

Data-driven learning: changing the teaching of grammar in EFL classes

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This study aims to investigate the experience of six early-career teachers who team-taught grammar to EFL college students using data-driven learning (DDL) for the first time. The results show that the teachers found DDL an innovative and interesting approach to teaching grammar, approved of DDL's capacity to provide more incentives for students to engage in discussion, and endorsed its effectiveness in transforming relatively passive students into active learners. The results also indicate some challenges that DDL entailed and possible ways for the teachers to meet them. The challenges included increased workload and technical difficulties in designing DDL materials and conducting DDL-centred activities, but the teachers still eventually improved their DDL teaching by following three key practices: reducing the number of corpus entries used, deploying complete concordance lines whenever possible, and asking the students focused guiding questions. This article concludes with suggestions for future DDL practice in EFL grammar classrooms.

Introduction

Data-driven learning (DDL) has been widely discussed in educational contexts over the past 20 years, with particular reference, in EFL classrooms, to the teaching of writing or grammar skills (for example [Johns 1991](#); [Boulton 2010](#); [Smart 2014](#)). Its popularity within the language teaching community may derive from the many advantages identified in the language materials generated from corpora, that is, what [Mishan \(2004\)](#) calls the richness and authenticity conferred by their cultural and linguistic content. These features are regarded as interesting and motivating for particular groups of learners ([Mishan ibid.](#); [Yang, Wong, and Yeh 2013](#)). Additionally, the way DDL-centred activities promote 'discovery learning' ([Johns ibid.](#); [Boulton ibid.](#)) is also believed to provide learners with incentives for entering discussion ([Gilquin and Granger 2010](#)). It has generally been found that students develop a strong grammatical consciousness (cf. [Schmidt 1990](#)) if they are involved in a discovery learning process (such as DDL), which leads them to notice and identify linguistic features in the target material. This consciousness-enhancing experience falls within the scope of the noticing hypothesis discussed in the field of second language acquisition (see [Flowerdew 2012](#): 216), and most likely leads to improved linguistic skills developing as students consciously notice

language features before producing them. The dynamic virtuous circle (i.e. incentives-engagement-improvement) triggered by the various advantages of DDL also links to the principles discussed in contemporary learning motivation theory (for example [Dörnyei and Ushioda 2011](#)).

In addition to theoretical support, many studies examine the effects of DDL in EFL classrooms. On the one hand, while some researchers have found that their students were initially discouraged by DDL-centred tasks (for example [Kennedy and Miceli 2001](#)), most DDL studies have reported that EFL students value the approach and comment positively on its use ([Rezaee, Marefat, and Saeedakhtar 2014](#)). On the other hand, many DDL investigators observe that DDL students improve their knowledge of collocations and grammar ([Rezaee *et al.* *ibid.*](#); Smart *op.cit.*) and develop the skills to apply effectively the new knowledge in writing (for example [Yoon 2008](#)), although others find that DDL does not clearly affect certain aspects of grammar (for example [Boulton *op.cit.*](#))

Although these are diverse research findings, DDL has tentatively been judged an optimistic approach in general (cf. [Yoon 2011](#)), given its grounding in theory, its multiple advantages, and the positive evidence discussed above. However, it is noteworthy that support for the pedagogic suitability of corpus use has mostly drawn upon evidence of student linguistic performance and learning attitudes. In contrast, to the best of the authors' knowledge, empirical investigations of corpus use specifically researching the hands-on perspectives/perceptions of teachers using DDL have been fewer, notably those comparing DDL with a conventional approach, such as Grammar Translation, which is particularly common in Taiwan's EFL grammar classrooms. The discussion of DDL teachers' perspectives mostly touches on general difficulties, such as concerns about the time necessary to prepare corpus-based materials or the time required to complete a DDL task in class (cf. [Johns *op.cit.*](#)). This study contributes to the current literature by shedding a different light on the effects of DDL. It investigated in depth the perceptions/perspectives of a group of early-career teachers who taught grammar to university-level English majors in Taiwan by blending DDL and Grammar Translation. In this process, a series of research questions were asked. First, how do early-career teachers perceive their teaching experience using DDL as opposed to Grammar Translation in EFL grammar classes? Do they encounter any problems? If so, how do the teachers tackle them? Moreover, from the teachers' perspective, what learning patterns occur in class among their students? Finally, having experienced it personally, what would the teachers do with DDL in their future teaching?

Methods

The study, the participants, and the treatments

The present study was conducted in the English Department of a Taiwanese university. Six second-year early-career teachers studying Masters degrees (two men and four women with an average age of about 25) who had majored in TESOL volunteered for this study. Before the study, all the teachers had at least one year's experience of teaching general English, including grammar, to Taiwanese students at

different levels. However, none of the teachers had ever taught or been taught with DDL before. The study design is presented in Figure 1 (see flowchart) and explained in detail below.

Before the teaching project started, all the teachers attended two three-hour training sessions on teaching DDL-centred activities and preparing DDL materials. Then as a team they were required to prepare DDL-based materials and teach three different sets of grammar concepts to three different classes of first-year English majors (Classes A, B, and C). Following their original teaching syllabuses, the three classes were taught one after the other over a three-week period. Class A was taught passives; Class B, relative clauses; and Class C, a group of lexical phrases indicating purpose, results, and contrast. Three classes, instead of one, were involved to ensure more feasible class and curriculum arrangements.

To give the teachers full experience of teaching with DDL in comparison with Grammar Translation, they were asked to employ two blends of DDL and Grammar Translation, and a Grammar Translation only approach to teach these different grammatical points. Specifically, the teachers used Treatment A on Class A (passives), teaching 60 per cent of the grammar (i.e. six out of ten grammar concepts/rules) by DDL and the remaining 40 per cent by Grammar Translation. The teachers used Treatment B on Class B (relative clauses) when 40 per cent of the grammar was taught by DDL and the

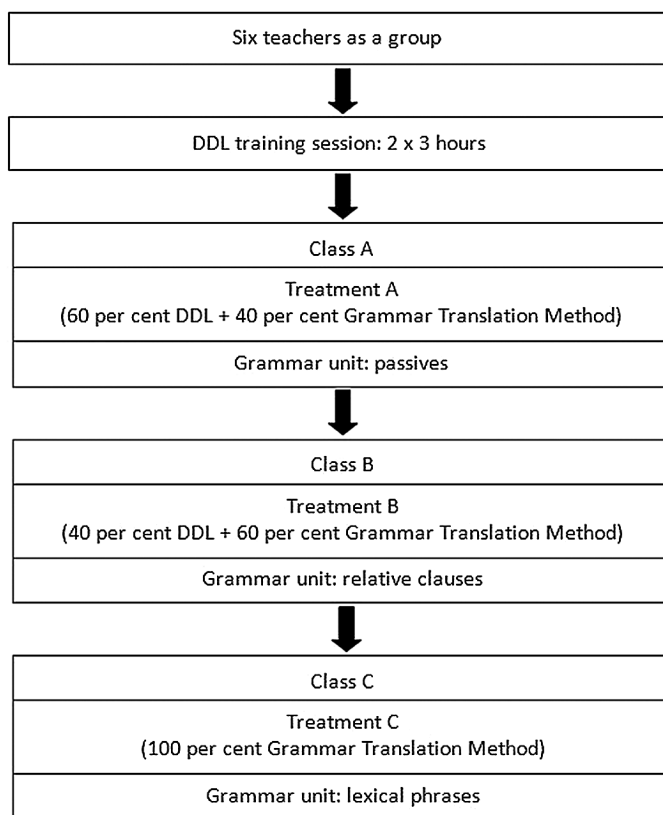


FIGURE 1
Flowchart of the research
study

remaining 60 per cent by Grammar Translation. Finally, the teachers used Treatment C, Grammar Translation alone, to teach the lexical phrases to Class C.

It should be noted that, while the 20 per cent difference between Treatments A and B may seem slight, this minor difference in ratio was likely to result in different perceptions/experiences, meriting further discussion, as a DDL-only treatment could be rather time consuming (cf. Johns op.cit.), and DDL was a totally innovative approach for the teachers in this study (and the undergraduates also).

DDL materials

The teachers compiled their own DDL materials for the grammar units scheduled for teaching in Treatments A and B. To teach the target rules, they drew on sample sentences from the British National Corpus (corpus.byu.edu/bnc), which is a free-to-access online database containing 100,000,000 English words collected from the late twentieth century.

Figures 2 and 3 illustrate the DDL materials collected by these teachers for teaching the passive pattern ‘have/get something done’ and the relative pronoun ‘whom’ following a preposition.

Example DDL sessions and a typical Grammar Translation lesson

In a typical DDL session, after presenting the concordance lines, the teachers would ask the students either general questions or series of questions to help them identify and generalize the target grammar. For instance in one of the DDL activities during Treatment A, the students, after reading through the text shown in Figure 2, were asked: ‘Based on your observation, please specify any grammatical rules you found’. In another DDL session where the text in Figure 3 was taught using Treatment B, the students were given step-by-step instructions,

1.	do so; while 90 per cent of workers	had their pay reduced	for lateness, none of the manager
2.	ser—Herbers in Liverpool—and I	had my hair dyed	blonde and red, it looked great—I
3.	e Hillcrest Hotel in Widness where I	had my hair styled	and my make-up done, and then t
4.	al case is Edwards v Din. A drive	had his tank filled	with petrol. He then decided not t
5.	shop. Years ago, most of the shops	had their name printed	in that lovely gold lettering. ‘Thr
6.	be traced. Twenty thousand women	had their tests rechecked	when it was disclosed mistakes v
7.	re than over witness, one of the nuns	had her shoulder broken.	Several came from Shung Sep
8.	ses. More than half a dozen traders	had their shops damaged.	The RUC say they are investigatin
9.	nd syntax is important. It’s easier to	get your case accepted	if you offer it as a collective decis
10.	‘d been to college but she couldn’t	get her car started,	she had to get her dad to drive
11.	--erm, television on and go and	get your hands washed,	you can help me dish the dinner
12.	out a pause,’ Christine, help Yukio	get his helmet latched.	Kosi, Lars, go round the Lift
13.	ut of the corner of my mouth, ‘I must	get my watch fixed.’	It was an old one--one

FIGURE 2
Example of DDL materials in Treatment A

1	and the petitioning creditor must be a person	to whom	the debt is owed.
2	If the current trend continues, the landowners	to whom	the bothies belong, could decide...
3	They just need to have partners	with whom	they can work.
4	I had a bit of spare, there's a girl	who	I work with
5	it was the person who was her guiding light, the person	who	she really depended on...

FIGURE 3
Example of DDL
materials in
Treatment B

including ‘Please observe the node words first’ (the term ‘node words’—words/phrases in the central column of a concordance—had already been explained to the students) and then asked ‘What or who do these words refer to in the sentences?’, ‘What are the functions or word forms of those words in the sentences?’, ‘Do you see any differences between the forms of the node words?’, and ‘Why do you think such differences exist?’. In both examples, after the students identified the rules, the teachers double-checked their understanding by asking them to use the patterns to create one or two sentences of their own.

In contrast, the teachers in the Grammar Translation lessons explained the grammatical pattern given in the textbook and then analysed one or two sample sentences aloud to show how the grammar worked, rather than asking students themselves to generalize/discover the rules. For example the teachers first taught the students that relative pronouns functioning as object could be left out. After the explanation, the teachers explained the grammatical structure of the following example and noted how ‘that’ (relative pronoun) could be omitted: ‘That’s the car (that) I used to own’. After the example, the students’ understanding was tested by a follow-up exercise from the textbook and by asking them to underline any relative pronouns that could be left out of the related sample sentences.

Data collection and analysis

To develop an in-depth understanding of the teachers’ teaching experience, after each session the participants were required to write a journal entry in English (minimum 200 words), freely reflecting on their teaching and making observations about their classes (altogether three journal entries per participant). After the project ended, the teachers produced an evaluative report (at least 500 words long, in English) focusing on the teaching experience overall with particular emphasis on the similarities or differences between teaching via DDL and Grammar Translation. In addition to the teachers’ textual reflections, the researchers (i.e. the authors of this study) kept in-class observation notes of their teaching performance, also in English, to complement the teachers’ reflections.

To portray the nature of the teachers’ DDL experience compared to their Grammar Translation teaching, the textual data collected were analysed primarily through Moustakas’ (1994) classic analytical techniques, allowing the researchers to move from specific observations

Pseudonyms	Gender	Journal 1 (No. of words)	Journal 2 (No. of words)	Journal 3 (No. of words)	Evaluative report (No. of words)	Total no. of words
Teacher 1	F	208	202	250	505	1,165
Teacher 2	M	306	219	290	748	1,563
Teacher 3	F	277	267	228	542	1,314
Teacher 4	F	230	219	284	510	1,243
Teacher 5	F	320	201	218	541	1,280
Teacher 6	M	283	467	365	940	2,055

TABLE 1
An overview of reflections
produced by the teachers

of individual teacher's experiences to generalized statements about the collective understandings of all these experiences. For reasons of space, only the final results of the analysis are presented here to shed light on the teachers' essential experience of DDL as a whole.

Results

This section first presents the number and length of the early-career teachers' reflections and then outlines the descriptions of their DDL teaching experience.

As Table 1 shows, the overall reflections from the teachers constitute a substantial account of 8,620 words for analysis. Although the journal entries varied in the level of detail, the researchers retained them all for analysis because in the majority of cases, they presented thoughts, feelings, and reflections clearly and showed a high level of consensus among the teachers.

An overview
of teachers'
perceptions as a
group

DDL viewed as a new, fresh, and interesting experience

In a majority of cases, Grammar Translation was designated by the teachers a 'traditional' and prosaic teaching method, while the whole process of teaching grammar using DDL was often described as 'new', 'innovative', 'fresh', and 'interesting'. As the teachers remarked in their reflections, 'using the corpus websites to find authentic examples is interesting and fresh' (Teacher 4), 'it is interesting to analyze corpus data' in preparing materials (Teacher 2), and the corpus examples are 'interesting' and 'fresh' because they are examples of 'authentic' and 'natural' language usage (Teachers 2, 3, 4, 5, and 6).

DDL transforms students into active learners

In addition to creating positive feelings amongst the teachers, the effect of the DDL treatments appeared to transform students into active learners. While some teachers commented that 'most Taiwanese students are used to being passive learners' in class, Teacher 2 explicitly pointed out that, in this project, 'the students [also] learned grammar passively' when taught with Grammar Translation. 'Without thinking', they directly 'imitated' or 'memorized' the grammar rules freely offered to them (Teachers 3, 5, and 6). Such a strong perception is likely to have resulted from the comparison with their DDL experience. Most of the teachers confirmed the fact that in the DDL treatments, the students started to think about what they

were learning, and they observed that the students discussed with peers and actively marked the DDL tables themselves when analysing the concordance lines. All the teachers consistently defined such behaviours as ‘active learning’, with specific descriptions: ‘active learning’, ‘learning actively’, ‘thinking actively’, ‘active involvement’, and ‘active engagement’. As Teachers 3, 4, and 6 further suggested, the DDL treatments created various opportunities for students to engage with an active thinking and learning model. They were not only ‘trained to observe and think about [what] grammatical rules actually work in those authentic sentences’ (Teachers 4 and 6) but ‘tried to generalize ... the grammar rules’ on their own (Teacher 3) rather than ‘just memorize the rules’ (Teacher 3).

DDL students at the centre of the grammar learning context

Following a DDL approach, three of the teachers (2, 4, and 5) developed a greater awareness that they themselves became the ‘authority’ or ‘the centre’ of the classroom during Grammar Translation sessions, making their students ‘passive’ ‘followers’ (imitators) who only ‘listened’. The nature of teaching and learning, however, were found to change drastically during DDL-centred activities. As Teacher 2 explicitly commented, ‘DDL provides a student-centred learning environment where the students engage themselves in [analysing] the materials and ... learn[ing] actively’. Teacher 1 also believed that introducing the DDL approach in grammar instruction would create a ‘student-centred atmosphere’. The changes in role were further reflected in the increased interaction between the teachers and the students and also between one student and another, in particular when this phenomenon was compared to the interaction in the Grammar Translation sessions. Teacher 2 criticized the latter for creating ‘a teacher-centred learning environment where students pay attention to the teacher’ rather than the learning materials; Teacher 5 described how ‘most of the interaction in [such a context] is from the teacher to the learners’, resulting in limited participation from the students.

DDL worth the increased workload, technical challenges, and extra time needed

Although the teachers frequently described their Grammar Translation experience as ‘traditional’, ‘dull’, ‘teacher-centred’, ‘limited’, and ‘passive’ because they were the ones ‘explaining all the grammar rules’ themselves, they approved of its ‘efficient’ nature in comparison to the increased workload and challenges that they experienced with DDL instruction alone. Some teachers explained this stance by stating that ‘Grammar Translation Method materials were easy to prepare’ (Teacher 3) and teaching in this way was ‘simple [yet] effective [in explaining] sentence patterns’ (Teacher 2). These features also won Grammar Translation approval for its ‘time-saving’ qualities (Teachers 2 and 5). The various advantages of Grammar Translation were believed to help the students easily understand the explicit grammar rules presented to them (Teachers 2 and 6). In contrast, the teachers commonly agreed that preparing DDL materials was time consuming (Teachers 1, 2, 3, 4, and 6). This happened partly because choosing enough suitable sentences from a long list of concordance lines was in itself a laborious

task, and partly because, as Teachers 1, 2, 3, and 5 conceded, it was rather ‘difficult’/‘challenging’ to manipulate the advanced queries from which to extract the lines containing the precise grammar patterns they wanted to focus on (Teachers 1, 3, and 5), not least because they were unfamiliar with corpora.

Time issues and technical challenges were also found when conducting DDL-centred activities in class. As DDL was also new to the students, ‘it [took] time for them to get used to [the] new [learning] method’ (Teacher 3). This may explain why Teachers 5 and 6 also described the process by which the students successfully identified the linguistic features hidden among the concordance lines as ‘time consuming’. Furthermore, the fact that some DDL example sentences contained vocabulary unfamiliar to the students was observed to add to their difficulties in analysing the data, thus possibly increasing the time needed to complete DDL tasks (Teachers 3 and 6). One last issue that challenged the students was the complexity of the guiding questions designed by the teachers themselves. As Teachers 2 and 3 reported, during the first DDL session some students looked ‘confused’, ‘felt it difficult to [understand] the (questions on) the handout’, and ‘did not understand how to answer [the teachers’] questions’.

Surprisingly, however, although the teachers reported challenges and concerns over the amount of time needed for DDL, most of them believed that DDL was worth the trouble (Teachers 2, 4, 5, and 6). This new approach, they felt, not only transformed the students into active learners and placed them at the centre of the learning context, as discussed above, but it also successfully ‘aroused students’ interest [to] learn grammar’ (Teacher 2), ‘increased their [in-class] participation and learning motivation’ (Teacher 6), and provided ‘meaningful’ and ‘contextualized’ materials (Teachers 5 and 6); it was believed to have helped the students to ‘learn better’ (Teacher 4) and improved their ‘long-term retention’ of the grammar acquired (Teacher 5). The teachers’ strong belief that DDL was worth ‘all the hard work’ can also be seen in their overall determination to adopt it in their grammar classrooms in future. This point is elaborated on below.

Solutions to DDL challenges: selecting less, scaling down, aiming precisely, and asking more

Perhaps other reasons why the teachers would willingly embrace DDL, despite its difficulties, are the solutions that they came up with after their teaching sessions. First, after Treatment A, they cut short the number of concordance lines (from a rough average of 12 to 5) for each grammar concept in Treatment B. (This practice can also be seen in the sample materials presented in [Figures 2 and 3](#).) By so doing, they reported that they no longer needed so much time to select samples from corpora. According to our observation notes, the scaled-down versions of concordance tables used in Treatment B in turn made it easier for the students to identify the target linguistic features. Although the teachers did not mention it in their reflections, we also observed another mechanism which probably increased the efficiency of DDL for students, that is, using relatively more complete sentences

(for example Figures 2 and 3). Doing this may have helped the students to understand the semantic meaning of the entries, thus leading to a quicker and more precise interpretation of grammar patterns. In addition to these techniques, the teachers were found to have selected sentences that contained a single grammatical item. This type of material may have helped the students to focus on only one possible answer, boosting their ability to discover the specific target grammar and consequently increasing the efficiency of the DDL approach. Most importantly, having seen how their students appeared lost when asked general questions in Treatment A, the teachers tried using more focused guiding questions in Treatment B (examples of these two types of question can be seen in the sample DDL sessions described above). As the researchers noted during Treatment B, the series of guiding questions indeed helped the students generalize the target patterns more quickly than those in Treatment A.

A blend of DDL and Grammar Translation: an ideal formula for grammar classes

Given students' strong belief and approval of DDL, it is not surprising to learn that almost every teacher was more or less determined to integrate the use of DDL in future grammar instruction. While Teacher 5 predicted that 'DDL will become the new trend of grammar learning', Teacher 4 remarked that '[she] would tend to mix up (integrate) Grammar Translation Method and DDL' as 'this added different colours in [her] teaching'. In addition, Teacher 1 stated that '[she would] use both ways (DDL and Grammar Translation) to teach grammar ... in future' and Teacher 6 was certain that 'in [his] (future) teaching, [he would] definitely choose DDL or a combination' of DDL and Grammar Translation.

That the combination of DDL and Grammar Translation won such endorsement from the teachers is probably attributable to the fundamental belief that these two approaches 'complemented' each other, forming an 'ideal' grammar teaching formula (Teachers 3, 4, and 6). In particular, Treatment B (40 per cent DDL and 60 per cent Grammar Translation) was held up as a 'perfect' proportion (Teacher 6).

Discussion and conclusion

The present study sought insights into teachers' experiences of using data-driven learning (DDL) (as opposed to Grammar Translation) to teach grammar to undergraduate students. The teaching experience of a group of early-career teachers was qualitatively investigated in this research. Overall, they endorsed the DDL approach: not only did it leave them feeling refreshed and interested, but its multiple advantages also earned strong commendation. Additionally, DDL turned a teacher-centred learning context into a student-centred classroom where interaction between teacher and students perceptibly increased. It is worth noting that the results of this study also echo the assumption of Gilquin and Granger (op.cit.), in that DDL was observed to motivate students to think actively about the grammar they were learning. Furthermore, the overall positive effects of DDL were believed to complement Grammar Translation, creating a blended approach that was highly recommended by the teachers for use in future grammar classrooms.

Such developments, of course, need wider empirical evidence, the more so in that the findings in this article are the results of a small-scale investigation. Nevertheless, seeing how the teachers' overall approval of DDL corresponded to the positive comments and feedback that previous investigators had collected from their students (for example Rezaee *et al.* op.cit.), their experience may well lead to eagerness among EFL grammar teachers to adopt such an approach.

Despite the overall positive feedback, it should not be forgotten that the effects of DDL came at a price: the extra time needed (cf. Johns op.cit.). On the one hand, this is probably the main reason why some teachers considered that a 20 per cent difference in the proportion of DDL in the classroom would make Treatment B in this study worth recommending more than Treatment A. But this major drawback was a result of the various initial difficulties, obstacles, and challenges, ranging from the teachers' literacy in using corpus data to their ability to design suitable DDL materials and guiding questions. Fortunately, such challenges can be tackled and the solutions, as outlined above, greatly improve the efficiency of DDL treatments on the part of both teachers and students. Although ways to improve DDL literacy are not explicitly discussed in our results (because the DDL materials created for Treatment B were clearly more focused on specific areas of grammar than those for Treatment A), it may be reasonable to assume that teachers' literacy with corpus databases can quickly improve with practical experience of DDL teaching. An alternative approach would be to provide more training sessions for teachers before they actually start using DDL in class.

Finally, while the design of the study is valid in itself, we, the researchers, are aware that this project was relatively short in length (only three weeks). In particular, the results are based on the teachers' experiences of using DDL treatments over only two weeks, in comparison to their one week of using the Grammar Translation approach. Although DDL as outlined in this project may appear promising, further investigation is necessary to ascertain how teachers would perceive its long-term use in class. Additionally, this project has presented the results of teaching with only one of many possible DDL-centred tasks, that is, presenting DDL tables, asking guiding questions, getting students to analyse and discuss the tables, and inviting their answers (see O'Keeffe, McCarthy, and Carter 2007 for other DDL activities). Future investigation into the effects of different DDL activities or focuses may contribute to our understanding of teaching with DDL to a greater degree. It must also be cautioned that in this project Treatments A, B, and C were used for teaching separate grammar points, which might have been more or less suitable for either DDL or Grammar Translation. Future investigation may shed greater light on the comparative effectiveness of the three treatments on the same grammar items. Most importantly, the early-career teachers team-taught their DDL classes and thus, shared the increased workload when preparing materials and conducting in-class teaching activities. Whether or not similar results or perceptions would be replicated if DDL were taught by a single teacher, as in most language classrooms, would be a fruitful line for future research to pursue.

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