

Which turn to take? Teachers' Use of Translanguaging in Foreign Language Classrooms

Nienke Smit,¹ Jornt S. Holtman,² Wander M. Lowie³, Marijn W.G. van Dijk³
& Marjolijn H. Verspoor⁴

¹ Utrecht University, Netherlands

² Hanze University of Applied Sciences, Netherlands

³ University of Groningen, Netherlands

⁴ University of Pannonia, Hungary

Correspondence: n.smit@uu.nl

DOI: <https://doi.org/10.26262/ijce.v4i1.9480>

Abstract

Pedagogical translanguaging, the planned, deliberate, and flexible use of two or more languages in the same lesson, is a highly recommended practice in the foreign language (L2) classroom, but thus far there are no quantitative empirical studies supporting translanguaging behavior. To analyze the use of translanguaging, the present study analyzed L2 classroom interaction in 39 lessons in 2594 pairs of teacher questions and student answers, zooming in on the trade-off between (a) getting an answer and (b) getting an answer in the L2. A cluster analysis identified four types of lessons: (1) mainly L2 - low L2 response, (2) mainly L2 - high L2 response, (3) mainly L1 - low L2 response and (4) L2-L1 translanguagers – moderately high L2 response. Comparing cluster (1) in which teachers spoke English exclusively and students gave minimal responses in the L2 to cluster (2) in which teacher also used English exclusively but obtained high levels of L2 response from the learners, reveals mixed outcomes when teachers adopt a monolingual stance (L2 only as the language of instruction). Lessons in cluster 4, the “translanguagers,” reveal a significantly higher level of student responsiveness. This implies that teachers who ask many questions in the L2, but receive few answers, may increase students’ active classroom participation by adopting pedagogical translanguaging. A possible interpretation of the outcomes of this study is that using the foreign language as the language of instruction and pedagogical translanguaging are complementary, rather than competing, strategies in a language teacher’s repertoire.

Keywords: interaction, translanguaging, time-series analyses, teaching-learning process, heuristic.

This is an open-access article distributed under the terms and conditions of the [Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License \(CC-BY-NC-ND 4.0\)](https://creativecommons.org/licenses/by-nc-nd/4.0/).

INTRODUCTION

Translanguaging, the use of two or more languages in one interaction, is commonly used by multilingual speakers in multilingual contexts (Cenoz & Gorter, 2020; Conteh, 2018). At present, policy recommendations have been made for pedagogical translanguaging (Fasoglio & Tammenga, 2021; Duarte, 2020), the planned and deliberate use of two or more languages in the same lesson. Nevertheless, translanguaging behaviors emerging from teacher-student interaction are still understudied and ill-understood, and thus far there are no quantitative empirical studies of translanguaging behavior in the foreign language (hereafter referred to as L2) classroom (Singleton & Flynn, 2022).

In a foreign language classroom, there are at least two languages competing for attention: the L1, which is the dominant language in the educational context, often used by teachers and learners outside the classroom, and the L2, which is the central focus of the teaching-learning process taking place in the classroom (Gibbons, 2015). In a language lesson, the verbal behavior of the teacher and learners is not only a means to achieve learning of some subject or theme, but it is also the focus of learning itself (Gibbons, 2015; Larsen-Freeman & Cameron, 2008). Whereas it is the teachers' main goal to organize lessons that promote L2 learning, this goal can be met through a joint teaching-learning process, in which teachers and learners are co-adapting (Smit et al., 2022). According to Larsen-Freeman and Cameron (2008), this process is dynamic in that language teachers are continuously adjusting as they aim to hit a moving target, which explains why there may be uncertainty for teachers as to when to use which language in a lesson. According to the global citizenship and multilingual competences framework (Mercer, n.d.), an important teaching skill is to "teach students how to use their different languages as resources". For teachers, this framework proposes that they know and use "strategies to encourage [...] students to draw on their multiple languages in the classroom for social and learning purposes" (Mercer, n.d.), often referred to as translanguaging.

Although translanguaging theory has received ample attention from researchers across the globe (Cenoz & Gorter, 2022; Garcia et al., 2017), empirical studies on the choice of language and its effects are scarce. Singleton and Flynn (2022) have recently criticized the ways in which the concept of translanguaging has wandered from its original definition due to a lack of conceptual clarity and empirical evidence about its robustness. To fill this research gap and provide quantitative empirical evidence, this paper aims to investigate patterns of use of the societal language (referred to as L1 from now on) and the target language (referred to as L2 from now on) by teachers and learners during EFL lessons.

Translanguaging in the Foreign Language Classroom

Translanguaging is based on an integrated notion of language, rather than on the

assumption that languages are separated and should be treated and used as such (Cenoz & Gorter, 2022). The notion of language without firm boundaries corresponds to a holistic, complex, dynamic view of language learning, teaching and use (Douglas Fir Group, 2016). Hiver (2022) explains how in a foreign language lesson, language learning and language teaching could be viewed as complex processes: the process of language teaching and the process of language learning mutually influence each other and are inextricably linked. Merely studying components that constitute the process, and not the ways components interact, does not automatically lead to accurate predictions about possible outcomes of this complex and interactive process. The holistic starting point of language as one complex and dynamic system is the primary reason why this paper adopts the term “translanguaging” rather than “code-switching”. Code-switching as a construct suggests two separate and possibly different and competing linguistic systems, whereas the term translanguaging indicates a multilingual stance (Cenoz & Gorter, 2022).

Viewed from a multilingual perspective, linguistic knowledge is acquired as the result of using languages. An important idea in translanguaging is that keeping the available languages separate would limit a language teacher in using a flexible multilingual repertoire of verbal pedagogical strategies (Cenoz & Gorter, 2022). Activating the full multilingual repertoire of one complex dynamic system in an educational setting might therefore reinforce learners' access to language (Cenoz & Gorter, 2022). Moreover, translanguaging also fits current educational research and policy aiming for inclusive and equitable education. As put forth by Garcia and Lin (2015), allowing learners to use their full linguistic repertoire acknowledges diversity in multicultural societies. Although we endorse the political and educational equity perspective and its arguments, the present study will not elaborate further on this side of the debate. Translanguaging strategies may help learners bridge the gap between experiences outside the classroom and within, between prior knowledge and the development of (new) language and academic skills (Cenoz & Gorter, 2022; Duarte & Günther-Van der Meij, 2022; Gibbons, 2015). It should be noted, however, that the absence of deliberate practice of the L2 by either the teacher or the learners or both, reduces the number or affordances for crossing boundaries between the L1 and L2 (Larsen-Freeman, 2019).

Baker and Wright (2017) define using the L1 and the L2 adaptively as pedagogical translanguaging: planned behavior which is often characterized by a teacher who deliberately fosters the use of different languages during the lesson in order to maximize engagement and comprehension (Mercer & Dörnyei, 2020). Translanguaging can be viewed as a system of verbal routines which are formed by the language that is used by teachers and learners. Patterns emerging from pedagogical translanguaging are typically planned and anticipated, patterns formed by spontaneous translanguaging might emerge from a process of self-organization (Cenoz & Gorter, 2022). Depending on the lesson goal, time of

day, type of curriculum and the characteristics of the learners, emerging interaction patterns might contain more or less of the L1 and the L2. This implies that contextual factors, such as for instance the age and the level of proficiency of the learners, are relevant in terms of how to interpret specific characteristics of the translanguaging patterns (e.g., proportion of L1 and L2, L2 teacher talking time and frequency of switches between the L1 and L2) (Hiver & Al-Hoorie, 2016).

Teacher Questions as Verbal Pedagogical Tools

An important verbal pedagogical tool to foster learners' language use are teacher questions. Teacher questions are a common type of verbal behavior and the very linguistic form, the question, aims to encourage learners to think and respond (Smit et al, 2022). When teachers and learners are engaged in question-and-answer interaction, many conscious and unconscious decisions are made. (Smit et al., 2022). Examples of these decisions are the type of question asked, the number of questions asked, whether or not to give and answer (and by whom and how many learners), the type of answer, and also the language that is used. In a language lesson, a teacher who asks a question is continuously confronted with the aforementioned trade-off between two pedagogical aims. First, the teacher would aim at eliciting a response from the students. Second, the teacher would aim at stimulating the student to use the L2. These are not necessarily converging aims because groups of learners might be reluctant to use the L2 for various reasons (Larsen-Freeman & Cameron, 2008). However, in a communicative language lesson, obtaining a high response percentage to questions asked and getting questions answered in the L2 are both essential. This leads to a situation in which the teacher needs to counterbalance these two aims. In order to achieve optimal interaction, the teacher needs to assess, in real-time and from moment to moment during the lesson, how to best phrase their questions. There are two risks involved in this decision process: the risk of not getting an answer at all and the risk of not getting an answer in the L2. The former risk involves a classroom management risk in that learners do not participate; the second risk involves a communicative skills risk in that they do not use the L2.

Whereas L2 use may promote target language practice in the classroom, the L1 might be used to activate learners and promote understanding of L2 input (Dönzelmann, 2019). However, allowing both the L2 and the L1 might increase the risk of a reduction in the amount of L2 utterances spoken or heard by the learners. This leads to the question whether teachers could use both the L1 and L2 language to optimize student responses and participation and, if possible, whether they do so. Based on 39 lessons taught by 39 different teachers, the present study focuses on whether teacher questions engage students in interaction and to which extent this interaction occurs in the L2. We will zoom in on the role of translanguaging behavior in 2594 pairs of teacher questions and student answers

and analyze the role the two different languages play during whole-class discussions.

THE STUDY

This explorative classroom observational study focuses on spontaneous (i.e., unplanned) translanguaging in communicative English as a foreign language reading comprehension lessons. In teacher education programs, teachers are usually instructed to optimize one pedagogical goal: maximizing the use of L2 as the language of instruction (Council of Europe, 2001; Fasoglio et al., 2015). When learning to teach reading comprehension, teachers are encouraged to use their learners' prior knowledge and skills in order to activate learning and help students comprehend the text (Grabe, 2012; Gibbons, 2015). During their teacher education, the teachers participating in this study were not exposed to the recent literature with views of translanguaging.

The Heuristic Model

The present study will be based on the following idea presented in Figure 1: whenever the teacher asks a question, they are faced with a trade-off between two possibly opposing aims and which involves a risk assessment of not getting an answer at all or not getting an answer in the L2.

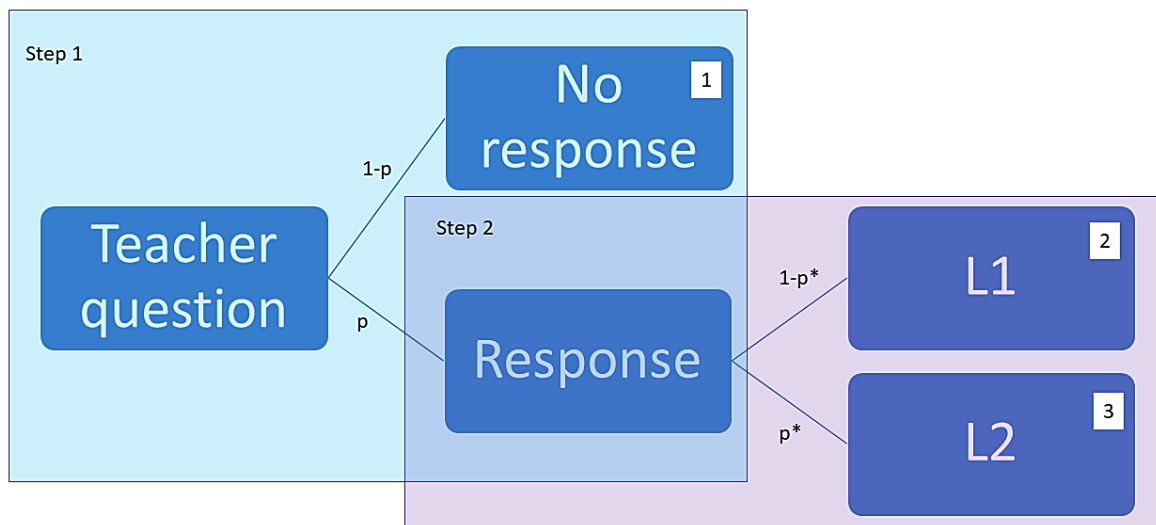


Figure 1. Heuristic model for possible student responses through teacher questions. p is for probability.

Figure 1 illustrates that whenever a teacher asks a question there are three possible outcomes:

1. the students do not answer: $p(\text{outcome} = 1) = 1 - p$
2. the students answer in the L1: $p(\text{outcome} = 2) = p \times (1 - p^*)$
3. the students answer in the L2: $p(\text{outcome} = 3) = p \times p^*$

We will make the following assumptions (to be tested in our research questions) which deal with the language the teacher uses (hence TL) and the language the student uses (hence SL).

- The probability of a getting a response in any language (p in Figure 1) depends on the teacher language (TL): $p = p(\text{TL})$ in the following way $p(\text{TL}=\text{L1}) > p(\text{TL}=\text{L2})$. This means that the probability of getting a student response is expected to be greater when the TL=L1 than when the TL=L2.
- The probability of getting an answer *in the L2* once a student has decided to answer (p^* in Figure 1) depends on the teacher's language: $p^* = p^*(\text{TL})$ in the following way $p^*(\text{TL}=\text{L1}) < p^*(\text{TL}=\text{L2})$. This means that if the TL=L2, we expect the probability of SL=L1 to be smaller than the probability of SL=L2.

These assumptions would imply that by speaking the L2 (TL=L2), the teacher decreases the probability of getting an answer, and at the same time increases the probability of getting an answer in the L2 if the question is answered. Therefore, we would like to investigate whether lessons in which both languages are used, translanguaging increases both the probability of getting a question answered and increases the probability of an answer in the L2.

Our study will be guided by the following research questions:

RQ1: Do students generally answer in the language in which the teacher poses the question?

H₀: The student is inclined to answer in the language that the teacher has used for the question. This implies:

$$p(\text{SL} = \text{L1} \mid \text{TL} = \text{L1}) > p(\text{SL} = \text{L1} \mid \text{TL} = \text{L2})$$

and

$$p(\text{SL} = \text{L2} \mid \text{TL} = \text{L2}) > p(\text{SL} = \text{L2} \mid \text{TL} = \text{L1})$$

In accordance with Figure 1, we hypothesize that both the probability of getting a response (p) and the probability of getting a response in the L2 (p^*) are probabilities contingent upon the language used by the teacher. Thus, we hypothesize that with the

choice of language used, the teacher is able to “pull” the interaction into a desired direction of the language used by the students.

RQ2: Do students answer relatively more questions in the L₁ than in the L₂?

We hypothesize that the learners are more likely to answer a teacher question if they use the L₁. The learners' decision process in response to a teacher question follows the two-step heuristic presented in Figure 1, in which the probability that the student answers (SL ≠ 0) when the teacher speaks the L₂ is smaller than the probability that the student answers when the teacher speaks the L₁. This implies that:

$$H_0: p(\text{SL} \neq 0 \mid \text{TL} = \text{L}_2) < p(\text{SL} \neq 0 \mid \text{TL} = \text{L}_1)$$

RQ3: Are the probabilities of p and p^* different for different lessons?

Teacher-student interaction patterns result from iterative behavior between teacher and learners. The way students respond to their teacher from moment to moment and vice versa determines the lesson outcomes. Patterns formed by question-and-answer sequences are a specific type of micro-level social interaction emerging from the way a group of learners and their teacher co-adapt (Smit et al., 2022). There is no reason to assume that these micro-level patterns are stable across different groups of learners taught by different teachers. This suggests that the probabilities of getting questions answered and getting questions answered in L₂ vary between lessons.

RQ4: Can different types of lessons be distinguished based on their outcomes with respect to percentage of questions answered and percentage of questions answered in the L₂?

Finally, we hypothesize that for different lessons, the L₁ and L₂ might be used in different ways to optimize the amount of active student participation. We would expect different types of lessons: lessons in which only the L₁ or only the L₂ is used and lessons in which both languages are used. We hypothesize that in lessons in which both languages are used, the “teacher pull” in combination with translanguaging might be used to increase the probability that students will answer a teacher's question.

METHOD

Participants

This study, based on the same dataset as in Smit et al. (2023), consists of 39 English-as-a-foreign-language classroom observations in the Netherlands. The teachers (male $n = 12$, female $n = 27$) were recruited through social media from 21 different schools, both rural and urban, with a high degree of geographical dispersion within the Netherlands. All had an EFL teaching qualification and taught teenagers in the last two years of the highest levels of Dutch education.¹ The maximum number of participating teachers working in the same school was four. Teacher experience ranged from novice (i.e., 1-5 years of experience) to senior teachers with up to 35 years of experience. Initially 43 lessons were recorded. Four lessons were excluded as they were disrupted due to unforeseen circumstances (e.g., a farmer strike, unruly student behavior, having to teach in a room which was too small).

The 875 students (408 male and 467 female) ranging from 14-17 years were in the two highest academic levels of Dutch secondary education. Their proficiency was at the CEFR B1 level, which is low intermediate.

Procedures

For the lesson observed, teachers were asked to teach a reading comprehension lesson² based on a text (fiction or non-fiction) as the main source of L2 input. There were no further requirements in terms of instruction, lesson organization, curriculum or lesson content. Teachers were explicitly asked to teach as if no camera were present. The average lesson duration was 51 minutes. The group size varied between 15-29 learners ($M = 22.9$, $SD = 5.6$).

Data Coding

The recorded lessons were coded with a validated Questions and Answers in *English Language Teaching (QAELT) coding scheme (Smit et al., 2022).³ The QAELT coding scheme consists of four-point scales for teacher questions and student answers in which openness of questions and answers as well as the level of complexity are accounted for. The QAELT coding scheme also consists of a four-point scale for the language used for questions and answers. The scale for teacher and learner language takes a holistic approach, using the following discrete labels: silence (0), Dutch (1), a mix of L1 Dutch and L2 English,

¹ Dutch secondary education is ability streamed. Students from the age of twelve onwards enter one of the following three levels: pre-vocational, general secondary or pre-university education. This study focuses on students in general secondary and pre-university education.

² Ethical clearance was provided by the Ethics Committee of the Department of Teacher Education at the University of Groningen (EC ref nos: 19-024/RM/AA & 19-069/RM/AA). Informed consent was obtained from parents, students and teachers. Teachers were offered a gift card as a reward for participation.

³ The full version of QAELT coding scheme (Smit et al., 2022) is open access and can be found in the IRIS repository: <https://www.iris-database.org/>

and (2) L2 (See Table 1). Student answers were coded at class level, which means that any response from any student was coded as representative of the whole group.

Two research assistants were trained to code teacher questions and students answers with the QAELT coding scheme. They used Mediacoder (Bos & Steenbeek, 2017) to generate question and answer time series. Rater 1 coded .45 of the data, rater 2 coded .55 of the data. Interrater reliability was calculated based on six randomly selected lessons (.15 of the data) which were coded independently by both raters. For the coding of teacher questions, reliability was high with a Cohen's kappa of $k = .75$. For the other three coded variables, reliability was very high with $k = .86$ for student answers, $k = .93$ for teacher language and $k = .89$ for student language.

Data Analysis

After coding the video data, teacher questions, student answers and language choice for both teacher and students were synchronized, resulting in pairs of questions and answers that were analyzed with R (R Core Team, 2022).

For RQ1, a bivariate relative frequency table (cross table in Table 2) was constructed to analyze the frequencies of teacher and student language use and their joint frequency distribution. To test whether teacher and student language choices were dependent on each other, a Chi-square independence test was performed. For a dependent relationship that was significant, we also analyzed whether the dependency was positive (the teacher pulls the student towards the language s/he used) or negative (the teacher pulls the student towards the language s/he did *not* use).

RQ2 concerned a comparison of the following two conditional frequencies:

- The relative frequency of getting a question answered if TL = L1
- The relative frequency of getting a question answered if TL = L2

These conditional frequencies were calculated on the level of the entire sample from the aforementioned bivariate relative frequency table. After that, the analysis was repeated on the level of the individual lesson to assess whether the effect differed among different lessons. For lessons where both the L1 and L2 were used, we plotted the pairs of conditional frequencies in a scatterplot. A paired t-test was performed to test whether significant differences between the two frequencies existed.

Table 1
QAELT coding scheme for teacher questions and language used

Code		Teacher question	Teacher Language	Student answer	Student Language
0	Label	Non-elicitation	None	No response	None
	Definition	The teacher does not really want an answer.	This option is not possible. A teacher always uses language to ask a question.	The learners do not answer	Students do not use any language
	Example	“That usually feels really good right?” ⁴	NA	NA	NA
1	Label	Closed question	L1	Simple	L1
	Definition	Question to which the teacher expects a certain answer.	Dominant language in the educational context	the learner understands the question and gives a very short answer (1-3 words)	Dominant language in the educational context
	Example	“Last time, what did we watch?”	“Wat keken we de vorige keer?”	“A song.”	“Een liedje.”
2		Clarification question	Mix of L1 and L2	Complete	Mix of L1 and L2
	Definitions	The teacher wants to know if the student understands	The question consists of words from both the L1 and the L2.	The learner answers the question by giving information that can be derived from the lesson content	The answer consists of words from both the L1 and the L2.
	Example	“How do you deal with a multiple-choice question?”	“Hoe deal je met een multiple-choice vraag?”	“Yeah, errr, yeah, there is always an unlogical* one.”	“Yeah, ehm, there is altijd een onlogische.”
3	Label	Complex question	L2	Complex	L2
	Definition	The teacher wants to know what the student thinks.	The second or foreign language taught.	Students’ responses are long (>1 sentence), extensive and/or learner adds a new perspective to the lesson	The second or foreign language learnt.
	Example	“How does Art feel about his brother?”	“How does Art feel about his brother?”	“Errr, he feels jealous of him. Errr, there is sort of competition between them. But the competition is non-existent. Because, well, err, his future is imaginary.”	“Errr, he feels jealous of him. Errr, there is sort of competition between them. But the competition is non-existent. Because, well, err, his future is imaginary.”

⁴ Examples used here to illustrate the types of questions and answers are in the L2. Examples used to illustrate the language are translations of the English answers. L2 English examples used here are literal transcripts from our data, L1 and mix examples were constructed to illustrate the codes and labels for teacher and student language (Smit et al., 2022).

In order to address RQ₃, four possible interaction patterns at the level of the entire sample were inspected, based on the frequency table analyses used for RQ₁. To analyze whether p^* (i.e., the probability to receive an answer in the L₂) varied between lessons, we calculated these tables for each lesson individually. Then we plotted the estimated probability density function for each of these four behavior types in a density plot, in which the distribution of the numeric variable was represented. This would reveal whether the observed pattern in the initial frequency table was stable or not between lessons.

For RQ₄, based on the outcome of the third research question, a K-means cluster analysis was performed to identify whether groups of lessons displayed similar outcomes with respect to answers given (either L₁ or L₂) and answers given in L₂, or whether no such distinction could be made.

RESULTS

RQ₁: Do students generally answer in the language in which the teacher poses the question?

Table 2 shows the relative frequencies of student responses. We see that .33 of the teacher questions were not answered by the students. There were very few occurrences of a mix of two languages for either teachers (.01) or learners (.02) in either a question or an answer (i.e., QAELT language code 2, i.e., mix L₁-L₂). As this behavior is so infrequent, these were excluded from further analyses.

Table 2

Relative frequencies for language in teacher- student interaction

	Student Answer				Total
	o	L ₁	Mix L ₁ -L ₂	L ₂	
Teacher question					
L ₁ question	.029	.067	.001	.004	.101
Mix L ₁ -L ₂	.004	.004	.001	.003	.012
L ₂	.302	.114	.014	.457	.886
Total	.334	.185	.016	.464	1.000

Based on the questions that were answered, after excluding the mix L₁-L₂ categories, cross tabulation in Table 3 presents the four types of most frequently occurring interaction: L₁ question – L₁ answer, L₁ question – L₂ answer, L₂ question- L₁ answer, L₂ question – L₂ answer. The relative frequencies were calculated only for the questions that actually received an answer (i.e., step 2 in the heuristic model presented in Figure 1). The final

column shows that the teachers ($n = 39$) used L2 for approximately .89 of the questions. L2-L2 interaction was found in approximately .71 of the pairs of questions that were answered. Table 3 also shows that L1-L1 interaction (.105) is greater than L1-L2 interaction (.007).

Table 3

Relative frequencies for most frequent teacher-student interaction

	Student Answer		
	L1	L2	Total
Teacher Question			
L1	.105	.007	.112
L2	.177	.711	.888
Total	.282	.718	1.000

In order to test whether a relation can be found between the language used by the teacher and the same language used in the students' answers, a Chi square independence test was performed. The results of this test ($X\text{-squared} = 448.63$, $df = 4$, $p < .001$) suggest that the null hypothesis that the student language is independent from the teacher language can be rejected. It can therefore be concluded that the language the teacher uses (L1 or L2) in a question is generally also the one used in the learners' responses, and that this effect is significant. These results support the teacher-pull hypothesis.

RQ2: Do students answer relatively more questions in the L1 than in the L2?

In order to answer RQ2 we analyzed the relative frequencies of student answers: no answer (SL=0), an answer in the L1 (SL=L1) or an answer in the L2 (SL=L2) given in Table 4. The following analyses include both Step 1 and 2 in the heuristic model (see Figure 1). The table thus not only includes the language choice (as for the analysis of RQ1), but also the answer frequency. Cross tabulation in Table 4 shows the relative frequencies for answers options when the teacher questions (TL) are in the L1 and L2 for these three options.

Table 4
Relative frequencies for answers when teacher questions are English (L2) and Dutch (L1)

	SL=0	SL=L1	SL=L2	Total
TL=L1	.029	.069	.004	.103
TL=L2	.310	.117	.474	.897
Total	.340	.186	.474	1.000

Note. Differences between sum and total are due to rounding.

From Table 4 it can be observed on the level of the entire sample, that .103 of the questions asked were in the L1 and that .029 of questions asked in the L1 were not answered. This leads to the following conditional answer frequency:

$$- p(\text{SL} = 0 \mid \text{TL} = 1) = .029 / .103 = .282$$

We also see that .897 of the TL questions asked were in the L2 and that .31 were not answered. This leads to the following conditional answer frequency:

$$- p(\text{SL} = 0 \mid \text{TL} = 2) = .310 / .897 = .345$$

A two-sample p-test for equality of proportion (X-squared = 533.97, df = 1, $p < .001$) was performed, which shows that this difference in answer frequency, contingent upon teacher language, is significant.

We consequently tested whether the difference in conditional answer frequencies for the sample, i.e., the difference between the L1 (.282) and the L2 (.345), also holds for each individual lesson. This means that the above calculation of the two relative frequencies was repeated for every lesson in which both languages (i.e., translanguaging) were used. In order to compare lessons, they are displayed in the scatterplot in Figure 2.

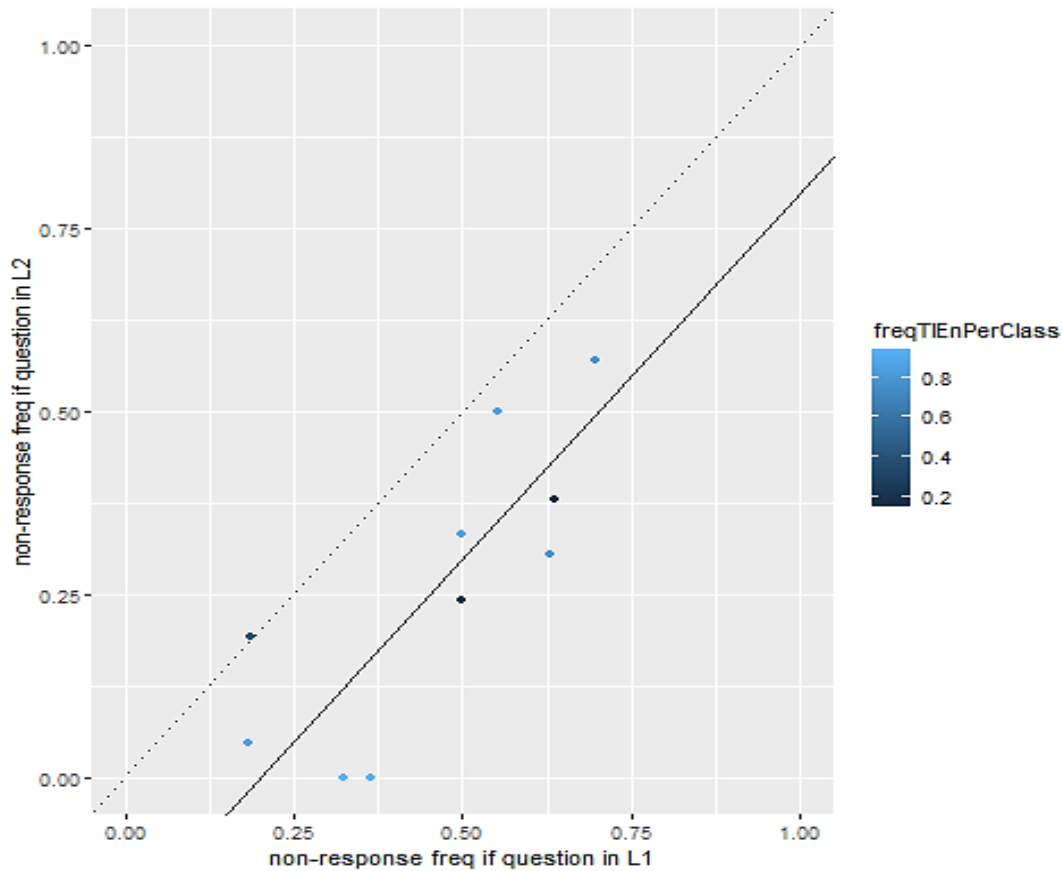


Figure 2. Frequencies of learner responses according to teacher language use in dual language lessons.

Each dot in the scatterplot represents one lesson. To remove teachers from the translanguaging sample who asked only one or two questions in the L1 or L2, a lower boundary was imposed on the definition of a translanguaging class: each language had to be used by a teacher for at least .05 of the questions for the lesson to be considered to use translanguaging.

In the scatterplot, the dotted line represents equality in the two conditional answer frequencies:

$$p(\text{SL} \neq 0 \mid \text{TL} = \text{L1}) = p(\text{SL} \neq 0 \mid \text{TL} = \text{L2})$$

Visual inspection of the figure reveals that all but one lesson lies below the equality line. This is an indication that the answer frequency for L2 questions is smaller than the answer frequency for L1 questions. The following null hypothesis, the probability that the student does not answer when the teacher speaks L1 is not greater than the probability that the student does not answer when the teacher speaks L2,

$$H_0: p(\text{SL} \neq 0 \mid \text{TL} = \text{L}_1) > p(\text{SL} \neq 0 \mid \text{TL} = \text{L}_2)$$

is refuted by a one-sided, paired t-test ($t(9) = 5.1077, p < .0001$). As each class has two conditional frequencies, a two-sample test is not required and a t-test can be performed on the differences in answer frequencies per class. As we hypothesize that the answer frequency for L2 questions is smaller than for L1 questions, a one-sided test is used. This implies that the answer probability for L2 questions is significantly lower than the answer probability for L1 questions.

The following two observations are made in this section:

1. in the overall sample, the estimated difference in answer probability between L1 and L2 questions is .05781.
2. in the subset of the sample of the teacher who use both the L1 and the L2 (translanguaging), this estimated difference in answer probability is .2001

This can be summarized as follows: the probability of not receiving an answer increase with .20 if the teacher chooses to speak L2 rather than L1. This holds for lessons in which a teacher uses both languages.

RQ3: Are the probabilities of p and p^* different for different lessons?

We analyzed the distribution of p (receiving an answer in any language, Step 1 in Figure 1) amongst the lessons in the entire sample. For each lesson, the relative frequency of questions being answered, $p(\text{SL} \neq 0)$, has been calculated. The estimated distribution of these frequencies can be found in Figure 3.

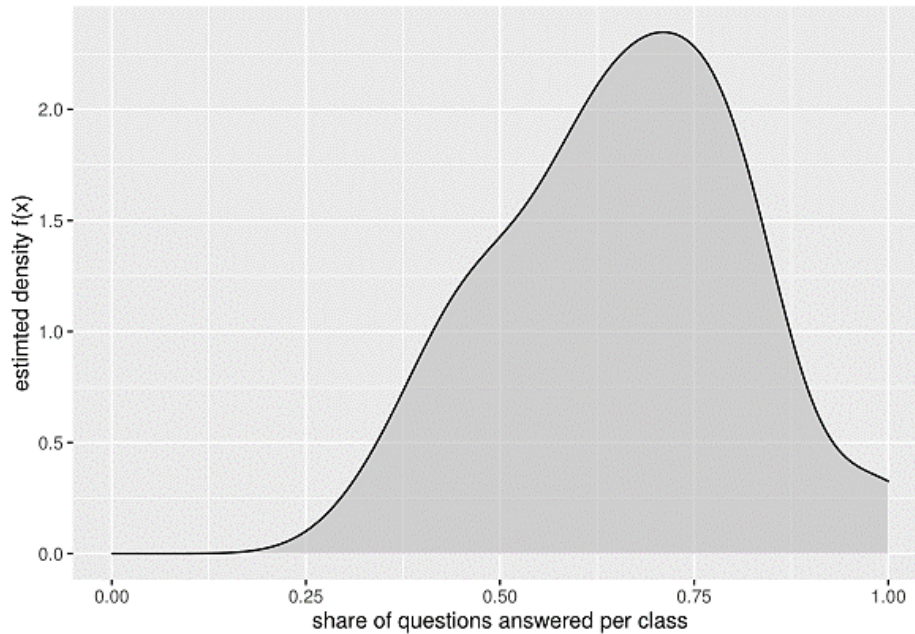


Figure 3. Distribution of answer probabilities (p) in the entire sample ($n=39$).

There is a lower boundary of .33 (roughly one third of the questions answered) in the distribution (different lower boundary in the chart due to smoothing) and a clear upper boundary of 1. In between this range of .67, we can observe a high variance around a clear central tendency (Mdn = .6596, $M = .6591$).

The steepness on the right-hand side indicates that it is rare to obtain response frequencies of over .75. The gentle decline of the left-hand side indicates that there is considerable room for frequency lower than the general tendency. Overall, it can be observed, that there is considerable variation in the parameter p among lessons.

Next, the distribution of p^* for the entire sample was analyzed. In the bivariate relative frequency table (Table 3), the distribution of the entire sample over the four lesson types (L1-L1, L1-L2, L2-L1, L2-L2) was estimated. Please note, that this behavior is conditional upon the question being answered, as the questions that are not answered have been removed from this analysis. In order to analyze whether the behavior displayed in the bivariate frequency table is constant across lessons, the same analysis was performed for every lesson. This implies, for example, that for the behavior type L2-L2, there are now 39 frequencies, rather than one. In order to analyze the variance of these behaviors, a Kernel density was estimated for each behavior type. This is graphically displayed in Figure 4.

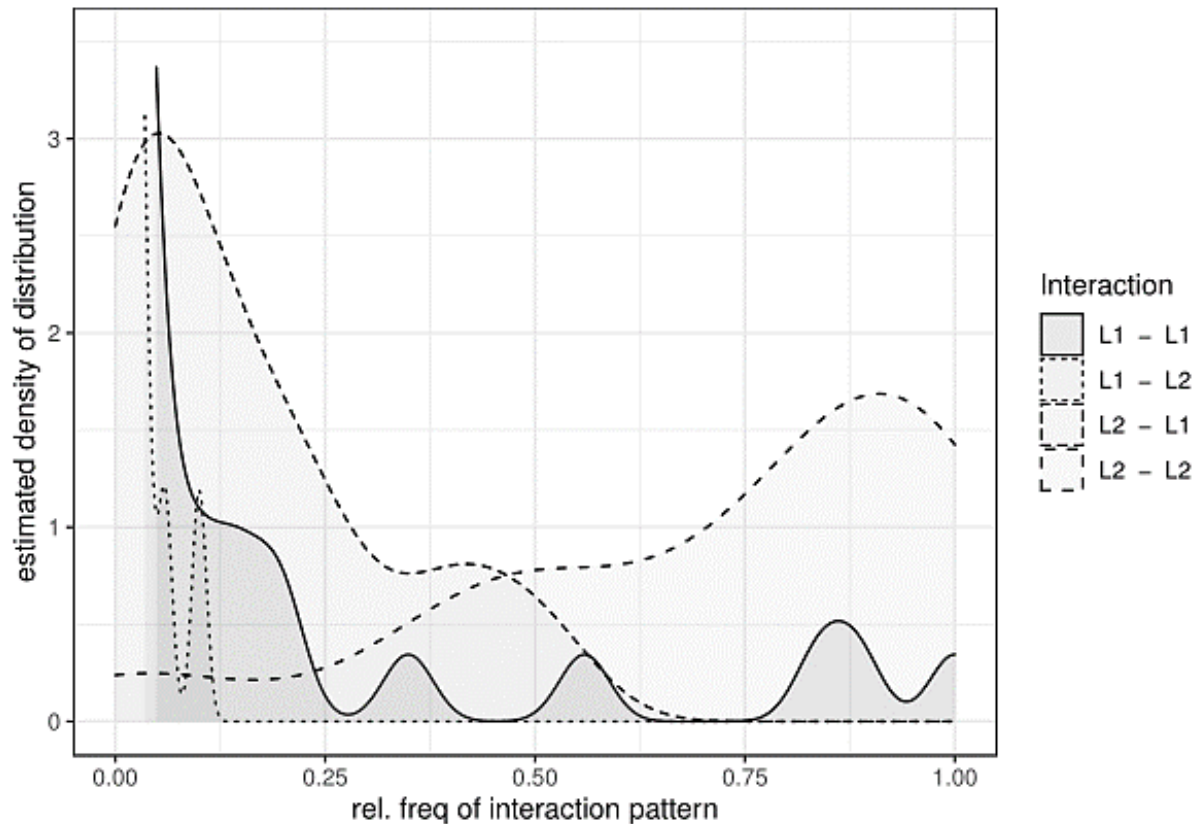


Figure 4. Distribution of teacher language – student language interaction types.

The estimated distributions of the four interaction types in Figure 3 show that:

- L1-L1 interaction has a very low incidence. This is similar for most classes. Some incidences of a higher frequency of L1-L1 interaction exist.
- L1-L2 interaction has a very low incidence. This holds for all classes in the sample.
- L2-L2 interaction has a relatively high incidence. This is in accordance with the average frequency of L2-L2 interaction for answered questions (.71, see Table 3) in the entire sample. However, L2-L2 interaction has a negative skew, which implies that there are classes where the incidence of L2-L2 interaction is low.
- L2-L1 interaction has a relatively low incidence. However, L2-L1 interaction has a positive skew, which implies that there are lessons with a higher occurrence of L2-L1 interaction.

Figure 4 therefore shows that among the two most prolific types of interaction (L2-L2 and L2-L1) there is considerable variance between the lessons.

RQ4: Can different types of lessons be distinguished based on their outcomes with respect to percentage of question answered and percentage of question answered in the L2?

In order to address the final research question, we focus on both Step 1 and 2 in the heuristic model (see Figure 1) for every lesson. Figure 5 shows a scatterplot displaying the frequency of student answers if a question is answered (p) and the frequency of L2 student answers for questions that were answered per lesson (p^*). Every dot represents a lesson and the color of the dot indicates the amount of L2 used by the teacher. The figure displays the two opposing goals from our heuristic: the trade-off between getting questions answered (p) and getting questions answered in L2 (p^*). Lessons where the TL=L2 and students respond in the L2 (which we consider lessons with optimal interaction) show up in the upper-right corner of this figure. The trade-off is visible as a shift towards the left (the amount of L1 increases) and up (answer frequency increases). As an example of how to interpret this figure, we see, for instance, that for the three lessons on the left, a moderate number of questions was answered, but both the students and the teachers used the L1.

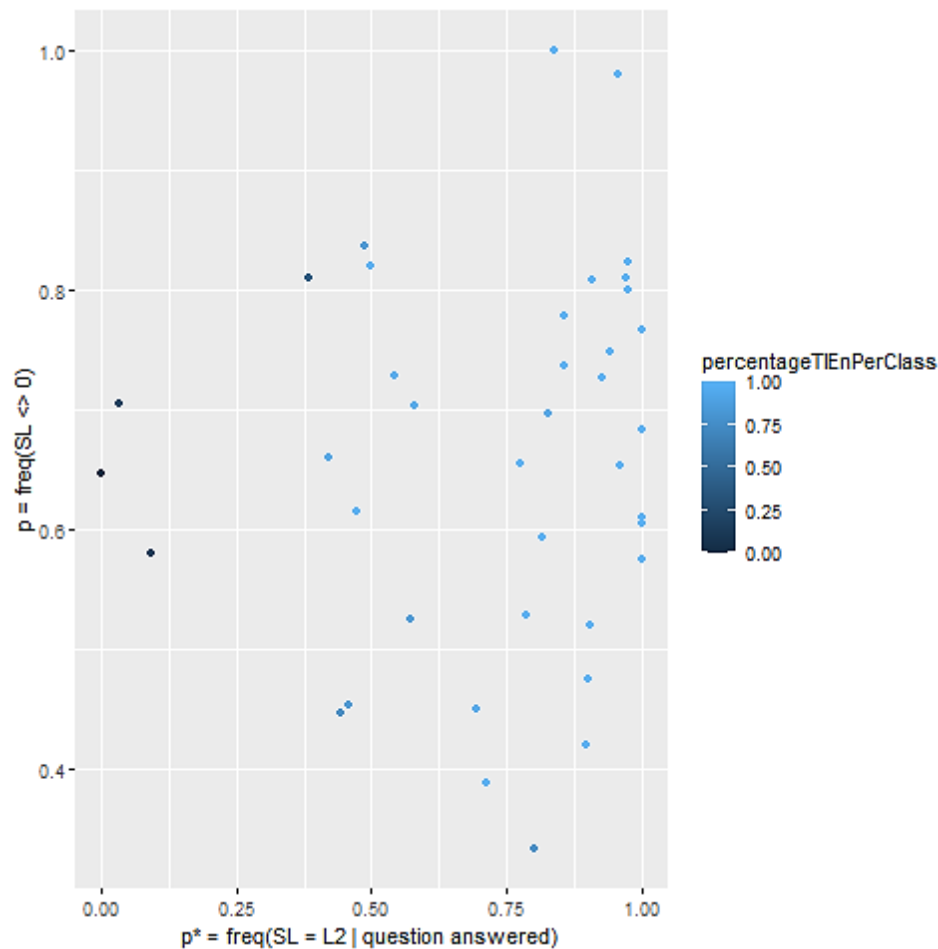


Figure 5. Conditional frequencies of receiving an L2 answer if the question is answered.

Based on the results displayed in figure 5, a K-means cluster analysis was performed to identify whether groups of lessons display similar outcomes with respect to answers given (either L2 or L1) and answers given in the L2, or whether no such distinction can be made.

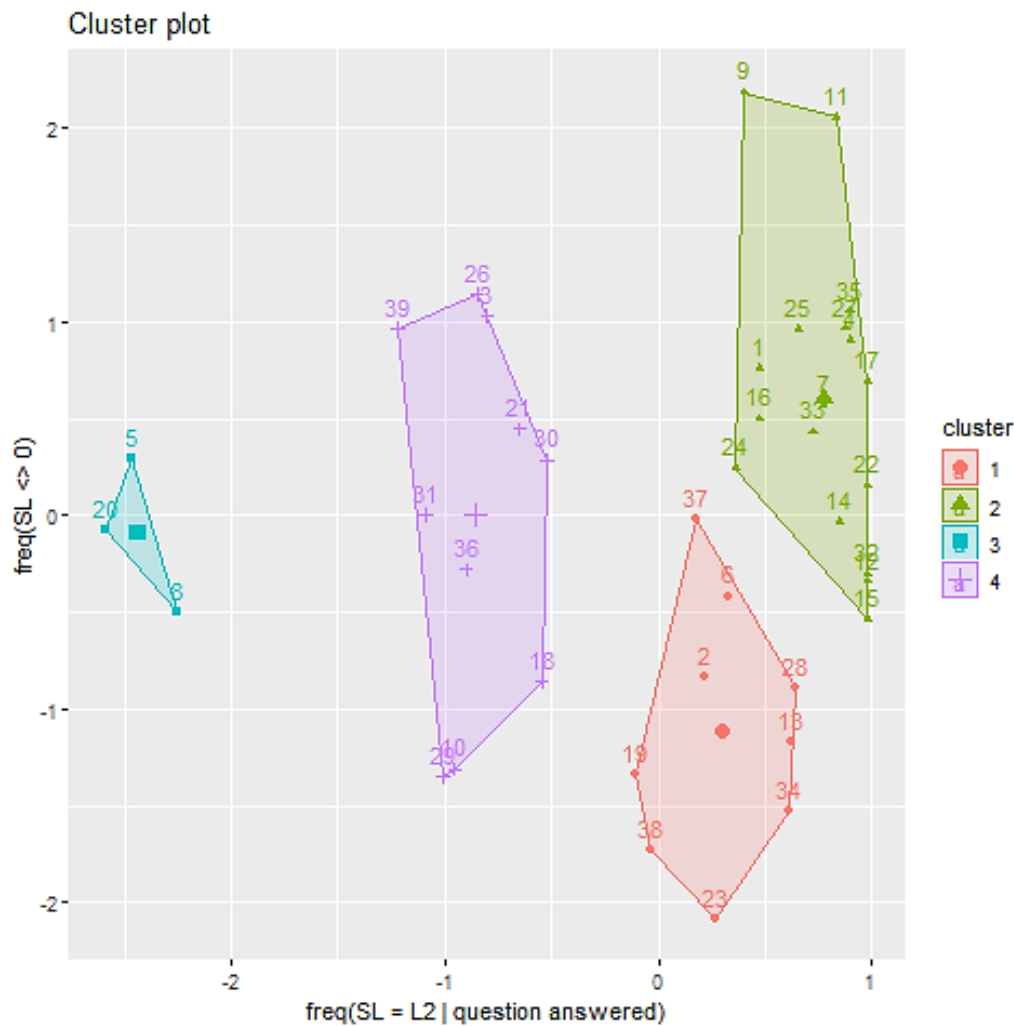


Figure 6. Cluster plot of the total frequency of getting an answer versus getting an answer in the L2 in relation to teacher language.

The results of the analysis show that four clusters can be identified:

Cluster 1 consists of nine lessons in which the teachers use the L2 almost exclusively (.97), but only have very limited success in getting their questions answered (.49 of all questions – see Table 5).

Cluster 2 consists of 17 lessons that display both a high frequency of questions in the L2 (.94) and a high frequency of questions answered (.75). From Table 5 we can see that the teachers who taught these lessons used the L2 exclusively.

Cluster 3 consists of three lessons in which the teachers use the L1 almost exclusively (.12 of the questions were in the L2 – see Table 5) and have a relatively high frequency of questions answered (.64 of the questions) in the L1.

Cluster 4 consists of the 10 dual lessons shown in Figure 2. They are characterized by a relatively large frequency of questions answered (.66), which is very similar to the frequency of questions answered in cluster 2, a high frequency of the teachers' uses L2 (.86) and an almost 50-50 frequency of student answers in the L1 and L2.

Table 5

Descriptive statistics for teacher-student interaction clusters

Cluster	TL	Number of lessons	Number of questions	Frequency SL= L2	Frequency Answered	Frequency TL = L2
1	mainly L2 low response	9	540	.81	.49	.97
2	mainly L2 high response	17	1033	.94	.75	1.00
3	mainly L1 moderate response	3	185	.04	.64	.12
4	mix L1 and L2 moderate response	10	836	.49	.66	.86

DISCUSSION AND CONCLUSION

Especially in the L1 Dutch context, where L2 English is ubiquitous, English language teachers have been trained to use the target language as much as possible and elicit as much English as possible from their students. However, recently a strong plea has been made also to use the L1 in the language of instruction, referred to as pedagogical translanguaging (Douglas Fir Group, 2016; Cenoz & Gorter, 2022). The argument is that knowledge about different languages is acquired by using them, resulting in multilingual knowledge. Thus, activating the full multilingual repertoire might reinforce learners' access to language and suppressing multilingual knowledge might make language learning less effective (Cenoz & Gorter, 2020). Within the Dutch context, we explored the use of the L1 and L2 during teacher-student interaction to see if there is empirical evidence in favor of translanguaging.

To investigate the use of translanguaging, the present study analyzed L2 classroom interaction in 39 lessons in 2594 pairs of teacher questions and student answers. For the current study we operationalized effectiveness as getting as many teacher questions

answered as possible and preferably in the L2. We presented a heuristic model with the trade-off foreign language teachers are facing when they decide to ask a question with regard to L1 and L2 use. When asking a question, the teacher is faced with the choice between getting an answer and getting an answer in the L2. Teachers in the Dutch context are encouraged to maximize L2-L2 interactions. However, we hypothesized that students are more likely to answer questions in the L1 and that in lessons in which both languages are used, the 'teacher pull' in combination with translanguaging might increase the probability that students will answer a teacher question. To investigate the patterns of language use, we tested our assumptions in four separate questions, which we will briefly restate with a brief summary of the findings:

Do students generally answer in the language in which the teacher poses the question? Our results show that the language (L1 or L2) the teacher uses in a question is generally also the one used in the learners' responses, supporting the 'teacher-pull' hypothesis. In other words, the teacher is the one who usually determines which language is used by the student. As far as we know, this is the first study that has empirically confirmed the existence of such a teacher pull in foreign language teaching in secondary education.

Do students answer relatively more questions in the L1 than in the L2? In line with our hypothesis, students prefer to answer questions in the L1. We found that students answer relatively more questions in the L1 than in the L2. In lessons in which a teacher uses both languages, there is a .20 greater probability that the student responds if the teacher asks the question in the L1. As far as we know, this is the first study that has empirically confirmed such an L1 preference of students in secondary education.

Are the probabilities of p and p^ different for different lessons?* We found various types of interaction: a low incidence of L1-L1 with a few clear exceptions, a low incidence of L1-L2, without exceptions, and a high incidence of L2-L2 and L2-L1 with considerable variance between the lessons. Based on these findings, a cluster analysis was performed for the next question.

Can different types of lessons be distinguished based on their outcomes with respect to percentage of question answered and percentage of question answered in the L2? We were able to identify four different clusters of L1 and L2 use. In Clusters 1 and 2 the teachers spoke the L2 almost exclusively, but in Cluster 1 only .50 of the questions were answered in the L2. In Cluster 2, a high answer frequency was found with .75 of the questions answered in the L2. In Cluster 3 the teachers spoke the L1 almost exclusively and .65 of the questions

were answered in the L1. In Cluster 4, teachers used both the L2 (.86) and the L1 (.24) for their questions and they received a .66 student response.

Within the Dutch context, we would consider Cluster 2 the most effective one as it had both most teachers' questions answered and answers in the L2. The second in line would be Cluster 4 (translanguaging), where the teachers used the L2 to a great extent, but switched to the L1. We do not have data about the teachers' reason to switch, but they may sense that switching would lead to a higher chance of getting a response. Switching is a strategy that teachers in Cluster 2 did not use; the learners apparently did not feel inclined to answer the questions in L2, but the teacher did not switch to the L1. This observation is in line with Larsen-Freeman and Cameron (2008), who argue that teachers need flexible linguistic and pedagogical repertoires because "almost anything goes in the abstract, but any particular moment in a lesson can be rich with learning potential and some directions to take might be better than others" (p.198). Adhering strictly to the policy of using the L2 as the language of instruction works really well in some lessons, but not at all in another cluster of lessons. This suggests that teachers with a flexible linguistic repertoire might steer classroom interaction towards a desired outcome: in groups who are likely to answer in L2, use L2 exclusively. In groups who are less likely to answer, use translanguaging to increase the answer frequency.

The pattern in which we identified a trade-off between getting an answer in the L2 and getting an answer at all is not only relevant for the empirical knowledge base of translanguaging but is also potentially relevant for policy and teacher education. To prepare teachers for a career in a multilingual society, translanguaging may very well be added to a teacher's pedagogical toolkit. For lessons in which teachers consistently use the L2 but receive minimal answers, it might be advisable to include L1 questions in their repertoire. This could possibly increase the frequency of questions answered. However, the effectiveness of adopting translanguaging may depend on the learners' level of L2 proficiency (Garcia et al., 2017). In the Dutch senior high school context, we would caution against adopting translanguaging as the preferred pedagogical stance in English as a foreign language lessons, as Dutch teenage learners of English have relatively high levels of English proficiency. For other modern foreign languages, such as French, German or Spanish in Dutch senior high schools, translanguaging might be a versatile option. This may depend on how comfortable learners are in the L2. A careful analysis of the teaching and the learners' context should therefore be factored in when making pedagogical decisions about which language(s) to use in which group.

A note of caution in terms of causality should be made, We analyzed how the teacher language impacts the interaction for the simple reason that in teacher question interaction the teacher goes first. Thus, an important limitation of the present study is that only teacher question and student answer behavior was examined (Smit et al., 2022; Mercer & Dörnyei,

2020). We acknowledge that there are many more possibly relevant aspects and variables in classroom interactional research. Follow-up studies may want to further examine the role of language switches initiated by the students. Whereas we saw that a teacher's language choice influences students' verbal behavior, in a complex dynamic system a previous moment also influences the next moment. Analyzing lagged timeseries data focusing on how student responses might influence the teacher's follow-up move could generate new insights into whether a student pull exists.

Future research might also want to zoom in on disentangling possible influencing factors that foster optimal target language interaction patterns as found in the seventeen lessons of cluster 4. Would it be possible to identify properties which have caused optimal L2-L2 interaction to come into existence? And can teachers and learners be trained to shift classroom interaction towards increased active verbal behavior from language learners? Finally, intervention studies are needed to see if pedagogical translanguaging strategies can be used with the aim to increase the number of student answers.

The present study revealed that some teachers speak the L2 all of the time and receive many answers, but there is also a group of lessons in which teachers use the L2 almost exclusively and receive minimal student responses. Teachers who used translanguaging received more answers than the L2-only teachers in Cluster 1. Promoting the exclusive use of the target language as the language of instruction may not always be the best strategy for every group of learners in every context. Our study suggests that maximizing the use of the target language as the language of instruction and pedagogical translanguaging might be better viewed as complementary, rather than competing, strategies in a language teacher's repertoire.

ACKNOWLEDGMENTS

The authors would like to express their gratitude to the teachers and students who allowed us to observe and learn from their interactions. We would also like to thank Diane Larsen-Freeman for her valuable feedback on a previous version of this manuscript. We are indebted to Melissa Idemudia and Patrick van de Wetering for coding the data.

REFERENCES

- Baker, C., & Wright, W. E. (2017). *Foundations of bilingual education and bilingualism*. Multilingual Matters.
- Bos, J., & Steenbeek, H. W. (2017) Mediacoder software for coding video and audio materials. [web-based computer software]. University of Groningen. <https://mediacoder.gmw.rug.nl/>
- Cenoz, J., & Gorter, D. (2020). Pedagogical translanguaging: An introduction. *System*, 92, 1–7, <https://doi.org/10.1016/j.system.2020.102269>.
- Cenoz, J., & Gorter, D. (2022). *Pedagogical translanguaging*. Cambridge University Press.
- Conteh, J. (2018). Translanguaging. *ELT Journal*, 72(4), 445–447. <https://doi.org/10.1093/elt/ccy034>
- Council of Europe. (2001). *Common European Framework of Reference for Languages*. Press syndicate of the University of Cambridge. <https://rm.coe.int/16802fc1bf>
- Fasoglio, D. & Tammenga, M (2021). SLO Startnotitie Moderne Vreemde Talen [Position Paper Modern Foreign Languages] Retrieved 22nd March, 2023 from “<https://www.actualisatiemvt.nl/uploads/startnotitie-moderne-vreemde-talen.pdf>”
- Donszelmann, S. (2019). Doeltaal-Leertaal: Didactiek, professionalisering en leereffecten. PhD Thesis Vrije Universiteit, Parthenon. [Target language-learning language: professional development and learning effects.] Retrieved 20th March 2023 from <https://research.vu.nl/en/publications/target-language-a-vehicle-for-language-learning-pedagogy-professi>
- Douglas Fir Group. (2016). A transdisciplinary framework for SLA in a multilingual world. *The Modern Language Journal*, 100, 19–47. <https://doi.org/10.1111/modl.12301>
- Duarte, J. (2020). Translanguaging in the context of mainstream multilingual education. *International Journal of Multilingualism*, 17(2), 232–247. <https://doi.org/10.1080/14790718.2018.1512607>
- Duarte, J., & Günther-van der Meij, M. (2022). Translanguaging pathways to higher education: A transition program for highly educated refugees. *Multilingua*, 41(3), 299–319. <https://doi.org/10.1515/multi-2021-0127>
- Fasoglio, D., Jong, K. de, Trimbos, B., Tuin, D., & Beeker, A. (2015). *Taalprofielen, herziene versie van taalprofielen 2004*. SLO. <https://www.slo.nl/publicaties/@4301/taalprofielen-2015/> [Language profiles, revised version of language profiles 2004.]
- Garcia, O., & Lin, A. (2015). Bilingual and multilingual education. In S. May (Ed.), *Encyclopedia of language and education* (3rd ed., pp. 117-130). Springer.
- García, O., Johnson, S. I., Seltzer, K., & Valdés, G. (2017). *The translanguaging classroom: Leveraging student bilingualism for learning*. Brookes Publishing.

- Gibbons, P. (2015). *Scaffolding language, scaffolding learning: Teaching English language learners in the mainstream classroom* (2nd ed.). Heinemann.
- Grabe, W. (2012). Reading in a second language. *The Oxford handbook of applied linguistics* (2nd ed.). Oxford University Press.
<https://doi.org/10.1093/oxfordhb/9780195384253.013.0006>
- Hiver, P. (2022). Complexity theory as a conceptual framework for language teacher research (pp. 15–33). In Y. Kimura (Ed.), *Language teacher motivation, autonomy, and development in East Asia*. Springer.
- Hiver, P., & Al-Hoorie, A. H. (2016). A dynamic ensemble for second language research: Putting complexity theory into practice. *The Modern Language Journal*, 100(4), 741–756. <https://doi.org/10.1111/modl.12347>
- Larsen-Freeman, D. (2019). On language learner agency: A complex dynamic systems theory perspective. *The Modern Language Journal*, 103, 61–79.
<https://doi.org/10.1111/modl.12536>
- Larsen-Freeman, D., & Cameron, L. (2008). *Complex systems and applied linguistics*. Oxford University Press.
- Mercer, S. (n.d.) *Global citizenship and multilingual competences*. GCMC. Retrieved 14th April 2022 from <https://gcmc.global/>
- Mercer, S., & Dörnyei, Z. (2020). *Engaging language learners in contemporary classrooms*. Cambridge University Press.
- R Core Team (2022). *R: a language and environment for statistical computing and graphics*. Version 4.1.3. [computer software]. <https://www.r-project.org/>
- Singleton, D., & Flynn, C. J. (2022). Translanguaging: A pedagogical concept that went wandering. *International Multilingual Research Journal*, 16(2), 136–147.
<https://doi.org/10.1080/19313152.2021.1985692>
- Smit, N., van Dijk, M., de Bot, K., & Lowie, W. (2022). The complex dynamics of adaptive teaching: Observing teacher-student interaction in the language classroom. *International Review of Applied Linguistics in Language Teaching*, 60(1), 23–40. <https://doi.org/10.1515/iral-2021-0023>.
- Smit, N., van Dijk, M., Holtman, J., de Bot, K., & Lowie, W. (2023). Zone in, zone out: Variability in teacher-student interaction. In revision.

