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Research Timeline

Collaborative writing

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Introduction

Writing has generally been perceived as a solitary activity, completed by the writer working alone. Yet, over the years we have witnessed a growing interest among researchers and educators in COLLABORATIVE WRITING, an activity that can be simply defined as the involvement of two or more writers in the production of a single text. This interest has been driven by two main factors. The first factor is the nature of workplace writing. Studies (e.g. Ede & Lunsford 1990; Mirel & Spilka 2002) have shown that in a number of workplaces, writing is often completed in teams rather than individually. The second factor is the advent of Web 2.0 applications such as blogs, wikis, and Google Docs, which have transformed literacy practices, making the creation and sharing of texts easier and more readily acceptable (Hyland 2016; Vandergriff 2016). In the field of second language (L2) learning, interest in collaborative writing was also spurred by early research conducted by Swain and her colleagues (e.g. Swain & Lapkin 1995; Swain 1998; see also timeline for additional references) showing the language learning opportunities of communicative tasks which involve joint written output (e.g. Dictogloss).

Before outlining the research conducted on collaborative writing, let me begin by explaining what I mean by collaborative writing. Although some composition scholars (e.g. Bruffee 1984) have suggested that all writing is collaborative to some extent (e.g. when a writer composes a text with a specific reader in mind), I view collaborative writing as an activity with very distinct traits (see Storch 2013). I define collaborative writing as an activity that requires the co-authors to be involved in all stages of the writing process, sharing the responsibility for and the ownership of the entire text produced. These traits distinguish collaborative writing from cooperative writing. In a cooperative or team writing task, there can be a division of labour, with each team member completing one discrete section of the text or having the responsibility for completing one sub-task (e.g. collecting information, editing the final version). Although the distinction between collaboration and cooperation may be blurred at times, and admittedly the two terms have been used by researchers interchangeably, I have argued (see Storch 2013, 2017) that not all pair/small group writing tasks are necessarily collaborative and that it is collaborative writing that maximises the opportunities for language learning. Thus, in this timeline, I focus only on research on collaborative writing and not cooperative writing (e.g. reports on group assignments).

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In collaborative L2 writing, the need to reach agreement on what and how to express ideas in the jointly produced text encourages learners to deliberate about language choice and grammatical accuracy. Swain used the term 'collaborative dialogue' (2000) and subsequently LANGUAGING (2006) to describe such deliberations, and the unit of analysis used to quantify and analyse instances of languaging is the LANGUAGE RELATED EPISODE (LRE) (Swain & Lapkin 1995; Swain 1998). These terms are used frequently in empirical studies that investigate the nature of learners' interaction during collaborative writing tasks and their potential outcomes for language learning. Researchers have also investigated a range of factors that may impact on the quantity and quality of these languaging episodes, including task type (e.g. jigsaw, dictogloss), the relative proficiency of the learners, task modality and learners' perceptions of the tasks. The assumption underlying these investigations is that the more learners engage in languaging, the more conducive the activity is to language learning.

Given the language learning opportunities created by collaborative writing tasks, researchers have also sought evidence for whether engagement in such tasks results in language learning gains. Various approaches have been deployed in these investigations of outcomes (for a detailed discussion, see Storch 2013), such as comparing individually and collaboratively produced texts or comparing learners' writing before and after the implementation of collaborative writing (i.e. a pre- post-test research design).

Studies on collaborative writing have been informed primarily by sociocultural theory and activity theory (AT), both theories having their genesis in the work of Vygotsky (1978, 1981). Key constructs from these two theories are often used by the researchers to analyse their data and explain their findings. These key constructs include the Zone of Proximal Development (ZPD) and scaffolding, language as a mediational tool, and learners' actions as deliberate and goal driven. The ZPD distinguishes between a learner's current and potential levels of development and forms the basis for the argument that only instruction or assistance which is dynamically attuned to a learner's potential level of development leads to learning. This form of assistance is termed SCAFFOLDING. In collaborative writing, learners can pool their linguistic knowledge to co-construct the scaffold; a process that has been termed COLLECTIVE SCAFFOLDING (Donato 1994; Storch 2002*).When co-constructing the scaffold, learners use language as a mediating tool. Language (whether it is the shared first language (L1) or L2) enables the learners to articulate their thinking and thus mediate their cognition. Research on collaborative writing has investigated the extent to which learners use their L1 and the functions that the L1 serves (e.g. Antón & DiCamilla 1998*; Swain & Lapkin 2000*; Storch & Wigglesworth 2003*).

Researchers investigating collaborative writing tasks have also observed that simply assigning learners to work in pairs or small groups does not necessarily mean that they will engage in languaging and scaffold each other's performance. As the seminal study by Storch (2002)* has shown, learners may form different relationships when engaging in collaborative tasks, some of which are not conducive to language learning. Storch's (2002) model of dyadic interactions distinguishes between four types of relationships according to the level of learners' contributions to the task and engagement with each other's contributions. This model has been adopted in many other studies investigating collaborative writing in

* Denotes the full reference is in the timeline itself.

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face-to-face (e.g. Watanabe & Swain 2007*) and computer mediated environments (e.g. Li & Zhu 2013*).

One reason why learners may not contribute to a collaborative writing activity is because they may prefer to write individually. This preference has been reported by several studies which have elicited learners' perspectives about the collaborative writing activity, whether completed face-to-face (e.g. Storch 2005*) or using Web 2.0 tools (e.g. Kessler 2009*). A number of researchers have sought to explain learners' behaviour during collaborative writing more systematically, including the relationships they form, by using AT as their theoretical framework. AT views learners as intentional agents whose actions can be explained by reference to their goals, orientation to the activity, and emotions (e.g. Storch 2004*; Li & Zhu 2017*).

The aim of this article is to provide a timeline of empirical studies on collaborative L2 writing that documents what has been the focus of investigation and the shift in this focus over the past 25 or so years (from the mid-1990s). I have selected seminal studies as well as studies conducted by emerging researchers in a range of educational contexts, in the teaching of English as well as other languages (e.g. French, Spanish, Korean) in second, foreign and immersion classes and to young and adult learners at different levels of L2 proficiency, in order to showcase the interest that this topic has stimulated across the world.

Two periods can be identified in this timeline. In the first period (approximately 15 years) most of the studies report on collaborative writing implemented in classrooms, with students working in pairs and interacting face-to-face. These studies have tended to focus on the nature of languaging (e.g. quantity, focus, quality and resolution of LREs) and the factors that influence the generation of LREs. A few also investigated whether engagement in collaborative writing resulted in language learning gains. The second period corresponds to developments in technology and thus includes studies which report on computer mediated (CM) collaborative writing using a range of digital tools such as wikis and Google Docs. Alongside this focus on CM collaborative writing, we have ongoing research on important aspects of face-to-face collaborative writing. In a sense, this second period reflects the reality of L2 classrooms, where both forms of collaborative writing complement L2 instruction. Studies investigating CM collaborative writing have focused predominantly on the nature of learners' contributions to the jointly produced text: that is, whether learners add, delete or change the content of the evolving text, including correcting the text for linguistic accuracy. However, there are different approaches adopted in this analysis of learners' contributions. Some researchers quantify the different types of contributions (e.g. Kessler 2009*), others employ a qualitative approach, describing and exemplifying the type of contributions learners make (e.g. Li & Zhu 2013*). Furthermore, in CM interactions, learners' attention to language can take two forms. Because all the participants in a CM collaborative writing activity have access to the joint text (synchronously or asynchronously), they can simply edit it without any interaction. Alternatively, they can engage in text-based interaction, similar to the languaging episodes (i.e. LREs) in face-to-face interactions. On the whole, contributions which edit the text for errors in language use in CM collaborative writing are treated as equivalent to languaging episodes, regardless of whether there is some interaction between peers about the correction made, because the act of editing draws learners' attention to form. Some researchers use LREs (or slightly

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different labels) when analysing learners' language related corrections of the joint text (e.g. Kessler 2009*).

The timeline has categorised these studies according to the following themes:

A. Learner interaction during collaborative writing: the nature of languaging
    1. Quantity and quality of languaging
    2. Use of L1 during languaging
    3. Collective scaffolding during languaging
B. Factors influencing the nature of languaging during collaborative writing
    1. Task type (e.g. jigsaw, dictogloss)
    2. Task modality (oral vs written)
    3. Learners' L2 proficiency
    4. Mode of interaction
C. CM collaborative writing: the nature of learners' contribution to the text
D. Relationships learners form
    1. In face-to-face collaborative writing
    2. In CM collaborative writing
E. The outcomes of collaborative writing
    1. The impact on the quality of the text produced
    2. Evidence of language learning
F. Learners' perceptions of and reflections about collaborative writing
G. Explaining learner behaviour during collaborative writing activities using AT

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Ede, L. & A. Lunsford (1990). *Singular texts/plural authors*. Carbondale: Southern Illinois University Press.

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Swain, M. (1998). Focus on form through conscious reflection. In C. Doughty & J. Williams (eds.), *Focus on form in classroom second language acquisition*. Cambridge: Cambridge University Press, 64–81.

Swain, M. (2000). The output hypothesis and beyond: Mediating acquisition through collaborative dialogue. In J. Lantolf (ed.), *Sociocultural theory and second language learning*. Oxford: Oxford University Press, 97–114.

Swain, M. (2006). Languaging, agency and collaboration in advanced second language learning. In H. Byrnes (ed.), *Advanced language learning: The contributions of Halliday and Vygotsky*. London: Continuum, 95–108.

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Vygotsky, L. S. (1978). *Mind in society. The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

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1994	Kowal, M. & M. Swain (1994). Using collaborative language production tasks to promote students' language awareness. *Language Awareness* 3.2, 73–93.	This was the first study to examine the nature of learner talk during a collaborative writing task. **Kowal & Swain** analysed the talk elicited by a dictogloss task implemented in a Grade 8, French immersion class. The talk was coded for what the LREs focused on, distinguishing between episodes focusing on grammar, meaning and orthography. The authors argue that the attention to language generated promotes language learning. They also note that learners' proficiency differences may impact on the nature of the LREs, a topic that was investigated in greater depth in subsequent studies (e.g. LEESER 2004; STORCH & ALDOSARI 2013).*	**A.1** **B.3**
1998	Antón, M. & F. J. DiCamilla (1998). Socio-cognitive functions of L1 collaborative interaction in the L2 classroom. *The Canadian Modern Language Review* 54.3, 314–342.	This study, conducted with beginner L2 learners of Spanish, represents a systematic investigation of the use of L1 during collaborative writing tasks. The study revealed that the shared L1 (English) served important cognitive functions, such as enabling these beginner L2 learners to deliberate about linguistic choices and to provide scaffolded assistance. The L1 also served an important social function, enabling the learners to negotiate and focus on the goals of the task.	**A.1** **A.2** **A.3**
1998	Storch, N. (1998). Comparing second language learners' attention to form across tasks. *Language Awareness* 7.4, 176–191.	**Storch**'s small-scale study (N = 9) was the first to investigate the impact of task type on the nature of LREs. The study, conducted with intermediate ESL students undertaking degree courses, compared the number and focus of LREs elicited by traditional grammar exercises (e.g. cloze) and collaborative writing tasks (e.g. short composition), finding that whereas the grammar tasks elicited more attention to form, the collaborative writing task elicited more attention to lexis.	**A.1** **B.1**
1998	Swain, M. & S. Lapkin (1998). Interaction and second language learning: Two adolescent French immersion students working together. *Modern Language Journal* 82.3, 320–337.	The significance of this case study by **Swain & Lapkin** is that it was the first attempt to trace evidence of learning to deliberations about language (LREs) during collaborative writing tasks. Using tailor-made tests, the authors showed that the knowledge learners (Grade 8 French immersion) co-constructed during the LREs was retained.	**A.1** **A.3** **E.2**

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Year	References	Annotations	Theme
2000	Swain, M. & S. Lapkin (2000). Task-based second language learning: The uses of the first language. *Language Teaching Research* 4.3, 251–274.	**Swain & Lapkin** built on ANTÓN & DICAMILLA's (1998) study to investigate the amount of L1 their French immersion students used when completing two different collaborative writing tasks (dictogloss and jigsaw), and the functions the L1 served. The study also examined whether the amount of L1 use affected the quality of the texts produced. The study found that the learners used their L1 sparingly, and that when used, it served important purposes. These findings allay the concerns that some teachers may have about implementing collaborative writing tasks, particularly in contexts where all learners have a shared L1. The study also found a link between L1 use and the quality of the text, but it varied with the task type.	**A.1** **A.2** **A.3** **B.1** **E.1**
2001	Swain, M. & S. Lapkin (2001). Focus on form through collaborative dialogue: Exploring task effects. In M. Bygate, P. Skehan & M. Swain (eds.), *Researching pedagogic tasks: Second language learning, teaching and testing*. London: Longman, 99—118.	**Swain & Lapkin**'s large-scale study (N = 65, Grade 8 French immersion) compared LREs generated by two types of tasks, dictogloss (a grammar focused task) and jigsaw (a meaning focused task), and whether differences in LREs related to the quality of the texts produced and learning gains (using pre- and post- tests). The study's main findings were that task type did not affect the quantity or the focus of the LREs generated. The authors attributed this unexpected finding to the mini grammar lesson and task modelling preceding both tasks (see also KIM & MCDONOUGH 2011). Furthermore, the lack of impact on text quality and language gains was explained in terms of the relatively short time the learners spent on the task, highlighting the need for longitudinal studies in order to investigate the language learning outcomes of collaborative writing (see SHEHADEH 2011).	**A.1** **B.1** **E.1**

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2002	Storch, N. (2002). Patterns of interaction in ESL pair work. *Language Learning* 52.1, 119–158.	This study, conducted with intermediate/advanced ESL learners, was the first systematic and qualitative analysis of pair interaction on a range of collaborative writing tasks. Using the criteria of equality and mutuality, **Storch** identified four distinct patterns of interaction and presented them in a model of dyadic interaction. This model has since been applied by researchers in diverse research contexts (see WATANABE & SWAIN 2007; LI & ZHU 2013; STORCH & ALDOSARI 2013). The study showed that learners who formed a collaborative relationship (with high equality and mutuality) generated more LREs and engaged in collective scaffolding. They also showed more evidence of language learning, as evident in their individual performance on subsequent tasks.	**A.1** **A.3** **D.1** **E.2**
2003	Storch, N. & G. Wigglesworth (2003). Is there a role for the use of the L1 in an L2 setting? *TESOL Quarterly* 32.4, 760–770.	Building on the small body of research on the use of L1 (see ANTÓN & DICAMILLA 1998; SWAIN & LAPKIN 2000), **Storch & Wigglesworth** investigated the use of L1 in a collaborative writing activity with high intermediate ESL adult learners who shared an L1. This study too found that the learners used their shared L1 to a very limited extent. Interview data revealed that the reluctance to use the L1 was related to the learners' belief that in the ESL context they were expected to use the L2.	**A.2** **F**
2004	Leeser, M. J. (2004). Learner proficiency and focus on form during collaborative dialogue. *Language Teaching Research* 8.1, 55–81.	**Leeser** considered an important aspect of pair work – the relative proficiency of members of the pair. The study, conducted with adult learners of Spanish completing a dictogloss task, found that proficiency pairing affected the number and type of LREs as well as their successful resolution. Pairs composed of high proficiency learners generated and correctly resolved the largest number of LREs, mostly dealing with grammatical form. Pairs composed of low proficiency students generated the smallest number of LREs, mainly focusing on lexis, and a high per cent of these LREs were unresolved.	**A.1** **B.3**

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2004	Storch, N. (2004). Using activity theory to explain differences in patterns of dyadic interactions in an ESL class. *The Canadian Modern Language Review* 60.4, 457–480.	This was the first study to apply AT in order to explain why learners may form different patterns of dyadic interaction (see STORCH 2002). **Storch** found that it was learners' goals and orientation to the task which explained the patterns formed.	**D.1** **G**
2005	Storch, N. (2005). Collaborative writing: Product, process, and students' reflections. *Journal of Second Language Writing* 14.3, 153–173.	In this study, the outcome of collaborative writing was investigated by comparing the quality of texts produced collaboratively and individually. The study, conducted with intermediate/advanced university ESL students, found that collaboratively produced texts were more accurate and of better quality. Follow-up interviews showed that most but not all the students had positive perceptions about the activity.	**E.1** **F**
2007	De La Colina, A. & P. M. García Mayo (2007). Attention to form across collaborative tasks by low proficiency learners in an EFL setting. In M. P. García Mayo (ed.), *Investigating tasks in formal language learning*. London: Multilingual Matters, 91–116.	This study extended the investigation of the impact of task type on languaging (e.g. STORCH 1998; SWAIN & LAPKIN 2001). What distinguished this study was that it was conducted with low proficiency learners. It found that the students were able to complete the tasks (jigsaw, text reconstruction and dictogloss) by using their L1 and collectively scaffolding their performance. However, the dictogloss task was the least successful in drawing learners' attention to form.	**A.1** **A.2** **A.3** **B.1**
2007	Storch, N. & G. Wigglesworth (2007). Writing tasks: The effects of collaboration. In M. P. García Mayo (ed.), 157–177.	In this large-scale study (N = 72), building on STORCH's (2005) study, **Storch & Wigglesworth** compared two writing tasks (reports and essay) produced collaboratively and individually by relatively advanced ESL learners. Using an extensive range of discourse analytical measures, the study confirmed that when learners work collaboratively they produce more accurate texts. Furthermore, analysis of the pair talk showed that the essays elicited more LREs than the reports but that in both tasks most of the LREs dealt with lexical choices.	**A.1** **B.1** **E.1**

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2007	Watanabe, Y. & M. Swain (2007). Effects of proficiency differences and patterns of pair interaction on second language learning: Collaborative dialogue between adult ESL learners. *Language Teaching Research* 11.2, 121–142.	This study built on STORCH's (2002) study, investigating the impact of proficiency pairing on the relationships learners formed. The study adopted an interesting methodology, using core participants who interacted on one task with a higher proficiency peer and on another task with a lower proficiency peer. **Watanabe & Swain** found that proficiency differences did not necessarily affect the patterns of interaction. Their study also confirmed that the collaborative pattern was the most conducive to language learning, as evident by the number of LREs generated by the pairs that collaborated and their post-test results.	**A.1** **B.3** **D.1** **E.2**
2008	Kim, Y. (2008). The contribution of collaborative and individual tasks to the acquisition of L2 vocabulary. *Modern Language Journal* 92.1, 114–130.	The study adds to the small but important body of research on the outcome of collaborative writing tasks. **Kim** compared attention to language (LREs) and performance on vocabulary tests (pre- and post-tests) of intermediate learners of Korean (N = 32), who completed a dictogloss task. Half of the learners completed the task in pairs, the other half individually while thinking aloud. Although the number of LREs generated was the same for pairs and individuals, the learners who participated in the collaborative dictogloss performed significantly better on the vocabulary tests.	**A.1** **E.2**
2008	Mak, B. & D. Coniam (2008). Using wikis to enhance and develop writing skills among secondary school students in Hong Kong. *System* 36.3, 437–455.	This is one of the earliest studies reporting on the implementation of a wiki task with high school learners of English as a foreign language (EFL) in Hong Kong. **Mak & Coniam**'s longitudinal case study (over two months) documents how the quality of the learners' contributions to the wiki changed over time, with the group members progressively contributing more ideas as well as elaborating on each other's ideas. However, the researchers also reported little evidence of learners correcting the successive versions of the wiki text for grammatical accuracy, attributing this to concerns about causing offence. Analysis of the evolving text showed evidence of improvement, both in terms of length and coherence.	**A.1** **C** **E.1**

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2008	Storch, N. (2008). Metatalk in pair work activity: Level of engagement and implications for language development. *Language Awareness* 17.2, 95–114.	In this study, **Storch** extends the analysis of LREs in collaborative writing tasks by drawing important distinctions between LREs showing substantial and superficial level of engagement by each member of the dyad. The author suggests that LREs which elicit substantial engagement are more likely to lead to language learning.	**A.1**
2009	Arnold, N., L. Ducate & C. Kost (2009). Collaborative writing in wikis: Insights from culture project in German class. In L. Lomicka & G. Lord (eds.), *The next generation: Social networking and online collaboration in foreign language learning*. CALICO Monograph Series (vol. 5). San Marcos, TX: Texas State University, 115–144.	This large-scale study (N = 54), conducted with intermediate German L2 learners, investigated the impact of teacher guidance on learners' contributions to a wiki. Archived wiki pages were analysed for the changes to the wiki text made, distinguishing between surface level, meaning-preserving and meaning-changing revisions. The study found that teacher guidance did not affect the number of revisions students made to their wikis or the nature of the revisions. The most frequent revisions were meaning-changing (adding rather than deleting texts). In contrast to the findings of other studies (e.g. MAK & CONIAM 2008; KESSLER 2009), the next most frequent type of revision was editing for language use. Interviews with the students showed that the students were mostly positive about their wiki experience.	**A.1** **C** **F**
2009	Brooks, L. & M. Swain (2009). Languaging in collaborative writing: Creation and response to expertise. In A. Mackey & C. Polio (eds.), *Multiple perspectives on interaction in SLA*. Mahwah, NJ: Lawrence Erlbaum, 58–89.	In this multi-staged and innovative study, **Brooks & Swain** examined not only whether learning occurred as a result of collaborative writing but also the most effective source of learning. Building on the results of SWAIN & LAPKIN's earlier study (1998), this study showed that learners retain a high proportion of what they deliberate about during the collaborative writing activity. Brooks & Swain also showed that the feedback learners provide each other may be more developmentally appropriate and thus more effective than the feedback provided by the expert (researcher).	**A.1** **E.1**

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2009	Kessler, G. (2009). Student-initiated attention to form in wiki-based collaborative writing. *Language Learning and Technology* 13.1, 79–95.	This was the first large-scale study reporting on learners' contributions to a group wiki. The 40 EFL learners (pre-service teachers) all formed one group. **Kessler** found (as in the case of MAK & CONIAM 2008) that the vast majority of the learners' contributions dealt with content. There was relatively little attention to language form (coded as LREs), with many errors in grammar being overlooked. Follow-up interviews revealed that reluctance to edit each other's contribution for accuracy was not related to lack of knowledge but to the students' perception of the wiki task as a meaning focused rather than language focused activity.	**A.1** **C** **F**
2009	Niu, R. (2009). Effect of task-inherent production modes on EFL learners' focus on form. *Language Awareness* 18.3/4, 384–402.	In an EFL context (China), **Niu**'s study (N = 16, upper intermediate) investigated the impact of modality on languaging, by comparing the nature of languaging on a collaborative oral output task and a collaborative written output task. Her findings showed that writing tasks produced collaboratively were superior to the oral tasks in terms of the amount of attention to language (LRE), the range of issues focused on and the depth of deliberations (see also STORCH 2008). Her findings suggest that collaborative writing tasks that combine speaking and writing may provide learners with greater opportunities for language learning than speaking only tasks.	**A.1** **B.2**
2010	Bradley, L., B. Lindström & H. Rystedt (2010). Rationalities of collaboration for language learning in a wiki. *ReCALL* 22.2, 247–265.	The study by **Bradley et al.** provides perhaps the clearest evidence of the effect of patterns of interaction on learners' contribution to wikis. The study was conducted with 54 advanced English for specific purposes (engineering) students in Sweden, working predominantly in pairs on wiki projects. Archived wiki pages were coded for patterns of learners' contributions, particularly in terms of providing feedback on each other's contributions. The study identified three distinct patterns of interaction: minimal involvement, cooperation, and collaboration. Groups that cooperated tended to add to and edit their own contributions, but overall there was little evidence of focus on language. The majority of the groups adopted a collaborative approach, where adding and revising the evolving text intertwined.	**A.1** **C** **D.2**

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2010	Elola, I. & A. Oskoz (2010). Collaborative writing: Fostering foreign language and writing conventions development. *Language Learning and Technology* 14.3, 51–71.	**Elola & Oskoz**'s study is one of the few studies that investigated systematically the impact of writing using wikis on the written product. This small-scale study (N = 8), conducted with advanced learners of Spanish, compared argumentative essays produced in pairs (using wikis) and subsequent essays produced individually (also using wikis). Employing a range of measures, the researchers found no significant differences between the essays produced collaboratively and individually. Since both essays were produced using wikis, the researchers were also able to discern differences in how the students approached the tasks when composing individually and in pairs. The authors also noted that in both writing formats, many errors were ignored. Survey results showed that learners enjoyed working on wikis, but most preferred to do so individually.	**A.1** **C** **E.1** **F**
2010	Kessler, G. & D. Bikowski (2010). Developing collaborative autonomous learning abilities in computer mediated language learning: Attention to meaning among students in wiki space. *Computer Assisted Language Learning* 23.1, 41–58.	This reanalysis of the data collected by KESSLER (2009) found that half of the group members (N = 40) contributed little to the joint wiki and that most of the contributions consisted of adding or deleting information, rather than synthesising or rephrasing. The study also identified three distinct stages in the wiki task corresponding to the type of contributions made. The findings suggest collaboration may take time to develop, and occurs when the learners become more confident with co-authoring.	**A.1** **C**
2010	Storch, N. & A. Aldosari (2010). Learners' use of first language (Arabic) in pair work in an EFL class. *Language Teaching Research* 14.4, 355–375.	This study extends earlier studies investigating learners' use of L1 (e.g. SWAIN & LAPKIN 2001) by considering the impact of proficiency pairing and task type on learners' L1 use. The study also found modest use of L1 by these EFL students, even in pairs composed of relatively low proficiency learners. Language exercises (editing) elicited more L1 use than collaborative writing tasks.	**A.1** **A.2** **B.1** **B.3**

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2011	Kim, Y. & K. McDonough (2011). Using pretask modelling to encourage collaborative language learning opportunities. *Language Teaching Research* 15.2, 183–199.	This study investigated primarily the impact of pre-task modelling on learners' languaging and the relationships they formed. The study was conducted with young (middle school) Korean EFL students, who completed one collaborative writing task (dictogloss) and two oral pair tasks (decision making and information gap). It found that learners who were exposed to pre-task modelling were more likely to collaborate, generated more LREs and resolved a larger proportion of these correctly compared to those who were not exposed to the modelling. The collaborative writing task (dictogloss) elicited more LREs than the oral tasks, thus providing further evidence of the benefits of the writing modality (see also NIU 2009).	**A.1** **B.2** **D.1**
2011	Shehadeh, A. (2011). Effects and student perceptions of collaborative writing in L2. *Journal of Second Language Writing* 20.4, 286–305.	**Shehadeh**'s study was the first longitudinal study that compared the performance of low intermediate EFL learners writing collaboratively and those writing individually. Using a pre- post- test design, the study found that learners who wrote collaboratively throughout the semester showed greater improvement in text quality and vocabulary than those working individually, but that collaboration did not result in greater accuracy. Surveys conducted with the learners who worked collaboratively found that most enjoyed the activity and felt that their speaking and confidence improved.	**E.2** **F**
2012	Fernández Dobao, A. (2012). Collaborative writing tasks in the L2 classroom: Comparing group, pair, and individual work. *Journal of Second Language Writing* 21.1, 40–58.	This study considered whether group size may impact on the nature and outcome of languaging. **Fernández Dobao** compared the quality of texts produced collaboratively in small groups and in pairs with those produced individually. It also compared the nature of languaging in small groups and pairs. The study found that the small groups (intermediate Spanish L2) produced more LREs and resolved a higher proportion of these LREs correctly compared to pairs. Groups also produced more accurate texts than pairs and individuals.	**A.1** **E.1**

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2012	Kessler, G., D. Bikowski & J. Boggs (2012). Collaborative writing among second language learners in academic web-based projects. *Language Learning and Technology* 16.1, 91–109.	This was the first study reporting on the use of Google Docs, a synchronous application. Advanced English for academic purposes (EAP) learners' postings were analysed and coded as either language related contributions (LRC) or non-language related contributions. LRC distinguished between meaning (e.g. adding, deleting text) and form related contributions (i.e. attending to accuracy). The analysis revealed, as in the case of previous studies using wikis (e.g. KESSLER 2009), that although the posts showed some evidence of collective scaffolding, most of the contributions were to meaning. Attention to form was fairly superficial, dealing mainly with mechanics (spelling, punctuation).	**A.1** **A.3** **C**
2013	Li, M. & W. Zhu (2013). Patterns of computer-mediated interaction in small writing groups using wikis. *Computer Assisted Language Learning* 26.1, 61–82.	**Li & Zhu**'s case studies (three triads), conducted with EFL learners in China, built on previous studies reporting on patterns of interaction in wiki collaborative projects (e.g. BRADLEY et al. 2010). Based on the analysis of posts and informed by STORCH's (2002) model of dyadic interaction, three patterns of triadic interaction were identified. As in the case of dyadic interaction, this study too found that in a triad forming a collective (i.e. forming a collaborative relationship) there was a high level of contribution to the text, including revisions for language, and evidence of collective scaffolding. Post-task interviews suggested that the students' perceptions about the benefits of collaborative writing were related to the patterns of interaction the students experienced.	**A.1** **A.3** **C** **D.2** **F**

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2013	Storch, N. & A. Aldosari (2013). Pairing learners in pair work. Activity. *Language Teaching Research* 17.1, 31–48.	**Storch & Aldosari** present additional insights into the potential impacts of the relative proficiency of members of the pair (see LEESER 2004; WATANABE & SWAIN 2007) on learners' interaction in collaborative writing activities. The study investigated the impact of different pairing on languaging and on the relationships the learners formed. This longitudinal study, conducted with EFL learners in Saudi Arabia, confirmed the findings of LEESER's (2004) study, that the frequency of LREs aligns with proficiency level: the highest number of LREs were generated by pairs composed of two high proficiency learners. In terms of patterns of interaction, the study found that pairs of similar proficiency (whether high-high or low-low) were more likely to collaborate than mixed proficiency pairs. Of particular pedagogical importance was the finding that pairs composed of relatively low proficiency learners may generate fewer LREs than mixed proficiency (i.e. high-low) pairs, but may benefit more from the activity because they are more likely to contribute to and engage with the activity.	**A.1** **A.3** **D.1**
2014	Oskoz, A. & I. Elola (2014). Promoting foreign language collaborative writing through the use of Web 2.0 tools and tasks. In M. González-Lloret & L. Ortega (eds.), Task-based language teaching. Amsterdam: John Benjamins (vol. 6), 115–148. https://doi.org/10.1075/tblt.6.05osk.	**Oskoz & Elola** explored how online tools (chats and wikis) support collaborative writing. The study compared students' collaborative writing processes via voice-chats (synchronous, resembling face-to-face communication) and via text-based wikis. The authors found that the effect of the medium of communication was mostly due to the inherent affordances of these tools. While the synchronous nature of voice communication enabled students to focus more on the global aspects of writing (e.g. content and organisation), the editing feature of wiki encouraged students to pay more attention to the local aspects of writing (e.g. vocabulary use, grammar).	**A.1** **B.4** **C**

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2014	Strobl, C. (2014). Affordances of Web 2.0 technologies for collaborative advanced writing in a foreign language. *CALICO Journal* 31.1, 1–18.	**Strobl**'s study, conducted with advanced German L2 learners, is informative for a number of reasons. It compared both the product and the processes of individual and collaborative writing (a synthesis task). In the collaborative condition, learners used discussion forums and Google Docs for planning and writing, and were guided throughout by prescriptive step-by-step instructions. The study found that although there were no statistically significant differences in accuracy and complexity, collaboratively produced texts showed better synthesis. There were also differences in terms of processes. Whereas individual writers tended to adopt a linear approach to writing and revising, in the collaborative condition, the writing and reviewing phases were intertwined, with a sizeable proportion of discussion topics focusing on language (coded as LRC in KESSLER et al. 2012). In follow-up surveys, the students identified both positive and negative aspects of the collaborative activity. Yet most expressed a preference for individual writing.	**A.1** **C** **E.1** **F**
2016	Bikowski, D. & R. Vithanage (2016). Effects of web-based collaborative writing on individual L2 writing development. *Language Learning & Technology* 20.1, 79–99.	This study investigated whether online collaborative writing ultimately enhances learners' L2 writing (see also ELOLA & OSKOZ 2010). This large-scale (N = 59) longitudinal study used Google Docs to compare the outcomes of collaborative and individual writing. Analysis of pre- post-tests results revealed that the participants in collaborative writing classes showed greater writing gains than the individual writers. Moreover, the students who wrote collaboratively – and their teachers – were very positive about the experience. Although not the main focus of investigation, observation notes suggested three distinct patterns of group interactions.	**D.2** **E.2** **F**

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2016	Fernández Dobao, A. (2016). Peer interaction and learning. A focus on the silent learner. In S. Ballinger & M. Sato (eds.), *Peer interaction and second language learning*. Amsterdam: John Benjamins, 33–62.	Although a number of studies considered the relationships learners form in collaborative writing activities (e.g. STORCH 2002; WATANABE & SWAIN 2007), and noted that in some patterns one learner does not contribute to the activity, what distinguishes this study is that it focused on the silent learners in the group activity. Conducted with intermediate learners of Spanish L2 and using a pre-post-test design, the study found that silent learners benefited from exposure to the small group talk (LREs) that the collaborative writing task generated. The study also found that even for the silent learners, it is the quality of the LREs (length, depth of engagement) that impacts on language learning outcomes (see also STORCH 2008).	**A.1** **E.2**
2016	Li, M. & D. Kim (2016). One wiki, two groups: Dynamic interaction across ESL collaborative writing tasks. *Journal of Second Language Writing* 3.1, 25–42.	**Li & Kim**'s study investigated in greater depth the nature of equality and mutuality (see STORCH 2002) in the interaction of two groups (intermediate EAP) working on two research related wiki tasks. Unlike other studies investigating the nature of learners' contributions to CM collaborative writing, this study also considered the learners' scaffolding strategies employed to encourage peer contributions. The study found dynamic patterns of interaction for both groups, throughout the writing process.	**A.1** **A.3** **C** **D.2**
2016	McDonough, K., W. J. Crawford & J. De Vleeschauwer (2016). Thai EFL learners' interaction during collaborative writing tasks and its relationship to text quality. In S. Ballinger & M. Sato (eds.), 185–208.	**McDonough et al.**'s study, conducted with Thai EFL students, considered the nature and focus of learners' interaction (language, content, text organisation) on two types of collaborative writing tasks (summary and problem-solution). The study found that these learners focused mainly on language (using LREs as a unit of analysis), and more importantly, that the amount of talk generated (predominantly in L1) was positively related to the quality of the text produced, but only for the problem-solution task.	**A.1** **A.2** **B.1** **E.1**

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2016	Rouhshad, A. & N. Storch (2016) A focus on mode: Patterns of interaction in face-to-face and computer-mediated modes. In S. Ballinger & M. Sato (eds.), 267–290.	**Rouhshad & Storch**'s study compared the interactions of the same dyads when completing a collaborative writing task face-to-face and when using Google Docs. Using LREs as units of analysis, the study found that the learners (intermediate level, ESL) deliberated more extensively about language when working face-to-face. Furthermore, in the face-to-face mode they tended to collaborate; in the Google Docs mode the predominant pattern was cooperative or dominant/passive. The authors call for more careful design of CM collaborative writing tasks in order to optimise their language learning opportunities.	**A.1** **B.4** **D.1** **D.2**
2017	Li, M. & W. Zhu (2017a). Explaining dynamic interactions in wiki-based collaborative writing. *Language Learning & Technology* 21.2, 96–120.	**Li & Zhu** used a case study approach to investigate wiki writing by two small groups of intermediate/advanced EAP learners completing two research related tasks. Analysis of the learners' contributions to the wikis showed that, in both case studies, patterns of interaction changed over time. Using student interviews and reflection papers, the researchers explain these changes by reference to three dynamic sociocultural factors: goals (see also STORCH 2004), agency and emotions. To date, emotions have received very little attention in research on L2 learning.	**C** **D.2** **F**
2017	Li, M. & W. Zhu (2017b). Good or bad collaborative wiki writing: Exploring links between group interactions and writing products. *Journal of Second Language Writing* 35.1, 38–53.	This study creates an important link between two bodies of research on wiki collaborative writing: patterns of interaction (e.g. see LI & ZHU 2013) and the quality of the texts produced collaboratively. Using a case study approach, **Li & Zhu** analysed the texts produced by four small groups of intermediate/advanced EAP students using a range of discourse and global measures awarded by two raters. The study found that the group that formed a collective pattern produced the highest quality texts, particularly in terms of text structure; those that exhibited dominant/defensive or cooperative patterns produced relatively lower quality writing. The authors explain their findings by reference to a key trait of collaboration, that of co-ownership.	**C** **D.2** **E.1**

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2017	Yim, B. & M. Warschauer (2017). Web-based collaborative writing in L2 contexts: Methodological insights from text mining. *Language Learning & Technology* 21.1, 146–165.	**Yim & Warschauer**'s contribution, unlike the studies listed in this timeline, is largely to methodology. The authors propose that data mining techniques, used to analyse large data sets, can also be used to enhance research on the processes (nature of contribution and relationships), outcome and students' perceptions of CM collaborative writing activities.	**C** **D.2** **E.1** **F**
2017	Mozaffari, S. H. (2017). Comparing student-selected and teacher-assigned pairs on collaborative writing. *Language Teaching Research* 21.4, 496–516.	The study, conducted with intermediate level EFL learners in Iran, deals with one of the important decisions when implementing collaborative writing activities (see STORCH 2013); namely, the formation of groups. This experimental study compared the nature of learners' interaction and the quality of their texts in student-selected and teacher-assigned pairs completing a face-to-face collaborative writing task. The findings showed that although the pairing method had no impact on patterns of interaction (STORCH 2002), the teacher-assigned pairs generated more LREs and produced a better joint text.	**A.1** **D.1** **E.1**

*Authors' names are shown in small capitals when the study referred to appears in this timeline.