"Romantic" beats "classic": New insights on the effects of self-regulation on learning by writing

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Abstract: For several decades writing has been advocated as an academic activity that can facilitate knowledge acquisition. Theories of writing and models of writing development that researchers draw on to explain the positive effects of writing to learn emphasize the importance of self-regulation, particularly, planning, monitoring and revision. Yet, there is some empirical evidence indicating that the self-regulation of writing may be detrimental to learning. To analyze systematically the effects of self-regulation on learning by writing we conducted an empirical study. Participants (n=87) read an instruction that induced (1) self-regulated writing, (2) spontaneous writing or (3) self-regulated and spontaneous writing. Under the control condition, participants did not receive instruction in writing to learn. All participants then wrote an entry to a learning journal. Results showed that self-regulated writing exerted a negative influence on knowledge construction during writing and on post-test performance. In light of these findings, the emphasis on self-regulation strategies in writing-to-learn instruction should be reconsidered.

Introduction

As they move through high school and college, students engage in a variety of writing activities. They write to improve their writing and argumentation skills, to document academic work or to demonstrate what they have learned in a class. Teachers also assign writing-to-learn tasks which aim at supporting students in acquiring or deepening their knowledge of subject matter. One of the tenets of research-based writing instruction (e.g., Graham, 2006; Harris & Graham, 1992) is that learners should be taught to self-regulate their writing, i.e. to plan, monitor and revise the rhetoric, structure and content of their texts. However, the rhetorical and structural quality of the written product is not the main target outcome of writing to learn, in contrast to other academic writing activities such as writing a term paper or completing an essay exam. Hence, learners may not benefit from self-regulating their writing when engaging in a writing-to-learn activity. There is some empirical evidence suggesting that adopting a self-regulated stance toward writing, which Galbraith (1992) referred to as "classic", may indeed be detrimental to learning. Galbraith (1992) found that learners who adopted a "romantic" stance toward writing, treating writing as a spontaneous, creative process not involving the planning and monitoring of text characteristics, showed higher gains on measures of knowledge construction than those who adopted a "classic" stance toward writing. However, empirical studies involving a typical writing-to-learn task (such as journal writing) and comparing the effects of the self-regulated ("classic") stance and the spontaneous ("romantic") stance toward writing are missing. Therefore, we conducted an empirical study in which we instructed students to adopt different stances toward writing and had them write an entry to a learning journal. Our aim was to advance research on self-regulation and learning by writing and to contribute to the improvement of writing-to-learn instruction. Before reporting on the study we sketch the theoretical and empirical background relevant to our research.

Self-regulation in cognitive theories of writing

Despite empirical evidence of the positive effects of writing on learning there are few models of processes of writing to learn. Therefore, researchers draw on cognitive theories of writing to explain the knowledge and achievement effects of academic writing activities. Klein (1999) subsumed research on learning by writing under four sets of theories: Shaping at the point of utterance, forward search, backward search and genre. The perspective on the self-regulation of writing offered by the "shaping at the point of utterance" and "forward search" models differs widely from that of the "backward search" and genre models. As a consequence, they also differ in their implications for writing-to-learn instruction.

The "shaping at the point of utterance" theory was proposed by Britton (1982). The central assumption of Britton's model is that knowledge emerges as ideas are expressed in writing. Therefore, writers should engage in spontaneous writing and not focus on the linguistic and rhetorical characteristics of the written product. That is, they should not self-regulate their writing. The assumption underlying Britton's model forms the backbone of the "forward search" models of writing-to-learn: Producing text in a spontaneous fashion allows the writer to reread and reflect on his ideas which triggers further idea generation, setting of rhetorical goals and text revisions. What Klein has termed forward search is strongly advocated by Galbraith (e.g., 1992). He argues that writing does not yield learning through a sequence of self-regulatory processes (planning, translating, monitoring and revising). Instead, he proposes that ideas are generated as the writer's implicit knowledge and the emerging

text interact. Hence, when the goal of writing is knowledge acquisition writing should take the form of "spontaneous spelling-out of ideas in continuous prose" (Galbraith, 1992, p. 45) with subsequent linguistic and rhetorical revisions to the text. Rhetorical goals are not set prior to writing but emerge during writing. Galbraith refers to this stance toward writing as "romantic" – an allusion to romanticist writers' departure from adherence to prescribed rhetorical formats.

Empirical studies on the effects of writing-to-learn instruction that is based on "shaping at the point of utterance" and "forward search" models are scarce. There is some evidence of the benefits of revising notes taken during lectures (Benton, Kiewra, Whitfill & Dennison, 1993) and of rereading and revising entries to a learning journal (Hübner, Nückles & Renkl, 2006). Moreover, studies from writing research indicate that expert writers revise their texts several times to increase the global coherence of their output whereas novice writers make mostly linguistic and rhetorical revisions at the sentence level (Klein, 1999). Theoretical considerations speak in favor of and against instructing writers to adopt a "romantic" stance when engaging in writing-to-learn activities. On the one hand, externalizing ideas in writing may free working memory capacity for deeper processing and the external representation may facilitate the drawing of inferences. On the other hand, the continuous text that is written spontaneously has to be processed in order to trigger idea generation and revisions which may actually increase working memory load (Torrance & Galbraith, 2006).

The "backward search" and genre models provide a different perspective on the self-regulation of writing than the models just described. Among the theories described as "backward search" models by Klein (1999), the Bereiter and Scardamalia (1987) model has been the most influential in writing-to-learn research. According to Bereiter and Scardamalia's *knowledge transforming* model, expert writers move between the content space, which represents their knowledge and beliefs about the topic they intend to write about, and the rhetorical space, which contains their knowledge and beliefs about the context of the writing activity and the rhetorical goals they intend to direct their writing at. As they move continuously between the two spaces, expert writers solve the "problems" of what to say and how to say it by setting rhetorical goals, breaking them down into subgoals, translating knowledge into text to satisfy the goals, checking whether the goals were met and revising the text accordingly. Moving between the two spaces is supposed to yield learning as writers transform, i.e. restructure, their knowledge as they do so. The Bereiter and Scardamalia model is similar to genre models of writing (Klein, 1999) in that self-regulatory processes directed at the production of high-quality text are considered essential to learning. The core assumption of the genre models (e.g., Langer & Applebee, 1987) is that writing genres impose specific structural, linguistic and rhetorical constraints. In order to meet the requirements of the respective writing genre, learners have to self-regulate their writing which in turn induces deep-level cognitive processes, for example, identification of links between arguments and critical evaluation of counterarguments in the case of a compare-and-contrast essay.

Most of the evidence presented in support of the Bereiter and Scardamalia (1987) model stems from studies comparing expert writers' strategies and novice writers' strategies. The studies converge on the finding that expert writers plan and revise their texts more often and at a deeper level than novice writers. And the extent of their planning and revision activities is related to the quality of the texts they produce (for a review, see Klein, 1999). Kirkpatrick and Klein (2009) recently demonstrated that training secondary students to use planning strategies when writing analytic essays increases the quality of the texts written by the students. As with most studies on writing, however, Kirkpatrick and Klein did not include outcome measures of knowledge in their study. There are studies which provide support to the assumption of the genre models. Langer and Applebee (1987), for example, reported on the positive effects of analytic writing on comprehension with secondary students. However, the link between the characteristics of writing genres and the cognitive processes supposed to be triggered by them has not been established.

As pointed out at the beginning of this section, the "shaping at the point of utterance" and "forward search" models and the "backward search" and genre models imply different approaches to learning by writing. Galbraith (1992) contrasted the "romantic" stance toward writing with that of Bereiter and Scardamalia (1987) and termed the latter the "classic" stance toward writing, referring to the strict adherence of the old Greek writers to stylistic conventions. The writer adopting a "classic" stance carefully plans what to write in which way and engages in self-monitoring during writing. In his study, Galbraith provided participants either with a "classic" writing instruction (writers were supposed to plan a text) or with a "romantic" writing instruction (writers were asked to write a text without focusing on its structure and rhetoric). Galbraith found support for the "romantic" approach. Writers who adopted this stance toward writing outperformed those who adopted a "classic" stance on measures of idea generation and knowledge acquisition. However, the participants in his study were not instructed to write in order to learn but to produce a piece of text about a topic of their choice. A controlled experiment including a typical writing-to-learn task is still missing.

Before we report on our study we now turn to research on learning by writing and its implications for writing-to-learn instruction.

Research on learning by writing

In the 1970s, researchers and educators began to advocate the inclusion of writing activities not only in language classrooms but also in mathematics and science classrooms in high school as well as at the post-secondary level (e.g., Fulwiler & Young, 1982). Although the voices of the *writing-across-the-curriculum* advocates have somewhat faded off their arguments stand strong. Writing has been shown to contribute to knowledge acquisition in a range of academic disciplines (e.g., Applebee, 1984; Connor-Greene, 2000; McCrindle & Christensen, 1995; Rivard, 1994) and to produce positive effects on academic achievement (Bangert-Drowns, Hurley & Wilkinson, 2004). However, the effects identified in writing-to-learn studies are typically small and found under certain conditions only. Nückles, Schwonke, Berthold and Renkl (2004), for example, showed that graduate students who engaged in journal writing over the course of a semester but were not instructed in writing to learn did not demonstrate use of deep-level cognitive strategies in their writing.

Studies such as that by Nückles et al. (2004) indicate that learners have to be provided with instructional support either before or while they engage in writing to learn. Writing research has converged on the findings that self-regulation characterizes skilled writing and determines students' written outcomes (for a review, see Graham & Harris, 2000). Therefore, instructional models of writing development, for example, the *self-regulated strategy development model* by Harris and Graham (1992) put strong emphasis on the teaching of self-regulation strategies, particularly planning, self-monitoring and revision strategies. However, self-regulation may not play the same role in learning by writing and may even be detrimental to learning (cf. Galbraith, 1992). With most academic writing activities (e.g., lab report, term paper, thesis) the texts produced by the students are judged against the standard or conventional characteristics of the respective writing genre. For information on the characteristics of well-written texts, students are expected to draw on the guidelines provided along with the writing task and on the knowledge of text genres which they have acquired through formal instruction and literary socialization. Students' success on a writing-to-learn task, however, is not evaluated based on the rhetorical and structural quality of the written product but based on their achievement on measures of knowledge, performance and academic achievement. Therefore, learners who invest limited cognitive resources (cf. Torrance & Galbraith, 2006) in self-regulating their writing so as to produce texts with certain rhetorical and structural characteristics may not succeed on writing-to-learn tasks.

The assumption that adopting a self-regulated stance toward writing can be detrimental to learning is refuted by the results of Bangert-Drowns et al. (2004). Based on their meta-analysis of school-based writing-to-learn interventions, Bangert-Drowns et al. concluded that metacognitive prompts were among the predictors of learning by writing. However, studies conducted in years following the Bangert-Drowns et al. meta-analysis have shown that facilitating metacognitive self-regulation via prompts may not be sufficient to secure the positive effects of writing to learn. In a study by Berthold, Nückles and Renkl (2007), for example, students were prompted to use cognitive strategies, metacognitive strategies, cognitive and metacognitive strategies or no strategies during writing. It turned out that metacognitive prompts per se did not have a positive effect on learning outcomes. The difference between the studies included in the Bangert-Drowns et al. (2004) meta-analysis and the Berthold et al. (2007) study was the nature of the writing-to-learn task. Berthold et al. had their participants write entries to a learning journal, a writing genre employed for the purpose of learning by writing only and characterized by few rhetorical and structural constraints (Nückles et al., 2004). Bangert-Drowns et al. (2004), however, meta-analyzed studies that included a range of writing assignments. With some writing genres (e.g., analytic essays) the aim of writing to learn - as opposed to learning to write or demonstrating knowledge - may not be salient (cf. Klein, 1999). Metacognitive prompts might take effect with such writing assignments because they direct the writer's attention to learning processes and away from the constraints implied by the writing genre.

Altogether, we argue that instructing students to adopt a self-regulated stance toward writing may not be effective with regard to learning by writing.

Research questions

As shown in the background sections, cognitive theories of writing and research on learning by writing do not allow firm conclusions as to the effects of self-regulation on learning by writing. As a consequence, it is still unclear which model of the writing process writing-to-learn instruction should be based on – should students be instructed to adopt a "romantic" or a "classic" stance toward writing when asked to engage in a writing-to-learn activity? We addressed this gap in research by conducting an empirical study. In particular, we were interested in the following questions: How do writing-to-learn instructions that differ with regard to the stance toward writing they induce impact on (1) the number and adequacy of ideas generated while writing an entry to a learning journal, (2) the acquisition of content knowledge, and (3) the quality of the written product?

Method

Participants and design

The study was advertised through flyers and posters on the campus of a medium-sized research university and involved a sample (n=87) of college students (n=79) and professionals holding a college degree (n=8). With the

exception of age, the subsample of professionals did not differ significantly from the subsample of college students on any of the control variables we assessed. The mean age of the total sample was 24.16 (*SD*=4.91). The mean age of the professionals was 27.38 (*SD*=2.87). Females (*n*=59) and males were evenly distributed among the conditions.

A 2x2 experimental design was used with participants randomly assigned to one condition: (1) self-regulated writing (*n*=23), (2) spontaneous writing (*n*=22), (3) self-regulated and spontaneous writing (combined instruction condition, *n*=21), (4) writing without instruction in writing to learn (control condition, *n*=21).

Procedure and writing-to-learn instructions (experimental variation)

All participants attended a 30-minute video-taped presentation on a topic from the field of educational psychology (cognitive architecture, cognitive load theory and worked-examples effect). They were not allowed to take notes while watching the presentation. Then they were informed about the general aim of writing learning journals (attaining deep-level comprehension and improving strategic learning) and received the writing-to-learn instruction of the respective condition. The spontaneous writing instruction contained three metaphors: Participants were instructed to engage in self-talk, to approach the task with a creative mindset and to treat writing as discovery. Thus, the instruction induced a "romantic" stance toward writing (Galbraith, 1992). In the self-regulated writing condition, the instruction centered on three metaphors. The metaphors were supposed to induce a "classic" stance toward writing (Galbraith, 1992): Participants were instructed to think of writing as rhetorical problem solving, to approach the task with an analytic mindset and to treat writing as a process of continuous reflection and revision. For the combined instruction, we integrated the spontaneous and the goal directed writing instruction. Hence, it contained six metaphors that instigated participants to set and monitor rhetorical goals, write down their ideas as they occurred to them and revise the text if necessary, thus treating writing as a self-regulatory activity and a process of self-talk and discovery at the same time. In the control condition, participants did not receive any instructions beyond the information about the general aim of writing learning journals.

We decided to use metaphors to induce specific stances toward writing for the two reasons. First, persons bound for or holding a college degree can be expected to have at least some experience in writing at an academic level and to have acquired strategies for writing over the course of their academic and professional careers. Therefore, a flow chart or other representation of a writing scheme (as often used in writing instruction) was likely not to be considered by the participants during the actual writing activity because of low perceived usefulness. Second, metaphors are well suited to assist learners in forming a conceptual model of a task as they illustrate complex concepts and trigger associations. Metaphors were successfully used as vehicles for instruction, for example, by Bromme & Stahl (2005) in a study on learning from hypertexts.

Measures and rating

Participants' knowledge of the presentation topic at post-test (after they had completed the writing-to-learn task) was assessed by means of six free-response items. Three items tested participants' understanding of the concepts directly addressed in the presentation (e.g., "Explain the types of cognitive load and how they interact."). The remaining three items required deep understanding of the presentation topic. Hence, these items addressed transfer of knowledge. One of the items described, for example, a classroom scenario in which students were unable to solve math problems on their own after having been presented one example. Participants were asked to explain the scenario from the perspective of cognitive load theory. We also administered a knowledge pre-test to assess participants' prior knowledge of the presentation topic. The knowledge pre-test consisted of four free-response items: One question on cognitive architecture, two on cognitive load theory and one on worked-out examples. The knowledge tests were graded for the overall quality of the answers on a six-point scale (following Biggs & Collis, 1982) and for the number of correct answers (post-test only). In order to be able to control statistically for other potential confounding variables, participants were asked to provide socio-demographic information and information on their prior experience in writing learning journals. They were also asked to rate the perceived helpfulness of the writing-to-learn instruction.

The texts produced by the participants were analyzed for the number of new ideas, correct statements and incorrect statements they contained. With regard to the quality of the written products, two independent raters assessed the structure and coherence of the texts and the degree to which deep-level cognitive (elaboration) and metacognitive (reflection) learning strategies were evidenced in the texts. Inter-rater reliabilities for these ratings were satisfactory (ICC_{unjust}=.71 to ICC_{unjust}=.76).

Results

The participants of the four conditions did not differ significantly with regard to any of the socio-demographic variables, their prior experience in writing learning journals, their performance on the knowledge pre-test and the amount of text they produced. Hence, the subsamples constituting the four conditions were comparable. Across conditions, participants reported low experience in journal writing (number of entries to learning journals written prior to participation in the study: *M*=3.47, *SD*=11.28).

A two-way univariate analysis of variance (ANOVA) with overall quality of the answers on the knowledge posttest as the dependent variable and α=.05 revealed a significant main effect for self-regulated writing, $F(1,83)=5.74$, $p=.019$, $\eta^2=.07$ (Figure 1). Further ANOVA analyses also yielded a significant main effect of self-regulated writing on quantitative performance at post-test (number of correct answers on the knowledge post-test), $F(1,83)=7.35$, $p=.008$, $\eta^2=.08$ (Figure 2). Hence, the participants in the self-regulated writing condition and those in the combined instruction condition learned less from writing the entry to the learning journal and acquired a more shallow understanding of the presentation topic than those who received the spontaneous writing instruction or no instruction in writing to learn (control condition).

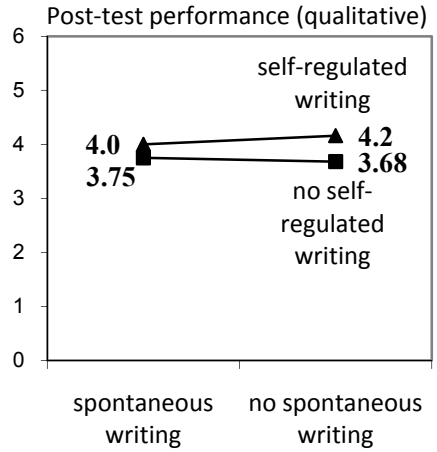

Figure 1. Main effect of self-regulated writing on overall quality of answers on the knowledge post-test (rated on a six-point scale with higher numbers indicating lower quality).

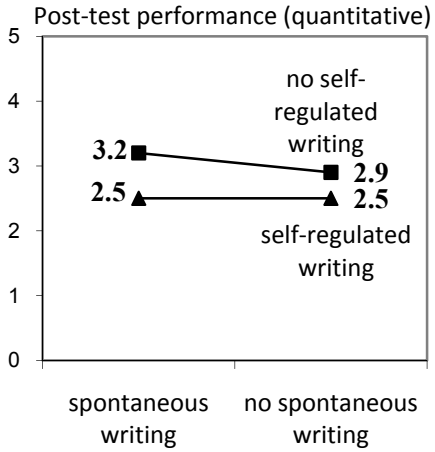

Figure 2. Main effect of self-regulated writing on number of correct answers on the knowledge post-test.

Similar findings emerged from the separate ANOVA analyses we conducted with the number of new ideas and the number of correct statements identified in the learning journals as the dependent variables: The participants who had been instructed to self-regulate their writing produced significantly fewer new ideas ($F[1,83]=4.37$, $p=.040$, $\eta^2=.05$) and fewer correct statements ($F[1,83]=7.41$, $p=.008$, $\eta^2=.08$) than those who had not been instructed to do so (Figures 3 and 4). In all of the four conditions, the average number of incorrect statements made in the learning journals was low. The highest number of incorrect statements was found in the combined instruction condition, followed by the self-regulated writing condition.

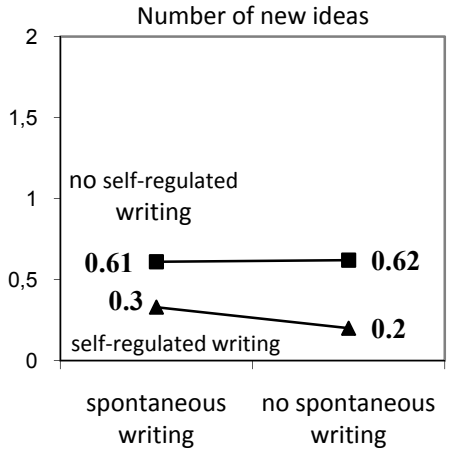

Figure 3. Main effect of self-regulated writing on number of new ideas in the journal entry.

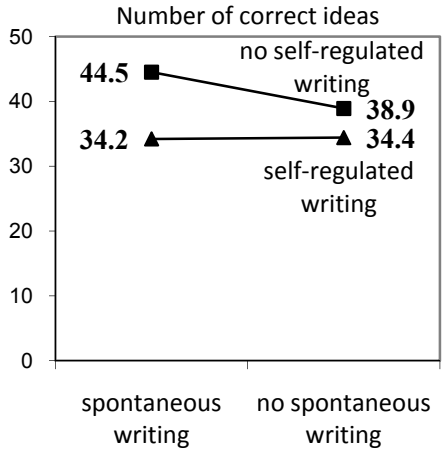

Figure 4. Main effect of self-regulated writing on number of correct ideas documented in the journal entry.

There were no significant differences between the conditions with regard to the quality of the written product (see Table 1 for means and standard deviations). Descriptively, however, participants who had been instructed to adopt a "classic" stance toward writing (self-regulated writing, combined instruction) received lower structure and elaboration ratings than those who wrote spontaneously or without prior instruction.

Table 1: Ratings of the quality of the journal entries written by condition

	Spontaneous writing condition	Self-regulated writing condition	Combined instruction condition	Control condition
Structure *M (SD)*	3.57 (1.50)	3.50 (1.53)	3.33 (1.27)	3.52 (1.53)
Coherence *M (SD)*	4.04 (1.58)	4.55 (.96)	4.00 (1.41)	4.00 (1.51)
Elaboration *M (SD)*	3.96 (1.49)	3.82 (1.22)	3.62 (1.49)	3.81 (1.25)
Metacognition *M (SD)*	2.04 (1.52)	2.50 (1.37)	2.24 (1.64)	1.48 (1.25)

Note. The journal entries were rated (separately on each dimension) on a six-point scale ranging from 1 (no evidence in the journal entry) to 6 (strong evidence in the journal entry).

Despite the differences in learning processes and outcomes between the four conditions, participants did not perceive the helpfulness of the writing-to-learn instructions to be different. An ANOVA with perceived helpfulness as the dependent variable did not yield a significant result, $F(3,83)=2.37$, $p=.077$.

Altogether, the following picture emerges from the analyses of the knowledge post-test and the journal entries written by the participants: Adopting a self-regulated ("classic") stance toward writing impeded learning (as evidenced by participants' quantitative and qualitative performance on the knowledge post-test). At the process levels of writing and learning, the results are somewhat inconsistent but also point toward negative effects of self-regulation on learning by writing.

Discussion and future work

The results of our study support the notion that learners should not be instructed to self-regulate their writing when they engage in a writing-to-learn activity. Not only did those writers whom learning by writing had been presented to as a self-regulated activity fare worse with regard to knowledge acquisition. There also was some indication that setting rhetorical goals, followed by planning, monitoring and revision of the emerging text exerted a negative influence on writing and learning processes: Writers who had been instructed to adopt a self-regulated stance toward writing were less successful at demonstrating idea generation, correct knowledge and high-quality writing than those who wrote spontaneously, in a "romantic" fashion.

Our findings corroborate the results of the study by Galbraith (1992) who found that writing spontaneously was superior to careful planning with regard to idea generation and knowledge acquisition. The results of the present study are also in line with recent studies on learning by writing which have called into question the sole effectiveness of metacognitive prompting (e.g., Berthold et al., 2007). Furthermore, the outcomes of the self-regulated writing condition and the combined instruction condition challenge the assumption that findings from research on writing and writing development can be generalized to learning by writing. The fact that the participants in our study were adults whereas those in most studies on writing development were children and adolescents might have played a role. But it is much more reasonable to assume that there are fundamental differences between the processes of writing to learn (and learning how to do so most effectively) and learning to write (cf. Klein, 1999). When designing writing-to-learn instruction this has to be taken into account. An interesting question would be whether changing the focus of the self-regulated writing instruction would have affected the outcomes of our study. In the self-regulated writing condition and in the combined instruction condition, participants were asked to monitor their understanding of the presentation topic but also to set and monitor rhetorical goals. This might have decreased the salience of the actual aim of the writing-to-learn task, i.e. knowledge acquisition. In the future, we plan to conduct a study involving two self-regulated writing conditions: In both conditions writers will be instructed to adopt a self-regulated stance toward writing - but the focus will be rhetoric and structure in one condition and on comprehension in the other. To our knowledge such a design has not been realized with a writing-to-learn task.

At first glance, the outcomes of the control condition do not seem to fit into the general picture that emerged from our study. The participants of the control condition showed strong performance on the knowledge posttest and the quality of their journal entries was almost as high as in the spontaneous writing condition. The apparent contradiction between these findings and studies pointing toward the ineffectiveness of unguided journal writing (e.g., Nückles et al., 2004) may be explained by the very nature of the writing-to-learn instructions. The instruction of the control condition asked participants to write in such a way as to obtain deep understanding but did not refer to any characteristics of the writing genre. This may have lifted the rhetorical and structural constraints off the writing-to-learn task that operated in the self-regulated writing condition and in the combined instruction condition but not in the spontaneous writing condition. Hence, participants in the control condition may have engaged in the same writing behavior and cognitive processes as those in the spontaneous writing condition. This explanation is somewhat speculative though as our design did not include a manipulation check on the experimental variation. Hence, we do not know how the participants processed and implemented the writing-to-learn instructions of the experimental and control conditions. Future studies should consider

analyzing the writing process itself (in addition to its product and outcomes) both at the level of writing behavior (e.g., via log-file analysis) and cognitive processes (employing a think-aloud methodology).

Another surprising finding is that we were unable to identify significant differences between conditions regarding the quality of the texts written by the participants. The descriptive differences, however, largely reflect the instructions the participants received in the respective condition. Participants who were instructed to adopt a "classic" stance toward writing demonstrated low cognitive-elaborative strategy use but relatively high metacognitive strategy use. Despite being instructed to self-regulate their writing they received lower ratings for the structure of their texts than the participants who had been instructed to adopt a "romantic" stance toward writing. In the present study, the lack of significant differences and the partially inconsistent results may be explained by the fact that the participants were inexperienced in writing learning journals and wrote a single journal entry only. Studies are needed in which participants write several entries to a learning journal over an extended period of time.

In conclusion, additional studies are required to further clarify the effects of self-regulation on the outcomes (and processes) of writing to learn. In addition to comparing writing-to-learn instructions which direct self-regulation either at text characteristics or at comprehension we suggest that process analyses and long-term interventions be carried out. Along the lines of Klein (1999), we hope to have reopened inquiry into metacognitive processes in writing to learn and sparked further discussion on effective writing-to-learn instruction.

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