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Teachers' and students' perceptions of the effects of content and language integrated learning (CLIL) chemistry education: A case study at a secondary school in the Netherlands

Wim Thijssen, Luc Ubaghs

Abstract

The practical situation of CLIL chemistry education was examined at a secondary school in the Netherlands. A total of 54 students and 3 teachers from three classes were asked to assess their perceptions of CLIL chemistry education using a student or teacher questionnaire, respectively. In addition a classroom observation was used. Seven perception scales—students' proficiency, students' confidence, teachers' confidence, teachers' didactics, teachers' corrective feedback, students' efficacy, and students' group work—were constructed of which one, students' group work, turned out to be inadequate after calculating Cronbach's α reliability coefficients. Results show that students' proficiency is correlated with students' confidence. Teachers' confidence, teachers' didactics, and teachers' corrective feedback are all three positively correlated. Furthermore, students' proficiency is negatively correlated with teachers' confidence. Results also indicate that, according to teachers, students are less confident in English, whereas the students have a more positive opinion. Similar results were obtained from the teachers' confidence scale. Both students and teachers are positive about CLIL chemistry education. Finally, students perceive corrective feedback as almost nonexistent, whereas teachers believe they often give corrective feedback.

1. Introduction

There is broad consensus within the European Union that existing language barriers need to be lifted to successfully achieve European integration (Marsh, 2002). Therefore, it is important that a broad range of school-leavers have a communicative proficiency in languages other than their mother tongue. This need can be answered in language teaching by many ways, one of which is the method of content and language integrated learning (CLIL).

Content and language integrated learning (CLIL) refers to methodologies used in teaching situations where a second language is used as a medium for teaching non-language content. It is an umbrella term which encompasses bilingual education, content based instruction, immersion, TTO (an abbreviation commonly used in the Netherlands for “Tweetalig onderwijs”), English (or other languages) as medium of instruction and other methodologies (Mehisto et al., 2008; Coyle et al., 2010).

The present study started from the fact that one of the researchers works at a school which offers CLIL education. This school started offering CLIL education five years ago. School management was interested in contributions that need to be done to further improve their CLIL education. The focus of the study was on CLIL chemistry education, because both researchers teach chemistry.

2. Theoretical framework

The concept behind CLIL is that languages are best learned from meaningful content in an environment where people also speak the target language (Snow et al., 1989). Lightbown and Spada (2006) speak of a “two for one” approach because learners learn subject matter and target language at the same time, thus significantly increasing their exposure to the target language.

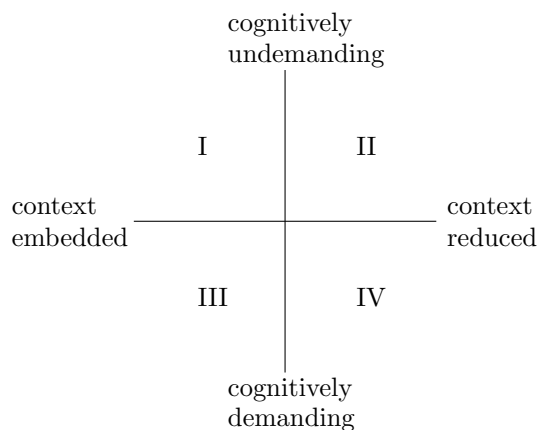
As a reflection and planning tool for CLIL instructions and a way to relate language proficiency to academic performance, it is appropriate to use Cummins’s Framework (Cummins, 1983). It highlights the role of context as fundamental to supporting children’s language and literacy development. For this purpose Cummins used a quadrant in which context is represented on the horizontal axis and the cognitive demands of language are represented on the vertical axis of the framework (Figure 1). Cummins showed that learners who progress through these four quadrants are increasingly challenged to manipulate language in cognitively demanding and context-reduced situations that differ significantly from everyday conversational interactions (Cummins, 2000).

Also Genesee (1987) suggests that the academic curriculum stimulates language development by placing increasingly high levels of cognitive and linguistic demands on students. His theories are based on the assumption that communicative skills are acquired by purposeful communication.

In the Netherlands, De Graaff and Koopman (2006) have made recommendations for effective didactical CLIL education based on “the scale of five” defined by Westhoff (2002). These five components are: (1) an extensive exposure to input, (2) input treated with focus on content, (3) input treated with focus on form, (4) pushed output, and (5) strategic learning.

The first part of the scale, extensive exposure to input, speaks for itself. Learners should be exposed to as much input as possible. Yet, it is most

Figure 1: Cummins’s Framework (1983): Range of contextual support and degree of cognitive involvement in language tasks and activities.



important that this input is authentic, functional, and attractive. Lastly, this “rich” input should be of $i + 1$ (Krashen, 1982), which means that the level of input should always be one level above the learner’s interlanguage.¹ Secondly the learner should focus on meaning. This will come out when the input has to be understood to complete a specific task. When tasks are authentic and doable this will lead to meaningful learning activities since the learner will have to process the input to continue with the task. Also, authentic tasks will motivate learners much more than when they are given, for example, grammar exercises.

Form-focused instruction (FFI) refers to attention to the formal aspects of language, e.g., grammar, spelling, and intonation (Andringa, 2005). Spada (1997) describes form-focused instructions as “pedagogical events which occur within meaning-based approaches to second language instruction but in which a focus on language is provided in either spontaneous or predetermined ways” and “any pedagogical effort which is used to draw the learners’ attention to language form either implicitly or explicitly”. Studies have shown that learners will benefit from FFI in terms of speed, efficiency, and competence (Lightbown and Spada, 2006; Lyster, 2007).

An important aspect of FFI is the type of corrective feedback in relationship to the type of error teachers provide to learners and the immediate learner repair. Lyster and Ranta (1997) describe this type of interaction as negotia-

¹An interlanguage is an emerging linguistic system that has been developed by a learner of a second language who has not become fully proficient yet but is approximating the target language (Selinker, 1972).

tion of form: “the provision of corrective feedback that encourages self-repair involving accuracy and precision and not merely comprehensibility”. The negotiation of form proved to be more effective at leading to immediate repair than recasts or explicit correction (Lyster, 1994, 1998). Thus, it is important that teachers provide feedback in such way that learners correct mistakes themselves.

Pushed output is another component on Westhoff’s “scale of five” which is of great importance when acquiring a language. Swain (2005) suggest that knowledge that is needed to speak will not come unless learners are “pushed” to speak, i.e., learners have to utilize structures they have not yet acquired, under demanding conditions, that they find uncomfortable.

Lastly, Westhoff argues that tasks have to be realistic, informative, and functional in order to make as much combinations of features as possible.

There are different methods to study for example classroom management, students’ efficacy, teachers’ interpersonal behavior, etc. These include classroom observations, questionnaires, and interviews. Research investigating both teachers’ and students’ perceptions is regarded as important, because divergence and convergence between students’ and teachers’ perceptions have proven to be usable variables in investigating teaching-learning processes, or interesting points to seize upon in the preparation of teachers and staff development (Brekelmans and Wubbels, 1991; den Brok et al., 2006). Nonetheless, Aleamoni (1999) and Greenwald (1997) have criticized the use of student’s perceptions as being undifferentiated, and being influenced by factors such as teacher popularity or grading leniency, or student background characteristics. However, more recent studies by De Jong and Westerhof (2001) and Kunter and Baumert (2006) have shown that the effects of popularity and grading leniency are probably overestimated.

3. Research questions

The present study compares teachers’ and students’ perceptions of CLIL chemistry education at a secondary school in the Netherlands. According to Westhoff, effective didactical CLIL education is based on “the scale of five”. In the present study these five scales were further specified into the following seven scales: students’ proficiency, students’ confidence, teachers’ confidence, teachers’ didactics, teachers’ corrective feedback, students’ efficacy, and students’ group work. Additionally, correlations between these scales were studied so that feedback to improve CLIL chemistry education is obtained. Thus, the following research questions are addressed:

1. What does CLIL chemistry education at a secondary school in the Netherlands look like according to teachers and students? To what degree do

teachers and students feel efficacious for CLIL chemistry education?

- a. What correlations exist, according to students' perceptions, between the following seven scales: students' proficiency, students' confidence, teachers' confidence, teachers' didactics, teachers' corrective feedback, students' efficacy, and students' group work?
- b. To what extent do teachers and students share the same perception (or different perceptions) of the following six scales: students' confidence, teachers' confidence, teachers' didactics, teachers' corrective feedback, students' efficacy, and students' group work?

4. Methodology

4.1. Participants

Students — The study was conducted in a medium-sized public secondary school in the Netherlands. Three classes of grade 9 (in Dutch: 3 vwo) students ($n = 54$) were involved. All students took English as a compulsory course from grade 7 and chemistry from grade 9. There were 28 female (52%) and 26 male (48%) students. Four students were not born in the Netherlands, but none of them were born in an English-speaking country. The average grades² were 6.8 for Dutch and 7.3 for English as well as for chemistry. Two students stayed in an English-speaking country for an extended period of time; one for 4 months and one for 6 months. Only one student had parents whose native tongue was English.

Teachers — Three CLIL chemistry teachers participated in this study. Two of them had extensive teaching experience (25 and 10 years, respectively, of which 19 and 4 years of CLIL teaching, respectively). One of them has taken a CLIL course and additionally holds a Cambridge Certificate of Proficiency in English (CPE). One teacher involved in this study was new to teaching and had less than one year of experience.

4.2. Instrumentation and analysis

Two types of instruments were used in this research: (a) a teacher as well as a student questionnaire and (b) a classroom observation. We decided to adopt both because a classroom observation give us a more comprehensive view.

The student questionnaire (page 16), consisting of fifty-six items, and teacher questionnaire (page 21), consisting of sixty-nine items, were designed to gather both quantitative and qualitative data. They can be divided into three

²The Dutch grading scale runs from 1 (very poor) to 10 (outstanding). The lowest pass mark is usually set at 5.5 as narrow pass, and 5.4 and below constitute a fail.

Table 1: Perception scales linked to questionnaire item numbers.

Scale	Questionnaire item numbers	
	Students	Teachers
Student's proficiency (SP)	1–4	–
Teachers' proficiency (TP)	–	6–11
Students' confidence (SC)	6–7, 10–11, 14–16	14–15, 19, 31–32
Teachers' confidence (TC)	8–9, 12–13	12–13, 16–18, 29–30, 33, 35
Teachers' didactics (TD)	17–25	20–28, 34, 38–42
Teachers' corrective feedback (TF)	26–28, 31–37	49–51, 53–59
Students' efficacy (SE)	29–30, 38–40	60–64
Students' group work (SG)	41–44	65–68

sections. The first one was intended to collect personal and background data while in the second one the student or teacher had to scale their English pronunciation and their (oral and written) grammatical correctness using a scale ranging from 0 (“very poorly”) to 10 (“native-like/excellent”). The third section included questions about the students’ and teachers’ CLIL chemistry impression. It should be noted that in a five-point Likert scale the neutral point is not always centered. The questionnaires were all completed anonymously.

All questions—except for questions about report card grades (student questionnaire), (CLIL) teaching experience (teacher questionnaire), and percentage estimate on the amount of English used in the chemistry lesson (both student and teacher questionnaire)—were closed-ended.

After administering the questionnaires, data were entered into IBM’s statistical analysis software program SPSS, version 19. This comprises calculating percentages, mean scores and standard deviations, correlations, and Cronbach’s alpha coefficients.

Table 1 shows the categorization of the questionnaire item numbers into seven scales: students’ or teachers’ proficiency, students’ confidence, teacher’s confidence, teachers’ didactics, teachers’ corrective feedback, students’ efficacy, and students’ group work. The Cronbach’s α coefficient was calculated for each perception scale as a measure of internal consistency (Table 2). Teachers’ didactics (calculated from the student questionnaire) and students’ efficacy (calculated from the student as well as the teacher questionnaire) had Cronbach’s α below 0.60. However, due to the small deviation from the for practical purposes acceptable value of 0.60 the scales were considered adequately consistent for this study (Cronbach, 1951). Because the Cronbach’s α of the students’

Table 2: Reliability, calculated by Cronbach’s α , and number of questionnaire items of each scale.

Scale	Students		Teachers	
	α	N items	α	N items
Student’s proficiency (SP)	0.84	4	–	–
Teacher’s proficiency (TP)	–	–	0.94	5
Student’s confidence (SC)	0.78	7	0.89	5
Teacher’s confidence (TC)	0.80	4	0.96	9
Teacher’s didactics (TD)	0.51	9	0.95	15
Teacher’s corrective feedback (CF)	0.8	10	0.63	10
Student’s efficacy (SE)	0.56	5	0.58	5
Student’s group work (SG) ^a	0.35	4	^b	4

^a Due to a low Chronbach’s α this scale is omitted in this study.

^b Too low to be significant.

group work scale was significantly less than 0.60, this scale was omitted from the present study.

A direct classroom observation, which took 50 minutes, was used for a more comprehensive view on the subject matter. The observation was made from the back of the classroom, and a checklist with various items derived from the student questionnaire was used to measure the type of CLIL interactions between teacher and students. Additionally, some small notes were taken.

5. Results

As discussed in the introduction, important aspects of CLIL teaching are (1) extensive exposure to input and (2) input treated with focus on content (Westhoff, 2002). Table 3 shows that input to the English language during chemistry education is very high according to both the students and teachers ($\geq 87\%$ of the chemistry lesson is taught in English). Table 3 also shows that the English input is content based. For example, on a scale from one indicating “nearly always”, two “often”, three “almost never”, and four “never” a mean of 3.31 and standard deviation of 0.58 are obtained for the question “When difficult chemical concepts are explained for the first time, how often are these explained in Dutch?”. According to the students as well as the teachers only specific chemistry words are translated into Dutch (mean = 2.56, standard deviation = 0.60 and mean = 2.67, standard deviation = 0.58, respectively). Therefore, the input to English is extensive.

Table 3: Exposure to the English language using an open-ended item as well as a four-point Likert scale with 1 indicating “nearly always”, 2 “often”, 3 “almost never”, and 4 “never” (SD = standard deviation).

Item (item number)	Students		Teachers	
	Mean	SD	Mean	SD ^a
What percentage of the chemistry lesson is taught in English? (5;5)	93%	6.80	87%	15
When difficult chemical concepts are explained for the first time, how often are these explained in Dutch? (22;45) ^b	3.31	0.58	3.33	0.58
How often does your teacher translate specific chemistry words into Dutch? (23;46) ^b	2.56	0.60	2.67	0.58

^a This standard deviation is understood to be merely indicative because of the low number of teachers involved in this study.

^b The questions were slightly rephrased in the teacher questionnaire.

5.1. Correlations between the seven scales

Table 4 shows the correlations between the different scales. Two scales were expected to positively correlate with each other, i.e., students’ proficiency (SP) and students’ confidence (SC) as well as students’ confidence and students’ efficacy (SE) (Schunk and Zimmerman, 1996). As can be seen in Table 4 a positive correlation coefficient of 0.46 does indeed exist between students’ proficiency and students’ confidence. However, no significant correlation exists between students’ confidence and students’ efficacy. This is measured

Table 4: Correlations between the various perception scales as computed from the student questionnaire (SP = students’ proficiency, SC = students’ confidence, TC = teachers’ confidence, TD = teachers’ didactics, TF = teachers’ corrective feedback, SE = students’ efficacy).

Scales	SP	SC	TC	TD	TF	SE
SP	1	0.46**	-0.42**	-0.02	0.05	0.14
SC	0.46**	1	-0.07	0.19	-0.06	0.26
TC	-0.42**	-0.07	1	0.48**	0.29*	0.18
TD	-0.02	0.19	0.48**	1	0.31*	0.37**
TF	0.01	-0.06	0.29*	0.31*	1	0.42**
SE	0.14	0.26	0.18	0.37**	0.42**	1

** Correlation is significant at the 0.01 level

* Correlation is significant at the 0.05 level

Table 5: Questions referring to the students' efficacy scale using an a five-point Likert scale with 1 indicating "strongly disagree", 2 "disagree", 3 "neither disagree nor agree", 4 "agree", and 5 "strongly agree" (SD = standard deviation).

Item (item number)	Students		Teachers	
	Mean	SD	Mean	SD ^a
I am more motivated in chemistry in the English language because I also learn English at the same time (38;60) ^b	3.11	0.97	3.00	1.00
While I learn chemistry I also develop my English language skills (39;62) ^b	3.78	0.90	4.33	0.58
My experience with chemistry classes in English are positive (40;63) ^b	3.83	0.89	4.67	0.58
Teaching chemistry in English makes more students choose chemistry in higher level education ("bovenbouw") (-;64)	–	–	3.33	0.58

^a This standard deviation is understood to be merely indicative because of the low number of teachers involved in this study.

^b The questions were slightly rephrased in the teacher questionnaire.

by the question "While I learn chemistry I also develop my English language skills" which resulted in a students' mean of 3.78 vs. a teachers' mean of 4.33 (Table 5). It should be noted that students' motivation for chemistry is independent of CLIL chemistry education according to students and teachers as can be seen from item numbers 38 (student questionnaire) and 60 as well 64 (teacher questionnaire) in Table 5.

The negative correlation between the perception scales students' proficiency (SP) and teachers' confidence (TC) suggests that the higher a students' appraisalment for the English language is, the lower the teachers' confidence appears. However, teachers' confidence (TC), teachers' didactics (TD), and teachers' corrective feedback (TF) are all three positively correlated.

Table 4 shows that a positive correlation exists between students' efficacy (SE) and teachers' didactics (TD) as well as between students' efficacy (SE) and teachers' corrective feedback (TF).

5.2. Degree of equal perceptions of the six scales between teachers and students

The degree of similarity between the students' and teachers' perception scales were studied. Table 6 shows a difference between the students' and teachers' perception means of the students' confidence scale. This scale consisted of five points from 1 being "negatively" and 5 being "positively" with

Table 6: Comparison between students' and teachers' means and standard deviations of each perception scale (SD = standard deviation).

Scale	Scale point(s)		Students		Teachers	
	<i>N</i>	Neutral	Mean	SD	Mean	SD ^a
Students' confidence	5	4	3.69	0.49	2.13	0.64
Teachers' confidence	5	4	3.35	0.63	2.85	0.76
Teachers' didactics	4,5 ^b	4 ^c	3.01	0.33	3.36	0.71
Teachers' corrective feedback	4	–	1.50	0.51	2.17	0.31
Students' efficacy	5	3	3.66	0.48	3.93	0.42

^aThis standard deviation is understood to be merely indicative because of the low number of teachers involved in this study.

^bFour-point scale used in the student questionnaire, five-point scale in the teacher questionnaire.

^cNeutral point exists only for the teacher questionnaire.

the neutral point at 4. According to the teachers, students are less confident in their English proficiency, whereas the students have a more positive opinion. A comparable difference between the means of the students' and teachers' perception is also observed in the teachers' confidence scale.

The teachers' didactics scale does not differ significantly in the perception of students and teachers. Table 6 also shows that the mean values of the students' efficacy scale (SE) are located on the positive side of the scale (3.66 and 3.93, respectively). Thus, both students and teachers are positive about the CLIL chemistry education. For instance, students report that they “nearly always–always” ask questions in English (mean of 4.43; Figure 2). Furthermore, students agree with the statement that they develop their English language skills during chemistry classes (mean of 3.78; Figure 3).

An important aspect of CLIL teaching, as discussed in the introduction, is the type of corrective feedback in relationship to the type of error teachers provide to their students. Therefore, different types of corrective feedback questions in a four-point scale were formulated. As can be seen in Table 6 a difference of 0.67 exists between the students' and teachers' means of the corrective feedback scale. According to students, teachers “never–almost never” give any type of corrective feedback, whereas to the teachers' believe corrective feedback is “often” given (Table 7). Similar results were obtained from other questions about corrective feedback, i.e., item numbers 31–37 of the student questionnaire resulted in a mean of 1.38 indicating “almost never” and item numbers 53–59 of the teacher questionnaire in a mean of 1.76 indicating “often”.

Figure 2: Distribution of the student scores for question 29: “If you have questions, how often do you ask these in English?” (1 “never”, 2 “almost never”, 3 “often”, 4 “nearly always”, 5 “always”).

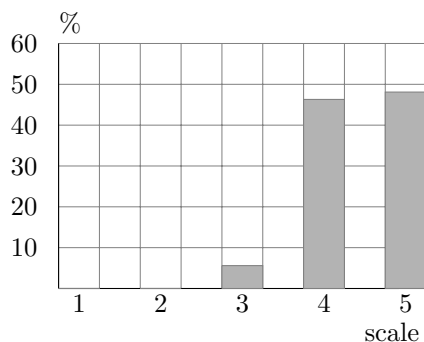
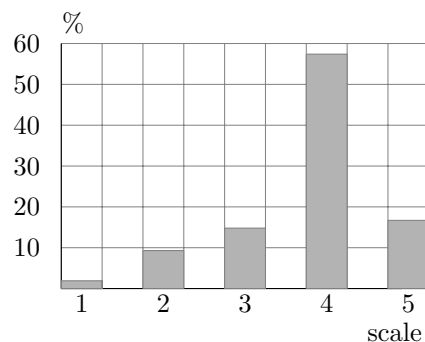


Figure 3: Distribution of the student scores for question 39: “While I learn chemistry I also develop my English language skills” (1 “strongly disagree”, 2 “disagree”, 3 “neither disagree nor agree”, 4 “agree”, 5 “strongly agree”).



A classroom observation was used to further strengthen the outcomes of the teachers’ corrective feedback scale. This observation showed that students were exposed to a high amount of English input which corresponds to both the student and teacher questionnaire. The teacher used the English language almost exclusively and only translated five (chemistry) words into Dutch during the observation. The teacher as well as the students asked and answered questions in English. However, a lot of discussions between students—whether it is

Table 7: Questions referring to the teachers’ corrective feedback scale using an a four-point Likert scale with 1 indicating “never”, 2 “almost never”, 3 “often”, and 4 “nearly always” (SD = standard deviation).

Item (item number)	Students		Teachers	
	Mean	SD	Mean	SD ^a
How often does your teacher correct your spoken English grammar? (26;49) ^b	1.61	0.81	3.00	1.00
How often does your teacher correct your English pronunciation? (27;50) ^b	1.78	0.90	3.00	1.00
How often does your teacher correct your written English grammar? (28;51) ^b	1.94	0.90	3.33	0.58

^a This standard deviation is understood to be merely indicative because of the low number of teachers involved in this study.

^b The questions were slightly rephrased in the teacher questionnaire.

subject matter or general discussions—were typically in Dutch. Additionally, no corrective feedback by the teacher was observed although two opportunities to this occurred: the incorrect use of the word “typical” as an adverb and the incorrect use of “when” (instead of “if”) by a student. The impression was that during these instances the teacher was primarily focussed on subject matter and classroom management, and therefore corrective feedback was disregarded.

6. Discussion

Before discussing the results of the present study, it is important to note that the small teacher sample used in the present study only allows some preliminary conclusions with respect to teachers’ perception.

Results show that no significant correlation exists between students’ confidence and students’ efficacy. A possible reason for this discrepancy is that students value the advantages of CLIL teaching less than teachers. Teachers’ confidence (TC), teachers’ didactics (TD), and teachers’ corrective feedback (TF) were shown to correlate all three positively. This has also been shown by Dobbins (1996). Independent of CLIL-teaching, it is known from the literature that good teachers’ didactics and corrective feedback positively correlate with students’ efficacy (Sloat et al., 1977; Schunk, 1985, 1989; Schunk and Zimmerman, 1996). This corresponds to our findings as can be seen in Table 4.

According to the teachers, the students as well the teachers are less confident in their English proficiency, whereas the students have a more positive opinion. A possible explanation for this difference could come from the fact that students have less self-criticism compared with teachers.

The teachers’ didactics scale does not differ significantly in the perception of students and teachers. However, due to a different type of teachers’ didactics questions (Table 1) in the student and teacher questionnaire and a different number of Likert scale points, the students’ and teachers’ means of the teachers’ didactics scale are difficult to compare. Further studies are necessary to review this scale.

During the classroom observation, no corrective feedback was observed. The impression was that during these instances the teacher was primarily focussed on subject matter and classroom management, and therefore corrective feedback was disregarded. Several studies confirm this thought. De Graaff et al. (2007) have shown that teachers regard themselves in the first place mainly as subject teachers, and that explaining forms and giving rules is in essence the domain and expertise of the EFL³ teacher. Furthermore, studies have shown that students’ motivation and good classroom management skills

³EFL refers to English as a Foreign Language

are important aspects of successful CLIL teaching (Pablo and Estefani, 2008; Fuentes and Hernández, 2011). Thus, it is likely that the teacher gave more attention to subject matter and classroom management at these instances.

7. Conclusions

The outcomes show that the chemistry education at the school of our study were almost exclusively in English, and thus the students were exposed to a high amount of English input. Furthermore, students used the English language with confidence. However, corrective feedback occurs to a minimum extent.

This study also shows that positive correlations exist between students' proficiency and students' confidence as well as between teachers' confidence, teachers' didactics, and teachers' corrective feedback. The correlation between students' proficiency and teachers' confidence is negative. Finally, students' efficacy is positively correlated with the perception scales teachers' didactics and teachers' corrective feedback .

Additionally, the degree of similarity between the students' and teachers' perception scales were studied. According to the teachers, students are less confident in English, whereas the students have a more positive opinion. Similar results were obtained from the teachers' confidence scale. No significant perception differences between students and teachers were obtained from the teachers' didactics scale. The students as well as the teachers answered positively on questions about the students' efficacy of the CLIL chemistry education at the school of this study. Finally, students perceive corrective feedback as almost nonexistent, whereas teachers believe they often give corrective feedback.

In general, we conclude that effective CLIL chemistry education starts with good classroom management skills. Only then will other teaching aspects of CLIL, such as teachers' corrective feedback, be able to flourish.

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8. References

- Aleamoni, L., 1999. Student rating myths versus research facts from 1924 to 1998. *Journal of Personnel Evaluation in Education* 13, 153–166.
- Andringa, S.J., 2005. *Form-Focused Instruction and the Development of Second Language Proficiency*. Dissertation. Rijksuniversiteit Groningen.
- Brekelmans, M., Wubbels, T., 1991. Student and teacher perceptions of interpersonal teacher behavior: a Dutch perspective. *The Study of Learning Environments* 5, 19–30.

- den Brok, P., Bergen, T., Brekelmans, M., 2006. Convergence and divergence between students' and teachers' perceptions of instructional behaviour in Dutch secondary education, in: Fisher, D., Khine, M. (Eds.), *Contemporary approaches to research on learning environments: worldviews*. World Scientific, Singapore, pp. 125–160.
- Coyle, D., Hood, P., Marsh, D., 2010. *CLIL: Content and Language Integrated Learning*. Cambridge University Press, Cambridge.
- Cronbach, L.J., 1951. Coefficient alpha and the internal structure of tests. *Psychometrika* 16, 297–334.
- Cummins, J., 1983. Language proficiency, biliteracy and French immersion. *Canadian Journal of Education / Revue canadienne de l'éducation* 8, 117–138.
- Cummins, J., 2000. *Language, Power, and Pedagogy: Bilingual Children in the Crossfire*. Multilingual Matters, Clevedon.
- Dobbins, R., 1996. Student teacher self-esteem in the practicum. *Australian Journal of Teacher Education* 21 (2), 2.
- Fuentes, M.A., Hernández, E., 2011. From “this is impossible” to “I will make the standard higher”: A close look at interaction in the CLIL classroom. *Bellaterra Journal of Teaching & Learning Language & Literature* 4, 17–36.
- Genesee, F., 1987. *Learning Through Two Languages: Studies of Immersion and Bilingual Children*. Newbury House, Cambridge, MA.
- de Graaff, R., Koopman, G.J., 2006. *Didactische Richtlijnen bij Tweetalig Onderwijs. Onderzoek naar Didactische Gedragingen van Docenten bij Tweetalig Onderwijs*. IVLOS, Universiteit Utrecht, Utrecht.
- de Graaff, R., Koopman, G.J., Anikina, Y., Westhoff, G., 2007. An observation tool for effective L2 pedagogy in content and language integrated learning (CLIL). *International Journal of Bilingual Education and Bilingualism* 10, 603–624.
- Greenwald, A., 1997. Validity concerns and usefulness of student ratings of instructions. *American Psychologist* 52, 1182–1186.
- de Jong, R., Westerhof, K., 2001. The quality of student ratings of teacher behaviour. *Learning Environments Research* 4, 51–85.
- Krashen, S., 1982. *Principles and Practices of Second Language Acquisition*. Pergamon Press, Oxford.
- Kunter, M., Baumert, J., 2006. Who is the expert? Construct and criteria validity of student and teacher ratings of instruction. *Learning Environments Research* 9, 231–251.
- Lightbown, P.M., Spada, N., 2006. *How Languages are Learned*. Oxford University Press, Oxford. 3 edition.
- Lyster, R., 1994. The effect of functional-analytic teaching on aspects of French immersion students' sociolinguistic competence. *Applied Linguistics* 15, 263–287.
- Lyster, R., 1998. Negotiation of form, recasts, and explicit correction in relation to error types and learner repair in immersion classrooms. *Language Learning* 48, 183–218.
- Lyster, R., 2007. *Learning and Teaching Languages Through Content. A Counter Balanced Approach*. John Benjamins, Amsterdam.
- Lyster, R., Ranta, L., 1997. Corrective feedback and learner uptake. negotiation of form in communicative classrooms. *Studies in Second Language Acquisition* 19, 37–66.
- Marsh, D. (Ed.), 2002. *CLIL/EMILE — The European Dimension: Actions, Trends and Foresight*. The European Union, Brussels.
- Mehisto, P., Frigols, M.J., Marsh, D., 2008. *Uncovering CLIL: Content and Language Integrated Learning in Bilingual and Multilingual Education*. Macmillan Education, Oxford.
- Pablo, M.N., Estefani, J.L., 2008. CLIL teaching competences: lesson planning and classroom teaching procedures and strategies, in: *EUCLID – APPC European CLIL In Development: A Primary Phase Consortium*, pp. 19–30.

- Schunk, D.H., 1985. Self-efficacy and classroom learning. *Psychology in the Schools* 22, 208–223.
- Schunk, D.H., 1989. Self-efficacy and achievement behaviors. *Educational Psychology Review* 1, 173–208.
- Schunk, D.H., Zimmerman, B.J., 1996. Modelling and self-efficacy influences on children's development of self-regulation, in: Juvonen, J., Wentzel, K.R. (Eds.), *Social Motivation: Understanding Children's School Adjustment*. Cambridge University Press, Cambridge, pp. 154–180.
- Selinker, L., 1972. Interlanguage. *International Review of Applied Linguistics* 10, 209–231.
- Sloat, K.C., Tharp, R.G., Gallimore, R., 1977. The incremental effectiveness of classroom-based teacher-training techniques. *Behavior Therapy* 8, 810–818.
- Snow, M.A., Met, M., Genesee, F., 1989. A conceptual framework for the integration of language and content in second/foreign language instruction. *TESOL Quarterly* 23, 201–217.
- Spada, N., 1997. Form-focused instruction and second language acquisition: A review of classroom and laboratory research. *Language Teaching* 29, 73–87.
- Swain, M., 2005. The output hypothesis: Theory and research, in: Hinkel, E. (Ed.), *Handbook of Research in Second Language Teaching and Learning*. Erlbaum Associates, Mahwah, NJ, pp. 471–484.
- Westhoff, G.J., 2002. Een 'schijf van vijf' voor het vreemdetalenonderwijs. *Bedrijvige Talen* 26, 9–15.

- There are no good or wrong answers; fill out what you believe is correct.
- Please be sure to only check one box for each question: or . If you make a mistake, cross out the check box or erase your mistake and mark the correct check box.
- The questionnaire will take approximately 20 minutes of your time.

Your gender: female male

Where were you born?

- the Netherlands
 English-speaking country
 other _____
specify country

My average mark for Dutch, English and chemistry on my latest school report was:

Dutch: English: Chemistry:

Have you ever stayed in an English-speaking country for an extended period of time?

- no
 yes, for _____ months
specify amount of months

	no	almost never	sometimes	regularly	always
Do you speak					
Dutch at home?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
English at home?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do you speak languages other than Dutch or English at home?

- no
 yes _____
specify language(s)

What is your farther's native tongue?

- Dutch
 English
 other _____
specify language

What is your mother's native tongue?

- Dutch
 English
 other _____
specify language

Do you speak English outside of school?

- no (continue with question 1)
 almost never
 sometimes
 regularly
 always

When do you speak English outside of school?

- talking to family who live outside of the Netherlands
- talking to friends who live outside of the Netherlands
- home work discussion with parent(s)
- home work discussion with brother(s) and/or sister(s)
- on holidays
- playing computer games online with others
- other _____

please specify

} *more than one answer is possible*

How would you characterize

- | | very | | | | | | | | | | “native-like” |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | poorly | | | | | | | | | | /excellent |
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 1. your English pronunciation? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. the grammatical correctness of your oral English? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. the grammatical correctness of your written English? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. your overall English proficiency (oral and written)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

5. What percentage of the chemistry lesson is taught in English? Percent

- | Compared to Dutch, | much less | less | somewhat less | the same | more |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 6. how confident are you when speaking English? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. how confident are you when writing English? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. how confident does your teacher seem to be when speaking English? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. how confident does your teacher seem to be when writing English? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- | Compared to the same situation in Dutch, | much more | more | somewhat more | the same | less |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 10. how frequently are you trying to find adequate words when speaking English? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. how frequently are you trying to find adequate words when writing English? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. how frequently does your teacher seem to try to find adequate words when speaking English? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Compared to the same situation in Dutch,	much more	more	somewhat more	the same	less
13. how frequently does your teacher seem to try to find adequate words when writing English?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. the time it takes up to make home work in English is	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. how complicated is taking a written chemistry exam in English for you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. to what extent do you lose your concentration during chemistry classes because of the English?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		nearly always	often	almost never	never
17. How often does your teacher not seem to know English technical (chemical) words?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. How often can your teacher explain the subject in different ways?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. How often are you able to perfectly follow your teacher's English speaking?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. How often do you understand your teacher's English humor?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. How often does your teacher talk enthusiastically in English?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. When difficult chemical concepts are explained for the first time, how often are these explained in Dutch?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. How often does your teacher translate specific chemistry words into Dutch?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. How often are specific differences between the use of Dutch and English words explained by your teacher?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. How often does your teacher demand that you ask questions in English?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. How often does your teacher correct your spoken English grammar?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. How often does your teacher correct your English pronunciation?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. How often does your teacher correct your written English grammar?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- | | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | | almost | | nearly | |
| 29. If you have questions, how often do you ask these in English? | never | never | often | always | always |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | | | neither | | |
| 30. Do you believe you learn chemistry better or worse when taught in English? | much worse | worse | worse nor better | better | much better |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Questions 31–34 are **only** about errors you make in your **spoken** English and your teacher’s linguistic corrective feedback, if any. Whether you have responded chemically correct is irrelevant.

- | | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | | almost | often | nearly | always |
| | | never | | always | |
| 31. How often does your teacher clearly indicate that what you have said was incorrect (e.g., “Oh, you mean ...”, “You should say ...”)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 32. How often does your teacher reformulate your sentence to correct your English? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 33. How often does your teacher request clarification of your spoken English (e.g., “What do you mean by X?”)? <i>Reminder: whether you have responded chemically correct is irrelevant</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 34. How often does your teacher give linguistic feedback by strategically pausing his sentence to allow students to “fill in the blank” (e.g., “No, not X, but ...”)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Questions 35–37 are **only** about errors you make in your **written** English and your teacher’s linguistic corrective feedback, if any. Whether you have responded chemically correct is irrelevant.

- | | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | | almost | often | nearly | always |
| | | never | | always | |
| 35. How often does your teacher correct your English by underlining or striking through the incorrect word or phrase and writing down the correction? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 36. How often does your teacher indicate errors in your written English by underlining or striking through the incorrect word or phrase, but without giving any feedback? <i>Reminder: whether you have responded chemically correct is irrelevant</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

		almost never	often	nearly always	always
37. How often does your teacher write down suggestions on your written material without providing the correct answer so that you must correct your mistake yourself?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How much do you agree with the following statements?	strongly disagree	disagree	neither disagree nor agree	agree	strongly agree
38. I am more motivated in chemistry in the English language because I also learn English at the same time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39. While I learn chemistry I also develop my English language skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40. My experience with chemistry classes in English are positive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

During group work:		never	almost never	nearly always	always
41. I talk English to other students when we discuss chemistry		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
42. I talk English to other students when we discuss about stuff other than chemistry (“when we chit chat”)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
43. How often do you correct linguistic errors of other students?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
44. How often do you accept linguistic feedback or corrections made by other students?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

			neither negatively nor positively		very positively
45. How do you generally react to being corrected, because of linguistic errors, by other students?	very negatively	negatively	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- Your answers will be anonymized in research reports; your name and the name of the school will not show up anywhere.
- There are no good or wrong answers; fill out what you believe is correct.
- Please be sure to only check one box for each question: or . If you make a mistake, cross out the check box or erase your mistake and mark the correct check box.
- For convenience, the masculine form (“he” and “his”) is used in the following questionnaire, but it is always to be understood to include both the masculine and feminine.
- The questionnaire will take approximately 25 minutes of your time.

1. For how many years have you been a teacher? Year(s)

2. For how many years have you been instructing in English? Year(s)

3. Have you taken any additional English course(s) after you graduated from secondary school?

No

Yes: _____
specify which kind of course(s)

4. Have you ever stayed in an English-speaking country for an extended period of time?

No

Yes, for _____ months
specify amount of months

5. What percentage of your English chemistry lesson is taught in English? Percent

How would you characterize	very					“native-like”					
	poorly					/excellent					
	0	1	2	3	4	5	6	7	8	9	10
6. your English pronunciation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. the grammatical correctness of your oral English?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. your overall oral English proficiency?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. the grammatical correctness of your written English (exams, handouts, use of the blackboard, etc.)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. your overall written English proficiency?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. your overall English proficiency (oral and written)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Compared to the same situation in Dutch,	much more	more	somewhat more	the same	less
12. how frequently are you trying to find adequate words when speaking English?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. how frequently are you trying to find adequate words when writing English?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. how frequently are your students trying to find adequate words when speaking English?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. how frequently are your students trying to find adequate words when writing English?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. the time it takes up to write lecture notes in English is	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. the time it takes up to construct a written exam in English is	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. how complicated is grading a written exam in English for you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. how hard is it for you to hold students' interest when teaching in English?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Compared to Dutch, in English I am able to	much less	less	somewhat less	the same	more
20. express myself clearly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. express myself accurately	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. explain something in different ways	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. differentiate statements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. present subject matter coherently	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. give appropriate examples unprepared	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. give a clear answer to student questions unprepared	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. make a humorous remark	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. get my enthusiasm across	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Compared to Dutch,	much less	less	somewhat less	the same	more
29. how confident are you when speaking English?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. how confident are you when writing English?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. how confident are your students when speaking English?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. how confident are your students when writing English?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. to what extent do you rely on your notes when teaching in English?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. to what extent do you go into subject matter in depth when teaching in English?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. to what extent is teaching in English strenuous for you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 When preparing for English-medium instructions,		nearly always	often	almost never	never
36. how often do you need to look up technical (chemical) terminology?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37. how often do you need to look up terminology not related to subject matter content (e.g., words to paraphrase or explain concept)?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 Compared to the same situation in Dutch,	much higher	higher	somewhat higher	the same	lower
38. what was the ratio time spent on preparation in proportion to teaching time when you prepared for an English-medium chemistry course for the first time?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39. what was this ratio when you prepared for an English-medium chemistry course that you have taught several times before?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

40. Compared to a Dutch-medium instructional setting, what amount of subject matter do you cover when teaching in English?	much smaller amount <input type="checkbox"/>	smaller amount <input type="checkbox"/>	somewhat smaller amount <input type="checkbox"/>	similar amount <input type="checkbox"/>	larger amount <input type="checkbox"/>
Compared to the same situation in Dutch,	much lower <input type="checkbox"/>	lower <input type="checkbox"/>	somewhat lower <input type="checkbox"/>	the same <input type="checkbox"/>	higher <input type="checkbox"/>
41. the quality of my overall English-medium instructions is	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
42. the quality of my English lecture notes are	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
43. Do you ask colleagues for help regarding English grammar or words?		never <input type="checkbox"/>	almost never <input type="checkbox"/>	often <input type="checkbox"/>	nearly always <input type="checkbox"/>
44. Do you ask colleagues to check your English exams, handouts, etc. for grammar mistakes?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
45. When you explain for the first time difficult chemical concepts to your class, how often do you explain these in Dutch?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
46. How often do you translate specific chemistry words into Dutch?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
47. How often do you explain specific differences between the use of English and Dutch words?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
48. Do your students have to ask questions in English?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
49. How often do you give corrective feedback to your students about their oral English grammatical correctness?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50. How often do you give corrective feedback to your students about their English pronunciation?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
51. How often do you give corrective feedback to your students about their written English grammatical correctness?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
52. How often do you speak English outside the class room to students of your English-medium chemistry course?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Questions 53–56 are **only** about the **oral English performance** of your students and your linguistic corrective feedback, if any. Whether the student has responded “chemically correct” is irrelevant.

	almost never	often	nearly always	always
53. How often do you make explicit linguistic corrections, i.e., you clearly indicate that what the students has said was incorrect (e.g., “Oh, you mean ...”, “You should say ...”)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
54. How often do you reformulate all or part of a students’ utterance and correct in this way the linguistic error of the student?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
55. How often do you request linguistic clarification, indicating to students that their utterance is ill-formed in some way (e.g., “What do you mean by X?”)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
56. How often do you give linguistic feedback by strategically pausing your sentence to allow students to “fill in the blank” (e.g., “No, not X, but ...”)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Questions 57–59 are **only** about the **written English performance** of your students and your linguistic corrective feedback, if any. Whether the student has answered “chemically correct” is irrelevant.

	almost never	often	nearly always	always
57. How often do you make explicit linguistic corrections on student’s written material, e.g., you underline or strike through the incorrect word or phrase, and correct the error?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
58. How often do you indicate errors on student’s written material by underlining or striking through the incorrect word or phrase, but without giving any feedback?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
59. How often do you write down linguistic suggestion or feedback on student’s written material without providing the correct answer so that students must correct the mistake themselves?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How much do you agree with the following statements?	strongly disagree	disagree	neither disagree nor agree	agree	strongly agree
60. Compared to the same situation in Dutch, students are more motivated in English-medium chemistry classes because of English learning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
61. Students learn the English language more effectively because of your English-medium chemistry classes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
62. Teaching in English helps students develop both their language skills and subject knowledge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
63. My experience with teaching subject content in English is positive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
64. Teaching chemistry in English makes more students choose chemistry in higher level education (“bovenbouw”)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
During group work:		never	almost never	nearly always	always
65. Students use English when they communicate subject matter to each other		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
66. Students use English when they communicate non-subject matter to each (“chit chat”)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
67. How often do students correct linguistic errors of their peers?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
68. How often do students accept linguistic feedback or corrections made by their peers?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
69. How do students generally react to being corrected by their peers, because of linguistic errors?	very negatively	negatively	neither negatively nor positively	positively	very positively
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>