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Synthesis writing

Teaching high school students how to read, plan, draft, and revise

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CHAPTER 1

INTRODUCTION

1 RESEARCH CONTEXT

The start of this dissertation was triggered by news items in Dutch media in 2015 about the poor writing skills of first-year students. However, this seems to be an Age-Old concern (Van Dis, 1962; De Vries, 1971), just like media that eagerly tap into these concerns and publicize the results of writing skills research as 'bad news about the declining writing skills of our youth' (Rijlaarsdam, 1986, p. 1).

Despite concerns about *writing* skills, in education the emphasis remains mainly on practicing *reading* skills. This paradox might be caused by the fact that at least 50% of the final mark for Dutch Language and Literature in high school exams is determined by testing reading skills and, at the same time, an observed decline in students' reading skills (OECD, 2019). Nevertheless, teachers invest time and energy in teaching writing skills. In the lower grades of secondary education, they spend 17 to 45 percent of their time on writing skills and hardly use textbooks (Meestringa & Ravesloot, 2014). Yet, they share the concerns expressed in the media (Oudakker & Groenendijk, 2020).

A possible explanation for the poor writing skills that teachers in higher education encounter, is that the skills taught in secondary education and the skills students are expected to master when they enter higher or academic education are not aligned (Bonset, 2010; Wertenbroek et al., 2016). In secondary education, writing skills are often taught in isolation, not aimed at acquiring knowledge or demonstrating knowledge through writing. Yet, in 11th or 12th Grade, students are required to write a report about a comprehensive research project that covers several school subjects [Dutch: 'sectorwerkstuk' or 'profielwerkstuk']. Such a research report includes a theoretical framework section, comparable to what students are expected to be able to compose in higher education. However, students are often ill equipped to compose it. Teaching students to synthesize source information prior to 11th Grade could be a way to promote the development of the necessary skills for composing a well-integrated and structured theoretical framework section. Consequently, students' research reports along with the research skills reflected in them could be seen as a means to determine if they are ready for the transition to higher or academic education (Oudakker & Groenendijk, 2020; Wertenbroek et al., 2016).

A more integrated curriculum is desirable, not only within cross-curricular projects such as students' research projects, but within Dutch as a school subject as well. A study in 2018 of NederlandsNu! [DutchNow!] in cooperation with the

section board of *Levende Talen Nederlands* [Living Languages Dutch] into teachers' preferences for the central examination of Dutch as a school subject, led to the recommendation to integrate reading and writing skills in the exam. This recommendation is currently being explored by *Centraal Instituut voor Toetsontwikkeling* [Central Institution for Test Development, Cito] and *College voor Toetsen en Examens* [Counsel for Tests and Exams, CvTE] who are developing integrated reading and writing assignments. An example of such an assignment is writing a short synthesis through which students show that they can select, organize, and structure information on the one hand, and that they are able to integrate that information correctly in a new text on the other. As we write this introduction (Autumn, 2021), these assignments are being tested in schools. The plan is to publish them in early 2022, so they can serve as examples for teachers, developers of teaching materials and test makers.

How can teachers design effective instructions for teaching synthesis writing based on these examples? Much is already known about effective writing instruction (see for example for primary education: Van Weijen & Janssen, 2018). However, not much scientific insights about (teaching) writing find their way into the classroom (Taalunie [Union for the Dutch Language which develops and promotes policy on Dutch in the Netherlands, 2015]¹ Therefore, it is unlikely that teachers themselves will develop effective, evidence-based instruction based on examples of a new, unfamiliar writing task. Fortunately, the government has taken various initiatives in recent years to bring research and education together. One of those initiatives is the financing of educational research by the *Nederlandse Organisatie voor Wetenschappelijk Onderzoek* [Dutch Research Council, NWO] in the form of *Doctoral Grants for Teachers*.

This dissertation was made possible by such a *Doctoral Grant*, which allows teachers in secondary and higher education to conduct educational (domain specific) research two days a week for five years, while maintaining their teaching position.² This combination often results in practice-oriented research: teachers experience a problem within their teaching practice and search for possible solutions in the research literature. Subsequently, they design and test solutions that best fit a particular age group, first within their own teaching practice and then more broadly, at other schools and in collaboration with other teachers. This may increase the chance that the results of this type of research will actually be applied in educational practice. One of the main goals of this research project

¹ See: <https://taalunie.org/informatie/112/taalunie-union-for-the-dutch-language>.

² See <https://www.nwo.nl/en/researchprogrammes/doctoral-grant-teachers>.

was therefore to develop effective instructions for learning how to compose synthesis texts that are feasible for educational practice.

In accordance with the usual research approach among teacher-researchers, we first performed a systematic review of literature on synthesis writing interventions. We analysed the six most effective interventions, which yielded two important design principles. These principles formed the basis for the design of a learning unit. But rather than designing a one-size-fits-all unit, which runs the risk of actually suiting no one in practice, we aimed to create a flexible unit. Students could create their own personal learning path within the unit by choosing between strategies. We then tested this flexible learning unit in a first iteration with colleagues from the first author's school. Next, when the unit proved to be sufficiently valid, feasible and effective, we tested it at other schools in a second iteration, with other colleagues.

In this introduction, we provide an overview of previous research on synthesis tasks, followed by a review of the literature on writing processes, more specifically the interaction between planning strategies and writing instruction. Finally, we provide an overview of the chapters in this dissertation.

2 SYNTHESIS TASKS

Over the past years a fair amount of research has been carried out on performing synthesis tasks. However, it seems difficult to define the task. Task definitions that were used traditionally in earlier studies often focused on sub-processes that play an important role in writing a synthesis text. Spivey and King (1989) for example, stressed the importance of selecting, organizing, and connecting in discourse synthesis and defined it as "a highly constructive act in which readers become writers" (Spivey, 1984), which emphasizes the hybrid nature of the task.

Segev-Miller (2004) acknowledged the importance of selecting, organizing, and connecting in a synthesis task and the hybrid nature of the task. In addition, she proposed that it requires creating one's own macroproposition, or "super-proposition", from different – sometimes even contradictory – macropropositions in several source texts. In a true synthesis, the information must be organized in a new, previously non-existent conceptual structure.

Segev-Miller's view was inspired by Kintsch and Van Dijk (Segev-Miller, 2004, pp. 5-6), who proposed a model for text comprehension based on the notion of a (global) macrolevel and (local) microlevel organization of semantic text structures. Text comprehension is limited by the capacity of the working memory and that is why a reader looks for macro-operators that reduce the information in a text base to its essence: the theoretical macrostructure. They do so by deleting

all propositions that are either irrelevant or redundant and by constructing new inferred propositions. However, when summarizing a text, it is possible to replicate its structure, thus adopting the macrostructure of the source text. The synthesis task is cognitively more demanding than summarizing because it requires conceptual transformation and the production of the writer's personal and creative perspectives (Segev-Miller, 2004).

Boscolo et al. (2007) derived part of their definition from Kintsch and Van Dijk's model, as well as Segev-Miller (2004) did, but with an addition. They introduced the 'intertextual' *situation model* and stated that building a unique situation model from different text bases is a complex task that requires deep elaboration of the sources. In writing a synthesis a writer must elaborate different sources of information, and then compare, transform, and integrate them into a more inclusive one, an intertext. An intertext may incorporate previous experiences, and hence also previous text bases, regarding the same or similar situations. At the same time, the model may incorporate more general knowledge instances from semantic memory about such situations. Therefore, every intertext is unique.

However, as Vandermeulen et al. (p. 187, 2020a) pointed out, what a synthesis task actually entails, has still not been clearly defined. Different research domains and foci may be related to different views on synthesis tasks. Researchers ask students to synthesize, but in doing so they pursue different goals. This affects the way researchers interpret the outcomes of synthesizing tasks. On the one hand there are studies that focus on *learning from texts*, in which synthesizing is usually aimed at supporting reading comprehension (e.g., Barzilai & Ka'adan, 2017; Braten et al., 2021; List et al., 2021; Mateos et al., 2008; Saux et al., 2021). As a result, the text produced during the synthesis task is mainly seen as the written record of the mental (reading) comprehension process. On the other hand, there are studies that focus on *writing instruction*, in which the written product is seen as an indication of writing competence. Within writing research, there is a subjective and an objective approach. The subjective approach refers to research into producing a written argumentative synthesis, in which conflicting sources must be reconciled (Casado-Ledesma et al., 2021, González-Lamas et al., 2016; Granado-Peinado et al., 2019; Mateos et al., 2018, 2020). This requires deliberate argumentation and encourages writers to consider all claims and make reasoned judgments. The assessment of the final text in such studies is often based on the level of integration and argument coverage, and less on communicative aspects such as reading ease (Mateos et al., 2008; Mateos & Solé, 2009; Solé et al., 2013). This is because this research aims to teach students how to deal with a large amount of conflicting information and make reasoned judgments. The

communicative aspect is therefore less important. The objective approach refers to research into producing informative syntheses, in which a current state of affairs is described, based on informative, but possibly also conflicting sources. Such an informative synthesis can include claims. However, the writer's stance towards the topic is objective rather than subjective. In studies into informative syntheses, the quality of the final synthesis text is often judged from a communicative perspective (Boscolo et al., 2007; Vandermeulen et al., 2020a), in which content aspects such as source coverage and integration, as well as more reader-oriented aspects such as coherence, cohesion and formulation are taken into account.

In this dissertation, we adhere to the definition formulated by Klein and Boscolo (2016), who described synthesizing as a recursive reading-writing activity in which a writer draws on several source texts while synthesizing a new text which is a unique integration. Furthermore, our focus is on learning to perform *informative synthesis* tasks with the aim of describing a current state of affairs, based on a limited number of sources. The quality of the resulting texts is judged holistically from a reader-oriented perspective. It should be possible to read the synthesis text independently of the source texts and its content might even extend beyond the information provided in the sources.

What remained underexposed in much research into synthesizing tasks is the step in which the mental models resulting from the processes described by Spivey and King (1989) are transformed into a well-constructed, reader-oriented text. In the context of this dissertation, we aimed to pay attention to both the synthesizing processes and transformation of the mental model into a text. Therefore, we designed and tested a unit in which students who had no experience in performing synthesis tasks practiced the basic synthesizing processes step-by-step, after which they composed their own source-independent and reader-friendly texts.

3 WRITING ROUTINES

Despite the variety of definitions and research foci in studies on synthesis tasks, the body of research is growing. From their analyses of 69 empirical studies published in refereed journals or books in English from 1993 to 2013, Cumming et al. (2016), concluded that students often experience difficulties with the complex processes of writing from sources. Hybrid tasks, wherein reading and writing are inextricably intertwined, can even result in cognitive overload. To prevent overload from occurring, writers tend to develop a certain routine: a fixed writing process approach (Torrance & Galbraith, 2006, p. 74).

Writing routines are often expressed in terms of the extent to which a writer is committed to two dimensions of idea generation processes: pre-writing-content-planning (from now on referred to as Preplanning) and post-writing-revising (from now on referred to as Drafting) (Galbraith, 1992; Kieft & Rijlaarsdam, 2005). Preplanning concerns the extent to which students engage in structuring the content of their texts *before* starting to produce full text, while Drafting concerns the extent to which students need to start writing *immediately* to develop content through text production. Earlier research suggests that writers have mixed routines, but the extent to which they tend to Preplan and Draft differs not only between individuals (Kieft et al., 2007), but also within individuals, due to differences in prior knowledge and topic interest (Van Steendam et al., under review).

Instruction aimed at preventing cognitive overload during writing often focuses on offering content preplanning strategies. Despite the widely proven effectiveness of preplanning strategies such as outlining and graphic organizers (e.g., Limpo & Alvez, 2018; Kellogg, 2008), not all preplanning strategies are equally effective for all types of writers (Kieft et al., 2007; Rijlaarsdam et al., 2012), and all types of goals, for instance learning-to-write, or writing-to-learn (Kieft et al., 2008). Some writers may benefit more from Drafting strategies than from Preplanning strategies (Galbraith & Torrance, 2004). However, so far research has not provided unambiguous answers to the question which strategy is most effective for which goal and how their effectiveness is related to writing routines.

Although it remains unclear what the best instructional approach is for students with and without a strong adherence to a particular writing routine, writing instruction in the most widely used textbooks in secondary education in The Netherlands is predominantly focused on Preplanning (e.g., Nieuw Nederlands [New Dutch], Op Niveau [Up to Standard]). Therefore, we investigated the option to develop a unit for learning to write synthesis texts, that takes variation in students' writing routines into account so that the effectiveness of the unit does not depend on students' routines. To achieve this desired independence, we offered students two different strategies: one catering to the Preplanning routine and one to the Drafting routine. On two occasions, students could choose between those options. This way, three learning paths could be created within the same unit: a) all-Preplanning, b) all-Drafting, and c) Switching between the two options. The students substantiated each choice they made with arguments. We expected that both choosing and substantiating would contribute to students' metacognitive knowledge about their own writing routine and thus help them to set clear writing goals, and then choose an optimal individual learning path.

4 STRUCTURE OF THIS DISSERTATION

This dissertation aimed to answer the main research question:

Does a unit that teaches students how to write synthesis texts, while taking different writing routines into account, improve the quality of ninth-grade pre-university students' synthesis texts, regardless of their preferred routine?

This question was addressed through five sub-studies on which we report in five chapters.

Chapter 2 describes the bottom-up analysis of the most effective interventions we found through a systematic review of the research literature. Subsequently, we formulated instructional design principles as a starting point for the design of evidence-based units for learning to write synthesis texts. Finally, we determined which learning activities contributed effectively to the improvement of students' synthesis writing and created an overview of crucial synthesis learning activities in effective interventions.

In Chapter 3 we report on the systematic design and evaluation process of the unit. To evaluate its quality, we considered three aspects of the design: validity, feasibility, and its effectiveness. This chapter includes both a theoretical, argumentative account of the content and construct validity, as well as an empirical study on feasibility and effect. Therefore, two datasets are presented. First, for the discussion on validity issues, we substantiated the design principles for the learning unit with findings from the research literature and elaborated on the choices we made regarding the operationalization of those principles in the instructional design. Second, we assessed the feasibility and main effects of the unit, based on data from a quasi-experimental intervention study.

Chapter 4 reports on an experiment in which the effect of a single component of the design was measured: an animated three-minute video aimed at promoting the integration of source information into synthesis texts. This video was part of the whole-task synthesis assignment that the students performed prior to engaging in the intervention. We considered such an instruction essential because instruction in synthesis tasks is relatively scarce in secondary education. Therefore, it was likely that students would lack a well-developed task definition, which could compromise the validity of the task. We investigated whether it is possible to further develop students' task definition using a pre-instructional video.

Next, we redesigned and tested the unit based on the insights obtained from designing and testing the prototype. Chapter 5 comprises the results of two studies into the effectiveness of the first and the redesign of the instructional units. The first of the two studies is partly incorporated in Chapter 3, which

reports on the design and evaluation process of the learning unit. Here, in Chapter 5, the focus is on the effect of the intervention and the influence of students' writing routines on the effect. Because students' writing routines have been shown to affect the effectiveness of writing instruction, we aimed to design a unit that was equally effective for all writers, regardless of their routine. To that end, we provided students with the option to choose between a Preplanning or Drafting strategy twice during the lessons, so that they could create an individual learning path within the unit. We expected that offering choices might facilitate the generation of students' metacognitive task knowledge and promote equal effectiveness for students with different writing routines.

In Chapter 6 we investigate the effect of a one-hour training session for students, on the coherence between peer and teacher assessments of synthesis texts. Strikingly, there is little agreement among teachers of Dutch about the requirements that written products must meet. Often the emphasis in the assessment of texts is on spelling and formulation errors, possibly with some general remarks about text structure (College voor Toetsen en Examens [Counsel for Tests and Exams], 2011). Regarding a genre that is still relatively unknown in secondary education, such as the synthesis text, there will certainly be a lack of clarity among teachers about what constitutes a good text. We expect that an assessment tool with which teachers can validly diagnose and assess the quality of synthesis texts will contribute to the introduction of the learning unit in education. However, besides the importance of a reliable assessment of text quality by teachers, assessing (parts of) synthesis texts by students is an important learning activity in the learning unit. Therefore, we wanted to learn more about the way these peer assessments of text quality relate to teacher assessments and to what extent this relationship can be strengthened by teaching students to assess each other's texts the way teachers would.

In Chapter 7 we conclude with a general discussion on the main findings of the studies presented in this dissertation. In addition, we provide implications of our research for educational practices, as well as suggestions for future studies.

Chapters 2 to 6 are based on research papers that have each been submitted to different national and international journals for publication. This has the advantage that all chapters can be read separately. However, this also resulted in (considerable) overlap in the introduction and method sections of the various chapters.

Chapter 2

Van Ockenburg, L., Van Weijen, D., & Rijlaarsdam, G. (2019). Learning to write synthesis texts: A review of intervention studies. *Journal of Writing Research, 10*(3), 401-428. <https://doi.org/10.17239/jowr-2019.10.03.01>

Chapter 3

Van Ockenburg, L., Van Weijen, D., & Rijlaarsdam, G. (2021). Learning how to synthesize: The design and evaluation of a reading-writing learning unit for high-school students. *L1-Educational Studies in Language and Literature, Volume 21*, 1-33. <https://doi.org/10.17239/L1ESLL-2021.21.01.06>

Chapter 4

Van Ockenburg, L., Van Weijen, D., & Rijlaarsdam, G. (2021). Een mini-interventie: het effect van een animatievideo van drie minuten op de integratie van broninformatie in syntheseteksten. [A brief intervention: can a three-minute animation video promote the integration of source information in synthesis texts?] *Pedagogische Studiën, 98*(1), 46-66. <https://pedagogischestudien.nl/search?identifier=721616>

Chapter 5

Van Ockenburg, L., Van Weijen, D., & Rijlaarsdam, G. (2021). Choosing how to plan informative synthesis texts: Effects of strategy-based interventions on overall text quality. *Reading and Writing*. <https://doi.org/10.1007/s11145-021-10226-6>

Chapter 6

Van Ockenburg, L., Van Weijen, D., & Rijlaarsdam, G. (2022). Beoordeling van schrijfpodochten door leerlingen. Effecten van een korte beoordelaarstraining. [Students' assessment of synthesis text quality. The Effect of a One-Hour Assessment Training Session.] Under review.