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Translanguaging practices in CLIL and non-CLIL biology lessons in Switzerland

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ABSTRACT

EN Studies on translanguaging in Content and Language Integrated Learning (CLIL) programmes have predominately focused on the use of the first language (L1) as a potential resource in CLIL lessons. This article argues that translanguaging practices that involve more than students' L1 are valuable, even necessary, pedagogies in both CLIL *and* non-CLIL biology lessons. The qualitative analysis of transcripts from 31 CLIL (English) and non-CLIL (German) biology lessons in Switzerland reveals that translanguaging involving the source languages of the technical vocabulary represents a particularly useful tool for negotiating meaning. Only one of the two instructors who participated in this study engaged in this kind of translanguaging when discussing the semantic content of technical vocabulary. Interestingly, this instructor had more extreme attitudes concerning classroom linguistic behaviour, upholding the need for monolingual (i.e., English-only) practices in his classroom. This observation indicates that teachers' stances towards translanguaging do not necessarily coincide with their practices.

Key words: TRANSLANGUAGING PRACTICES, TRANSLANGUAGING WITH SOURCE LANGUAGES, BIOLOGY, CONTENT AND LANGUAGE INTEGRATED LEARNING (CLIL), SWITZERLAND

ES Muchos de los estudios sobre translingüismo en programas del aprendizaje integrado de contenidos y lenguas extranjeras (AICLE) se han enfocado en el uso de la lengua materna (L1) como posible recurso para el aprendizaje y la enseñanza de segundas lenguas a través de contenidos. Este artículo argumenta que las prácticas de translingüismo que involucran otros recursos más allá de la L1 del alumno constituyen unas estrategia pedagógicas valiosas (quizá necesarias) y eficaces en clases de biología con o sin un modelo AICLE. El análisis cualitativo de un corpus de 31 lecciones de biología de AICLE (inglés) y no AICLE (alemán) en Suiza revela que el translingüismo en el ámbito del vocabulario técnico en la L1 representa una herramienta particularmente útil para la negociación del significado. Solo uno de los otros docentes que ha participado en este estudio ha empleado translingüismo al hablar del contenido semántico del vocabulario técnico. Curiosamente, este docente tenía actitudes extremas relacionadas con el comportamiento lingüístico en el aula, ya que sostenía la necesidad de prácticas monolingües (esto es, el uso exclusivo del inglés) en su clase. Esta observación indica que las posturas de los docentes hacia el translingüismo no coinciden necesariamente con sus costumbres.

Palabras clave: PRÁCTICAS TRANSLIGUALES, TRANSLENGUAR CON LAS L1, BIOLOGÍA, APRENDIZAJE INTEGRADO DE CONTENIDOS Y LENGUA (AICLE), SUIZA

IT Gli studi sul *translanguaging* nei programmi CLIL (*a*pprendimento integrato di contenuti e lingue straniere) si sono concentrati principalmente sull'uso della lingua materna (L1) come potenziale risorsa nei corsi con metodologia CLIL. In questo articolo si sostiene che le pratiche *translanguaging* che integrano altre risorse oltre alla L1 degli studenti sono altrettanto valide e persino necessarie nei corsi di biologia con o senza metodologia CLIL. L'analisi qualitativa di un corpus di 31 corsi di biologia CLIL (in inglese) e non CLIL (in tedesco) in Svizzera, rivela che il *translanguaging* che includa l'uso della lingua di partenza del lessico tecnico nella L1 degli studenti rappresenta uno strumento particolarmente utile alla negoziazione del significato. Solo uno dei due insegnanti che hanno partecipato allo studio si è servito del *translanguaging* per discutere del contenuto semantico del lessico tecnico. È interessante notare come lo stesso insegnante abbia atteggiamenti più estremi riguardo al comportamento linguistico, sostenendo la necessità di implementare pratiche monolinguistiche (ossia, solo l'inglese). nelle sue classi. Questa osservazione indica che le posizioni degli insegnanti nei confronti del *translanguaging* non coincidono necessariamente con le loro pratiche.

Parole chiave: PRATICHE TRANSLANGUAGING, TRANSLANGUAGING CON L1, BIOLOGIA, APPRENDIMENTO INTEGRATO DI CONTENUTI E LINGUE STRANIERE (CLIL), SVIZZERA

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1. Introduction

Traditionally, language education has been dealt with and believed to be best achieved by promoting strict monolingual instruction and keeping languages separated. In other words, the target language (TL) is best learnt without any interference from other languages (Hall & Cook, 2012). Early studies reported in Creese and Blackledge (2010) show that "moving between languages" (p. 105) was traditionally strongly discouraged in the classroom and seen as a last resort. According to Lasagabaster and García (2014), this separation of languages is based on two popular ideas: firstly, the fear that the learning of a second language (L2) could come at the cost of proficiency in the first language (L1), and secondly, that more exposure automatically leads to higher proficiency (p. 558). Even within Second Language Acquisition (SLA) and applied linguistics research, language acquisition and learning have typically been treated as processes that are ideally "uncontaminated by knowledge and use of one's other languages" (May, 2014a, p. 2).

Only recently has the field of applied linguistics and educational research begun to shift from a monolingual perspective toward a more inclusive and flexible perspective on multilingualism. This has been coined the *multilingual turn*, in that it assumes "multilingualism, rather than monolingualism, as the new norm of applied linguistic and sociolinguistic analysis" (May, 2014a, p. 1). Even though awareness of the monolingual bias in research is rising and thus shifting, as evidenced in recent publications problematizing this issue (see e.g. Conteh & Meier, 2014; May, 2014b), in practice this shift is far from complete as the prevalent ideology in classrooms is still often monolingually oriented (Cummins, 2005, 2007, 2008).

This holds true even for educational approaches such as Content and Language Integrated Learning (CLIL), a European educational model that was originally introduced in 1994 with the aim of promoting multilingualism and multiculturalism through the integration of content and language (Coyle, Hood, & Marsh, 2010; Marsh, Maljers, & Hartiala, 2001). In CLIL programmes, content subjects such as history or biology are taught in a second or foreign language with the aim of improving both content knowledge as well as language proficiency. Since its introduction, CLIL, in many different forms, has become a firm component of the bilingual education landscape in Europe[1]. However, many CLIL classrooms, like L2 classrooms, are, from a pedagogical perspective, still frequently monolingually-oriented spaces (Gierlinger, 2015; Lasagabaster 2013). Despite this monolingual orientation, Moore and Nikula (2016; Nikula & Moore, 2016) recently showed that translanguaging—the use of languages other than the TL—is actually a feature of many CLIL classrooms. They further found that translanguaging fulfils a variety of different purposes in the CLIL classroom, enriching it on multiple levels. Yet, Moore and Nikula, like other scholars, mainly examine alternating language use in CLIL classes (see Section 2.2), focusing not on *multilingual* practices, but on practices primarily concerned with the use of the L1 as a potential resource in CLIL lessons.

This article investigates the translanguaging practices in CLIL (English) and non-CLIL (German) biology lessons in Switzerland to show how a broader understanding of translanguaging can shed light on new and potentially valuable and effective pedagogies in CLIL and non-CLIL biology lessons. Switzerland is an ideal context to investigate translanguaging beyond the simple use of L1 and TL —especially in technical subjects such as biology—due to the many languages present there: the individual linguistic repertoires of students and teachers (Swiss German or other L1s), the medium of instruction (Standard German or English), and the languages present in the technical vocabulary of the subject-specific language of biology (Greek, Latin and other languages). Further, it is worthwhile to examine how these diverse translanguaging practices reflect teachers' attitudes to the TL use in their classes, as well as how their attitudes and practices coincide or deviate from each other.

2. Translanguaging

2.1. Definition

There are generally two ways to approach the term translanguaging. The classical approach starts with its etymology. The term is an English translation of the Welsh word *trawsieithu,* which describes a specific pedagogical practice in which, as part of a revitalization programme of Welsh, teachers would teach in Welsh and students would answer in English (Williams, 1994). Williams and later Baker (2011) reported on the cognitive advantages of this pedagogical practice involving varying language input and output.

[1] Although CLIL used to be a predominately European phenomenon, it has established itself as part of bilingual educational programmes all over the world (see e.g. Lo & Macaro, 2012; McDougald & Anderson, 2015; Tedick & Cammarata, 2012).

While for Williams and Baker, translanguaging remained primarily a pedagogical approach, García (2009) expanded the term to denote typical bilingual behaviour (see also Lewis, Jones, & Baker, 2012b, p. 647). According to García (2012):

> Translanguaging posits that bilinguals have *one linguistic repertoire* from which they select features *strategically* to communicate effectively. That is, translanguaging takes as its starting point the *language practices of bilingual people as the norm,* and not the language of monolinguals, as described by traditional usage books and grammars. (p. 1, emphasis in original)

Similar to the multilingual turn, translanguaging in García's sense shifts away from a monolingual perspective, taking practices of bilinguals as the normal mode of communication. Further, García states that bilinguals have not two separate repertoires that they can switch between, but one single linguistic repertoire from which they choose depending on context. This is in line with Canagarajah's (2011) elaboration of translanguaging as "treating the diverse languages that form their [the students'] repertoire as an integrated system" (p. 401).

Another way to look at translanguaging, as Li (2018) proposes, is to start with *languaging*, the view that language per se is not a finished product, but an ever-ongoing process to express thought and cognitive and meaning-making processes. Adding the prefix *trans-* to *languaging* emphasizes, according to Li (2018), the fluid nature of multilinguals' practices in two aspects: first, these practices do not work "unilingually in a politically named language", and second, they include all kinds of "cognitive, semiotic, and modal resources" (p. 18). While the first aspect resonates with García's proposition of one single linguistic repertoire for multilingual individuals, Li elaborates further by claiming that translanguaging is not restricted to the use of linguistic repertoires, but can include various para- and non-linguistic resources.

Translanguaging, then, is not simply a synonym for other related terms such as code-switching, code-mixing or translation (García & Li Wei, 2014; Lasagabaster & García, 2014; Lewis, Jones, & Baker, 2012a; Li Wei, 2018; Moore & Nikula, 2016; Nikula & Moore, 2016). Although code-switching, code-mixing and/or translation can be part of translanguaging, translanguaging goes beyond by saying that there are not only two separate codes that one switches back and forth, but that there is a multitude of integrated and interacting resources that compose each individual's repertoire where the individual can choose from in order to communicate effectively. From this perspective, translanguaging is neither a synonym for nor mutually exclusive with the idea of code-switching or code-mixing. Instead it adds and expands this notion to all kinds of linguistic and non-linguistic resources[2]. It is thus not only timely but necessary to investigate the value of such a broader notion of translanguaging with regard to CLIL.

2.2. Translanguaging and CLIL

Although translanguaging occurs in everyday communication as well as in school contexts (Canagarajah, 2011, p. 401), it is the educational context where it has attracted the most attention, as reflected in the publication of recently edited volumes on that topic (e.g., Cenoz & Gurter, 2015; García & Li Wei, 2014; Mazak & Caroll, 2017; Paulsrud, Rosén, Straszer, & Wedin, 2017). Translanguaging has also become a very prominent and popular theme in current CLIL research. Some studies on translanguaging in CLIL focus on teachers' attitudes to and self-reported use of the L1 in the CLIL classroom. These studies have found that CLIL teachers seem generally open towards using the L1, however, since they have not been trained on how to use translanguaging as a pedagogic strategy, they feel insecure as to what extent they should use or allow the L1 (see Gené-Gil, Juan Garau, & Salazar Noguera, 2012; Gierlinger, 2015; Lasagabaster, 2013; Méndez García, & Pavón Vázquez, 2012). Other studies on translanguaging in CLIL that focus on classroom data have revealed that translanguaging is not only a feature of many CLIL classrooms, but also that translanguaging practices do indeed serve various purposes such as facilitating content, managing the classroom, creating language awareness, or signalling alignment, to name just a few (see e.g. Gallagher & Colohan, 2017; Gierlinger, 2015; Moore & Nikula, 2016; Nikula & Moore, 2016; Paulsrud 2014, 2016; Toth 2018). Thus, translanguaging practices can enrich the CLIL classroom on multiple levels. Nevertheless, in their investigation of translanguaging practices in the CLIL context, the above-mentioned studies all follow the paradigm of bilingualism by focussing on practices primarily concerned with the use of the L1 as a potential resource in CLIL lessons. However, following the exploration of translanguaging outlined

[2] See Holmström and Schönström (2018) and Murray (2018) on translanguaging involving sign language.

in Section 2.1., it follows that one should take an approach to translanguaging in CLIL that goes beyond the simple use of L1 and TL, but incorporates all facets of the multilingual repertoires of students and teachers. This is exactly what the present study sets out to do.

3. The present study

The present study is an exploratory, qualitative investigation of teachers' and students' translanguaging practices. This study examines the multilingual resources used in whole-class interactions as well as teacher monologues in 31 teacher lectures in CLIL (English) and non-CLIL (German) biology lessons. It analyses classroom transcripts as well as transcripts of semi-structured interviews with participating teachers about their views on translanguaging in the classroom.

3.1. The context

In Switzerland, the context of the present study, language education can vary considerably among different regions due to its decentralised education system and its complex plurilinguistic situation[3]. There are no national CLIL programmes in public schools during compulsory education (grades 1-9), and those schools that employ CLIL are mostly grass-roots movements based on individual initiatives (e.g. *Schulprojekt 21*, see Büeler, Stebler, Stöckli, & Stotz, 2010). The only nationwide implemented form of CLIL is called *zweisprachige Matur* (bilingual baccalaureate), which can be found at *Gymnasien*, upper-secondary or grammar schools, and is offered in around 70% of 177 schools (SKBF, 2014, p. 150). The most common form of the *zweisprachige Matur* is found in the German-speaking part of Switzerland with Standard German as the mainstream language (ML) and English as the target language (TL) (Elmiger, 2008, pp. 15, 26; SKBF, 2014, p. 150). The data collected for the purpose of this study are taken from an upper-secondary school that offers the *zweisprachige Matur* in this most common form, with ML Standard German and TL English.

3.2. Classroom data and analysis

Data were collected by the author over a consecutive period of four weeks in 2015 at an upper-secondary school in the canton of Basel-Land. The data consist of 31 video-taped biology lessons (45 min) taught by two teachers, who teach their subject biology in both German (non-CLIL) and English (CLIL). Basel-Land is a canton in the Northwest of Switzerland that shares borders with France and Germany and thus belongs to the German-speaking part of Switzerland. Consequently, the L1 of both teachers and most students is Swiss German. Students in this study were in grades 10 and 11 and ages 15 to 17 years old. A distribution of the lessons according to the teachers can be seen in Table 1.

Table 1. *Distribution of video-taped biology lessons according to teachers.*

	Teacher 1 (T1)		Teacher 2 (T2)	
Grade + Programme	***Class***	***Hours***	***Class***	***Hours***
10 CLIL	1e	5	1b	5
10 non-CLIL	1a	6	1f	6
11 CLIL	2e	3	2b	2
11 non-CLIL	2d	2	2h	2
Total	16h		15h	

Note: 1h indicates one lesson of 45min

Classroom data include whole-class interactions and teacher monologues. Whole-class interactions are defined as "consist[ing] of the teacher conducting a dialogue with the class as a collective conversational partner" (Dalton-Puffer, 2007, p. 31), whereas teacher monologue is identified as any "[l]onger stretches of coherent teacher talk is the classic lecture-type format for presenting curricular information" (p. 32) that are not part of whole-class interaction and often start with a discourse marker like *okay*, *alright*, or *now* (Lemke, 1990, p. 64).

[3] There are four official languages (Standard German, French, Italian and Romansh), a spoken variety (Swiss German) that differs considerably from the official Standard German, and one fifth of the population that has a different L1 than any of the above-mentioned languages (BFS, 2017, p. 32; EDA, 2017).

For the analysis of the classroom data, I draw on Moore and Nikula's (2016) broad categories of salient and unmarked translanguaging[4]. Moore and Nikula define salient translanguaging situations as those where "participants orient to language in order to facilitate content learning" and unmarked translanguaging as situations where "participants orient primarily to the flow of interaction" (p. 219). That is, in salient translanguaging, the focus is on the language as it serves to clarify technical terminology or subject-specific concepts. Moore and Nikula found, for instance, that salient translanguaging in the L1 was used by a teacher for the purpose of clarifying key lexis, negotiating its meanings and having explicit reflections on language (e.g. T: "what does x mean in the L1?"). They also found that it can be student-initiated (e.g. S: "what does x mean in the L1?"), or can even be prompted by the teacher asking for students' expertise and at times, may even foster linguistic creativity (Moore & Nikula, 2016, p. 219-226).

Unmarked translanguaging, on the other hand, occurs unnoticed and is used to keep the interaction going without any obvious signs in the interaction that participants are consciously translanguaging. In Moore and Nikula's work, unmarked translanguaging was mainly present in the teachers' regulative register, as a result of teachers managing the classroom, clarifying and checking instructions of tasks and most importantly, signalling alignment with students by switching to the L1 or the TL (pp. 226-231).

In the first step of analysis, I identified instances of translanguaging in all CLIL and non-CLIL biology lessons by marking them as salient or unmarked translanguaging. Since I argued that in this particular Swiss context, a more inclusive notion of translanguaging is necessary, I then considered instances of translanguaging that go beyond the use of the L1 and TL in both CLIL and non-CLIL biology lessons. Since Moore and Nikula investigated translanguaging practices in a variety of subjects (biology, physics, geography, history, technology and music) in three different contexts (Finland, Spain and Austria), I assumed that similar instances of salient and unmarked translanguaging are present in the CLIL data at hand. Due to the special sociolinguistic context of the study, where Swiss German is spoken in addition to Standard German in the non-CLIL lesson, I expected salient and unmarked translanguaging practices to occur in these lessons as well, however, likely to a lesser extent than in the CLIL classroom. Last but not least, due to the technical nature of the subject content, I expected that translanguaging practices also occur involving subject-specific terminology.

3.3. Teacher interviews

To complement the classroom data, I conducted two semi-structured interviews with both teachers. Both teachers are Swiss and, thus, non-native speakers of English. Both are content and not language teachers, and lateral entrants in the teaching profession, i.e. they worked in a different field before they decided to become teachers. T1 holds a Ph.D. and a PostDoc in zoology and also worked in the information technology (IT) sector. At the point of the interview, he had approximately five years of teaching experience, with three in CLIL. T2 studied IT at a Swiss university before obtaining a PhD in zoology in Britain. He had approximately nine years of teaching experience, with three in CLIL. Even though the primary focus of these interviews was on getting the teachers' perspectives on the differences between CLIL and non-CLIL lessons, the issue of translanguaging arose in both interviews. The semi-structured interviews lasted 35 and 45 minutes respectively, and they were audio-recorded, transcribed, and qualitatively analysed with a focus on translanguaging.

4. Results and discussion

In this section, I first discuss the results of the classroom data with regard to salient and unmarked translanguaging. When appropriate, I include excerpts from the teacher interviews in the discussion of the classroom data. At the end, I reflect upon the classroom data through the lens of each individual teachers' perspectives on translanguaging. Throughout this section, the following abbreviations are used: L1 = Swiss German, ML = Standard German, TL = English.

[4] I did not use functional categories to classify instances of translanguaging like other researchers (e.g. Paulsrud, 2014, 2016; Toth, 2018) as such predefined categories might have limited the scope of the exploration and veered from the study's aim to explore translanguaging practices that go beyond the use of the L1.

4.1. Translanguaging practices

4.1.1 Salient translanguaging in CLIL biology lessons

Teachers used salient translanguaging practices in CLIL biology lessons to clarify and explain key lexis and scientific concepts, exploit more proficient English students' knowledge, and to allow for linguistic creativity and for students to inquire about key lexis and its meanings. By far the most frequent salient translanguaging practice used by the teachers is shown in the following excerpts, where a technical term is directly followed by a translation in the ML (Excerpts 1 and 2, see Appendix for transcription conventions).

Excerpt 1. CLIL biology lesson 20150507_2e[5]

1.	T1	Airways are enforced by **rings of cartilage**, *Knorpelspangen*.

Excerpt 2. CLIL biology lesson 20150507_1b

1.	T2	To **reinforced concrete** that's *Stahlbeton* in German.

Excerpts 1 and 2 occur both in teacher monologues, a function of which is "to ensure that all of the listeners are able to follow the message" (Moore & Nikula, 2016, p. 220). However, translanguaging involving key lexis also occurs in interaction, for instance, as an explicit pedagogical strategy, as shown in Excerpt 3. The teacher wants to ensure that his students understand what chickpeas are before starting the experiment, and thus prompts the students to provide the German equivalent for chickpeas to ensure mutual understanding.

Excerpt 3. CLIL biology lesson 20150511_1e

1.	T2	**Chickpeas**. What are **chickpeas**?
2.	S	*Kichererbsen*.
3.	T2	*Kichererbsen*, exactly.

On the other hand, salient translanguaging in interaction also frequently occurs when students lack a term and thus use the ML equivalent (Excerpt 4) or explicitly ask for the translation of the word (Excerpt 5). In such cases, it is usually the teacher who provides students with the English term so the students can then incorporate it into their responses.

Excerpt 4. CLIL biology lesson 20150521_2e

1.	S	Well, I don't know how, but uhm the big arrow, it just shows that they uhm *Gleichgewicht*?
2.	T1	**Balance.**
3.	S	The **balance** of the reaction is on the right side.

Excerpt 5. CLIL biology lesson 20150507_1b

1.	S1	The upper (end) is in general yeah just yeah it's uhm. *Was heisst zusammenfassen*? [*What does summarise mean?*][6]
2.	S2	Mh? *Zämmefasse? Ah was heisst das scho wieder?* [Mh? *Summarise? Ah what is it again?*]
3.	T2	**Summarise**.
4.	S1	Yeah, **summarise,** please.

[5] All excerpts in this article are taken from the data that forms the basis of this study. "CLIL biology lesson 20150507_2e" means that Excerpt 1 is taken from a biology lesson in English (CLIL), of class 2e on the 7th of May 2015. All subsequent excerpts are labelled accordingly.

[6] All English translations in square brackets have been made by the author.

Excerpt 5 is interesting with regard to language choice: In line 1, S1 switches mid-sentence from English to Standard German to ask for the equivalent in English, whereupon S2 replies in Swiss German. The teacher, however, sticks to English, and provides the translation, which is then incorporated by S1 in line 4.

Sometimes, not only students lack a term, but also the teachers. Since in the present case both CLIL teachers are non-native speakers of English, they occasionally were not sure of terminology in the TL. One strategy to solve this is illustrated in Excerpt 6, where the teacher asks the class for the English equivalent of *Seeroosen*.

Excerpt 6. CLIL biology lesson 20150528_1b

1.	T2	What i- what is *Seerosen* in English?
2.	S	(xx)
3.	T2	Pardon?
4.	S	Wasn't it **water lily**?
5.	T2	**Water lily**, yes, thank you. **Water lily**.

One could argue that, in this situation, the teacher simply uses translanguaging to "reinforce meaning" (Moore & Nikula, 2016, p. 220), or, similar to Excerpt 3, wants to ensure that the whole class knows the term in question in the ML and the TL. However, in this case, the teacher's *thank you* in line 5 as well as the intonation from the video-recording indicate that this seems to be a genuine request for information from the teacher.

As seen across the above excerpts, a frequent translanguaging strategy to solve a situation where the teacher does not know the TL term consists of consulting and even exploiting students' knowledge. This occurs particularly when the "class itself is multilingual, in which case it may contain students who are more competent TL speakers than the teacher" (Moore & Nikula, 2016, p. 223). In fact, T1 and T2 both have CLIL classes that are very multilingual in nature, including native speakers of English. Thus, it seems "only logical that the teacher acknowledge[s] that expertise, and exploit[s] it" (Moore & Nikula, 2016, p. 223). This is in fact confirmed by T1 (Interview Excerpt 1), who explains this to be a strategy he often uses.

Interview Excerpt 1. CLIL biology lesson 20150521_2e[7]

1.	T1	What I do when I'm lacking a word, or I really don't know a word, then I very openly ask the native speakers in front of the class: "Can you please provide a translation for this word?"

Translanguaging can also be used as a reply to student-initiated clarification requests ("what is x?"). Moore and Nikula (2016) discuss such cases in terms of the *principle of least effort* (see p. 223), meaning that it is often easier (and more time-efficient) for teachers to simply translate a term rather than paraphrase it in the TL. However, this is not always an option, especially when there is no direct equivalent in the ML, or if the teacher needs to explain the scientific concept behind a term. Take for instance Excerpt 7, where the student-initiated clarification request revolves around the complex concept of affinity.

Excerpt 7. CLIL biology lesson 20150521_2e

1.	S1	What means **affinity**?
2.	T1	*Begehren*? Uhm you can also call it just call simply call it uhm love for oxygen. I mean it really is or eh uhm. Anybody have a better word for that?
3.	S2	**Magnet**?
4.	T1	Pardon?
5.	S2	**Magnet**?
6.	T1	**Magnet**?
7.	S2	No?
8.	T1	Well, you will see soon why magnet is not really appropriate

[7] This and all subsequent excerpts from the teacher interviews have been translated from Swiss German to English by the author.

Affinity and the German technical term *Affinität* derive from Latin *affinitas*. Thus, it would make no sense for the teacher to merely provide the student with the ML equivalent of the technical term, as it is exactly the same as in English, and will thus say nothing about the actual concept of affinity. Consequently, he instead decides to provide the student with a translation of a more everyday term *Begerehen* (desire). He also tries to circumscribe it ("love for oxygen") and then asks the class for a better word. When S2 suggests magnet as an alternative (line 3), the teacher's response in line 8 concludes that this is not an appropriate alternative though. Interestingly enough, although the teacher mentions in line 8 that the students will soon see "why magnet is not appropriate", at the end of this very lesson it becomes evident that despite all the teacher's attempts to explain the scientific concept in question, the students seem to not have grasped it yet.

Another translanguaging practice that we encounter is when there is a term in the ML that does not have an exact equivalent in the TL. Lin (2016) claimed that sometimes, "the L1 of the students might not encode or construe technicality in the same way as English" (p. 49). An example of this is Excerpt 8, where the teacher explains what happens to the muscles when one exercises too much, which is a concept incorporated in the term *Muskelkater* (muscle hangover). Since there is no direct equivalent for this feeling of sore or aching muscles after exercising too much in English, the teacher chooses to explicitly translanguage by using we—meaning us who speak German—and explaining that *we* have a term for this concept, which we call *Muskelkater*.

Excerpt 8. CLIL biology lesson 20150518_1e

1.	T1	This has to do something with *Muskelkater*. We call it s- uhm *Muskelkater* that your muscles actually hurt after an exercise.

This may have something to do with the aforementioned principle of least effort: if there is an existing technical term encoding the whole concept in the ML but not in the TL, it might be easier (although not necessarily pedagogically preferable) to simply use the term already encoding the concept, instead of explaining it to the students in the TL.

Translanguaging also creates a space that allows for linguistic creativity. In fact, two purposes identified by Moore and Nikula (2016, pp. 224-226) for salient translanguaging concern joint negotiation of subject-specific language and the creative use of two languages as a resource. Excerpt 9 shows a particularly interesting exchange in this regard: the teacher draws on both the TL and the ML to discuss subject-specific language (line 1), which then triggers a linguistically creative exchange (lines 2-3). In this case, subject-specific language revolves around the word *peanuts* and how the English and German names are actually misleading since peanuts do not belong to the taxonomy of nuts. This then triggers an exchange where the student, following the teacher's explanation, attempts to create the taxonomically correct name for peanuts in German (line 2), which is then completed by the teacher's creative coinage of the German terms *Erderbsen* (earthpeas) and *Erdbohnen* (earthbeans) (line 3).

Excerpt 9. CLIL biology lesson 20150528_1b

1.	T2	*Erdnüsse*. Well, uhm this is all, the also the, the English name **peanuts**, **pea** is correct, it belongs to the family of of **peas**, of beans, but **nuts** is incorrect. These are not **nuts**.
2.	S	**Peanuts** are not **nuts**. And in German, *Erdnüsse*, *Erd*, **earth**, is correct, because they (live), they grow underground, but of course, **nuts**, *Nüsse*, it's not correct. *Ja*.
3.	S	So, **peanuts** in German should actually (be) called *Erd-*, *Erd-*
4.	T2	*Erderbsen*. *Ja*. Something like that or *Erdbohnen*.

Contrary to Moore and Nikula (2016,), I have not found any instances of "learners' joint negotiation of subject-specific language," where peers are "stepping in with support when their colleagues signal gaps by translanguaging" (p. 224-225). In cases where a student signals a gap by translanguaging, it is the teacher, not the peer, who provides the missing term (as illustrated in Excerpts 4 and 5). Apart from this, though, I have found salient translanguaging practices in CLIL biology lessons to be used very similarly to the contexts shown in Moore and Nikula's work.

4.1.2. Unmarked translanguaging in CLIL biology lessons

Unmarked translanguaging, as explained in Section 3.2, refers to situations in the classroom where translanguaging is used, but not explicitly focused on, i.e. the interaction goes on "as if nothing unusual has occurred" (Bonacina & Gafaranga, 2011, p. 329). With regard to unmarked translanguaging in CLIL biology classes, most occurrences are found in the regulative register (Christie, 2002), that is, in situations concerned with classroom management and not with content teaching. By far the most frequent occurrence of unmarked translanguaging concerns the use of certain established administrative terms in Standard German that do not exist as such in English. In Excerpt 10, for instance, the teacher closes the lesson by reminding his students that there will be an *Arbeitswoche* next week, which literally translates to *Labour Week,* but simply refers to a project work week.

Excerpt 10. CLIL biology lesson 20150521_1e

1.	T1	Next time in a week, we will make a class lesson uhm. So it will not be biology (xx) we'll talk about what's coming up soon, namely the *Arbeitswoche*. And then uh the next time uhm the lesson after that we will talk about what's happening in here in the chloroplasts.

In Excerpt 11, a student uses the word *Berufswahltag*—literally *Job Choosing Day*, which is a specific event taking place every year where students can inform themselves about future job opportunities.

Excerpt 11. CLIL biology lesson 20150505_2b

1.	S	(xx) we already we've already saw when we were there like *Berufswahltag*?

As is shown in the excerpts above, these terms are administrative and not subject-matter related. Importantly, these German terms contain highly contextualised meanings known to all participants. Following the principle of least effort, it makes sense to simply use these, rather than painstaking circumlocution to convey the same meaning in English.

Translanguaging can also occur when discourse markers from the whole repertoire are employed, which is a typical bilingual behaviour (see Moore & Nikula, 2016, p. 229; Nikula & Moore, 2016, p. 8). Although Standard German and Swiss German share some discourse markers with English such as *so* or *okay*—in which case it is impossible to determine the exact source of the discourse marker—I found examples where the discourse marker *aso* in Swiss German (*also* in Standard German) meaning *so* or *that is* was transferred to English. Excerpt 12 shows the teacher using this discourse marker.

Excerpt 12. CLIL biology lesson 20150528_1b

1.	T2	the stem is shiny, *aso* [that is] shiny surface.

Another unmarked translanguaging practice that is illustrated in Moore and Nikula (2016, p. 229, extract 22) consists of the teacher using the L1 to make a meta-comment. In Excerpt 13, the teacher switches to Swiss German to make a meta-comment to himself about his action, before returning to content teaching in English.

Excerpt 13. CLIL biology lesson 20150505_2b

1.	T2	It's the Sebastian et al. is it (Früh)? *Ah i muess no einisch go luege.* [Ah I have to look at this again]. It is this one here.

Thus, I have found instances of translanguaging with contextualised Standard German to be the most frequent unmarked translanguaging practice, one that did not occur in Moore and Nikula's (2016) data (see for example pp. 226-231). Similar to them, I found occurrences of unmarked translanguaging in the form of

discourse markers and meta-comments. I did not, however, find any unmarked translanguaging due to signalling alignment or emotional charge (see pp. 230-231).

4.1.3. Salient and unmarked translanguaging in non-CLIL biology lessons

Translanguaging has received much less attention in monolingual content classes where the ML is the medium of instruction and, thus, the focus is on content learning and not on language. However, looking at the non-CLIL data of biology lessons, there are in fact instances of translanguaging. On the one hand, this has to do with the sociolinguistic context of this study, where the medium of instruction (Standard German) is not the language students typically converse in (Swiss German). Consequently, it seems logical to find instances of translanguaging in non-CLIL lessons involving Standard and Swiss German. On the other hand, this also has to do with the subject matter, as will be seen further below. Starting with unmarked translanguaging, there are similar instances as in the CLIL biology lesson, for instance with regard to the discourse marker *aso,* as shown in Excerpt 14.

Excerpt 14. *Non-CLIL biology lesson 20150505_1f2*

1.	S	Uhm *aso* es hat unten so Stacheln und die sind uhm gegen Fisch *aso* dass sie nicht gefressen warden. [Uhm *so* it has spikes down there and they are uhm against fish *that is* that they don't get eaten.]

Similar to Excerpt 13 in the previous section, the teachers, Swiss German speakers themselves, also use Swiss German for making meta-comments reflecting on their own actions, as illustrated in Excerpt 15.

Excerpt 15. *Non-CLIL biology lesson 20150505_1f1*

1.	T1	*Das mussi no ufschribe dass es richtig esch gsi.* Uh können Hefe können Atmung und Gärung betreiben wenn Sauerstoff zur Verfügung steht? [*I just have to note that down that it was correct*. Uh can yeast can run respiration and fermentation if there is oxygen?]

Both excerpts above include instances of unmarked translanguaging through the use of Swiss German discourse markers (Excerpt 14) or meta-comments (Excerpt 15). Interestingly, the most common salient translanguaging practice in the CLIL biology lessons—translating key terms (see Excerpts 1 and 2)—is also found in the non-CLIL lesson. In Excerpt 16, the teacher provides the English equivalent of the term in question.

Excerpt 16. *Non-CLIL biology lesson 20150505_2h*

1.	T2	Deshalb sind ja auch die uh **Herzsehnen** hier *heart strings* (xx) die verhindern dass diese Klappe hier durchschlägt und einfach so auf die andere Seite umklappt. [That's why the uh **heart strings** here *heart strings* (xx) which prevent that this valve here penetrates and simply turns down to the other side.]

One explanation for this excerpt could be that the teacher provides the translation of the term in order to draw students' attention to this fact that the language of science is generally English. However, since the English equivalent is directly followed by unintelligible talk, it is hard to come up with a conclusive interpretation for the teachers' translanguaging behaviour in this specific excerpt. Nevertheless, it shows that salient translanguaging from Standard German to English is also present in the non-CLIL lesson.

As mentioned in Section 3.1, biology lessons in Switzerland provide a rich context for the study of translanguaging since there are multiple languages at work simultaneously. While all the previous excerpts involved translanguaging with Swiss German, Standard German and/or English, the following excerpts illustrate translanguaging practices involving the source languages of the subject-specific terminology. Natural sciences in general have a high amount of technical terms, many of which derive from languages such

as Latin (e.g. *synthesis, assmiliation*) or Greek (e.g. *photo-, chlorophyll*). If we adopt a broader view of translanguaging that goes beyond the simple use of the TL and ML/L1, translanguaging with the source languages of subject-specific terminology must be included in this investigation.

An example of this can be found in Excerpt 17. The teacher is explaining the term assimilation. In order to do that, he employs all of his and his students' existing linguistic resources by drawing on related familiar terms from French and English. At the end of his turn, the teacher explicitly asks the students what the word *similar/similaire* in English or French means in German. A student then provides the correct translation (line 2), and from this the teacher then reconstructs the technical term assimilation.

Excerpt 17. Non-CLIL biology lesson 20150526_1f2

1.	T2	**Assimilation**. Gehen wir vom gehen wir vom Begriff aus. **Simile** kennen Sie aus dem Englischen aus dem Französischen, also die Endung ist ein bisschen anders **similar** or or **similaire**. Französisch oder Englisch **similar** heisst was? Ja? [**Assimilation**. Let's start with let's start with the term itself. **Simile** you know from English or French, well the ending is a bit different **similar** or or **similaire**. French or English **similar** means what? Yes?]
2.	S	Gleich und gleichwertig. [Same and equivalent.]
3.	T2	Gleich ja. Gleich. Und bei der **Assimilation** werden diejenigen Prozesse bezeichnet die Stoffe gleichmachen wie die eigenen Stoffe, und das ist zum Beispiel was die Photosynthese macht […] Und deshalb wird werden Prozesse wie die Photosynthese Assimila- auch **Assimilation** genannt. [Same yes. Same. And **assimilation** is what we call processes that make substances the same like their own substances, and this is for example what photosynthesis does. (…) And this is why processes such as photosynthesis are also called assimila-**assimilation**.]

Although the term *assimilation* originally derives from Latin *assimilare*[8], the teacher draws on more familiar resources the students may have (i.e. French and English[9]) in order to break down the meaning of the word itself. This is a good example of the pedagogical strategy of unpacking–repacking (Lin 2016), where teachers break down technical terms (i.e. unpacking) and then repack or put everything together in order to show the students how the term is used in scientific discourse. In this example, the teacher then repacks *assimilation* and shows the students why processes such as photosynthesis are considered processes of assimilation. Here translanguaging serves to clarify not only key lexis, but also to help students understand the scientific concept behind the key lexis.

It becomes even more interesting when we look at what the teacher does in the following excerpt. Excerpt 18 is taken from the same lesson, but this time the teacher explains the opposite of assimilation—dissimilation. He takes a similar approach by drawing on French and English as resources.

Excerpt 18. Non-CLIL biology lesson 20150526_1f2

1.	T2	und die Umkehrung davon etwas ungleich machen. Jetzt muss ich grad überlegen auf Französisch ungleich. Das Gegenteil von **similaire** ich muss irgendeine Vorsilbe im Französischen davorhängen. Ich bin nicht nicht, ich weiss, ich weiss nicht aso, der Fachbegriff ist **Dissimilation. Dis-** und **Dis-** uh ist ein Vorsilbe übersetzt mit un-ungleich. **Dis-** was gibts schlaues Wort mit **dis**- das mit **dis-** beginnt. Kommen nur englische Wörter in den Sinn. Englisch wird sehr die die Vorsilbe **dis-** sehr oft verwendet für un-. **Disease**. Ja **disease** danke ja. **Disease.** Uh **ease** das bedeutet wohl, dass es einem wohl ist. Man ist **at ease** dann ist es einem wohl, **disease** das heisst eigentlich unwohl, unwohl sein. [and the opposite of it is to make something not the same. Now I have to just think what is not the same in French. The opposite of **similar** I have to add some prefix in French. I

[8] http://www.oed.com/view/Entry/11934?redirectedFrom=assimilation#eid.

[9] Pupils in the canton of Basel-Land start learning French in grade 3 and English in grade 5 (EDK 2013, p. 2).

am not, no, I know, I don't know so, the technical term is **dissimilation**. **Dis**- and **dis**- uh is a prefix translated as not not-the-same. **Dis-** what clever word is there that with **dis-** starts with **dis-.** Can only think of English words. English the the prefix **dis-** is frequently used for not. **Disease**. Yes **disease** thanks yes. **Disease.** Uh **ease** this means well, that one is at ease. One is **at ease**, then one is well. **Disease** that means actually not well, not being well.]

In this example, first, based on the previous explanation, the teacher associates the opposite of assimilation, *dissimilation*, with making "something not the same." The teacher then draws on French, but eventually struggles to come up with the opposite of *similaire*. In the middle of the excerpt, he clarifies that "the technical term is *dissimilation*." He then goes on to dissect the word, singling out the prefix *dis-* as meaning *not*. In the end, he comes up with the English example of *disease,* and he explains how the prefix *dis-* changes the semantics of the word it is attached to, and that, consequently the technical term dissimilation means making something "not the same".

Other examples of this kind of salient translanguaging occur in the non-CLIL biology lessons, as Excerpts 19 and 20 illustrate. In Excerpt 19, the teacher explicitly asks for the meaning of the Greek word *chloro,* and when the student provides the answer (line 2), the teacher uses this to reconstruct the literal meaning of the word *chlorophyll*.

Excerpt 19. Non-CLIL biology lesson 20150526_1f2

1.	T2	Was heisst **chloro**? Wer weiss es gerade? Ja ? [What does **chloro** mean? Who knows this? Yes?]
2.	S	Grün. [Green.]
3.	T2	Genau, grün. Also Chlorophyll heisst auf Deutsch Blattgrün. [Exactly, green. So **chlorophyll** means in German Leaf green.]

Excerpt 20 deals with the concept of holo- and hemi-metabolic metamorphosis. Insects can be holometabolic, meaning they go through a complete metamorphosis (e.g., butterflies), whereas hemimetabolic insects do not change considerably in their appearance from larval to adult stage (e.g., locusts). By explaining the literal meaning of the Greek prefixes *holo-* and *hemi-,* the concept of complete and half metamorphosis becomes more graspable.

Excerpt 20. Non-CLIL biology lesson 20150507_2h

1.	T2	Imago ist das erwachsene Tier. Das ist **holo**metabol. **Holo** heisst? [Imago is the adult animal. This is **holo**metabolic. **Holo** means?]
2.	S1	Ganz. [Whole]
3.	T2	Dankeschön, ja. Ganz. Sollte auf der Liste draufstehen. [Thank you, yes. Whole. Should be on the list.]
4.	S1	Stimmt. [True.]
5.	T2	Die Alternative ist **hemi**metabol. **Hemi** heisst? [The alternative is **hemi**metabolic. **Hemi** means?]
6.	Ss	Halb. [Half]
7.	T2	Halb. Ja das ist wunderbar wie das chunnt. **Hemi** heisst halb. [Half. Yes this is wonderful how this turns out. **Hemi** means half.]

If we find this kind of translanguaging in the non-CLIL biology classes with German, we might also find these in the CLIL biology lessons with English. And indeed, as the subsequent section shows, this translanguaging practice is also present in CLIL biology lessons.

4.1.4. Translanguaging with source languages in CLIL biology classes

Similar to the salient translanguaging examples in the previous section, Excerpt 21 illustrates this translanguaging practice in the CLIL biology lesson. The topic of the lesson is dendrochronology[10], the scientific study of dating trees by counting their rings. The teacher uses translanguaging with the Greek roots in order to assist students understanding the term and the concept behind it. He translates the first part of the term *dendro*, then goes on by asking the students whether they have an idea of what the second part of the term—*chronos*—means. Although S1's answer in line 2 is unintelligible, based on the teacher's reaction (line 3), it seems not to have been the correct answer. The teacher makes another analogy to c*hronologer*, a word for a stopwatch, which then triggers the correct answer by S2 in line 4.

Excerpt 21. CLIL biology lesson 20150518_1b

1.	T	**Dendro** could you know the word **dendro**? Probably not. **Dendro** is a tree. **Chronos** that's a word you might know **chronolog** of **chronology.**
2.	S1	(xx)
3.	T	It's not exactly no, a **chronometry** that's if therefore what is chr- what we call a stopwatch was originally called a **chronologer**, yes?
4.	S2	Time.
5.	T	It's time, time, yes.

Excerpt 22 works in the same way—the teacher explicitly asks what the term *blastoderm* means, and the student replies by deconstructing the term into its components *blasto* and *derm* and their literal equivalents in English[11].

Excerpt 22. CLIL biology lesson 20150526_2b

1.	T2	**Blastoderm** what is a **blastoderm**? Martina[12]?
2.	S1	**Blasto** means germ and **derm** skin.
3.	T	Mmh. Exactly.

In Excerpt 23, a similar exchange occurs. The topic revolves around the meaning of the term *exodermis.* In line 1, the student initiates this translanguaging exchange first by translanguaging herself to Swiss German (*ah nei*) and then directing her question to the teacher in English by asking whether *exo* actually means outside, which is confirmed by the teacher (line 2). The student then deduces that *exodermis* in that case must be outside of the *epidermis*. She then states that she does not know what *dermis* means. The teacher provides the translation in line 4, and then continues himself by inquiring whether the students know the meaning of *epi*. Although the student does not know the literal meaning of the prefix *epi*, she knows a German word starting with this prefix. Taking up the student's idea of epicentre and recasting his initial question in line 8, the student (line 9) suggests that deducing from the word epicentre, *epi* must mean "more in the middle". The teacher corrects this (line 12) by clarifying that *epi* actually means "above the centre," whereupon the student (line 13) concludes that *epi* is "more outside" than *exo,* which is then confirmed by the teacher and put into perspective with the technical term *endodermis* (lines 14 and 16).

[10] This is a great example of a technical term that can be broken down by engaging with source languages. The Greek word *dendro* stands for *tree*, *chronos* means *time* in Greek, and the Greek suffix *–logy* can be translated as *the science/study of.* Thus, the literal meanings of these three terms already contain all the information one needs—dendrochronology is the study of time in trees.

[11] What is not shown in Excerpt 22 is the teacher's repacking of the term, where he, based on the student's explanation, uses the literal meaning "germ skin" to explain and describe the specific stage of *blastoderm* in the embryonic development.

[12] All names of participants have been changed in order to preserve their anonymity.

Excerpt 23. CLIL biology lesson 20150504_1b

1.	S	Uhm (xx) *ah nei* (xx) and doesn't uhm **exo** mean outside?
2.	T2	Yes.
3.	S	So it would be outside the **epidermis** oh now it's **dermis,** what does **dermis** mean?
4.	T2	**Dermis** is skin.
5.	S	Aha.
6.	T2	And **epo** what does **epi** mean that's the question.
7.	S	Mmh ah Epizentrum.
8.	T2	Mmh it's an **epicentre** yes. What does **ep**i mean?
9.	S	So more in the middle than outside.
10.	T2	No.
11.	S	Okay then.
12.	T2	**Epicenter epi** has nothing to do with centre, **epi** is something above the centre.
13.	S	Mmh, so it's more outside than **exo.**
14.	T2	**Epi** in this at least in this case it's more outside and then you have **exo** and **exo** in many contrast to **endo.**
15.	S	Ah.
16.	T2	There is also the **endodermis.**

All of these excerpts (17-23) show that translanguaging including the source languages of subject-specific technical vocabulary can be a very efficient scaffolding strategy in CLIL and non-CLIL biology lessons. It might have attracted the meticulous reader's attention that all of the excerpts concerning salient translanguaging in Sections 4.1.3 and 4.1.4 come from only one of the two teachers. Indeed, only T2 translanguages with languages other than English, Standard German or Swiss German.

4.2. Teacher perspectives

Although translanguaging occurred in both teachers' classrooms, only one teacher, T2, engaged in translanguaging practices using the source languages (Latin, Greek) of subject-specific vocabulary and did so in both CLIL and non-CLIL lessons. This section examines both teachers' attitudes with regard to the use of English in their classes to see whether their translanguaging practices might be reflected in their attitude towards translanguaging.

Interestingly, in the interviews, both teachers reveal that they imagine their CLIL classrooms as idealised monolingual spaces.

Interview Excerpt 2.

1.	T1	I am consistent in the classroom. As soon as I hear Swiss German, I tell them they should talk in English. But this is a Sisyphean task. I do it nevertheless, I do it consistently until the higher grades (xx). And I simply remind them. And I also understand that they fall back. That is, back to the mother tongue, this is somehow understandable. Uhm yeah. Yes, it- it is annoying because I consistently have to remind them. Because it actually is a concern of mine that they can speak English. And I also make this extra effort since it neither is my mother tongue. And yeah, but it is not disruptive, it simply is an extra effort yeah.

In Interview Excerpt 2, T1 explains that he has to consistently remind his students to speak in English (TL), so that they will not switch back to Swiss German (L1). By calling it a "Sisyphean task," he hints at the fact that students very easily slip back to speaking Swiss German with each other and that his reminding never holds for long. His statement that "it is actually a concern of mine that they can speak English" particularly reveals his ideology of a monolingual classroom. It shows the teacher's idea that learning English is directly connected to the amount of exposure; that is, the stricter the focus on the TL English, the more his students will learn. This attitude regarding the use of English is also present, and perhaps more extreme, in T2's interview.

Interview Excerpt 3.

1.	T2	Outside of biology class, I actually expect and I tell them this in the beginning as well, I expect that they whatever lies within the scope of school, that is here in the school building, here I expect that they speak English. […] This is- this is immersion is diving in. And actually I expect tell them that, but sometimes the implementation is a bit rocky. When they enter this door here inside it's English. It's English.

In Interview Excerpt 3, T2 goes as far as requesting that his students talk to him in English even outside of the classroom. He explains this view by saying that this is "immersion," and immersion is "diving in."

One of the earliest arguments for CLIL was this metaphor of the language bath (Bürgi, 2007), i.e., that simple additional exposure to a language automatically increases the proficiency of that language. This view has largely been rejected, however, as it is convincingly claimed that simple exposure is not enough to enhance proficiency (see e.g. Llinares, Morton, & Whittaker, 2012). Additionally, the idea of a monolingual classroom rarely holds true. This is something that both teachers hint at in their interviews. T1, for instance, explicitly says that his students often fall back on talking in Swiss German and that he has to constantly remind them to speak in English. T2 says it less explicitly, but hints at the same idea: when he says that "sometimes the implementation is a bit rocky," he means that the "implementation" of only speaking English is not always easy and does not always work, as was shown in the analyses of classroom exchanges. Interestingly, it is only T2, the teacher with the stricter attitude towards English-only use in and outside of his classroom, who engages in translanguaging practices involving the source languages of technical words (see Sections 4.1.3 and 4.1.4). This shows that teachers' attitudes towards translanguaging do not necessarily coincide with their practices.

Yet, T2 does not specifically discuss the use of vocabulary-specific source languages as translanguaging. Since he translanguages using vocabulary-specific source languages in both the CLIL *and* non-CLIL lessons, it may imply that he sees this practice primarily as a strategy to teach biology in general, no matter the programme (CLIL or non-CLIL). However, even after the qualitative investigation it seems that T2 does in fact translangauge more frequently, not only with regard to source languages, but also in regards to L1/ML and TL. It would thus be interesting to investigate quantitatively whether T2 indeed uses more translanguaging with the L1/ML in the CLIL classes as compared to T1, and, thus, whether his extreme attitude towards English-only is really not reflected in his practice.

5. Conclusion

In this article, I examined the translanguaging practices in two teachers' CLIL and non-CLIL biology lessons. In both teachers' CLIL lessons, I found salient translanguaging involving the TL and L1/ML. This kind of translanguaging was used in order to clarify and negotiate key lexis and scientific concepts (teacher- and student-initiated), to exploit student knowledge, and to create space for linguistic creativity. Unmarked translanguaging was found in both the CLIL and non-CLIL lessons, in the form of discourse markers and meta-comments, and, in the CLIL lessons, in the use of highly contextualised ML words. Importantly, by looking at the data with a more inclusive view of translanguaging, I also found instances of translanguaging with the source languages of the subject-specific vocabulary. This involved translanguaging with the etymology of technical terminology such as Latin or Greek. These kinds of translanguaging practices were identified in both CLIL and non-CLIL biology lessons, and the excerpts in Sections 4.1.3 and 4.1.4 have shown how this practice can enhance and scaffold students' understanding of scientific terminology and its associated concepts. In fact, these excerpts show that translanguaging with subject-specific terminology, using all linguistic resources available, can be an efficient pedagogy to clarify and negotiate meaning in biology lessons.

Further research, however, is needed to validate to what extent this kind of translanguaging is actually successful in facilitating content learning.. Nevertheless, translanguaging provides a potential tool to help students comprehend complex concepts. For instance, in Excerpt 7, when T1 struggled to explain the word *affinity* to his students, drawing on resources from Latin (*affinitas)* and French (*affinité)* may at least have provided another possible avenue for students to understand the meaning of this word. This kind of translanguaging—engaging with the source languages of technical terms to deduce and negotiate scientific concepts—can therefore be a pedagogy that is particularly useful in CLIL. In light of recent research

investigating the subject-specific requirements for CLIL teachers and students (see e.g. Hüttner & Smit, 2018; Lorenzo & Dalton-Puffer, 2016; McCabe & Whittaker, 2017), this study shows the potential of translanguaging as an effective, perhaps even necessary, pedagogical tool in biology lessons. While translanguaging, including source languages of technical terms, is not necessarily restricted to the subject of biology, it does seem particularly useful for subjects with a high density of technical words. It would be interesting to explore translanguaging with source languages in other subjects to understand the value of such a pedagogy for different CLIL subjects.

This article also highlights the need, in research on translanguaging practices, to pair data from surveys, questionnaires, and interviews with transcripts from actual classroom interaction. Too often still, researchers rely on self-reported data, as in Lasagabaster's (2013) study, which discusses teachers' L1 use, but is actually referring to their self-reported LI use. As Gierlinger (2015) states:

> The majority of these studies base teachers' beliefs on code switching on qualitative interviews or questionnaires without any reference to classroom data, and therefore may run the risk of presenting a perspective whose results do not adequately portray the complexity of the classroom code-switching context. (p. 351)

While studies that focus on teachers' reported language use can give us important insights into the attitudes that shape teaching, this study shows that what teachers say they do and what they do are not always the same. While T2 in this study is the teacher with more extreme attitude towards the use of English in, and even outside of, his classroom (based on the belief that more exposure leads to more proficiency), he indeed seems to engage in more translanguaging than T1, using not only the TL of English, the ML of Standard German and his L1 Swiss German, but also the source languages of the subject-specific vocabulary. Thus, studies that draw only on surveys, questionnaires, and interviews may actually tell us very little about actual classroom discourse, and further research linking teacher attitudes and actual translanguaging practices is needed.

Transcription notes

Identity of speakers

T1, T2	teacher 1, teacher 2
S	unidentified student
S1, S2	probably student 1, student 2
Ss	several or all students simultaneously

Commentary in the transcript

(x), (xx)	indicates a stretch of talk unintelligible to the researcher
(founder)	indicates an unclear or probable item
[thanks]	indicates the English translation of an utterance made in the ML or L1
the **cell** means *Zelle*	bold font shows key terms that are subject of translanguaging, whereas italics show the actual translanguaging practice

References

Baker, Colin (2011). *Foundations of bilingual education and bilingualism* (5th ed.). Clevedon, United Kingdom: Multilingual Matters.

Bundesamt für Statistik (2017). *Die Bevölkerung der Schweiz 2016*. Neuchâtel: Bundesamt für Statistik.

Bonacina, Florence, & Gafaranga, Joseph (2011). 'Medium of instruction' vs. 'medium of classroom interaction': Language choice in a French complementary school classroom in Scotland. *International Journal of Bilingual Education and Bilingualism, 14*(3), 319–334.

Büeler, Xavier, Stebler, Rita, Stöckli, Georg, & Stotz, Daniel (2010). *Evaluation "Schulprojekt 21" - Executive summary*. Retrieved from http://www.ife.uzh.ch/de/research/ppd/forschung/abgeschlosseneprojekte/evaluationen/schulprojekt21.html

Bürgi, Heidi (2007). *Im Sprachbad: Besseres Englisch durch Immersion. Eine Evaluation zweisprachiger Ausbildungsgänge an drei kantonalen Gymnasien in der Schweiz* (1. Aufl. ed.). Bern, Switzerland: Hep Verlag.

Canagarajah, Suresh (2011). Codemeshing in academic writing: Identifying teachable strategies of translanguaging. *The Modern Language Journal, 95*(3), 401–417. http://dx.doi.org/10.1111/j.1540-4781.2011.01207.x

Cenoz, Jasone, & Gurter, Durk (Eds.). (2015). *Multilingual education: Between language learning and translanguaging.* Cambridge, United Kingdom: Cambridge University Press.

Christie, Frances (2002). Classroom discourse analysis: A functional perspective. London, United Kingdom: Continuum.

Conteh, Jean, & Meier, Gabriela (Eds.). (2014). *The multilingual turn in langauges education: Opportunities and challenges*. Bristol, United Kingdom: Multilingual Matters

Coyle, Do, Hood, Philip, & Marsh, David (2010). *CLIL: Content and language integrated learning*. Cambridge, United Kingdom: Cambridge University Press.

Creese, Angela, & Blackledge, Adrian (2010). Translanguaging in the bilingual classroom: A pedagogy for learning and teaching? *The Modern Language Journal, 94*(1), 103–115. http://dx.doi.org/10.1111/j.1540-4781.2009.00986.x

Cummins, Jim (2005) A proposal for action: Strategies for recognizing heritage language competence as a learning resource within the mainstream classroom. *The Modern Language Journal, 89*(4), 585–592.

Cummins, Jim (2007) Rethinking monolingual insructional strategies in multilingual classrooms. *Canadian Journal of Applied Linguistics, 10*(2), 221–240.

Cummins, Jim (2008) Teaching for transfer: Challenging the two solitudes assumption in bilingual education. In Jim Cummins & Nancy H. Hornberger (Eds.), *Encyclopedia of language and education* (2 ed., Vol. 5: Bilingual education, pp. 65-75). New York, New York: Springer.

Dalton-Puffer, Christiane (2007). *Discourse in content and language integrated learning (CLIL) classrooms*. Amsterdam, Netherlands: John Benjamins.

EDA - Presence Switzerland (2017). Language – facts and figures. Retrieved from https://www.eda.admin.ch/aboutswitzerland/en/home/gesellschaft/sprachen/die-sprachen---fakten-und-zahlen.html

EDK - Erziehungsdirektoren (2013). *Ich lerne Sprachen: Eine Informationsbroschüre zum Lernen von zwei Fremdsprachen ab der Primarschule*. Bern: Schweizerische Konferenz der kantonalen Erziehungsdirektoren (EDK). Retrieved from http://www.edk.ch/dyn/26820.php

Elmiger, Daniel (2008). *Die zweisprachige Maturität in der Schweiz: Die variantentreiche Umsetzung einer bildungspolitischen Innovation*. Bern, Switzerland: Staatssekretariat für Bildung und Forschung. (SBF).

Gallagher, Fiona, & Colohan, Gerry (2017). T(w)o and fro: Using the L1 as a language teaching tool in the CLIL classroom. *The Language Learning Journal, 45*(4), 485–498. http://dx.doi.org/10.1080/09571736.2014.947382

García, Ofelia (2009). *Bilingual education in the 21st century: A global perspective*. Oxford, United Kingdom: Wiley-Blackwell.

García, Ofelia (2012). Theorizing translanguaging for educators. In Christina Celic, & Kate Seltzer (Eds.), *Translanguaging: A CUNY-NYSIEB guide for educators* (pp. 1–6). New York, New York: CUNY-NYSIEB.

García, Ofelia, & Li Wei (2014). *Translanguaging: Language, bilingualism and education*. Basingstoke, United Kingdom: Palgrave Macmillan.

Gené Gil, Maria, Juan Garau, Maria, & Salazar Noguera, Joana (2012). A case study exploring oral language choice between the target language and the L1s in mainstream CLIL and EFL secondary education. *Revista de Lingüística y Lenguas Aplicadas, 7*(1), 133–145. http://dx.doi.org/10.4995/rlyla.2012.1129

Gierlinger, Erwin (2015). 'You can speak German, sir': On the complexity of teachers' L1 use in CLIL. *Language and Education, 29*(4), 347–368. http://dx.doi.org/10.1080/09500782.2015.1023733

Hall, Graham, & Cook, Guy (2012). Own-language use in language teaching and learning. *Language Teaching, 45*(3), 271–308. http://dx.doi.org/10.1017/S0261444812000067

Holmström, Ingela, & Schönström, Krister (2018). Deaf lecturers' translanguaging in a higher education setting. A multimodal multilingual perspective. *Applied Linguistics Review, 9*(1), 90–111. http://dx.doi.org/10.1515/applirev-2017-0078

Hüttner, Julia, & Smit, Ute (2018). Negotiating political positions: Subject-specific oral language use in CLIL classrooms. *International Journal of Bilingual Education and Bilingualism, 21*(3), 287–302. http://dx.doi.org/10.1080/13670050.2017.1386616

Lasagabaster, David (2013). The use of the L1 in CLIL classes: The teachers' perspective. *Latin American Journal of Content & Language Integrated Learning, 6*(2), 1–21.

Lasagabaster, David, & García, Ofelia (2014). Translanguaging: Towards a dynamic model of bilingualism at school / Translanguaging: Hacia un modelo dinámico de bilingüismo en la escuela. *Cultura y Educación, 26*(3), 557–572. http://dx.doi.org/10.1080/11356405.2014.973671

Lemke, Jay L. (1990). *Talking science: Language, learning, and values*. Norwood, New Jersey: Ablex.

Lewis, Gwyn, Jones, Bryn, & Baker, Colin (2012a). Translanguaging: Developing its conceptualisation and contextualisation. *Educational Research and Evaluation, 18*(7), 655–670. http://dx.doi.org/10.1080/13803611.2012.718490

Lewis, Gwyn, Jones, Bryn, & Baker, Colin (2012b). Translanguaging: Origins and development from school to street and beyond. *Educational Research and Evaluation, 18*(7), 641–654. http://dx.doi.org/10.1080/13803611.2012.718488

Li Wei (2018). Translanguaging as a practical theory of language. *Applied Linguistics, 39*(1), 9–30. http://dx.doi.org/10.1093/applin/amx039

Lin, Angel M. Y. (2016). *Language across the curriculum & CLIL in English as an additional language (EAL) contexts: Theory and practice*. Singapore: Springer.

Llinares, Ana, Morton, Tom, & Whittaker, Rachel (2012). *The roles of language in CLIL*. Cambridge, United Kingdom: Cambridge University Press.

Lo, Yuen Yo, & Macaro, Ernesto (2012). The medium of instruction and classroom interaction: Evidence from Hong Kong secondary schools. *International Journal of Bilingual Education and Bilingualism, 15*(1), 29–52. http://dx.doi.org/10.1080/13670050.2011.588307

Lorenzo, Francisco, & Dalton-Puffer, Christiane (2016). Historical literacy in CLIL: Telling the past in a second language. In Tarja Nikula, Emma Dafouz, Pat Moore, & Ute Smit (Eds.), *Conceptualising integration in CLIL and multilingual education* (pp. 55–72). Bristol, United Kingdom: Multilingual Matters.

Marsh, David, Maljers, Anne, & Hartiala, Aini-Kristiina (Eds.). (2001). *Profiling European CLIL classrooms*. Jyväskylä, Finland: University of Jyväskylä and European Platform for Dutch Education.

May, Stephen (Ed.). (2014). *The multilingual turn: Implications for SLA, TESOL, and bilingual education*. New York, New York: Routledge.

Mazak, Catherine M., & Carroll, Kevin S. (Eds.). (2017). *Translanguaging in higher education: Beyond monolingual ideas.* Bristol, United Kingdom: Multilingual Matters.

McCabe, Anne, & Whittaker, Rachel (2017). Genre and appraisal in CLIL history texts: Developing the voice of the historian. In Ana Llinares & Tom Morton (Eds.), *Applied linguistics perspectives on CLIL* (pp. 105–124). Amsterdam, Netherlands: John Benjamins.

McDougald, Jermaine S., & Anderson, Carl Edlund (2015). CLIL and education coming together: The crossroads for multilingualism. *Latin American Journal of Content & Language Integrated Learning, 8*(2), 73–83. http://dx.doi.org/10.5294/laclil.2015.9.2.1

Méndez García, María del Carmen, & Pavón Vázquez, Víctor (2012). Investigating the coexistence of the mother tongue and the foreign language through teacher collaboration in CLIL contexts: Perceptions and practice of the teachers involved in the plurilingual programme in Andalusia. *International Journal of Bilingual Education and Bilingualism, 15*(5), 573–592. http://dx.doi.org/10.1080/13670050.2012.670195

Moore, Pat, & Nikula, Tarja (2016). Translanguaging in CLIL classrooms. In Tarja Nikula, Emma Dafouz, Pat Moore, & Ute Smit (Eds.), *Conceptualising integration in CLIL and multilingual education* (pp. 211–234). Bristol, United Kingdom: Multilingual Matters.

Murray, Joseph, J. (2018). The Baobab: Translanguaging in a multimodal sign language translation project. *Applied Linguistics Review, 9*(1), 135–156. http://dx.doi.org/10.1515/applirev-2017-0085

Nikula, Tarja, & Moore, Pat (2016). Exploring translanguaging in CLIL. *International Journal of Bilingual Education and Bilingualism*, 1–13. http://dx.doi.org/10.1080/13670050.2016.1254151

Paulsrud, BethAnne (2014). *English-Medium Instruction in Sweden: Perspectives and practices in two upper secondary schools.* (Doctoral thesis). Stockholm University, Stockholm. Retrieved from http://su.diva-portal.org/smash/record.jsf?pid=diva2%3A715747&dswid=-5048

Paulsrud, BethAnne (2016). English-medium instruction in Sweden: Perspectives and practices in two upper secondary schools. *Journal of Immersion and Content-Based Language Education, 4*(1), 108–128. http://dx.doi.org/10.1075/jicb.4.1.05pau

Paulsrud, BethAnne, Rosén, Jenny, Straszer, Boglàrka, & Wedin, Åsa (Eds.). (2017). *New perspectives on translanguaging and education.* Bristol, United Kingdom: Multilingual Matters.

SKBF - Schweizerische Koordinationsstelle für Bildungsforschung. (2014). *Bildungsbericht Schweiz 2014*. Aarau: Schweizerische Koordinationsstelle für Bildungsforschung.

Tedick, Diane J., & Cammarata, Laurent (2012). Content and language integration in K–12 contexts: Student outcomes, teacher practices, and stakeholder perspectives. *Foreign Language Annals, 45*(s1), 28–53. http://dx.doi.org/10.1111/j.1944-9720.2012.01178.x

Toth, Jeanette (2018). *English-medium instruction for young learners in Sweden. A longitudinal case study of a primary school class in a bilingual English-Swedish school.* (Doctoral thesis). Stockholm University, Stockholm. Retrieved from http://su.diva-portal.org/smash/record.jsf?pid=diva2%3A1205724&dswid=-5048

Williams, Cen (1994). *Arfarniad o Ddulliau Dysgu ac Addysgu yng Nghyd-destun Addysg Uwchradd Ddwyieithog, [An evaluation of teaching and learning methods in the context of bilingual secondary education]* (PhD thesis). University of Wales, Bangor. Retrieved from http://e.bangor.ac.uk/id/eprint/9832

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