Chapter 13

Developmental Trends in a Writing To Learn Task

Perry D. Klein, Jennifer S. Boman and Melanie P. Prince

Students’ writing strategies show considerable development during their school years; how does this affect their ability to use writing as a tool for learning? Students in Grades 4, 6, 8, and university, completed one of two physics tasks, and then wrote explanations as they thought aloud. Some students simply recorded their previous explanations, while others constructed more complex explanations during writing. A path analysis showed that educational level contributed to pre-writing science explanations and metacognitive writing operations; general writing strategy and pre-writing science explanations contributed to post-writing science explanations. This suggests that young students can use writing for learning, but older students can do so more effectively.

13.1. Introduction

Traditionally, cognitive research has focused on the causes of good writing: topic knowledge, strategies, working memory span, oral language ability, and so forth (e.g., Abbott & Berninger, 1993; Bereiter & Scardamalia, 1987; Butterfield, 1996; McCutchen, 2000). However, attention has recently turned to the cognitive effects of writing (e.g., Galbraith, 1999; Grabowski, this volume; Klein, 1999; Tynjälä, Mason, & Lonka, 2001; Piolat, this volume; Vernon, this volume). Considerable evidence now indicates that writing can contribute to students’ learning in content areas such as science and history (e.g., Bangert–Drowns, Hurley, & Wilkinson, 2004; Rivard, 1994; Wiley & Voss, 1999). Consequently, writing to learn activities have been implemented at every educational level, from elementary school through university (e.g., Audet, Hickman, & Dobrynina, 1996; Beins, 1993; Rosaen, 1990). This raises an important issue: during this developmental span, students’ writing changes profoundly (e.g., Beal, 1996; Bereiter & Scardamalia,
Does this change affect students’ ability to use writing as a vehicle for learning? And if so, how?

Developmental changes in writing can be broadly characterized as a gradual shift in the kind of processes that drive composing. For children in early elementary school, writing depends largely on language production processes and resources that are shared by speech. These include verbal intelligence, idea generation, oral vocabulary, and clause production (Abbott & Berninger, 1993; Berninger & Swanson, 1994; Berninger et al., 1992; Juel, 1988). Writing is also affected by mechanical skills, including handwriting and spelling (Abbott & Berninger, 1993; Berninger et al., 1992; Juel, 1988; Maki, Voeten, Vauras, & Poskiparta, 2001).

In the mid-elementary grades, language-production abilities and mechanical skills continue to affect the quality of students’ writing (Berninger et al., 1994; Graham et al., 1997; McCutchen, Covil, Hoyne, & Mildes 1994). Additionally, knowledge about genre such as narrative and exposition develops and contributes to writing (Berninger & Swanson, 1994; Donovan & Smolkin, 2002; Englert, Stewart, & Hiebert, 1988). Planning occurs, but remains largely local, i.e., focused on the upcoming sentence. Some planning occurs prior to writing, and contributes to its quality, but this remains sporadic, and consists largely of producing possible content. Students’ revisions address both semantic and mechanical features, but remain largely local, i.e., focused on the current sentence; when post-writing revision occurs, it often fails to improve the quality of the final text (Beal, 1996; Berninger & Swanson, 1994; Cameron, Edmunds, Wigmore, Hunt, & Linton, 1997; van Gelderen, 1997). To a large extent the process of text production continues to resemble that of speech production, so that pre-writing plans, first drafts, and final drafts have substantially similar content and language; think-aloud protocols taken during composition are often nearly identical to final texts (Bereiter & Scardamalia, 1987).

During the later elementary and secondary school years, students’ writing comes increasingly under the control of metacognitive processes (Bereiter & Scardamalia, 1987; Berninger & Swanson, 1994; Berninger, Whitaker, Feng, Swanson, & Abbott, 1996). Students supplement local planning with more extensive planning prior to writing. They also supplement local revision with post-writing revision; they become increasingly able to detect, diagnose, and correct errors, moving from surface level revisions toward text level revisions that can change the gist and quality of a composition (Beal, 1996; Berninger & Swanson, 1994). Students acquire explicit knowledge about writing and mobilize this to guide their writing behavior (Berninger, Whitaker, Feng, Swanson, & Abbott, 1996).

These changes amount to a qualitative shift from writing that is dominated by language production processes and mechanics, to writing that is guided by metacognitive processes. However, this does not imply a strict stage model of writing. The late-developing metacognitive aspects of writing complement, rather than replace, the early-developing language-production processes, and the language-production processes themselves continue to develop (e.g., Berninger & Swanson, 1994; Flower & Hayes, 1981; Torrance, Thomas, & Robinson, 1996). Moreover, the extent to which writers engage in metacognition depends on variables such as individual level of writing ability, personal writing style, rhetorical task, and availability of instructional assistance (e.g., Beal, 1996; Bereiter & Scardamalia, 1987; De La Paz & Graham, 2002; Levy & Ransdell, 1996; van Gelderen, 1997).