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'Writing to Learn' Research: A Synthesis of Empirical Studies (2004-2019)

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Abstract: This paper adds to writing to learn research by reporting on empirical and conceptual studies on the subject matter but also by speculating on the learning virtues that writing offers besides its function as an assessment tool, namely that it can provide students with an adequate avenue to reflect on their learning. For this purpose, I reviewed 17 studies spanning a 17-year period (2004-2020) and representing both the L1 and L2 contexts. Reviewed studies examined writing to learn in different disciplines and grade levels across countries, including the US, Canada, Turkey, Norway, Spain etc. Later in this paper, I set out to elaborate on thematic patterns if these existed and identify areas where further research may be warranted. Findings indicated that writing to learn is an effective instructional strategy across different grade-levels and disciplines both in the L1 and L2 teaching and learning contexts. Finally, this paper overviews relevant pedagogical implications and future research directions.

Keywords: *Writing to learn, learning to write, feedback, low-stakes writing tasks, content-areas, disciplines.*

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Introduction

Writing remains one of the main components of language learning. It is, at the same time, an instrument of communication and transmission of knowledge. In educational settings, especially in language education, writing has mostly been viewed as an end product in itself. In this sense, pedagogical approaches to writing in language classrooms focused more on the learning to write component rather than providing language learners with opportunities to learn from their writing. Such approaches, unfortunately, emphasize fluency over coherence and assessment over learning. While learning to write remains an integral component of language learning, writing to learn provides students with adequate opportunities to engage in critical thinking and explore their own ideas and understandings of the materials they encounter in different content and language courses (Langer & Applebee, 1987). In this view, writing should not be used merely as an assessment tool through the implementation of high-stakes/graded assignments but also, and most importantly, as a learning tool through the implementation of low-stakes/ungraded writing activities and assignments (Manchón, 2011; Hyland, 2011).

In this sense, the significance of low-stakes writing activities, also called writing to learn activities, is to promote exploratory, retrospective, and reflective learning environments where students test their understandings at the same time as they are processing learned information and developing literacies relative to the language and content areas (Lew & Schmidt, 2011; Driessens & Parr, 2019). In other words, when we consider writing as an activity in the language and content area classrooms, we often associate it with assessment and grading. Concretely, students' writings are expected to display qualities such as fluency in the target language and understanding of what has been learned in content area classes; however, it is high time that instructors and schools put greater emphasis on the learning potential of writing namely through implementing writing to learn strategies and tasks that emphasize the unique properties of writing as an instrument of learning (Emig, 1977). This assertion is consistent with the contention of Deveci (2019) that writing ought to be viewed as being for and because of lifelong learning. In *Learning-to-Write and Writing-to-Learn in an Additional Language*, the problem as Manchon (2011) viewed it consists in the fact that writing to learn scholarship had mostly examined writing through cognitive and sociocultural lenses. As she readily noted, the cognitive framework relies on input hypothesis and output hypothesis while the sociocultural framework lends itself to the examination of the roles of social interaction and collaboration in Second Language Acquisition (Manchon, 2011).

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Regarding the strands of research in writing-to-learn, Manchon (2011) distinguished between descriptive studies and interventionist studies. The former tends to be process oriented and involved in collaborative writing while the latter includes feedback and input/output studies.

Literature Review

Learning to Write

I take it to be axiomatic that writing is an essential component in second and foreign language teaching and learning. The strand of research that empirically examines learning to write focuses on how L2 students learn to write in an additional language. Broadly speaking, learning to write research is inspired primarily by a cognitive approach to writing. The *learning to write* scholarship is, then, interested in investigating the complex processes of planning, editing, evaluating, and revising involved in writing. *Learning to write*, moreover, has often been approached as a problem-solving activity rather than an instrument that facilitates communication and learning (Hyland, 2011, p. 18).

Central to the *learning to write* scholarship is students' cognitive processes and their reasoning during writing. The cognitive processes involved in writing, however, remain complex and often inaccessible to research. What I am leading to here is that these cognitive processes do not only involve the planning and thinking behind a learner's writing, but they also include other influences such as feedback from peers and teachers. It is also relevant to underscore that writers are dependent on contextual factors that shape their writing process and production including individual differences among learners (e.g., differences in language proficiency, motivation, personality) and the specific nature of the writing task itself. Before I turn to the discussion of *writing to learn* research, I want to emphasize the three areas of focus of learning to write research specifically as they relate to L2 writers. In this respect, Cumming (2001) indicated that the *learning to write* scholarship focused on three major aspects (pp. 3-8).

- a) Text Features. That is, how L2 students' writings develop in terms of syntax, morphology, and vocabulary. Central to this inquiry is the increasing complexity and accuracy that L2 learners demonstrate with time.
- b) Composing Processes. Here, the focus is on L2 learners' cognitive processes including planning, revising, editing, decision making, and finding the right words/expressions to articulate their thoughts.
- c) Contexts of Writing. Writing is inherently situated and personal. In other words, when it comes to writing, contextual factors matter. Accordingly, studies that examined writing contexts have been conducted in authentic classroom settings and have mostly used ethnographic or case-study research designs to investigate the role of contextual factors in the L2 writing experience.

Writing to Learn

Here, I return to my focus on this paper: *writing to learn* research. Perhaps I should point out first that research on *writing to learn* can be traced back to the late 1970s. Specifically, back when Janet Emig wrote her seminal article "Writing as a Mode of Learning" in which she argued that writing is a unique *linguaging process* and, thus, holds a unique value for learning. Indeed, Emig was the first scholar to claim that "Writing serves learning uniquely because writing as process-and-product possesses a cluster of attributes that correspond uniquely to certain powerful learning strategies" (Emig, 1977, p.122). What this means, moreover, is that *writing to learn* remains a type of instructional intervention that promotes, in addition to writing development, students' critical thinking skills through an exploration of their own conceptions and conceptual changes during writing to learn processes and productions. And, I want to argue, that unlike *learning to write* research which focuses primarily on the process of writing, how L2 students learn to write in an additional language, *writing to learn* research explores the possibilities in which the act of composing and producing a text leads to learning.

As its name suggests, *writing to learn* involves two multifaceted and complex activities: writing and learning. It is helpful to see that in the case of *writing to learn* research, writing is viewed as an instrument of learning. It enables students to learn a language and acquire knowledge in different content areas (Manchon, 2011). The premise of *the writing to learn* potential as a teaching and learning strategy lies in the fact that the more learners engage with and process course-related materials in writing the more information/knowledge they may potentially retain and, eventually, internalize. This, in my view, involves teachers' explicit attention to this matter by designing and implementing writing to learn activities across language and content area classrooms. I certainly do not mean to suggest that teachers must grade or provide feedback on every writing to learn task. Rather, I want teachers to consider alternative options such as students' self-assessment as well as collaborative and peer feedback both in class and online.

There is, however, a few concerns to be taken into account when examining *writing to learn* research. Specifically, Hirvela (2001) observed that *writing to learn* studies offer no clear explanation as to the specific role of writing in L2 learners' negotiation to acquire richer content knowledge. In like manner, Newell (2006) emphasized another problematic issue in *writing to learn* research which concerns its lack of specific and coherent definition of what counts

as learning. Newell, then, explained that students' knowledge of the topic along with the nature of the writing task itself may play a significant role in the type of thinking and learning that takes place during writing. Most importantly, he noted that summary writing, for instance, is factual and based on reporting information, and, thus, may not offer the same potential for learning and critical thinking as analytical writing which requires students to critically interpret and evaluate information. This particular inference leads one to believe that the type of writing matters when educators design and implement writing to learn tasks.

Reflecting on the history of *writing to learn* research, Klein and Pietro Boscolo (2016) emphasized the major trends that this strand of research has undergone since its beginnings in the late 1970s. In light of their description, it seems that the first decades in *writing to learn* research had focused on the effects of writing on learning. That is, how the former is personal and subject to learners' own set of objectives and strategies. Furthermore, the emergence of other trends such as *Writing Across the Curriculum (WAC)* and *Writing in the Disciplines (WID)* marked a notable milestone in the *writing to learn* scholarship. In essence, *WAC* highlighted a general approach to writing across different disciplines by encouraging students to write, often during low-stakes/ungraded assignments, in all courses, and across various disciplines not only in English classes whereas *WID* focused on preparing students to write in different disciplines while taking into consideration the composition peculiarities specific to each discipline. Finally, *the social turn* in second language acquisition shifted the L2 writing research from predominantly cognitive approaches to embracing social and cultural perspectives that inform writing practice.

By emphasizing the learning virtues of writing, *writing to learn* advocates make the case for teaching and learning contexts where students engage in writing in the language and content area classrooms. In their view, the more opportunities teachers provide their students to meaningfully negotiate and process what is being taught in writing, the higher their chances are to engage with the content. Now, when I assert that, I do not mean to overlook what Newell (2006) highlighted. That is, teachers should remain cognizant of the influence that the type of writing to learn task might have on the overall value of this instructional intervention. Let me offer one concrete example to illustrate this point. Informal, ungraded, writing activities such as learning journals, reflections, and online discussions are viable avenues for students not only to negotiate and construct their understanding of content but also to develop their critical thinking skills.

High-Stakes and Low-Stakes Writing Tasks

Now it is no doubt the case that writing remains an effective learning instrument that helps students achieve several learning goals due in part to how writing provides students with invaluable time to process and reflect on what they learn in the language and content area classrooms. More specifically, students may be able to approach learned concepts through critical and analytical lenses especially through reflective and expository writing tasks. Likewise, Manchón and Roca de Larios (2011) illustrated how their L2 writer participants developed a sense of multidimensionality and audience awareness as they intensively engaged in writing activities during an EAP class (English for Academic Purposes). Their findings, moreover, indicated that students' instances of meaning making through writing helped them identify content areas they have not fully understood while providing them with opportunities to attend to, reprocess, and reinforce areas they have ostensibly understood.

And this leads to my next point, namely, whether the nature of the task affects the learning potential of writing. To put it otherwise, while writing may be an effective learning tool, some researchers and educators could argue that the learning potential of writing depends on the nature of the writing task itself. What I want to call attention to is the distinction between graded and ungraded writing tasks or what is also known as high-stakes and low-stakes writing. In this view, McDermott (2010) distinguished between *writing to earn* tasks which are typically high-stakes and graded writing assignments (e.g., exams, graded essays, and term papers) and *writing-to-learn* assignments which tend to be informal, low-stakes/ungraded, writing tasks. According to McDermott, low stakes writing tasks should be what instructors emphasize and value in their teaching to help students engage in learning in the content areas. What this means, moreover, is that ungraded writing activities allow students ample opportunities to express their opinions, be creative, and, most importantly, be reflective. I think we can put this vision further. I would like, for instance, to see students not only revisit what has been learned in class but also question it. From my vintage point, writing to learn could be a remarkable avenue for students to articulate their conceptual doubts, misunderstandings, and questions. Such avenues may not be possible in high stakes writing assignments where stress over performance could minimize the retrospective and reflective nature of writing as an instrument of learning.

Typically, low stakes writing consists of informal writing tasks that encourage students to engage with content they have been introduced to in class. Since low stakes writing tasks focus more on meaning and coherence (clarity and cogency of thoughts/ideas) rather than on correct use of language and vocabulary (language fluency), students have more freedom to express their opinions and explore their reasoning. In this sense, the purpose of ungraded, low stakes, writing assignments is not to produce well-structured and excellent written productions. Rather, low stakes writing tasks prioritize students' processing of content in a way that is less stressful and where they can engage with the content and test their hypotheses/understandings.

Yet another reason for implementing low stakes writing tasks in my view remains their product-oriented nature. In other words, such writing tasks like journals should, by definition, be non-punitive tasks that teachers do not necessarily have to grade. In fact, such tasks remain an excellent way to introduce students and guide them to engage in peer feedback to maximize the learning benefits of writing. The learning potential behind ungraded writing tasks lies, then, in their capacity to actively involve the students in their own learning. As for the types of low stakes/ungraded writing activities, instructors may choose from a myriad of writing tasks that could best address their instructional objectives and their students' learning needs. For instance, in addition to free writing activities and journals, Ackerman (1993) provided a few examples of informal *writing to learn* tasks.

- Admit and exit slips (statements or questions as catalyzing and focusing exercises)
- Dialogs
- Dialectics (writing to record and to respond or explain)
- Unsent letters
- Brainstorming and listing (pp. 343-344).

In the same fashion, *the Center for Teaching Excellence* at the University of Waterloo in Canada recommends the following writing activities.

- One-sentence summaries, directed paraphrasing, and explaining a concept
- Online discussion groups/forums
- Journals and personal/opinion-based responses
- Emailing an author to clarify a concept (The University of Waterloo, 2019).

Method

Purpose

This paper aimed at synthesizing research studies that examined *writing to learn* in different educational settings. Based on the reviewed L1 and L2 writing literature, it might be concluded that writing remains an effective learning tool; however, much needs to be examined in terms of the variables that could maximize or mitigate its learning potential. At the same time, the type of writing tasks and writing strategies may also be decisive factors in shaping the learning potential of writing. Because of its highly cognitive nature, investigating students and teachers' perceptions of *writing to learn* interventions remains ineluctable if we want to understand how learners and educators utilize *writing to learn* across different content areas and grade levels.

What I want to call attention to in this paper besides synthesizing *writing to learn* research is a sense of pedagogical relevancy of this instructional approach since it seems to offer viable avenues for teaching and learning practice in the language and content area classrooms. To the best of my knowledge, moreover, up to this date, there has not been a true synthesis or integrative review of *writing to learn* research; hence, the value and purpose of conducting this research synthesis. It follows, therefore, that this paper sets forth to report on what binds the reviewed studies on *writing to learn*. In so doing, the aim was to identify common themes as well as areas of convergence and divergence within and across the reviewed empirical and conceptual *writing to learn* studies.

Search Procedures

This project started by conducting an iterative search of electronic databases, including, *ERIC*, *Google Scholar*, *JSTOR*, *PsycINFO*, *the ProQuest Dissertations & Theses*, and *online library databases*. Keywords used in searches included: ("writing to learn", "writing as a learning tool/strategy", "writing to learn in the content areas", "learning to write and writing to learn", "low-stakes writing tasks", "high-stakes writing tasks", "does writing promote language learning?" "Does writing promote content knowledge/learning?"). Given the scant attention that *writing to learn* has received thus far, I have also explored the topic using alternative search terms such as journal writing, reflective writing, and essay writing and their respective roles in learning. Lastly, an attentive search of a few articles' reference lists was also employed in order to identify relevant research articles that had been cited by authors of the most recent *writing to learn* studies. In this regard, I thoroughly examined the reference lists of the most recent research studies. That is, the ones published in 2016 onward.

Selection Criteria and Data Analysis

This review on *writing to learn* aimed at synthesizing recent studies on the subject matter. Thematically, the goal was to select studies that took into consideration either teachers or students' perceptions of *writing to learn* activities. In the meantime, studies that specifically focused on activities that promote the learning potential of writing were included in this paper. Because of the highly cognitive nature of *writing to learn*, empirical studies that approached this type of writing through a cognitive lens were also included in this research synthesis. Another key element relates to whether the studies were conducted in an L1 or L2 classroom setting. In this respect, I purposefully aimed at having studies that represent the L1 and L2 contexts and that examined *writing to learn* in various disciplines, grade levels and countries. Chronologically, this paper prioritized recent studies that were published in the last 17 years (2004-2020). As such, *writing to learn* studies conducted earlier than 2004 were excluded. Studies were selected based on thematic and research design parameters. To be included, each study needed to have a defined set of participants and a specific setting, incorporate a specific qualitative/quantitative research design, and have a systematic data analysis and interpretation process. Alternatively, studies that conceptually addressed how writing could serve as an instrument of learning were also selected for inclusion. Initially, the search yielded 22 articles which were later narrowed down to 17 articles. I should note that for the five studies that were excluded, most of them lacked a systematic and comprehensive data analysis or were promoting certain *writing to learn* strategies based strictly on instructional practices and observations rather than on empirical research inquiry. After finalizing the list of articles, I conducted an inductive content analysis to explore the empirical and conceptual *writing to learn* studies according to themes and categories if these existed. It was noted that certain themes like writing to learn activities/strategies were recurrent. It is important to note that by assigning a theme/category to a certain research study, I aimed at identifying the most important theme rather than *the only* theme that the article discussed since some of the articles included in this paper examined more than one writing to learn component. In so doing, I identified four main categories that I include in four tables as appendices. (refer to appendices on pages 29-96).

Table 1. Studies by Theme/Category

| Category/Theme | Number of studies |
|--|-------------------|
| 1- Studies with a focus on teachers' perceptions of <i>writing to learn</i> . | 4 |
| 2- Studies with a focus on students' perceptions of <i>writing to learn</i> . | 4 |
| 3- Studies that examined cognitive processes involved in <i>writing to learn</i> . | 3 |
| 4- Studies that focused on the type of writing activities and strategies. | 6 |

Research Questions

This review of *writing to learn* research aimed at answering the following research questions:

- 1) What are the effects of writing when used as a learning tool?
- 2) Is there a difference in the effectiveness of writing to learn activities across various disciplines and grade levels?
- 3) What variable(s) might maximize or mitigate the learning potential of writing?
- 4) What are students and teachers' perceptions of writing to learn strategies/tasks?

Findings

RQ # 1: What are the effects of writing when used as a learning tool?

A close examination of the articles included in this research synthesis revealed that writing to learn interventions are effective both in language learning and in amassing greater content knowledge in content area classrooms across the disciplines. First, I am going to address the effects of writing to learn on students' learning performance. For instance, in their examination of English as a Foreign Language (EFL) students' perceptions of the learning potential of L2 writing, Manchón and Roca de Larios (2011) observed that after taking the EAP course, the participants shifted their focus from being uniquely concerned with accuracy to a multidimensional focus that included attention to textual features, audience, purpose, and content. In like manner, Lew & Schmidt (2011) emphasized the role of journal writing activities in fostering students' learning about critical reviews and text summaries. It has also been noted that students who engaged in *writing to learn* activities enhanced their learning and academic performance in comparison to students who received traditional instruction (İncirci & Parmaksiz, 2016). The same argument holds for (Cheng & Feyten, 2015; Driessens & Parr, 2019) which respectively highlighted the role of providing students with ample writing opportunities and the impact of teachers' modeling and written feedback on the development of students' reflective practices and critical thinking literacies. This assertion is consistent with the contention of Wright et al. (2019) that instructional interventions based on *writing to learn* strategies supported scientific literacy development among middle and high

school science class students. Along similar lines, Suhaimi et al. (2016) reported notable gains in mathematical concept learning among tenth graders after they engaged in journal writing activities.

RQ # 2: Is there a difference in the effectiveness of writing to learn activities across various disciplines and grade levels?

The empirical studies included in this paper did not indicate any notable differences in the effectiveness of writing to learn strategies across content areas and grade levels. In this sense, beneficial effects of writing to learn interventions have been noted in different language and content area classrooms. To illustrate, Schmidt (2004) reported that the implementation of writing to learn tasks resulted in a decreased apprehension of writing activities by students attending a nursing program. Nevid et al. (2012) examined the effect of writing assignments on students attending an introductory psychology course and reported a positive impact of writing to learn strategies. Furthermore, they noticed that brief writing assignments whether generic or reflective in nature were effective in bolstering students' content knowledge. In terms of learning gains across different grade levels, the reviewed studies had examined writing to learn in settings that ranged from elementary school to university. Most importantly, however, this variable had no noticeable effect on the consistency of the findings in favor of the learning potential that writing to learn interventions offer.

Another question relates to whether the difference between the L1 and L2 teaching and learning contexts resulted in different findings as far as the efficacy of writing to learn interventions is concerned. Ostensibly, the L1 and L2 variable had no bearing on the effects of *writing to learn* interventions. The fact of the matter is that the following ESL and EFL based studies: (Cheng & Feyten, 2015; İncirci & Parmaksiz, 2016; Kieft et al, 2008; Lew & Schmidt, 2011; Lund, 2016; Manchón & Roca de Larios, 2011; Suhaimi et al., 2016) had all underlined positive effects of writing to learn strategies and tasks on students' learning in the L2 context. In the same way, the L1 based studies included in this review: (Arnold et al., 2017; Driessens & Parr, 2019; Nevid et al., 2012; Ray et al., 2016; Schmidt, 2004; Wright et al., 2019) highlighted similar benefits of *writing to learn* interventions on students' overall learning experiences in the L1 context in the US and Canada.

RQ # 3: What variable(s) might maximize or mitigate the learning potential of writing?

To answer this question, let me start by referring to a meta-analysis on the effects of school-based *writing to learn* interventions on students' academic achievement where Bangert-Drowns et al. (2004) noted the role of certain contextual factors in shaping the learning potential of writing to learn interventions. More specifically, Bangert-Drowns et al. (2004) enumerated contextual variables related to "the intensity of the intervention, the nature of the writing task, and the ability of the students to take best advantage of writing's operation" and how these contextual elements "moderate the influence of writing on learning" (p.53). Along similar lines, *Table 2* overviews a few contextual variables that could have a bearing on the efficacy and overall successful implementation of writing to learn interventions.

Table 2. Variables Maximizing or Mitigating the Efficacy of Writing to Learn Interventions.

| Variable | Effect | Study/Studies |
|--------------------------------------|---|---|
| Explicit instruction | Students who received instruction that specifically addressed their writing needs showed notable learning gains. | Manchón & Roca de Larios (2011) İncirci & Parmaksiz (2016) |
| Intensive writing | Students reported learning benefits after engaging in intensive English writing activities. | Manchón & Roca de Larios (2011) |
| Custom-made instruction and feedback | Expansion of students' linguistic resources Teachers' constructive written feedback provided learning opportunities to students to develop a greater sense of academic literacy. | Cheng & Feyten (2015) Manchón & Roca de Larios (2011) |
| Individual differences | Learners who showed effective structure building ability benefited the most from writing to learn tasks. | Arnold et al. (2017) |
| Proficiency | Skilled writers produced organized essays while low-skilled writers needed explicit instruction. | Arnold et al.(2017) |
| Handwriting | Writing by hand had positive effects on students' concentration, creativity, and facilitated better processing of content. | Lund (2016) |

It is not surprising, actually, that explicit instruction and custom-made feedback figure among the variables that maximize the effectiveness of writing to learn tasks. But the most intractable problem involved in trying to implement these strategies lies in getting to know the students and their specific needs. This may not always be an easy task if we take into consideration issues related to class size and relatively short semesters. Closely related is how individual differences inform teachers' understanding of students' writing performance. Now, of course, individual differences

encompass various components including proficiency, motivation, learning style, and so forth. To further emphasize my previous point about the necessity of getting to know the students, let me offer this explanation. If effective, explicit instruction and custom-made feedback requires knowing the students, the same remark is valid when it comes to assessing how individual differences shape and influence students' writing. Additionally, it should come as no surprise that variables like intensive writing and handwriting correlated with gains in students' learning. Nevertheless, it is not clear whether intensive writing tasks that do not offer explicit instruction and feedback would be as effective as the intervention in (Manchón & Roca de Larios, 2011). As per the handwriting variable, Lund (2016) makes a solid case for the benefits of students' handwritten notetaking practices on their overall learning. To date, however, very little research has been conducted on how handwriting impacts on learning. Future research should, therefore, shed more light on this matter.

RQ# 4: What are students and teachers' perceptions of writing to learn strategies/tasks?

This question aimed at shedding light on students and teachers' perceptions and perspectives on *writing to learn* strategies. On the one hand, three empirical studies have examined writing to learn through a teacher-perspective lens (Sanchez & Lewis, 2014; Ozturk & Gunel, 2015; Ray et al., 2016). On the other hand, five other studies reported on how students perceive and react to writing to learn interventions: (Wright et al., 2019; Manchón & Roca de Larios, 2011; Suhaimi et al., 2016; Schmidt, 2004; Lund, 2016). First, to my mind, in any teaching and learning setting, the teacher remains an integral part of the educational process. Seen in this light, the teachers' choices of writing tasks, implementation of writing instruction, and, most importantly, their perceptions of the learning potential of writing activities may influence the type of teaching and learning taking place in their classrooms. Reflecting on whether writing helped preservice teachers improve their content learning and critical thinking skills, Sanchez and Lewis (2014) observed positive effects in this regard. The same argument holds for in-service teachers. As such, in another study that examined Turkish science teachers' perceptions of writing as a learning tool, Ozturk and Gunel (2015) concluded that although the participant teachers were aware of the role of writing in learning and literacy development, most of them did not use *writing to learn* tasks in their classrooms. Instead, writing in their classrooms took the form of notetaking. In contrast, Ray et al. (2016) surveyed 159 middle school language arts, science, and social studies teachers in the United States. Their survey data revealed that teachers reported regular use of various *writing to learn* strategies in their classrooms including short answer responses (88.8 % of teachers), note-taking (86.3 % of teachers), summary writing (81.5 % of teachers), graphic organizer or concept map (80.8 % of teachers), note taking while listening (80.3 % of teachers), explanation (78 % of teachers), description (71.9 % of teachers), analysis (70.3 % of teachers), writing answers to document based questions (66 % of teachers), compare/contrast (58.4 % of teachers), list (55.1 % of teachers), cause and effect (54.1 % of teachers), journal (54 % of teachers), and writing to make personal connections (52.76% of teachers). (p. 1062). Finally, I want to mention, at least briefly, the issue of students' perceptions of the learning potential of writing. In this view, Manchón and Roca de Larios (2011) specifically addressed how their L2 student participants perceived the benefits of engaging in intensive and challenging writing tasks as part of an EAP course. It is relevant to underscore, in this regard, that the L2 students in this study associated such positive perceptions with two mediating factors: instruction and writing. The former involved custom-made instruction while the latter was concerned with noticing and practice.

Along similar lines, but involving different content areas, both Schmidt (2004) and Suhaimi et al. (2016) respectively reported on students' positive perceptions of writing to learn tasks. Likewise, the first study indicated a decrease in writing anxiety and a positive attitude toward low-stakes/writing-to-learn tasks among students attending a nursing program at an American university whereas the second study revealed that tenth graders in Turkey had mostly shown positive attitudes toward the learning gains resulting from journal writing in their Mathematics class. As the authors made clear, the changes that occurred in students' perceptions of writing to learn tasks could be due to the nature of the writing prompts and the scores they received. In an interesting study, Lund (2011) found that Norwegian EFL teacher trainees relied heavily on writing to learn strategies especially notetaking during course lectures. Of great significance here is that the participants preferred to write by hand over typing their notes on electronic devices. Of equal importance, participants referred to factors such as better concentration, creativity, and information processing to explain their preference for handwriting over typing their notes on a computer/electronic device.

Discussion

As this research synthesis has shown, writing to learn interventions seem to be an effective way to support students' learning in language and content area classrooms. As stated previously, this review did not identify significant discrepancies in the effectiveness of writing to learn strategies across different grade-levels (from elementary school to university levels), content areas (Math, Science, English, etc.), and disciplines (Nursing, Psychology, Teaching etc.). And so, we see also that there was no notable differences in the effectiveness of writing to learn methods across the L1, ESL, and EFL contexts. However, these findings need to be interpreted with caution since not all studies included a control group. At the same time, much needs to be done in future research to ensure the validity and generalizability of these findings. For instance, there is scope for future *writing to learn* research to focus more on EFL contexts since previous studies have predominantly taken place in ESL settings. Furthermore, writing is a process; it is a process of discovery.

In other words, writing is thinking that takes shape in our texts. As Murray (1990) indicated, "The writing begins with the collection of the raw material of writing, information that will be arranged into meaning by that act itself. Writing is thinking" (p.60). On this account, Langer and Applebee (1987) reported similar conclusions. In *How writing shapes thinking: A study of teaching and learning*, they emphasized the learning potential of writing and described how different types of writing involve different learning processes.

There is clear evidence that activities involving writing lead to better learning than activities involving reading and studying only. Writing assists learning. Beyond that, we learned that different kinds of writing activities lead students to focus on different kinds of information, to think about that information in different ways. (p. 135).

What this means, moreover, is that *writing to learn* activities support students' language learning, content learning, and literacy development. In the meantime, writing to learn interventions seem to be effective in helping L2 learners, for instance, develop a holistic and multidimensional approach to writing; one that incorporates text features, audience awareness, purpose, and content as Manchón and Roca de Larios (2011) observed; however, it is critical to provide students with ample writing opportunities and adequate instructional support for them to be able to develop their critical thinking skills and content area literacies. As for this argument, it is crucial for instructors to make it a habit to implement as many low-stakes and ungraded writing to learn tasks as possible in both language and content area classrooms.

Clearly, teachers have a vital role to play in this respect. Supporting their students' writing efforts and providing a purpose and incentive for their low-stakes, ungraded, writing assignments, teachers maintain students' engagement and motivation to learn. As much as possible teachers should foster a culture of peer feedback where students' share their writing with a peer or a group of students and exchange evaluations and suggestions about each other's writing. Along similar lines, the efficacy of writing to learn interventions has been correlated with adequate instructional support. In this view, Manchón and Roca de Larios (2011) emphasized the role of custom-made instructional support especially as it relates to written feedback. Put more specifically, students benefit the most from feedback that takes into consideration their unique learning trajectories and language proficiencies.

From another perspective, although not intended to be a study on the concept of *writing to learn*, Karapetian (2020) found that implementing a flipped classroom approach had a positive impact on students' writing, critical thinking, and overall learning performance. It follows, therefore, that flipped classroom approaches could offer students the opportunity to learn at their own pace as they have ample time to reflect on the materials and be actively involved in their learning. It is also relevant to refer to Cheng and Feyten's (2015) perspective. They argued that in providing feedback to students on their writing to learn papers, teachers should not prioritize a focus on issues related to mechanics, style, and grammar. Rather, the authors invite instructors to encourage their students to be more agentive by taking active roles in their learning. Before confirming Manchón and Roca de Larios' (2011) observation that feedback ought to be tailored to each student, Cheng and Feyten (2015) elaborated on their conceptualization of feedback to students' *writing to learn* papers. On this account, the authors explained.

"The more effective feedback might be the one that engaged students in questioning, communicating, researching, exploring, building networks, utilizing resources. In addition, the feedback should be tailored to suit each student and consider the writer's needs, ability, personality, and culture" (p. 20).

What is evident here is that feedback and instruction in general may facilitate and support the learning potential of certain writing activities. However, much needs to be examined in this domain. There is scope for future research to attend to matters related to the role of feedback and explicit instruction in designing and implementing effective *writing to learn* interventions. Where research must move in the future is also toward investigating how students react, interpret, and, eventually, implement the feedback they receive from their instructors and peers. This, I suppose, cannot be achieved, unless similar attention is given to the role of student agency and individual differences in the processes involved in *writing to learn* productions.

Admittedly, the findings confirm that certain variables reinforce and support the learning potential of writing to learn tasks. This section overviews four of these variables. First, evidence from the reviewed studies suggests that explicit instruction plays a critical role in the effective implementation of writing to learn activities. In other words, students who received instruction that specifically addressed their writing and learning needs benefited the most from the *writing to learn* tasks. Also relevant here is that feedback has been shown to support students' learning and development of greater sense of literacies and critical thinking skills. But let us be clear. The challenge remains in the feasibility of this type of *writing to learn* intervention in the language and content area classrooms. While providing feedback that is tailored to specific student needs is quite effective, it is also time consuming. Thirdly, the amount of time spent in writing does make a difference. Clearly, instructors need to provide students with in-class and out-of-class writing activities—including using online platforms—where students can reflect on course materials and engage with their own ideas. Finally, individual differences remain another key factor in any teaching and learning context. Although it has been noted that language proficiency and content knowledge have a direct effect on the benefits reaped from *writing to learn* interventions, much is yet to be discovered about how individual differences in terms of

motivation, personality, language proficiency, and learning styles affect the complex processes involved in *writing to learn* tasks.

Recommendations

The examination of *the writing to learn* studies included in this paper revealed a few pedagogical implications. First, the findings suggest that schools, teacher training institutes, and teacher education programs have an instrumental role in preparing prospective teachers for an effective implementation of *writing to learn* strategies in the language and content area classrooms. Indeed, there is a need to shift from the idea that writing serves first and foremost as an assessment tool and that it is mostly up to English and ESL teachers to be in charge of writing instruction. Conversely, instead of relying solely on English instructors to implement writing to learn interventions—and given the apparent efficacy of these interventions—it would seem to make sense that more content area teachers across different disciplines and grade levels start including some form of writing to learn tasks into their curricula. But let me be clear. What I propose here would necessarily touch on the issue of teacher training. In simple terms, prospective and in-service teachers need adequate training that explicitly addresses how they should go about designing, evaluating, and providing feedback on writing to learn tasks.

The findings also suggest that individual differences matter in writing to learn interventions. But there is still a need to further elucidate how individual differences shape students' engagement with writing tasks. At issue here, I would argue, are three important constructs: motivation, personality, and language proficiency. Students tend to differ in such constructs hence the need to investigate how these differences affect the writing to learn processes and productions. What about the writing tasks themselves? Do different types of *writing to learn* activities achieve identical or similar effects? The studies reviewed in this paper offer no clear answer to this question. However, it seems that different writing tasks and genres operate differently. I think it is time for language and content area teachers to consider what would be lost, and what could be gained, if they gave their students the freedom and flexibility to reflect on what and how they learn. Students' writings, then, could be valuable to teachers to get to know how their students think, process, and engage with the materials.

Of the many other challenges to an effective implementation of writing to learn interventions, questions of type of writing to learn tasks and feedback stand out as particularly problematic. As much as possible, teachers should opt for writing to learn tasks that foster critical thinking. What I am leading to here is an explicit direction toward eliciting and valuing students' reflective and evaluative input through writing. Not only will such tasks inform teachers knowledge about how students are taking up the course content, but, most importantly, reflective and evaluating writing to learn tasks develop students' reasoning and logic through engaging in earnest retrospection and reflection. As per the feedback, at first glance, teachers might view writing to learn tasks as an additional burden to their already overwhelming duties. However, teachers do not have to provide feedback on all these tasks. There is room for them to make use of peer feedback both in-class and online; thus, allowing students further opportunities to engage with each other's writing. Eventually, teachers could join the peer feedback interactions when there is need to clarify concepts or simply facilitate student exchanges.

Conclusion

This qualitative synthesis of *writing to learn* research revealed that implementing writing to learn tasks result in notable learning benefits in language and content area classrooms. Although there is still much to be examined in terms of the different processes that govern writing to learn interventions especially concerning the types of writing tasks, their frequency, and feedback modes, there is reasonable evidence to believe that schools and instructors should consider implementing *writing to learn* activities across all grade levels. That is, introducing writing to learn pedagogies needs to be done both in the language and content area classrooms. Teacher training, however, remains a steppingstone if schools want to move toward this goal. The line of argument this paper has been pursuing has important implications for how writing can be used to further students' learning and academic achievement rather than being merely used for assessing students' content knowledge. Specifically, as a means toward this objective, I propose that instructors should implement informal (low stakes) writing tasks such as journals since these foster the development of students' literacies and critical thinking skills. The bottom line is that the more students write about what they learn, the more opportunities they have to process and reflect on what has been learned.

Before concluding this paper, a few limitations must be noted. I should say, first of all, that given the paucity of *writing to learn* research, this paper was informed by a fairly small number of studies. It follows, therefore, that caution is needed when interpreting the findings this paper has reported. The reviewed studies, moreover, were conducted in different language, content area, and grade-level contexts. Although the findings appear to lend support to the effectiveness of writing to learn interventions, intricacies within and across the reviewed studies should be taken into consideration. Finally, this study would have been enriched by adopting a deliberate critical stance toward the literature. While this research synthesis attempted at times to evaluate *writing to learn* research, critiquing the latter was not within the scope of this paper.

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Appendices

Appendix A: Studies with a Focus on Teachers' Perceptions on Writing to Learn.

| Article | Focus | Participants | Location |
|------------------------|--|---|--|
| Sanchez & Lewis (2014) | Examining whether writing in the content area help preservice teachers learn new material and develop critical thinking skills | 88 bilingual preservice teachers enrolled in two upper level Writing Intensive courses | a southwestern Texas university, United States |
| Ozturk & Gunel (2015) | Science teachers' perceptions of writing as a learning tool. | 131 science teachers in | Public schools in Erzurum, Turkey. |
| Cheng & Feyten (2015) | The examination of the role of teachers' written feedback on the development of L2 students' academic literacies. | Non-native English speaking graduate students from South Korea and Germany pursuing an MA Applied Linguistics | A large public university in southeastern United States. |
| Ray et al., (2016) | How middle school teachers use writing to support students' learning | 159 sixth through ninth grades language arts, science, and social studies teachers. | Middle schools, United States |

Appendix B: Studies with a Focus on Students' Perceptions of Writing to Learn.

| Article | Focus | Participants | Location |
|---------------------------------|---|--|---------------------------------|
| Manchón & Roca de Larios (2011) | Examining EFL students' perceptions of the learning potential of writing. | 18 EFL students and their EAP teacher | The University of Murcia, Spain |
| Suhaimi et al., (2016) | Students' perceptions of a Writing to Learn strategy (writing journals). | 43 students from two Grade 10 Math classes | A public school in Brunei |
| Wright et al., (2019) | What type of students benefits the most from writing to learn interventions in a science class? | A chemistry teacher, a physics teacher, and their 54 Grade 6-11 students | K-12 schools in United States |
| Karapetian | Students' perceptions of the flipped classroom teaching approach. | 87 University students majoring in Economics, Management, and Marketing. | University in Ukraine |

Appendix C: Studies that Examined the Cognitive Processes Involved in Writing to Learn.

| Article | Focus | Participants | Location |
|-----------------------------------|--|--|---|
| Kieft, Rijlaarsdam & Bergh (2008) | An aptitude lens to <i>writing to learn</i> | 220 eight grade students in a <i>Writing Argumentative Texts about Short Stories</i> class | 3 high schools in the Netherlands. |
| Lew & Schmidt (2011) | Investigating whether the practice of reflection journal writing can promote self-reflection and learning. | 3460 freshmen engaging in problem-based learning where students collaborate in groups to investigate issues of relevant to their studies | A polytechnic institution in Singapore. |
| Arnold et al. (2017) | The cognitive processes involved in <i>writing to learn</i> | Undergraduate students | Washington University, United States. |

Appendix D: Studies that Focused on the Type of Writing Activities and Strategies.

| Article | Focus | Participants | Location |
|----------------------------|--|---|---|
| Schmidt (2004) | The effects and benefits of <i>writing to learn</i> strategies. | Undergraduate nursing students | A private university in United States. |
| Nevid et al. (2012) | The learning benefits of <i>writing to learn</i> activities in Introductory Psychology classes | 208 students in three psychology classes where writing assignments were a course requirement. | A large university in United States |
| İncirci & Parmaksiz (2016) | Effects of <i>writing to learn</i> interventions on academic achievement and attitude toward learning. | 11th grade students taking an English class | A public school in Turkey. |
| Lund (2016) | The role of handwritten texts in EFL student teachers' <i>writing to learn</i> practices. | 19 Norwegian EFL teacher training students' practices and their thoughts about writing to learn activities. | Different Colleges of Education in Norway |
| Driessens & Parr (2019) | The role of quick writes in developing critical literacy | Sixth graders | An elementary school in Ontario, Canada. |
| Deveci (2018) | This study offers an epistemic perspective on writing. The author makes the case for writing as being <i>for</i> and <i>because</i> of lifelong learning | Not applicable (Conceptual article) | Not applicable (Conceptual article) |