before I had posed my first question. I kept her comments in the analysis because they support some of the theories mentioned previously.

WIB-ENG: - “The immersion method is fantastic! I can compare the level of English that our students speak with my own bilingual children – and I never spoke a word of Swedish with them I’ve been very strict with them. As a parent, I read many books about the difference between active and passive bilingualism and I was told not to worry if my children

answered back to me in Swedish when I spoke to them in English, but since their own school environment was in Swedish, their level of English suffered from it. After 6 months at the day-care centre my children stopped speaking to me in English and they would only reply to me in Swedish. But I assumed that what I read in those books was true, that this passive bilingualism will turn into active bilingualism. Now that they are grown ups, I still speak to them in English, but honestly, if I compare my three children's level of English with our students at BMSL I can assure you that our students have a higher level in general."

PHL-CAN: - "Can you give me some examples?"

WIB-ENG: "Every year, our new students are a bit nervous when they come up here in the Orange Track (grade 7-9) because they never had a real school subject in English before (other than *språkbud* and English as a subject) then suddenly all of their Mathematics education is in English. So with me, they get an extra 3 hours of English each week – not to mention the other extra hours they get with you (PHL-CAN) in other subjects like Geography and History and with GAD-AUS in Natural Science. But because I also speak Swedish fluently, sometimes in grade 7 the students speak to me in Swedish – especially the shyer girls at the beginning of the school year, but only 1 or 2 every year. However, they never ask me to speak Swedish with them. All the other students start speaking with me in English from day one. Sometimes, they do ask me to explain the terms when we start a new chapter – especially at the beginning – and they keep a page in their notebooks for special terms. For example, the word 'protractor' is a concept totally foreign to them. They won't be able to guess its meaning, so instead of saying the Swedish word for it, I try to demonstrate what a protractor is so they can develop their own mental image of the object and the concept. Sometimes, I ask if any of them know what the word protractor means, in order to get them active and to make my classes more interactive. If they give me the Swedish answer, I try not to pronounce the word *gradskiva* in Swedish. I do not want them to learn to pronounce it with my English accent. This is just an example, but I think it shows how the multilingual immersion method contributed to their understanding of concepts. When they come across words they don't understand they are so good at guessing the meaning, because they have been exposed to so many English and French words, they have a much broader vocabulary and deeper understanding of the concepts behind each part of the words they encounter. I don't think it has a negative impact on their Swedish. All students take the final National Test in Swedish in grade 9 and they are usually getting very good, if not excellent results."

PHL-CAN: - “Do you think BMSL’s *språkbad* method increases your students concept acquisition skills?”

WIB-ENG: “I think their understanding of concepts always increases, because they still get the Swedish explanations and questions in their textbooks, but the fact that their lessons are in English and explained using a different approach and language will, in my opinion, give them a broader understanding of the mathematical concepts. Bilingualism or multilingualism (in most cases) will help them solve problems while using different approaches because each language they use involves different sets of rules and abstractions that can be beneficial to their comprehension of mathematical concepts.”

PHL-CAN: - “Can you give me some examples of what you deemed beneficial?”

WIB-ENG: “In Maths, a lot of the basic concepts are very similar in Swedish and English, but the weaker language often becomes a support to their strongest language in problem solving. In other words, it gives them the ability to think more creatively. I think that bilingualism and multilingualism activates different parts of the brain as a child and it will make it easier to learn more things. I also think that learning a musical instrument may have a similar effect on the brain in the development of concepts. I believe it will make leaning and understanding easier as an adult because of their language skills.”

PHL-CAN: - “Does the method you use in class only contribute to the development of their level of English?”

WIB-ENG: “I think multilingual immersion programs like BMSL’s *språkbad* also contribute to the development of our students’ social skills, because it’s not only in the classroom that English and French are used – it’s everywhere! In general, our students’ level of French is not as high as their level of English. It requires a great deal of confidence for a student to use French (if French is not their mother tongue) the same way they use English in class, in the corridors and in the cafeteria at BMSL. However, many students do so when they reach grade 8 and 9.”

PHL-CAN: - “So you say that in general, it increases their self-confidence? Can you give me more examples?”

WIB-ENG: “BMSL has three languages as part of its profile, and many students are confident enough to choose to add a fourth language (Spanish) from grade 6 and a very high percentage of students receive instruction in a further language at BMSL, as they often have a different native language and receive Mother Tongue classes from Lund’s

*Modersmålsundervisningen*. So, at BMSL we have a few students who speak a fifth language and last term one of our 9<sup>th</sup> grade students completed with grade ‘A’ in Swedish, English, French, Spanish and Bosnian (Mother Tongue). On top of that, she’s taking Japanese classes in the evening outside of BMSL. I don’t think it’s a coincidence that her passion for languages contributed to the fact that she’s one of my best student in Mathematics too. Her ability to conceptualize learning must be influenced by her linguistic abilities and the confidence she gained from being a polyglot. I’m amazed that she’s not a musician as well, because as I mentioned earlier, these abilities often go hand in hand. Interestingly, she decided to choose *Naturvetenskap* at *Gymnasieskola* instead of a branch where she would further develop her skills for languages.”

PHL-CAN: - “Do you think that conceptualization happens on the linguistic level in the first place?”

WIB-ENG: “Sometimes students like this one who speak another foreign language at home - two different languages in some cases, where both parents speak different native languages, are already good in Swedish when they come to us in grade 7. Those who become fluent in English and functional in French before grade 6 often opt to add Spanish as a student choice (*Elevenval*) and those students are often very gifted and generally are excellent in mathematics too. I guess they perform well in most subjects, but I don’t know if it’s mostly because of the languages they become high achievers like this, it might help, but it’s hard to say if it’s not the other way around. But we never know, what if it’s their ability to think logically or their advanced Mathematics skills that is the reason why they become so skilled at languages? My guess is that it’s the other way around, because everybody acquires at least one language before they learn to solve a mathematical problem. So, I believe that conceptualization must happen on the linguistic level in the first place. One thing is sure; at BMSL they get real stimulation!”

PHL-CAN: - “According to you, is the *språkbad* method beneficial for every student?”

WIB-ENG: “The students who are struggling in most subjects are sometimes offered to drop the third language (French) so they can spend more time catching up on their Maths, Science or Swedish for example. However, these struggling students still get outstanding grades in English as a subject, because they are exposed to English on a daily basis and in a variety of subjects. It’s remarkable that those students manage to perform as well in the English national tests for example. They feel empowered by that because they know that their

English skills will become a “door opener” at *gymnasieskola*, university or in their future careers. To struggle academically on many subjects while excelling in English has a positive impact on their self-confidence. They still benefit from the best aspects of BMSL’s multilingual immersion program.

PHL-CAN: - “Can you give me specific examples of linguistic terms that might contribute to an enhanced conceptualization?”

WIB-ENG: “I think introducing new English maths terms is important, making sure they understand what those terms are in Swedish so they can be familiar with them in the textbook. Since I speak English in class while I explain problems that are described in Swedish in the textbook, I need to make sure my students are aware that sometimes words will be similar in English and Swedish, but most of the time they will be very different, even though they represent the same concepts. For example, in Geometry we have isosceles triangles and equilateral triangles and the students need to know their Swedish equivalents “*likbent*” and “*liksidig*” as soon as possible. In a way, I think that this example shows that knowing both terms in two languages increases the students’ understanding of the concepts attached to the geometrical shapes described.

PHL-CAN: - “Have you observed any other beneficial aspects that could be influenced by the *språkbad* method?”

WIB-ENG: “I think that the immersion method also increases the students understanding of the multicultural aspects of Mathematics. Having a British teacher that uses the metric system in class, but who brings a conceptual added value to their understanding by using examples from the imperial system can be helpful. I think that sometimes the children in Sweden and in Europe who are only exposed to the metric system have a big disadvantage because they seem to struggle with some basic concepts like just moving the decimal point. Somebody who has been brought up with the imperial system, like myself, can’t really understand how the students can have that problem with the metric system! British kids are used to multiply by using totally strange concepts like, to go from stones to pounds you multiply by 14, from pounds to ounces you multiply by 16 and they need to memorize formulas and other weird numbers in order to make conversions. It can be confusing initially for British kids, but once you’ve acquired these concepts, learning the metric system after that seems so simple. The only thing we need to do is to learn to move the decimal point. I see it as an advantage to have learned more complicated concepts before I learned an easier

concept, because it makes the metric system very easy to understand. When I see my students struggle with the metric system I can easily provide examples from the imperial system that are in essence harder to grasp, and I think that it might increase their understanding of the general idea of conversions of measurements. By using both concepts, I think I increase their cultural awareness – because the BMSL immersion method is more than linguistic – it also provides an opportunity to acquire foreign concepts that often contribute to a better understanding of the concepts used in Swedish society.”

### 4.2.2 Interviewee 2

The interview with GBF-FRA was done in French; the quotes are translations from the audio recording.

GBF-FRA has a Master's Degree in French Literature and Language. She also studied Pedagogy to get the French CAPES (teaching licence). After completing her studies she worked at the National Library of France from 2002-2005. Then she moved to Gothenburg, Sweden, where she worked as a teacher at *Göteborgs Franska Skolan* from 2005-2008. There, she was essentially working with the French curriculum CNED. She also had a special class with students from the International Baccalaureate. When she moved to Lund in 2008 she started working at BMSL. She has worked with all ages, from grade 1 to 9, but since 2011 she only teaches grade 7-9 students. She recently completed her "*VAL-utbildning*" and received her Swedish teacher's license to teach French in grades 7-9 and at *Gymnasie* 1-3.

PHL-CAN: - "What is your general impression about BMSL *språkbad*'s method?"

GBF-FRA: "I think the BMSL (*språkbad*) immersion method gives an advantage to the students who are interested in learning languages. If the students are not motivated they will encounter some difficulties in an immersion environment. However, we don't observe the same phenomena with English, because it has a different status than French among the youngsters of this generation. It is more part of the Swedish culture to speak English. Furthermore, it's the language they hear the most on TV and often the one they use the most on the Internet, while other languages like French, Spanish, German etc. don't have the same kind of exposure. However, even if some students don't feel confident enough to speak French, they often understand most of the basic instructions and common expressions because they are hearing them on a daily basis at BMSL."

PHL-CAN: - "Can you give me specific examples about how the *språkbad* method can influence the students' concept acquisition abilities?"

GBF-FRA: "I noticed that native Swedish speakers who come across various French grammatical distinctions as they learn French as a third or fourth language do not even realize that those distinctions often exist in Swedish and in English. They seem to have acquired these grammatical distinctions "naturally" without reflecting on their meaning or their importance. However, as they learn French grammar rules, I believe they further develop their conceptual understanding of their native language and of English as they learn French. I think that one of the characteristics of our students is that they often develop a strategy to

make links between the different languages they acquire. It necessitates a basic linguistic comprehension in order to really assimilate concepts. Abstract notions that are unique to a specific language are usually more difficult to grasp, but our role as teachers in an immersion school is to reformulate these concepts so that our students are able to comprehend their significance. In general, I think that their multilingual education is beneficial to their cognitive development, however we observed certain cases where the multilingual approach has not been beneficial to some students. We are all different and it seems to me that it is much harder for some students who haven't been raised bilingual or polyglot from an early age to assimilate concepts with the help of some linguistic strategies such as making rapprochements with the help of etymological or phonological resemblance for example. I see BMSL immersion *språkbad* method as a form of mental gymnastics for our students.”

### 4.2.3 Interviewee 3

DAB-USA studied International Business and Marketing at University of Texas in Dallas, when he moved to Sweden he got his teaching degree. He teaches English as a second language, English as a Native language and works as *språkbad* resource in Mathematics and Natural Sciences. He has been working at BMSL since 2011, but he has been teaching in Sweden for the last 10 years. Since English is a core subject in Sweden and one of the immersion languages at BMSL, DAB-USA only speaks English with his students. He speaks Swedish fluently, but the students never heard a single word of Swedish coming out of his mouth at BMSL.

PHL-CAN: - “What is your general impression of BMSL’s *språkbad* method?”

DAB-USA: “I think it’s great! One thing I noticed when I started at BMSL is that the English level of the students here is higher in comparison to children of the same age who are attending regular Swedish schools. The typical mistakes they make are the same one should expect from monolingual children who speak English only. So, I don’t think that the fact that most students have another native language has a negative influence on their level of English. Of course, I observed the typical grammar mistakes most Swedes are making, like saying “for two years ago” instead of “for two years” or “two years ago” because in Swedish they are used to saying “*för två år sedan*”. However, after living in Sweden for more than a decade, I noticed that it’s a mistake native English speakers tend to make as they are influenced by the Swedish grammar they are learning. I think it’s unconscious, it’s the kind of things people living in Sweden will say without thinking about it, but I rarely encounter these kinds of mistakes from my students on a written assignment. The level here is so high that I never have to cherry-pick words, I can speak freely as if the students were all native speakers of English. However, I do keep an open eye for the students with specific difficulties and I make sure after class that they understood the meaning of some difficult words.”

PHL-CAN: - “Do you think BMSL’s *språkbad* method increases your students’ concept acquisition skills and can you give me a few examples?”

DAB-USA: “For example, when I work with difficult concepts like ‘dystopia’, I keep it at the surface level. Not only because of their level of English, but mostly because I have to remind myself that my students are typical 12-15 year old students. I don’t feel that it is important at that stage to go too deep into the philosophical aspect of some concepts because we are not teaching university students here. Our immersion method is great, but we have to

make sure to keep the most difficult concepts at an introductory level in order to make sure the students acquire a basic understanding of these concepts without forcing them to know every single aspect, details and ramifications for each one of them. On the other hand, I think our students have an advantage here, because they seem to be able to conceptualize abstract ideas easily in comparison to other students attending the regular Swedish or American schools I worked at. It seems that most of our students are able to switch into different “modes” in order to conceptualize ideas.”

PHL-CAN: -“Can you provide more examples?”

DAB-USA: “I observe a variation in the difficulties encountered in English depending on the native language of my students. Most Swedes don’t struggle with the same concepts as other students who have other mother tongues spoken at home like: Persian, Russian, Arabic, French, Spanish or Croatian for example. One of the things people visiting our school notice is that English seems to be the dominant language spoken in the corridors in the Orange Track (*Högstadiet*) during breaks. I don’t think it interferes with their Swedish. As a matter of fact, I think the immersion method might contribute to develop their Swedish vocabulary and their understanding of concepts.”

PHL-CAN: -“What strategy do you use to take full advantage of the *språkbad* method?”

DAB-USA: “I try to create a pedagogical environment where the students will be rewarded by becoming risk-takers. I want them to feel that it’s OK to make mistakes. Anyone can go home and learn ten English words and do well on a test the day after, but this is not the purpose. The goal is to make sure that students are able to use the words in the right context in a real conversation, or when they write an essay. That’s what I think the immersion method is offering; an opportunity to put the vocabulary learned in context and into practice right from the start. One thing that I find interesting is that even in their Swedish class, our students read translated American and English literature, so I sometimes do something similar. For example, I sometime use short stories translated from Russian to teach English because I think that a multilingual immersion method should also open the door to a more multicultural education. The immersion method should not only contribute to the development of their linguistic competence; it should also help our students to develop their cross-cultural awareness. Furthermore, one more thing I observed here at BMSL is that our students are able to assimilate different English terms from different dialects. This might also contribute to develop their conceptualization abilities. When I speak about New York’s

subway, they all know that in London it's called the underground for example. Furthermore, our students are able to say things with different accents because they are exposed to a variety of different English on a daily basis. They have Maths in British English, History and Geography in Canadian English, Technology in Australian English, and with me they hear American English. That's why I'm confident to say that I think our students at BMSL are getting a real added value in their education."

#### 4.2.4 Interviewee 4

GAD-AUS has lived in Sweden for nearly, six years and she has been teaching at BMSL for the last three years. She used to teach in Australia from 1991-1997. She was a high school teacher there. She also lived in Germany and in the USA. She has no teaching experience in schools in those countries; however, she was home-schooling her own children while living in Germany and in the USA. Now at BMSL she teaches Technology and Mathematics.

PHL-CAN: - “What are the advantages and disadvantages of BMSL *språkbad*’s method and do you think it helps the students to develop their concept acquisition skills?”

GAD-AUS: “I think that the biggest challenge we face at BMSL is to teach the basics from the beginning, because some words don’t really translate. For example the course subject *teknik*, is it supposed to mean technology or technical skills? It is often hard in the beginning when the students want to systematically translate everything from one language to the other and when the concepts are not exactly the same in any of the languages used at BMSL. It is a bit confusing to start with, but after a while the students realize that they are not going to BMSL to become translators and that the subtle differences in these words can actually help them to develop a broader understanding of the concepts we are dealing with at school. There is so much material out there in English, particularly on the Internet, that quite often the students acquire understanding of concepts in English first and then it is the Swedish terms they encounter in their textbooks that we need to explain in class. I noticed a few disadvantages when I teach Mathematics in English, when some student’s level of English is not advanced enough. It is practically impossible to make sure the students understand every single Swedish words and term used in their textbook, because WIB-ENG and I are teaching it in English. Furthermore, all their tests are in Swedish too, and the sentence structures are very particular in Mathematics – that’s why our students may struggle during their first term in Maths in the Orange Track (*Högstadiet*). It makes it challenging for the students and the teachers to make sure that the students develop a capacity to acquire concepts independently, without trying to translate everything systematically. Nevertheless, I think that in general and in the long run, teaching the Swedish curriculum in foreign languages may increase the students’ cognitive abilities, because in my opinion, it stimulates them on a different level.”

PHL-CAN: -“Do you think it’s important to be consistent with the *språkbad* method?”

GAD-AUS: “As I said earlier, it is very tricky from the beginning and it’s hard to generalize because each student is different. For those who arrive in grade 7 and who are already fluent in two or three languages, it becomes a clear bonus because they are encouraged to learn to think about things in different kinds of ways while using different languages. I’m sure it creates a multitude of connexions in their brains and that must be beneficial in my opinion. However, I noticed that the students become very consistent in using only one language when they write essays in Technology. Usually, they are very good at sticking to a single language when they write. It’s very rare that I receive an essay that is written in “Swenglish”. I usually get essays written in English or Swedish and it’s very seldom that the students will suddenly use an English term in the middle of a Swedish essay and vice-versa.

PHL-CAN: -“Can you make a comparison between the *språkbad* method and other more conventional methods you have used in the past?”

GAD-AUS: “In Australia, I don’t think the foreign students were discouraged to use their mother tongue, but they weren’t encouraged to use it like here in Sweden either. When I compare both countries, I think Sweden has an advantage, and if I extend this observation to BMSL, I think our students have an even greater opportunity to benefit from the advantages of a multilingual education. I don’t think my former students in Australia who received a monolingual education will ever be able to enjoy the benefits of having received a multilingual learning. I mean, you can observe it when Australians travel. In general, they will have a much harder time learning a foreign language while abroad than a Swedish student who graduated from a school like BMSL.”

PHL-CAN: -“Can you give me specific examples about how the *språkbad* method can influence the students’ concept acquisition abilities?”

GAD-AUS: “In terms of terminology, one language will have a better name than another language for something or for a concept. For example, in English we have the concept collateral triangle, which is a *liksidig triangel* in Swedish and this seems very logical. But, in Swedish we have *likbent* which is “the two sides are the same” so it is also very logical. But in English we call this an isosceles triangle, which gives no clues about the concept behind the word. To me, it makes no sense at all, and it’s not a useful term to conceptualize an idea or an object. This is why I think that using a cross-linguistic pedagogy can be helpful in acquiring different concepts.”

#### 4.2.5 Interviewer's Observations

As the interviewer I noticed that many of my previous observations have been confirmed by my colleagues' answers. Even though some examples given were more about specific terms like protractor and isosceles triangle that represent objects rather than concepts. However, I understood that according to my colleagues, the development of a multilingual terminology contributes to develop the students' concept acquisition skills. It provides the students with an increased interpretational meaning for objects or topics and it enhances their ability to compare, contrast, analyse and understand more complicated concepts. In other words, it contributes to some kind of meta-understanding of concepts.

The parts of the interviews transcribed in this research have been chosen to illustrate the reality of the *språkbad* method according to the staff and the students in grade 7, 8 and 9 at BMSL. Some anecdotal comments and irrelevant observations have been removed from the transcripts, because they didn't contribute to the advancement of this research. All the names of the students mentioned in the interview have been removed as well. The thing that amazed me the most with these interviews is that the interviewees never seem to contradict each other. I also noticed that they tend to confirm each other's observations while giving different kinds of example. I found it interesting that GAB-AUS and WIB-ENG came up with the same example (isosceles triangle). Once again, this term may seem very specific and one could say that this kind of example is something that mostly contributes to the development of the students' multilingual vocabulary. However, once we take into account all the things and ideas attached to these kinds of terms, the interviewees seemed to agree that the sum of all this multilingual vocabulary contributes to some kind of meta-understanding of concepts. That is why I decided to use the terms 'protractor' and 'isosceles' in the questions included in the student survey. Nevertheless, I noticed during the interviews that my colleagues were all able to give some concrete examples about the relationship between concept acquisition and multilingual immersion, but often these were about grammar, syntax, vocabulary or objects. Maybe, I should have been more specific about the definition of "*begrepp*" (conceptualization) during the interviews. However, I did not want to influence their answers. I made sure not to give them my personal observations (previously mentioned: Renaissance, Subduction, etc.). I also noticed how important the intercultural perspective of learning is to my colleagues. Their observations are supported by those of Lorentz & Bergstedt (2006):

"A multicultural school has an ambition to develop a new way of relating to each other, a way that requires the whole school as a result of the multicultural situation, then this requires intercultural education and an intercultural approach, and an intercultural leadership of school leaders" (p.16).

Once the interviews were transcribed, I wrote the questions for the students' survey. My goal was to evaluate if our students shared similar opinions about the observations made by my colleagues and I. To begin with, I formulated many questions to see if the students were aware of the fact that they attended a school with an alternative pedagogy. Maybe, we take for granted that they understand that our school is unique? Then I formulated some questions in order to cross-examine some statements made by my colleagues during their interviews.

## 4.3 Survey Analysis

First I asked for the students' age, grade and gender. Then I asked them at what grade they started at BMSL. This gave me the opportunity to see if the students who arrived after grade 5 or 6 answered the questions differently than those who have been studying at BMSL since Preschool and F-class. I only observe a negligible difference about the attitude of the students who arrived in the later years towards French, but no difference regarding English.

**Table 2: At what grade have you started at BMSL?**

Preschool	F-class	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	6 <sup>th</sup>	7 <sup>th</sup>	8 <sup>th</sup> & 9 <sup>th</sup>
14	36	9	2	7	5	3	3	3	0

Then I asked them to put only one X for each question to see if the students perceived the observations made by the people interviewed in the same manner. Here are the results presented for the 81 students who answered the survey. For example, I wanted to verify if DAB-USA's statement about English being the most dominant language during breaks could actually be backed-up by some quantitative data.

**Table 3: Various questions**

	Swe	Eng	Fra	Other (name it)
What language do you consider your mother tongue?	41	12	13	(16) - Persian 3, Spanish 2, Slovakian 2, Dutch 1, Hungarian 3, Chinese 1, Russian 1, Bengali 1, Dari 1, Bosnian 1,
What language do you use the most with your father or "vårdnadshavare / guardian #1"?	50	8	9	(15) - Persian 3, Spanish 2, Slovakian 1, Dutch 1, Hungarian 1, Finnish 1, Czech 1, Hazagari 1, Bosnian 1, Croatian 1,
What language do you use the most with your mother or "vårdnadshavare / guardian #2"?	59	6	6	(11) - Persian 1, Danish 1, Bengali 1, Slovakian 2, Dutch 1, Hungarian 2, Chinese 2, Russian 1, Bengali 1, Dari 1, Finnish 1,
What language do you use the most with the rest of your family? (Siblings, Grand-parents, etc.)	46	7	11	18 different languages.
What language do you use the most during breaks at BMSL?	50	26	6	
What language do you use the most when you use the Internet or watch TV?	7	71	4	
What language do you use the most when you speak to GBF-FRA?	28	3	51	
What language do you use the most when you speak to GAD-AUS?	4	78	0	
What language do you use the most when you speak to DAB-USA?	2	80	0	
What language do you use the most when you speak to WIB-ENG?	4	78	0	
What language do you use the most when you speak to PHL-CAN?	7	59	19	
What language (other than your mother tongue) have you improved the most since you started at BMSL?	7	36	36	(3) Spanish 2, Chinese 1
What language would you use to make yourself understood if you were to travel to Paris this year?	0	22	60	

For the next step, I added a semi-open question to see if the students perceived the interviewees' statements about cross-cultural awareness and self-definition the same way. I asked the question: "As a student at BMSL, how would you define yourself? - As a citizen of Sweden? - A European? - An immigrant with another nationality? - Or as a citizen of the world? You can make your own definition, but choose the one that best represents you."

An impressive 32 students answered "I see myself as a world citizen". 29 feel more Swedish than anything else, while 9 students defined themselves as European and only 3 defined themselves as Lund/Skånebo. 9 students answered other nationalities like Iranian, Chinese, French, Bosnian, etc. One student defined himself as a citizen of the universe.

I also asked the question: "Do you (or did you) have "modersmålundervisning" lessons in your language?" The answers were: Yes 43, No 39. I added: "If yes, what language do you study?" Here are the answers I compiled: French 14, English 9, Persian 3, Hungarian 3, Spanish 4, Chinese (Mandarin) 2, Bosnian/Croatian 2, Slovakian 2, Dutch 1, Finnish 1, Czech 1, Dari 1. Then, I compared these students' answers with those who had two Swedish parents to see if I could test the claims made by my colleagues GBF-FRA, GAD-AUS, DAB-USA and WIB-ENG about the students who were exposed to more than 4 languages.

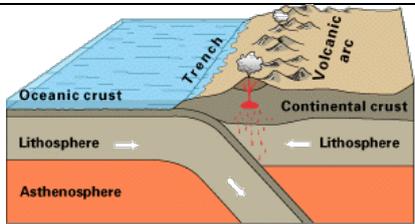
On the second page of the survey, I asked the students to answer the questions by choosing from a scale from 0 to 10 (0 being "not at all" or "no", and 10 being "a lot" or "yes"). All the questions were aimed at testing the claims and observations my colleagues and I made (with the exception of question number 4) and the students overwhelmingly confirmed our observations with averages above 7 on all questions (once again with the exception of question number 4). That question was actually the only question that was aimed at testing a statement made by an author that I excluded from the theoretical part of this study. It was inspired by an observation made by Francois Grosjean (2010): "Some bilingual and multilingual people feel that their personality changes depending on which language they are speaking. Do you feel this way too?" With a very low average of 4.5, the students have discredited this author's assumption. That's why I decided to remove it from the core content of this study. Furthermore, I did not deem this observation relevant in the context of concept acquisition in a multilingual immersion educational program. Here are the results with their average compiled:

**Table 4: Compiled results of the survey's second page**

1- According to you, to what degree does BMSL's "språkbadsmetod" (Multilingual immersion) contribute to develop your worldview ( <i>världsbildsutvecklingen</i> )?	594 0 1 2 3 4 5 6 7 8 9 10 7.2
2- According to you, to what degree does BMSL's "språkbadsmetod" (Multilingual immersion) contribute to develop your understanding of concepts ( <i>begreppsutvecklingen</i> )?	719 0 1 2 3 4 5 6 7 8 9 10 8.8
3- Do you think that knowing the same words and concepts in different languages can give you a better understanding in some subjects?	686 0 1 2 3 4 5 6 7 8 9 10 8.4
4- Some bilingual and multilingual people feel that their personality changes depending on which language they are speaking. Do you feel this way too?	367 0 1 2 3 4 5 6 7 8 9 10 4.5
5- According to you, to what degree does BMSL's "språkbadsmetod" (Multilingual immersion) contribute to the fact that BMSL performed very well in the National test in the past few years?	584 0 1 2 3 4 5 6 7 8 9 10 7.1
6- Because of BMSL's language immersion pedagogy, you understand that similar words like "affär – affaire – affair" in different languages mean completely different concepts?	623 0 1 2 3 4 5 6 7 8 9 10 7.6
7- To use a Swedish textbook (in Maths or other subjects) and have your lectures in English, is a good way to develop your linguistic competence and increases your understanding of concepts.	688 0 1 2 3 4 5 6 7 8 9 10 8.4

Finally, I asked specific questions about three concepts that were raised by the interviewees and myself. "The question about "begrepp"/ conceptualization. First, I asked the students to evaluate the credibility of my statement regarding the conceptualization of the words: *kollisionszon* / subduction zone/ *zone de subduction*. That is why I asked the following question: "In your opinion, which language conceptualizes this geographic phenomenon the best? (*Begrepp*) Swedish, English or French?"

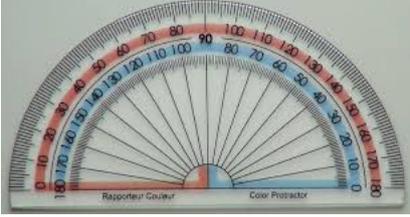
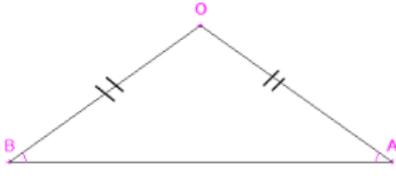
**Table 5: Which language conceptualizes this phenomenon the best?**

 <p>Oceanic-continental convergence Figure 1. Source: <a href="http://www.study.com">www.study.com</a></p>	SV: Kollisionszon	□19 : 23%
	Eng: Subduction zone	□46 : 56%
	Fr: Zone de subduction	□17 : 21%

The results are quite conclusive: only 23% of the students thought that this geographic concept is better represented by the Swedish word, and a total of 77% thought that the French and English words that included the prefix 'sub-' conceptualizes this geological phenomenon more efficiently.

Then, to test the observations made by both Mathematic and Science teachers WIB-ENG and GAB-AUS, I asked the following question: “In your opinion, which language conceptualizes these objects the best? (*Begrepp*) Swedish, English or French?”

**Table 6: Which language conceptualizes these objects the best?**

 <p>Figure 2. Source: <a href="http://www.rapporteurcouleur.com">www.rapporteurcouleur.com</a></p>	<table border="1"> <tbody> <tr> <td>SV: Gradskiva</td> <td>□40 : 49%</td> </tr> <tr> <td>Eng: Protractor</td> <td>□11 : 13%</td> </tr> <tr> <td>Fr: Rapporteur d’angle</td> <td>□31 : 38%</td> </tr> </tbody> </table>	SV: Gradskiva	□40 : 49%	Eng: Protractor	□11 : 13%	Fr: Rapporteur d’angle	□31 : 38%
SV: Gradskiva	□40 : 49%						
Eng: Protractor	□11 : 13%						
Fr: Rapporteur d’angle	□31 : 38%						
 <p>Figure 3. Source: <a href="http://www.tutorvista.com">www.tutorvista.com</a></p>	<table border="1"> <tbody> <tr> <td>SV: Likbent triangel</td> <td>□73 : 89%</td> </tr> <tr> <td>Eng: Isosceles triangle</td> <td>□5 : 6%</td> </tr> <tr> <td>Fr: Triangle isocèle</td> <td>□4 : 5%</td> </tr> </tbody> </table>	SV: Likbent triangel	□73 : 89%	Eng: Isosceles triangle	□5 : 6%	Fr: Triangle isocèle	□4 : 5%
SV: Likbent triangel	□73 : 89%						
Eng: Isosceles triangle	□5 : 6%						
Fr: Triangle isocèle	□4 : 5%						

The overwhelming dominance of the Swedish words (49% and 89%) confirms the observations made by both teachers in their interviews. In these cases, the fact that the students have access to a Swedish textbook in Mathematics, contributes to a better conceptualization of the objects. In other words, the students agree with WIB-ENG and GAB-AUS claims that the Swedish terms *gradskiva* and *likbent triangle* were easier to conceptualize than their English or French equivalents. So, it confirms the hypothesis that the access to a Swedish textbook has increased the comprehension of concepts attached to the object. In this case, it demonstrates that the words *isosceles* and *protractor* would have been much harder to grasp if the students would have used an English Mathematics textbook during their Mathematics lessons in English. Of particular interest is the high percentage of students who find “*Rapporteur d’angle*” more conceptually accessible than the corresponding Swedish and English terms. This example lends great support to the claim that meaning can be created from a deductive approach independently of the dominant language used in teaching or in textbooks. The conceptualization of specific terms for ideas and objects, in a multilingual environment, depends primarily on the linguistic competence of the student. It is understandable that a high percentage of students thought the French term “*Rapporteur d’angle*” illustrated the concept behind the object in a more efficient way, because ‘reporting an angle’ represents the main purpose of this object.

The only observation made during the interviews that was not confirmed by the students' survey was DAB-USA's statement about English being the most dominant languages during breaks. It seems that more than 60% of the students prefer to speak Swedish with their friends during the breaks in the corridors of the school. However, from my own experience, when an English-speaking teacher is around in the corridors, the students often use English. So, this could explain why DAB-USA had this impression. This is also confirmed by the survey. An overwhelming average surpassing 95% of the students answered that they use English in the presence of any of the three native English-speaking teachers (DAB-USA, GAD-AUS and WIB-ENG). Nevertheless, this observation does not contribute to the validation or invalidation of any aspect of this research study's main area of enquiry. This observation was added to the survey to substantiate an assertion made during one of the interviews.

## 4.4 Data Analysis – Analytic Induction

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After the data collection, I sat down with the gathered material and started to analyse the data. After recording and transcribing the most relevant parts of the interviews, I started to dig into the details. I used an analytic induction for the analysis of the collected data, which Bryman (2012) describes as a way to analyse data where the researcher searches for data supporting the research question(s) until the researcher has found data that is consistent to the hypothetical explanations. If divergent data is gathered, the researcher should either redefine or reformulate the hypothesis, so it is suitable for the research. Then, I used different online databases, such as Google Scholar and Summon, to search for some peer-reviewed articles that could support the claims made by the interviewees. In addition, Malmö University's library was used to find relevant books that can substantiate the data collected during the student survey. I have also accessed books and peer-reviewed articles for background research into the conceptualization of knowledge and the field of multilingual education in order to offer a concise analysis of this topic.

One important thing was highlighted by DAB-USA, WIB-ENG and GBF-FRA, and it can be referred to as code-switching practices'. They gave a few examples of interference from other languages while using a target language. For example some students might say something like: -'I need a *gradskiva* to answer this question'. I also occasionally noticed the same thing with my students' utterances. However, GAD-AUS believes that the students are quite consistent. In this regard, Kharkhurin (2012) views these practices as an obstacle to fluency in a target language: "Code-switching may result in underdevelopment of one's language due to insufficient intrinsic motivation to acquire translation equivalent in both languages" (p.100). However, Jim Cummins (1996) would argue that the "pupils' first languages are still frequently seen as either irrelevant to their academic progress or even as detrimental to attainment" (Foreword). On the other hand, code-switching can also be seen as an expansion of the conceptual system. The choice of specific terms as new connotations can generate entirely new meanings. That's why one could argue that using foreign words in a target language can be beneficial to the development of a meta-understanding of concepts. In light of these evidences and those brought forward during the survey and the interviews, one can confidently claim that this research study's primary question (What makes BMSL's multilingual immersion pedagogy an unambiguous incentive to maximize concept acquisition?) has been answered more than adequately.

## 5. Discussion

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Hopefully, more research on this subject will be conducted in the future. It would be interesting to investigate if there are alternative explanations, or other convincing conclusions or hypothesis for our students' academic success? One aspect of BMSL that should be considered in future researches is the juxtaposition of Montessori pedagogy with the *språkbad* method from preschool to grade 9. However, the scope of this research must be limited to grades 7 to 9 students and the multilingual immersion pedagogy used by the teachers in the Orange Team (*Högstadiet*).

### 5.1 Criticism Against Qualitative Research

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There will always be disadvantages regardless of the research method used. From the beginning I was aware of the main critiques regarding qualitative research and had those in mind throughout the research in order to minimize the impact of induced observations on the result of the research. Bryman (2012) raises four major criticisms against the qualitative research method. He claims that it is often too subjective and that it is difficult to replicate. Thereafter, he mentions that one of the main problems is that it can lead to generalization (p.44). Furthermore, the qualitative approach can minimise the importance of other aspects that could explain the high grades in the National Tests. One must be aware of the possible impact of BMSL students' socioeconomic affiliation on these good results<sup>5</sup>. In general, BMSL students come from relatively privileged environments where education is highly valued and where a flourishing language is also used in everyday life. This fact may affect their good results too, but unfortunately more in-depth researches would be needed to evaluate to what extent this hypothesis correlates to the third question tackled by this study. Therefore, the third question (Is the multilingual immersion pedagogy at BMSL one of the main reasons for the school's high scores in the Swedish National Tests in Maths, English, Swedish, NO and SO in grade 9 over the past few years?) cannot be answered adequately in this study, because as Bryman (2012) suggests, the qualitative method used might be perceived as inadequate (p.45).

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<sup>5</sup> See appendix 3 for more details about the National Tests' results.

Only a long-term quantitative method that includes a wider variety of data could provide an adequate answer to the third question. However, even though the answer to this specific question seems inconclusive, the qualitative nature of this research study strongly suggest that there is a correlation between the *språkbud* method and the outstanding results of the 9<sup>th</sup> graders in the different National Tests in the past few years at BMSL.

## 5.2 Recommendations

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I am equally aware of the criticism relating to quantitative research methods and the use of statistics to substantiate qualitative observations. That is why I would suggest that any future long-term research on related topics should be conducted independently and from an outsider's point-of-view. In order to prevent any form of bias or cognitive dissonance, I think that more cognitive tests, quantitative data and qualitative survey should be gathered and compiled about the students' concept acquisition abilities. Finally, instead of a case study I would suggest a comparative study. To compare BMSL with a non-multilingual immersion school from the same neighborhood, with students coming from similar socio-economic environments. I think it would definitely contribute to a deeper understanding of the impact of the *språkbud* method on concept acquisition. Finally, the second question raised by this research study (How do the creative, cross-linguistic and cross-cultural aspects of BMSL's multilingual immersion pedagogy contribute to the promotions of Lgr 11's broader definition of concept acquisition (*begrepp*)?) has been answered unequivocally. According to the students' survey and the teachers' interview, the meta-understanding of concepts generated by the *språkbud* method at BMSL, proves to be an efficient method to promote this kind of empowering multifaceted, knowledge-based education in a harmonious environment while achieving some of the most important goals of in the Swedish curriculum Lgr 11. Furthermore, plenty of examples throughout this research study suggest that the main goals of Lgr 11, which are aiming at promoting a kind of human development that is measured in happiness, are successfully achieved through the implementation of the unique BMSL's multilingual immersion method.

## 6. Conclusion

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This study demonstrates that by using the example of Bilingual Montessori School of Lund (BMSL)'s *språkbad* method to test the hypothesis that multilingual immersion pedagogy may have a positive impact on the conceptualization of topic-specific content is supported by an impressive body of empirical data in favour of this idea. Furthermore, it contributes to a deeper reflection on the concept acquisition processes. It establishes that it is highly plausible that BMSL's alternative multilingual immersion pedagogy played an important role in the school's outstanding achievements in the Swedish National Tests in grade 9 over the last few years. Coupled with a careful reflection on the method used, the empirical analysis of the four semi-structured interviews, the students' survey and the theoretical analysis of the literature on this topic, clarified the aim of this study by establishing that students can develop the ability to assimilate concepts through the use of different cross-linguistic strategies. It is also strongly suggesting that the *språkbad* method represents a pedagogical added value. The analysis led to the conclusion that multilingual immersion methods like the BMSL *språkbad* method can also contribute to generate more hypotheses together with thesis-supporting observations about the method's impact on the student's intercultural-awareness, creative thinking and cognitive development. The interviews also suggest that it contributes to some kind of democratization process.<sup>6</sup> Furthermore, this study established that BMSL's multilingual immersion pedagogy goals are promoting some of the most important goals of the Swedish National Curriculum Lgr 11. In addition, the empirical qualitative content analysis is based on examples taken from the interviewees' testimonies and it contributes to the development of a deeper understanding about processes involved in the comprehension of ideas and abstract concepts. Finally, this study establishes that a stimulating multilingual immersion-teaching situation can become a highly beneficial, pedagogical tool to develop the students' reflection skills and their overall understanding of topic-specific content.

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<sup>6</sup> As stated in section 1.3 and expressed by the teachers interviewed.

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# Appendix 1:

## Survey BMSL Orange:

Multidisciplinary Concept Acquisition in a Multilingual School Environment.

*Ämnesövergripande begrepp i en flerspråkig skolmiljö.*

Age: \_\_\_\_\_ Grade: \_\_\_\_\_ Gender: M  F

You started at BMSL in grade \_\_\_\_\_

Questions: (put <b>X</b> or fill with other language)	Swe	Eng	Fra	Other (name it)
What language do you consider your mother tongue?				
What language do you use the most with your father or "vårdnadshavare/guardian #1"?				
What language do you use the most with your mother or "vårdnadshavare/guardian #2"?				
What language do you use the most with the rest of your family? (Siblings, Grand-parents, etc.)				
What language do you use the most during breaks at BMSL?				
What language do you use the most when you use the Internet or watch TV?				
What language do you use the most when you speak to GBF-FRA?				
What language do you use the most when you speak to GAD-AUS?				
What language do you use the most when you speak to DAB-USA?				
What language do you use the most when you speak to WIB-ENG?				
What language do you use the most when you speak to PHL-CAN?				
What language (other than your mother tongue) have you improved the most since you started at BMSL?				
What language would you use to make yourself understood if you were to travel to Paris this year?				

As a student at BMSL, how would you define yourself? - As a citizen of Sweden? – A European? – An immigrant with another nationality? - Or like a citizen of the world? You can make your own definition, but choose the one that best represents you.

I see myself as: \_\_\_\_\_

Do you have "modersmålundervisning" lessons in your mother tongue? Yes  No

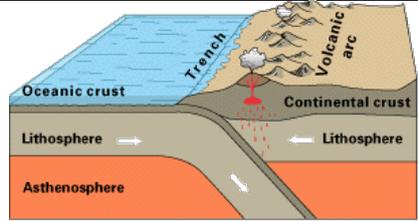
If yes, what language do you study? \_\_\_\_\_

Answer the next questions by choosing from a scale from 0 to 10 (0 being “not at all” or “no”, and 10 being “a lot” or “yes”):

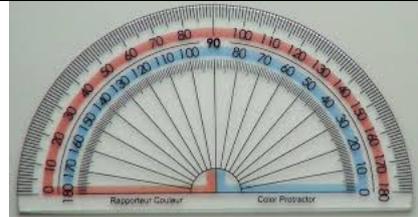
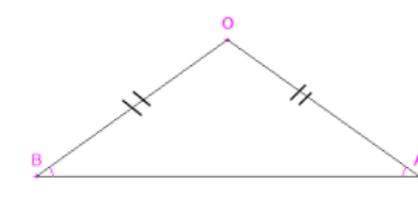
According to you, to what degree does BMSL’s “ <i>språkbadsmetod</i> ” (Multilingual immersion) contribute to develop your worldview ( <i>världsbildsutvecklingen</i> )?	<table border="1"> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>	0	1	2	3	4	5	6	7	8	9	10											
0	1	2	3	4	5	6	7	8	9	10													
According to you, to what degree does BMSL’s “ <i>språkbadsmetod</i> ” (Multilingual immersion) contribute to develop your understanding of concepts ( <i>begreppsutvecklingen</i> )?	<table border="1"> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>	0	1	2	3	4	5	6	7	8	9	10											
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Do you think that knowing the same words and concepts in different languages can give you a better understanding in some subjects?	<table border="1"> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>	0	1	2	3	4	5	6	7	8	9	10											
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Some bilingual and multilingual people feel that their personality changes depending on which language they are speaking. Do you feel this way too?	<table border="1"> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>	0	1	2	3	4	5	6	7	8	9	10											
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According to you, to what degree does BMSL’s “ <i>språkbadsmetod</i> ” (Multilingual immersion) contribute to the fact that BMSL performed very well in the National Test in the past few years?	<table border="1"> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>	0	1	2	3	4	5	6	7	8	9	10											
0	1	2	3	4	5	6	7	8	9	10													
Because of BMSL’s language immersion pedagogy, you understand that similar words like “ <i>affär – affaire – affair</i> ” in different languages mean completely different concepts?	<table border="1"> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>	0	1	2	3	4	5	6	7	8	9	10											
0	1	2	3	4	5	6	7	8	9	10													
To use a Swedish textbook (in Maths or other subjects) and have your lessons in English is a good way to develop your linguistic competence and increase your understanding of concepts.	<table border="1"> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>	0	1	2	3	4	5	6	7	8	9	10											
0	1	2	3	4	5	6	7	8	9	10													

Question about “*begrepp*”.

In your opinion, which language conceptualizes this geographic phenomenon the best? (*Begrepp*)

 <p>Oceanic-continental convergence</p>	SV: <i>Kollisionszon</i> <input type="checkbox"/>
	Eng: Subduction zone <input type="checkbox"/>
	Fr: <i>Zone de subduction</i> <input type="checkbox"/>

In your opinion, which language conceptualizes this object the best? (*Begrepp*)

	SV: <i>Gradskiva</i> <input type="checkbox"/>
	Eng: Protractor <input type="checkbox"/>
	Fr: <i>Rapporteur d'angle</i> <input type="checkbox"/>
	SV: <i>Likbent triangel</i> <input type="checkbox"/>
	Eng: Isosceles triangle <input type="checkbox"/>
	Fr: <i>Triangle isocèle</i> <input type="checkbox"/>

# Appendix 2:

## Quotes in their original language

### Original quote from Jörgen Birch-Jensen:

*“för de substantiv som kommer från engelskan är att det blir problematiskt när vi ska sätta dem i plural. För de flesta engelska substantiv gäller att man lägger till ett –s till ordet för att bilda plural, men så gör man ju inte med svenska substantiv. Våra vanligaste pluraländelser är –or, -ar, er, och det later väldigt konstigt när man använder dessa på engelska substantiv.” (Birch-Jensen, p.119)<sup>7</sup>*

### Original quote from Georges Ludi:

*”Un bilinguisme limité stigmatisant - appelé parfois "double semilinguisme" - a été observé chez des enfants dont l'éducation bilingue a échoué (Skutnabb-Kangas/Toukoma 1976, Haugen 1977). Il se manifesterait par un vocabulaire restreint, une grammaire fautive, un cumul de phénomènes d'hésitation dans la production et des difficultés d'expression dans les deux langues.” (Ludi, p. 87)<sup>8</sup>*

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<sup>7</sup> and <sup>8</sup> These quotes have been previously translated by me in 2014, for an essay entitled: *Mjök s'il vous please : Children Language Acquisition in a Polyglot Environment* that I wrote for an English Grammar course at Malmö University.

## Appendix 3:

Links:

***Här är skolorna med högst meritvärde***

<http://www.dn.se/nyheter/har-ar-skolorna-med-hogst-meritvarde/> Publicerad 2014-09-30

***BMSL 3:e bäst resultat på nationella prov 2013.***

[http://www.bmsl.se/Dokument/3e\\_bast\\_sverige.pdf](http://www.bmsl.se/Dokument/3e_bast_sverige.pdf) Publicerad 2013-12-14

***BMSL 2:e bäst resultat på nationella prov 2014.***

<http://siris.skolverket.se/siris/f?p=SIRIS:150:0::NO> Retrieved 2015-11-13