A Planning Process Model for Producing Written Texts

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I. Introduction

Previous research on L1 writing shows that composing processes consist of three major subprocesses, i.e., planning, translating and revising (Rohman 1965; Flower & Hayes 1981). In the model proposed by Rohman, three composing subprocesses—prewriting, writing and rewriting—are treated in a linear sequence: at the stage of "prewriting," the writer generates what he is going to write and organizes the ideas generated; at the "writing" stage, the writer translates the ideas into actual words on paper; and in "rewriting", the final act of composing, the writer evaluates and revises what has been written. Rohman indicated that these three stages are repeated in a linear sequence.

However, since the 1980's, this linear stage model of composing has been criticized by researchers who have tried to construct writing process models based on protocol analysis (Flower & Hayes 1981). They asked their subjects to think aloud, or say everything which came into their minds while writing, and found that processes such as planning, writing and rewriting occur not in a linear sequence, but in a recursive way. For example, when the subjects were rereading what they had written to find an expression incompatible with their beliefs, they found some information stimulated their imagination and suddenly triggered a new planning process. In this way, the three subprocesses can appear anytime during the composing process.

Planning processes are indispensable to writing because they include not only the processes of organizing the ideas and setting goals, but also generating the contents. Without ideas, one cannot start writing. The difference in planning processes is also associated with different levels of writing abilities. Good writers plan in various ways, not only retrieving ideas from long-term memory, but also creating goals, organizing ideas, and thinking about potential readers' expectations and discourse structures, while poor writers tend to be exclusively concerned about mechanics such as spelling or linguistic rules. Poor writers' planning lacks higher-level plans or goals compared with good writers' plans (Faigley *et al.* 1985; Flower & Hayes 1981b; Kaufer *et al.* 1986).

Although researchers (Faigley *et al.* 1985; Stallard 1974) point out that the planning stage is the crucial factor for good writing, no researcher has tried to construct a process model of planning. Planning processes have been described simply as a stage of the whole writing process.

The previous writing process models presented so far (Flower & Hayes 1981a; Scardamalia & Bereiter 1987) provide only insufficient description of planning processes. In these models, mental and physical aspects of planning are not adequately presented. Planning is treated simply as an invisible mental phenomenon, so that the process of planning activities through the interaction of written ideas and thought is not well described. Stotsky comments on this point:

In an article published in 1984, Linda Flower and John

Key words: composing, internal reprocessing, planning process, prewriting, process model, reviewing, revising, writing model.

> Hayes define planning as a "broad cognitive process" that includes such processes as finding a focus, incubation, "getting it right with oneself," and discovering what one means. Planning, they suggest, is "the purposeful act of representing current meaning to oneself." According to Flower and Hayes, planning also involves "basic cognitive operations" such as generating information, organizing information, and setting goals. Defined in this way, planning is a mental activity that seems to refer to any kind of relevant symbolic thinking occurring before or during the act of writing (1990: 38).

But we frequently observe that people write notes on paper first, then start arranging the ideas by using the notes, which is a physical manifestation of planning. As Stotsky argues, the interaction between thought and written language during planning can be observed in the protocol during composing. Hence, it is impossible to have a proper understanding of planning processes without considering the influence of written text on planning and the interaction between written ideas and thought.

The purpose of this paper is to construct a model of the planning process which can explain the mental and physical aspects of planning.

II. Writing Process Models in Flower & Hayes (1981a) and Scardamalia & Bereiter (1987)

Firstly, a brief review of the two major writing process models presented in Flower and Hayes (1981a) and Scardamalia and Bereiter (1987) will be provided. Then, how planning processes are treated in these models will be analyzed.

Flower and Hayes constructed their model (Figure 1) using thinking aloud protocols as their data source. Three major elements are presented in the model: *task environment, writer's long-term memory*, and *writing process*.

Task environment includes two constituents: *the rhetorical problem*, and *text produced so far*. These two parts influence the writing processes from the outside of "the writer's skin" (1981a: 369). Issues included in the *task environment* are *topic, audience* and *exigency*. Once the writer starts to produce a written text, the growing text, called *text produced so far* in the model, as an additional factor, affects the ideas which the writer is

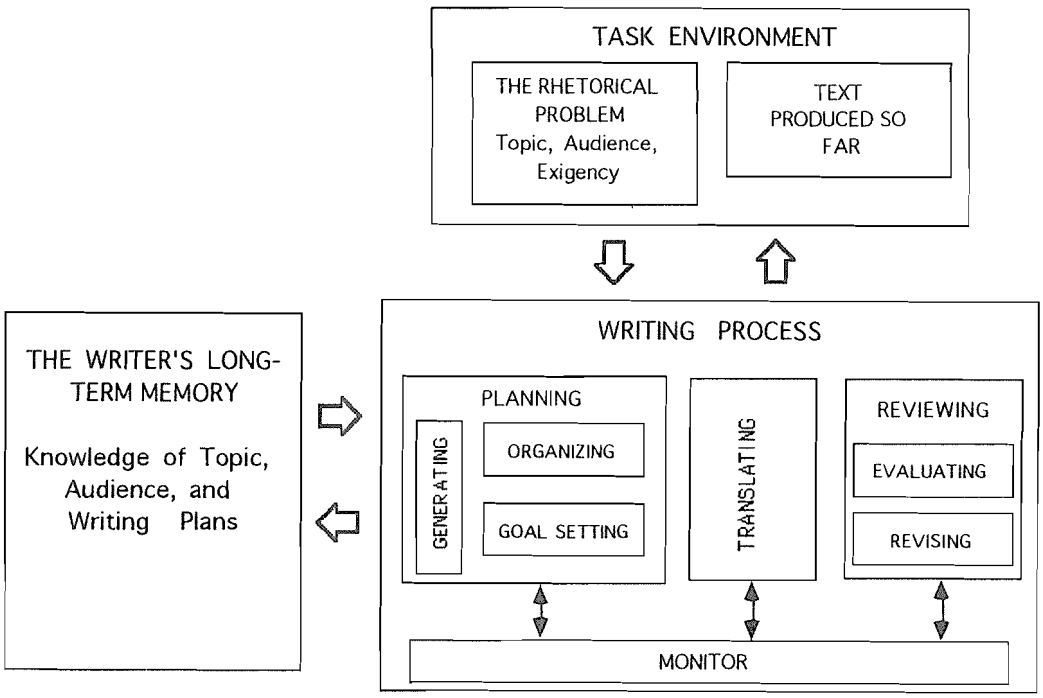

Figure 1. Structure of the Writing Model in Flower & Hayes (1981a)

going to write.

Another element which interacts with *writing processes* is the *writer's long-term memory*. The writer, when given a topic, accesses the knowledge stored in the long-term memory and retrieves ideas in relation to the cues he finds in the topic, genre, and rhetorical assignments.

The main part, *writing process*, is divided into three different subprocesses: *planning, translating*, and *reviewing*. *Planning* can be also separated into three basic subprocesses: *generating, organizing*, and *goal setting*. In *generating*, the writer generates the ideas by interacting with the long-term memory. The *organizing* process takes over the task of selecting the materials necessary for the paper out of the retrieved information, and the task of organizing these materials or deciding the order of presenting these materials. Furthermore, Flower and Hayes point out that the *organizing* process is not limited to the act of deciding the order of idea presentation, and that the process is also very significant for creative thinking:

> The process of organizing appears to play an important part in creative thinking and discovery since it is capable of grouping ideas and forming new concepts. More specifically, the organizing process allows the writer to identify categories, to search for subordinate ideas which develop a current topic, and to search for superordinate ideas which include or subsume the current topic (1981a: 372).

The other major aspect of *planning* is *goal setting*, which is one of the factors distinguishing good and poor writers because poor writers tend to compose without thinking of goals. Existing goals are occasionally retrieved from the writer's long-term memory, but usually goals are created and modified throughout the composing process.

In the process of *translating*, the ideas are put into invisible linguistic form and then into written language. The writer has to transform the representation of images into syntactically and lexically appropriate written English.

The process of *reviewing* is broken up into two subprocesses: *evaluating*, and *revising*. *Evaluating* is to read and evaluate what the writer has written in the light of the goal, the plan or the image. *Revising* is to change or modify the parts the writer feels it necessary to change.

All these processes are directed by the *monitor*, which can trigger any process when necessary. For instance, while rereading what was written for revising, the planning process can be called in anytime if the writer finds some cue for retrieving relevant information from the long-term memory.

The most important thing about this model is that these processes and subprocesses are "not fixed in a rigid order," but can be "called upon at any time" during composing (1981a: 375).

Scardamalia and Bereiter (1987) proposed two models, the knowledge-telling model (Figure 2) and the knowledge-transforming model (Figure 3), which focus on the differences in writing processes by mature and immature writers. The knowledge-telling model tries to capture the writing processes of immature writers, and explain how immature writers can compose without goal-directed planning which is infrequently found in the thinking-aloud protocol of immature writers (Burtis et al. 1983). On the other hand, the knowledge-transforming model accounts for mature writers' composing processes, which reflect "certain complex problem-solving procedures" (1987: 143).

Writers who employ the knowledge-telling process compose as follows. Given a certain writing task, the writer starts accessing the knowledge stored in the long-term memory, and retrieves the information relevant to the current topic or the genre of the task. If the writer judges that the information drawn from the long-term memory is useful and appropriate, he transcribes it on paper. Once a text is produced, it can also be used as a springboard or cue for subsequent memory search. However, the materials are retrieved from the long-term memory as a result of the association of ideas so that there is only "a built-in tendency toward relevance" (1987: 144). The selection of the materials does not reflect rhetorical requirements such as potential readers' background knowledge or the goal of the paper. Consequently, the information written in the product is coherent to the writer himself, but may not be so to readers.

The knowledge-transforming model, which describes mature writers' composing processes, assumes interaction between two different kinds of problem

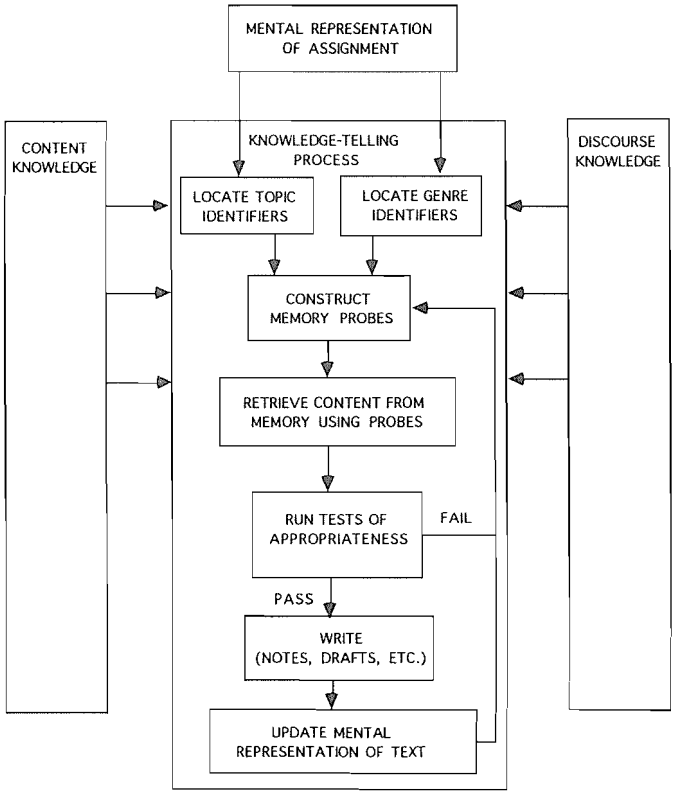

Figure 2. Structure of the Knowledge-telling Model. Scardamalia & Bereiter (1987: 144)

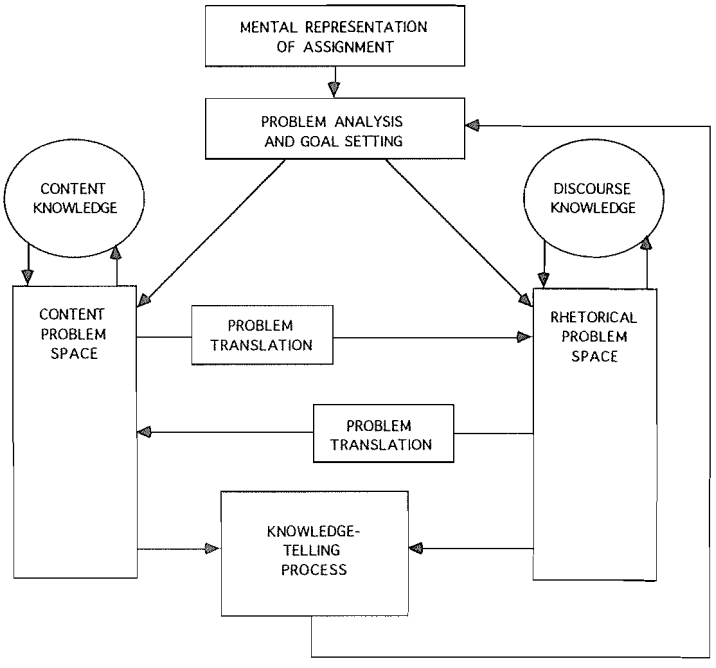

Figure 3. Structure of the Knowledge-transforming Model. Scardamalia & Bereiter (1987: 146)

spaces: the *content problem space* and the *rhetorical problem space*. The memory search itself is performed in the same way as the process of the knowledge-telling model that is incorporated as a subprocess in the knowledge-transforming model, but unlike the knowledge-telling process, problems in the *rhetorical problem space* are translated into ones in the *content problem space* and vice versa. For example, when a writer finds that certain information is too abstract for readers, he translates the problem into the *content problem space* and generates more specific examples. Knowledge-tellers, to begin with, do not take readers' points of view, and if they judge that certain material is too difficult for the potential readers, they just discard the material and try to think of a new idea.

III. Mental and Physical Aspects of Planning

Hayes and Flower presented the first version of their writing process model (Figure 4) in 1980, in which they hinted that writers occasionally produce written notes in the acts of *generating* and *organizing*. In their model, however, those visible written notes were not differentiated from the ideas appearing in the writer's head. Texts produced through the process of *translating* are defined as being "acceptable written English sentences" (Hayes & Flower 1980:15) and must have "the form of complete sentences" (1980: 15). Notes produced during *generating* or *organizing*, or "short bursts of writing" (1980: 22) must be, in most cases, not complete sentences. It is clear that those notes are not considered as the product from *translating*. Taking into consideration that only the texts from *translating* are treated as entities outside the writer according to the arrow pointing from *translating* to *text produced so far* in Figure 4, it seems reasonable to assume that Hayes and Flower took the notes that emerge during *generating* or *organizing* not as something which affects the writing process from the outside of the writer, but as something which plays the same roles as invisible mental constructs.

The act of organizing done only in the head of the writer, however, would be quite different from that of

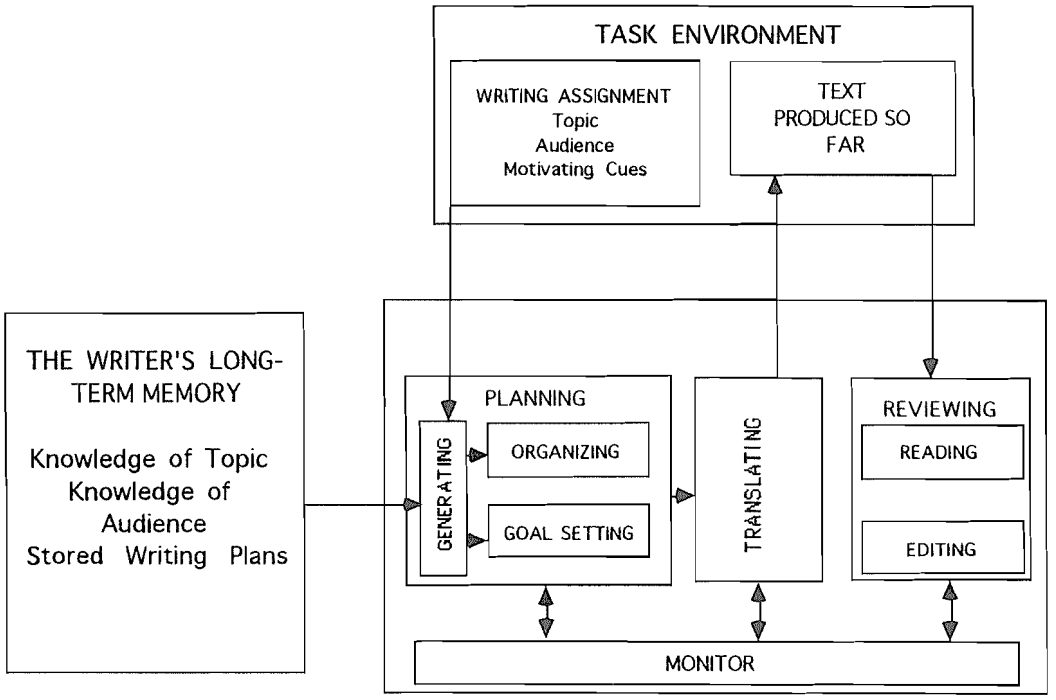

Figure 4. Structure of the Writing Model. Hayes and Flower (1980: 11)

organizing with the support of the ideas written on paper as an exterior memory storage unit in terms of working memory capacity.

In a subsequent paper by Flower and Hayes (1981a), their conception of planning as a mental operation became clearer. In this article, they specified planning processes as follows: "In the planning processes writers form an internal *representation* of the knowledge that will be used in writing" (1981a: 372). They clearly understood the act of planning as being limited to invisible mental operations. Transcribed words produced through the process of *translating*, i.e. "the process of putting ideas into visible language" (1981a: 373), are the targets exclusively for *reviewing*, not for *planning*, according to their explanation.

They stated that in the act of *reviewing*, written words can be a springboard for subsequent planning. Specifically, some written words being checked under the act of *reviewing* can be detected by the *monitor* as cues for further memory search. They did not, however, conceive of written words as a unit processed in planning.

Although Flower and Hayes (1980) presented a protocol in which Wendy, one of their subjects, showed the interaction between written ideas and thought for organizing, this type of interaction is not treated as such in Flower & Hayes (1981a). When Wendy had trouble in organizing her ideas, "she told herself to 'write a bunch of ideas down and connect them later'" (Flower & Hayes 1980: 46). What she produced here is not a text that is the target for revising, nor a written plan which can work as a guideline for developing the text. What Wendy produced was the materials for organizing. After she squeezed out all her ideas, she organized the materials, adopted some of them, and threw away the others. In other words, she performed the process of organizing physically and visibly on paper. Wendy is not a rare example of taking this type of strategy for dividing planning processes into independent stages or reducing the constraints of writing. Witte's (1987) Michelle also wrote down her content ideas on paper first, and instead of moving on to the stage of writing a connected text, she started planning again:

> In her second episode, Michelle transcribes content ideas as notes (designated in the protocol below by small capital letters), which she repeatedly studies throughout the reminder of the protocol. Episode 3 is primarily an organizing episode, in which Michelle numbers in order of importance the notes she had previously transcribed (1987: 409).
>
> Episode 1: (1) o.k.... (2) I think they should hire the woman... (3) but I don't know how to say it convincingly... (4) ummm...I guess I need a strong opening statement... (5) that would be convincing... (6) I guess I could start out by saying that...that I think the woman... (7) that we should hire the woman and (8) then explain why... (9) and then maybe I'll come up with a strong statement at the end... (10) or maybe I can just list all the reasons why... (11) why I think we should hire the woman... (12) and...and then try and write a convincing statement...
>
> Episode 2: (13) o.k....now...let me get...get hold of these thoughts going on in my head... (14) yeah... o.k....I think we should HIRE THE WOMAN... (15) because...well...because SHE'S QUALIFIED... (16) so at least SHE KNOWS...knows what? (17)...that should show she knows WHAT SHE'S DOING... (18) and having the most EXPERIENCE isn't always the...the most important thing... (19) besides you have to... you CAN'T BE BORN WITH...EXPERIENCE... (20) you have to get it somehow... (21) you have to acquire it... (22) the TWO GUYS HAVE MORE EXPERIENCE...but it [*i.e., the assignment sheet*] says...says that...SHE HAS ALL THE...the QUALIFICATIONS... (23) so if the woman...so if a woman...so if the woman has... (24) yeah...and if the woman has the EDUCATION... (25) that at least shows...she has the PONTENTIAL do to the work... (26) also the IMPRESSION that she... (27) that the woman gives in the interview would be... (28) could be a...a DETERMINING FACTOR... (29) she demonstrated that...that she's BRIGHT... (30) she demonstrated that she's bright... (31) must have impressed the boss... (32) and...and...has the CAPABILITIES to...to...deal with situations... (33) that...that...were unfamiliar... (34) o.k....I think this is enough listing...
>
> Episode 3: (35) now...I have to figure out now... (36) how...how to say it... (37) I don't know what else to...what I want to say... (38) I mean I wonder if I should list more... (39) I may need a stronger argument... (40) one...four....that'll be five...six [*subject numbers the notes she has previously written on the assignment sheet*]... (41) five and six are o.k.... (42)

> even four...five and six are o.k.... (43) one...two... and three are not very strong... (44) number six is good... (45) also number five... (46) well...that could go with six... (47) the fact...the fact that the woman does have the education... (48) which could give her the potential... (49) o.k....so five and six are good... (50) that'll make a good strong statement... (51) o.k....I think that...o.k....I'll start off with number six...and say that... (52) that we should hire Ms.X... (Witte 1987: 409–410).

> With her written notes before her, Michelle could presumably begin transcribing connected written text. However, she does not. Instead, she moves back into a planning mode in Episode 3,... (1987: 413).

Wendy and Michelle were actually not in the act of reviewing what they had written, but in the act of planning by arranging written ideas. To put it differently, their acts of planning were processed half internally in the head and half visibly on paper. They did not switch from a reviewing to a planning process, but remained all the time in the act of planning and simply switched the mode of the organizing process from a mental and invisible activity to a mixture of mental and physical activity.

The knowledge-telling model developed by Scardamalia and Bereiter also fails to clarify the differences in the mental and physical aspects of planning processes. They state that in the knowledge-telling model they try to "capture essential features of immature composing" and show "how text generation can take place under these circumstances without the need for an overall plan or goal" (1987: 142–3). As described above, knowledge tellers compose by association of ideas. A growing text as well as a given topic serve only as cues for further memory search, so that the interaction observed between thoughts and visible language in the knowledge-telling process takes place only in generating—the planning process of "what to say next." Unlike Wendy or Michelle, knowledge tellers do not interact with the written ideas for *organizing*. It seems, therefore, understandable that the act of planning visibly on paper is not described in the knowledge-telling model.

Good writers tend to employ strategies of dividing a heavy task into manageable pieces to reduce the cognitive burden. Careful planning of an overall text is also said to be a characteristic of good writers. In that sense, a dynamic interaction between written texts and thought during planning should be represented in the knowledge-transforming model—a model of mature writers' writing processes.

Knowledge transformers generate texts through the interaction between *content problem space* and *rhetorical problem space*. Scardamalia and Bereiter touched on the possibility that this interaction between the two problem spaces is a mental and physical operation as well, citing an example from Burtis et al.:

> In a study reported in Burtis et al. (1983), students were asked to plan and take notes before writing an assignment. Since the knowledge-telling model is geared to text generation, it would be expected that immature students' notes would closely resemble text. Students following a knowledge-transforming model, however, would be expected to represent a variety of ideas in notes that were not simply ideas for inclusion in a text. Figure 4 [not given in the present article] shows notes typical of 10-year-olds in the study. They are essentially texts written in list form. In contrast, the notes of graduate students are more like worksheets (1987: 154).

The knowledge-transforming model itself, strangely, did not focus on the differences between mental and physical aspects of planning processes. The type of interaction between visible language and thoughts observed in the graduate students' notes was not presented in the knowledge-transforming model.

The ideas or the texts produced through the interaction of two different problem spaces, according to Scardamalia and Bereiter, may lead to planning, i.e. another cycle of thinking and discovery, but may be left on paper as they are, unless they provide the new items of knowledge which are translated back into new content problems or rhetorical problems. The written ideas produced by writers such as Wendy and Michelle are the rough materials yet to be sorted out or organized, so they are not as developed or sophisticated as the ideas from knowledge-transforming processes. To put it differently, written ideas produced by the knowledge-transforming process are at a different level from the written notes produced by Wendy and Michelle.

IV. Planning Process Model

In this section, a process model (Figure 5) which focuses on the act of planning during composing will be presented. The model is proposed to overcome the deficiencies in the models presented previously. The unique features of this model are as follows:

1. **The mental and physical aspects of planning processes are presented.**
2. **The differences in planning process between mature and immature writers are explained.**

For convenience of explanation, each subprocess and route of interaction is numbered, but the numbers do not indicate the order of processing.

When writers are given a certain writing task, the task is first processed in *planning*. As shown in Flower and Hayes' model, *planning* includes *goal setting, content generation* and *rhetorical planning*. Mature writers move back and forth among these three subprocesses (Flower & Hayes 1980), but immature writers exclusively devote their energy to generating contents in response to the topic without considering the purpose of the paper or rhetorical requirements (Scardamalia & Bereiter 1987).

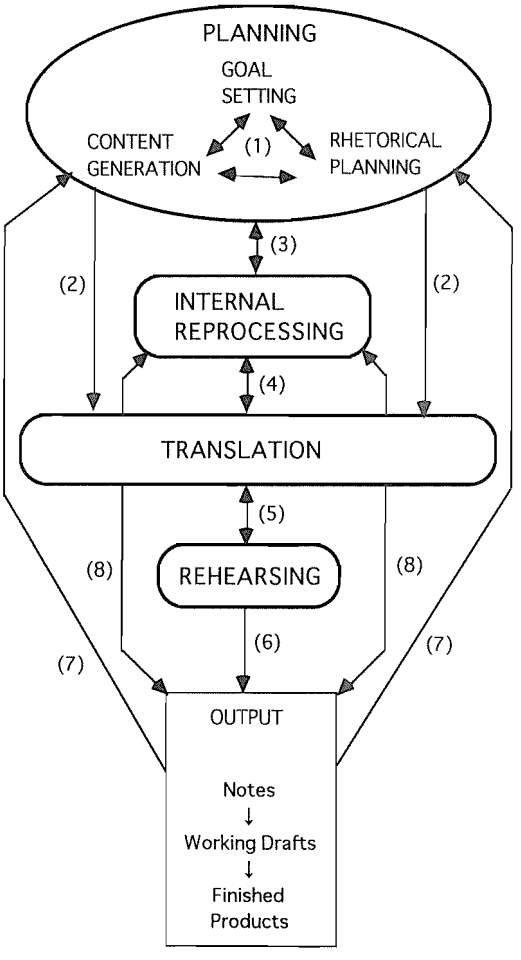

Figure 5. Planning Process Model

Before the ideas are translated into syntactically well formed sentences, they are checked and reevaluated in light of the goals created through the process of *planning* and rhetorical requirements, and then organized in *internal reprocessing*. However, if the writer decides to delay organizing the ideas due to a high cognitive burden, or employs the strategy of writing down whatever comes to his mind, the ideas generated in *planning* directly go to the process of *translation*.

In *translation*, the ideas "represented in a variety of symbol systems other than language, such as imagery or kinetic sensations" (Flower & Hayes 1981a: 373) are put into linguistic forms. But, unlike the *Translating* process in Flower and Hayes' model, before being transcribed into visible forms on paper, the ideas are first translated into some mentally translated entities, which Witte (1987) calls "pretext."[1)]

Those mentally translated sentences are rehearsed internally or often vocally in *rehearsing* just at the point of transcribing. If pretexts do not express the right images of the ideas, fail to catch nuances of the writer's own thought, or do not fit grammatically with the previous sentences, they are brought back into *translation* and re-translated into other expressions. But it must be noted that *translation, rehearsing* and transcribing visibly on paper often occur simultaneously.

Visibly written *outputs* are labeled as *notes, working drafts* or *finished products* according to the writer's sense of completion or the strategies the writer employs. *Notes* include everything from brief records for aiding memory to tentatively written ideas waiting to be sorted out, organized, or used as cues for subsequent memory search. That is, *notes* are in most cases produced on paper without being processed in *internal reprocessing*. *Working drafts* are products between *notes* and *finished products*, and mainly the target for the revising process. *Working drafts* are perceived as

tentatively finished products which can be revised not only locally but also globally, but unlike *notes*, they have at least been once screened and organized in terms of a goal or plan. *Finished products* refer to products writers do not feel any necessity to retouch. A written product is placed on a continuum from *notes* to *finished products*, but the label can be changed to another one if the writer's perception of the written product differs. As *working drafts* are the targets for revising, *notes* are mainly the materials for *internal reprocessing*. Any of those three written products can serve as cues for *planning*.

V. Implications of the Model

According to the present model, the interaction between thought and written ideas for planning can be described in a way similar to the following description of *notes*. If a writer judges that *notes* need to be screened in terms of appropriateness, or reorganized for effective presentation, they are brought back into *internal reprocessing* and reprocessed in the light of the goal or overall plan created in *planning*. Thus, *internal reprocessing* treats both the ideas generated internally and the ideas transcribed visibly on paper. For the type of writer who thinks out the ideas carefully and tries to produce as perfect sentences as possible from the beginning, the internal or invisible interaction between *planning* and *internal reprocessing* indicated as route (3) would be busy. For another type of writer who produces and transcribes as many ideas as possible without censoring them, and organizes those ideas later, the interaction labeled (8) between written products and *internal reprocessing* would be observed.

Thus, whereas the models presented in the previous section do not provide a clear distinction between these two types of planning processes, the present model can explain the differences. It can offer the basis for investigating how arranging the ideas visibly on paper instead of in a limited workspace of working memory influences final products. The model also provides a theoretical foundation for pedagogical practices. For instance, when dealing with immature writers who use the written ideas only for further content generation—one of characteristics of knowledge tellers—teachers often advise them to reflect on the appropriateness or relevance of the ideas in terms of the goal and rhetorical situation. In this case, these writers can activate the interaction marked (8) between written ideas and thoughts in *internal reprocessing*. This must be distinguished from the advice to students to "think it out before you write on paper," because the latter is expected to activate the interaction (3) between *planning* and *internal reprocessing*. According to the models presented in the preceding section, those two teaching methods would be interpreted to activate completely different processes of the models, i.e. revising and planning.

Another feature of this model is that it can describe the differences between mature and immature writers in terms of the gap between actual states of written products and writers' perception of those products. That is, mature writers have a proper understanding of the states of their products, while immature writers do not. Mature writers, regardless of writing styles, perceive well what their products lack. For example, if they write on paper whatever comes to their minds, they are aware that these written notes are incomplete and need to be rethought before being put into final products. In contrast, when immature writers produce incomplete *working drafts*, they tend to misinterpret them as different states of products such as *finished products*. Even if they perceive that their products are not satisfactory, they frequently ignore their perception because they are often concerned with lower level goals such as avoiding making any grammatical and spelling mistakes, or simply because they want to get finished with the task. In fact, comparing the revisions by 20 experienced adult writers and 20 college freshmen, Sommers (1978) found that the student writers typically considered their first drafts as conceptually finished ones, needing only mechanical revisions and lexical changes.

Labeling processes precisely, irrespective of their being visible or invisible, is a prerequisite for analyzing writing processes. For example, researchers (Crowley 1977; Hayes *et al.* 1987) studying revising processes by mature and immature writers claim that mature writers make more global revisions than immature writers. However, since the dichotomy of being visible and invisible applies to the analysis, if manipulating written texts visibly is classified only as a revising

process, the visible act of planning that writers such as Wendy or Michelle did on paper can be misinterpreted as revising, which inevitably leads not only to inaccurate understanding of writing processes, but also to wrong judgements of writers' abilities due to a number of macro revisions. Indeed, Faigley and Witte (1981) counted the number of revisions visibly made on paper at several levels such as *formal changes, meaning-preserving changes, microstructure changes*, and *macrostructure changes*, and found that mature writers made fewer *macrostructure* changes than immature writers contrary to their expectation. But if they had gathered and analyzed verbal protocols during composing, they might have found the mature writer subjects devoting more of their energy to internal reprocessing of the ideas before transcribing rather than revising them after having transcribed. Thus, proper understanding of writers' revising processes requires the accurate measurement of planning processes because these two processes are two sides of the same coin. Classified this way, it will be possible to investigate whether mature writers spend more time for both planning and revising than immature writers, or whether a relation of planning and revising activities is that of a trade-off; that is, more planning leads to less revising, and vice versa.

VI. Concluding Remarks

Producing written connected texts involves complex cognitive operations. As stated in Hayes and Flower (1980), even protocol analysis can provide only an incomplete record of composing processes. In addition, during composing, writers not only perform mental operations, but interact with previously written sentences at various stages of their composing. For example, the act of rereading earlier sentences takes place as a planning strategy as well as a subprocess of revising. In this way, as visible language influences a writer's planning, the act of planning should not be confined solely to a mental operation.

The planning process model presented here can describe the act of planning as a physical operation as well as a mental operation. This model can provide a point of departure for further research on planning processes, and for studying the interaction between written texts and thought in planning. At the same time, this model can offer another perspective for diagnosing the difficulties of immature writers.

Note

1. The term *pretext* is explained in Witte (1987) as follows:

   As the term is used here, *pre-text* refers to a writer's tentative linguistic representation of intended meaning, a "trial locution" that is produced in the mind, stored in the writer's memory, and sometimes manipulated mentally prior to being transcribed as written text. As mentally generated and stored "trial locutions," pre-texts have both a semantic and a syntactic component, and they may take the form of phrases, dependent clauses, sentences, or sentence sequences. Pre-texts differ, therefore, from all nonlinguistic representations of intended meaning such as nonverbal images and feelings. Pre-texts also differ from the more abstract plans writers generate. What distinguishes a pre-text from an abstract plan is the former's approximation to written prose. Unlike many plans, which can and do exist independently of linguistic structures, pre-texts are characterized by such structures. A pre-text represents, in effect, the writer's attempt to instantiate abstract plans and goals in linguistic forms. Thus distinguished from abstract plans and goals, pre-texts represent critical points along a continuum of composing activities between planning and transcribing written text.

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