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Reporting Design Principles for Effective Instruction of Writing: Interventions as Constructs*

Gert Rijlaarsdam, Tanja Janssen, Saskia Rietdijk, and Daphne van Weijen

Interventions as Constructs

Meta-analyses of intervention studies in writing show that various types of interventions vary in the extent that they promote writing skill (Hillocks, 1986; Graham, McKeown, Kihara, & Harris, 2012). These types are broad clusters of interventions like ‘collaboration’, ‘summary writing’ and ‘strategy training’. In meta-analyses it is difficult to provide insight in the distinctive features of types or groups of interventions, but in research papers on single interventions, the intervention itself is rarely laid out fully for the reader who wants to gain insight in its intricacies and thereby find out what its crucial ingredients could have been. While in various research fields working groups set up schemes for complete reporting on intervention studies, (Altman, Schulz, Moher, Egger, Davidoff, Elbourne, Gøtzsche, & Lang, 2001; Mayo-Wilson, Grant, Hopewell, Macdonald, Moher, & Montgomery, 2013; Moher, Schulz, & Altman 2001),¹ the stress is on covering all elements of the procedures important for replication, but not so much on the content of the intervention itself. For studies in the field of learning and instruction however, it is also important to get grip on especially the content of the interventions. While a certain standard is usually adhered to when reporting about the dependent variables (variables, instruments, indices for validity and reliability), such a standard is lacking when reporting the independent variable: the intervention as a complex and hierarchical program of teaching and learning activities. This hampers replication and concurrent studies, theory building, and communication about effective writing instruction. It also hampers the dissemination and implementation of effective interventions

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1 See www.consort-statement.org, and www.equator-network.org.

into practice, which, besides theory building, is the ultimate goal of educational intervention research. When the basics of the intervention are unclear, this could result in invalid implementation in the classroom.²

We see an intervention as a—complex, multidimensional—construct, that must be defined at one hand and operationalised at the other hand. Reviewers must receive enough information to evaluate the construct and the way it is operationalised. Since most research journals are now published in digital format, with options to add digitalized information on the content and structure of the intervention, lack of space is no longer a valid argument for omitting accurate descriptions of interventions. The aim of this Volume is to present the design principles and their operationalisations of strategy instruction programmes analytically, since this category of instructions proved to be so effective (Graham & Perin, 2007). Then this Volume would provide researchers and educational designers with the ingredients of the effective writing programmes. As a side product, we would like to design and illustrate a reporting system for interventions in writing research. In this chapter, we aim to explore such a reporting system for interventions in writing, illustrated with examples from the other chapters in this Volume. The exploration must result in a system that could be used in research papers on writing intervention research. Such an initial standard table for reporting writing research interventions might become part of author instructions.³ The restriction to just one category of writing interventions makes it possible to compare the design principles and the way they are operationalised in various interventions and educational cultures.

When we consider interventions as constructs, the parallel with the dependent variable in a research question is obvious. These constructs must be well chosen in line with the research question and theoretical framework presented. When one claims an effect of intervention *x* on writing skill *y*, then writing skill *y* must be defined, and operationalised. The same holds for *x*, the intervention or independent variable.

2 Digital publishing does help a bit to understand the intervention. Intervention materials can easily be added now in digital environments. But even if these materials are available online, like the research instruments are available in appendices, this is not sufficient to estimate the quality of the intervention. Therefore we need an theoretical account for the basic structure of the intervention/the lessons/the learning materials, that relates this specific intervention to a larger group ('type') of interventions, as if they are operationalizations of a certain construct.

3 In fact we aim to expand the standard element in APA's Journal Article Reporting Standard for describing interventions analytically (see VandenBos, 2010, p. 249).

The first level of the definition of an intervention contains the design principles that were set. These principles are the parameters of the intervention-as-construct. The principles define the intervention, like the construct-to-measure defines the operationalisation of the construct in items or rating scales, like ‘Text Quality in this study is defined by Relevant Content, Rhetorical Organisation and Accuracy’.

The second level contains the intended learning activities. Design principles create the space for educational designers to program the learning activities that represent these principles. Intended learning activities are then operationalisations of these principles. Here we see the parallel with reporting the dependent variables. Reporting intended or programmed learning activities, representing a design principle, is as reporting items of an instrument that represents a certain construct. The report must provide reviewers and readers with sufficient information so that they can assess the validity of the operationalisation, for the experimental as well as for the comparison condition (concurrent experimental and/or control condition). The information must provide a basis for a validity check.

Such a report could also contribute to wider, more informed, and more precise dissemination and implementation of the results. Design principles can be used by curriculum designers, course developers, teachers and researchers as guidelines for designing new or adapted writing courses and curricula. The learning activities reported make clear what design principles mean and can make their implementation and/or subsequent comparative research more accurate.

In this chapter we will explore what a descriptive system for interventions may consist of. We will start by building the definition of the design principles in interventional writing research, and then apply the system to some of the chapters in this Volume and end with a first version of a reporting scheme.

Design Principles

The concept of design principles is not new. Researchers often use statements to define their interventions. What we would like to do is to set up a *system* to make it easier to define interventions, and to guarantee a certain level of completeness.

Let us start from scratch, with an example from writing research. Englert, Raphael, Anderson, Anthony, and Stevens (1991) distinguished three general teaching principles for good strategy instruction in writing:

- a) Emphasize the role of dialogue in writing development (social dialogue becomes internalized as private inner speech or self-talk);
- b) Provide scaffolded instruction (providing temporary, adjustable support);
- c) Transform solitary writing into a collaborative activity (interaction between readers and writers in a literacy community).

These three teaching principles define the space for choices teachers must make when they set up writing lessons in the spirit of Englert and her co-workers. These teaching principles are instructional design principles. They are imperatives: ‘emphasize’, ‘provide’, ‘transform’. The additions between brackets provide information of various sorts: about the rationale of the principle (‘social dialogue becomes internalized as private inner speech’), clarification of the term used (‘providing temporary, adjustable support’), or an example of the principle (‘interaction between readers and writers in a literacy community’). We will try to align these three statements.

We can transform two of the three principles into “if-then” statements:

Principle (a): *If you aim to achieve internalization of social dialogues as private inner speech or self-talk, then emphasize the role of dialogue in writing development.* Here the aim is the intended learning outcome (private inner speech), which will probably take place when social dialogue takes place in writing lessons.

In a rule format: If private speech/self-talk development [learning outcome] is the aim, then social dialogue [learning activity] must take place. The designer’s task is to define such instructions that such a social dialogue takes place and that the process of internalisation will take place.

Principle (c): *If you aim to transform solitary writing into a collaborative activity, then create interaction between readers and writers in a literacy community.* Here the aim is that learners must experience the relation between reading and writing,—writing has a complement in reading. This experience is a learning activity, to be realised by creating a literacy community of writers and readers in the classroom, the instructional activity.

In rule format: if experiencing writing-reading [learning activity] is the aim, then a literacy community [instructional design] is necessary. What is left out here is the rationale for the learning aim or learning outcome: why should learners experience that writing has a complement in reading? As writing researchers we can fill in the blank, but any five researchers who do so will generate at least two, and probably more, rationales or learning outcomes.

For Principle (b) such a means-end-analysis does not seem to apply. The aim of the action is kept implicit: If you aim at x, then provide scaffolded instruction/temporary, adjustable support. The imperative, the preferred teaching

action—provide scaffolds—has no explicit goal, no intention, no direction, no rationale.

From analysing this example we learned that complete statements about an instructional design describe means-end-relations, in which (1) the learning activity is central, (2) the learning activity should have an aim as complement (the learning activity has a goal, an expected outcome), and (3) the learning activity is a result of or stimulated by an instructional action.

Basic and Variable Principles

We will elaborate on this scheme later in this section. To get a better grip on design principles, we move to literature from instructional science. Reigeluth (1999), one of the founders of instructional design research, distinguished two types of design principles: basic and variable principles. A basic principle describes a relationship that is always true under appropriate conditions regardless of the program or practice involved. Merrill (2002) labels these basic principles as First Principles. He assumes that there can be only a few first principles of instruction that connect programs, practices and design theories. He claims that when a given instructional program violates or fails to implement one or more of the first principles, there will be less learning and performance. Therefore, he defines these first principles as prescriptive rules or 'laws'.

Probabilistic Design Principles

Reigeluth (1999) and Koper and Tattersall (2005) take a somewhat more moderate stance about the lawfulness relation in First Principles. They define design principles as probabilistic. Applying a rule does not guarantee that we reach the desired outcome, but it does increase the probability that we will reach this outcome. The argument is that using design rules will probably result in better courses than ad hoc and random decisions about course design. However, a humbling argument is that our understanding of learning and teaching is still underdeveloped: "They [design principles] are necessary but not sufficient for the production of excellent tools for practitioners, essentially because of our current far-from-complete understanding of learning and teaching" (Burkhardt, 2006, p. 232).

Note that design principles are not value free, but relate to certain pedagogical and psychological ideologies or preferences, and therefore may be culturally bound and time-dependent. What works in one culture, might not fit in another culture, not only because of the conditions required for implementation, but also at the level of First Principles. For instance, in Western writing education, students are stimulated and often expected to deliver a draft for

teacher comments, but this is not done in East-Asian, Confucian traditions, in which the norm is that students should not bother their highly respected teachers with unfinished texts (Nguyen, 2012).

We conclude that basic design principles (1) express a means-end-relationship, (2) connect variation in practices and programmes on a basic level, abstracted from the intervention-as-implemented, and (3) as a set predict the quality of learning when implemented adequately. When a design principle has been implemented, and the actual implemented programme or intervention did not work, then there are two potential explanations for this lack of effect. It might be due to inappropriate conditions (Merrill, 2002, p. 43), or, if conditions were appropriate, the principle must be reconsidered from a theoretical point of view. Here again we notice the similarity with the dependent variable in a study: when no effect of the intervention is observed, one reason might be that the measurement and/or the explanatory theory was not valid.

Learning Activity as Basic Unit of Description

A proposal for how to formulate design principles as heuristic guidelines is provided by Van den Akker (1999). His mapping sentence reads as follows:

If you want to design intervention X [for purpose/function Y in context Z]; then you are best advised to give that intervention the characteristics C₁, C₂, ..., C_m [substantive emphasis]; and do that via procedures P₁, P₂, ..., P_n [procedural emphasis]; because of theoretical arguments T₁, T₂, ..., T_p; and empirical arguments E₁, E₂, ... E_q.

This format is meant for course designers, and overarches the whole process of designing, including the process of designing itself (“via procedures for educational design P₁, P₂, ..., P_n”) as one tries to find cost optimal procedures for educational design, such as rapid prototyping. For setting up a system for a research report we focus on two components in this mapping sentence: (1) the characteristics and (2) the theoretical arguments:

If you want to design intervention X [for purpose/function Y in context Z]; then you are best advised to give that intervention the characteristics C₁, C₂, ..., C_m [substantive emphasis]; because of theoretical arguments T₁, T₂, ..., T_p

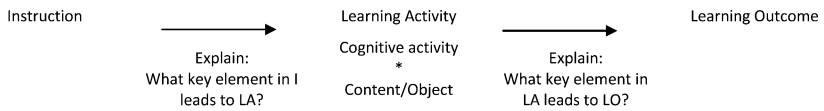


FIGURE 12.1 *Learning activity as mediating variable*

We see the—string of—intended learning activities as the basic characteristics of an intervention. On the lowest level of implementation, a design principle describes what should be done (instruction activity) to stimulate a learning activity in students, that results, theoretically, in a certain learning result for students. A learning activity is a building brick in a larger scenario, that contains acts or units.

Learning activities are defined as “(...) any activities of an individual organized with the intention to improve his/her knowledge, skills and competence.” (Classification of Learning activities, Manual, 2006). The activity must be intentional (as opposed to random learning), so the act has a predetermined purpose. A single learning activity is defined as being ‘characterized by unity of method and subject’. This means that each time there is a change in method of learning or subject of learning, the learning activity will change: a learning activity is a cognitive or meta-cognitive activity that deals with a certain content or object.

In a lesson, course, or intervention, a learning activity is a mediating variable between the instructional act and the learning outcome. The learning activity is activated by something (a teacher, the student himself/herself, a prompt in a program) to achieve something else (the target variable being related to writing proficiency in our case) (see Figure 12.1, adapted from Bimmel, Canton, Fasioglu, and Rijlaarsdam, 2008).

When designing an intervention, the key decision is to choose the learning activity that one thinks is the best option for realizing a certain outcome or experience. This decision is based on experience, theory or research. In most cases, the designer will generate a series of learning activities, with sub-products or outcomes that support the continuation, as it is the object for a next learning activity. Learning activities then form clusters. In Table 12.1, we provide examples of responses to the analytic questions that relate learning activities, instructional activities and learning results to each other.

To stimulate the learning activity, the designer must prompt the learner: with a motivational cue, a task (an aim), an instruction (‘how to’, ‘what to’), a facilitating worksheet and other supporting materials.

The three cases in Table 12.1 read as a theoretical account of design decisions: a certain learning activity is prompted for a certain reason. The learning activity and aim are theoretically connected in a means-end relation. The learning activity is prompted in a specific instructional environment, optimized in accordance with certain rationales or theoretical considerations. When reporting on an intervention, we need to provide the whole scheme for each *crucial* learning activity:⁴

1. Description of the learning activity, which contains a cognitive activity operating on content, that
2. most probably, in accordance with some rationale, will lead to a specified outcome, and that
3. is prompted under specified instructional conditions, which,
4. most probably, in accordance with some rationale, will lead to activation of the learning activity.

Empirically Based List of Learning Activities in Writing Interventions

Defining learning activities in writing programs is not easy, as we experienced in a seminar on effective ingredients of strategy oriented writing interventions (Amsterdam, May 2012). In this seminar, participants (writing education experts, curriculum designers, teachers) attempted to extract the basic ingredients or design principles from interventions that proved to be effective. Five programmes were presented, four of which are represented in this Volume (Harris and Graham, Fidalgo, Mason, Martínez). During the seminar we applied a Delphi-type method. First the researcher presented the intervention with a focus on the learning activities. Then participants extracted the elements they found crucial, shared them in pairs to select one crucial element, and then

4 As part of a research project, interventions and measurements ought to be piloted. For measurements we have statistical indices to check reliability and validity. For checking the independent variable, we can collect data on feasibility, fidelity and perceived effects for instructors and participants. What we might consider to report is the validity of the intervention/course/lessons: therefore we need a document that outlines the independent variable as construct, and relates the units (learning activities, presented in an hierarchy) to the operationalization (learning materials). A panel of specialists (three?) creates a validity report, via some Delphi procedure.

TABLE 12.1 *Three examples of learning activities in writing lessons aimed at learning-to-write and writing-to-learn*⁵

Learning activity

Label/Describe:

Explain:

Why is the Learning Activity most probably effective for the Learning outcome?

What is a crucial, obviously effective Learning Activity?

This Learning Activity is probably effective because (The learning outcome is usually mentioned in this statement).

Learning activity:

Rationale: leads to ... because

1. *Compare and contrast* via observation of two different approaches of a (sub) task in writing (models);
2. *Content*: can be applied to all subtasks in the writing process (generating, structuring information, applying a strategy, processing of feedback etc.).

Comparing and contrasting of approaches leads more or less automatically to evaluation and abstracting information. This information about a writing (sub) process then becomes part of the learner's writing process repertoire.

5 The cases are generated from the data we collected in the Amsterdam Strategy Writing Seminar, details about that seminar are provided on pages 287 and 292.

Instructional activity/requirements

Label/Describe:

What is crucial, obviously effective to get a student involved in this particular Learning Activity?

Explain:

Why is this instruction most effective to stimulate this Learning Activity?

*This Instructional Activity is most probably effective, because ...
(What is the power of the Instructive Action?)*

Paradigm

Potentially best conditions:

1. Availability of different 'models' (live, audio, visual, video).
2. Task (compare/ who did a better job, why?)
3. Task (compare / does my own approach resemble the approach of model A or B? What can I learn from each model?)

Rationale: because ...

1. Variation in modelling behaviour increases learners' repertoire and stimulates comparison/ analysis/ reflection.
- 2 & 3. Observing *an sich* is not enough for learning; observing can be seen as data collection, and a task (compare/ evaluate) as a stimulus to work on these data.

Features of writing processes may become more clear by using different (contrasting) models of writing processes, and by focusing on comparing/ evaluating those models. This is necessary in order for learners to be able to apply those features in their own writing process, and extend their repertoire.

Learning to Write

TABLE 12.1 *Three examples of learning activities in writing lessons (cont.)***Learning activity**

Learning activity	Rationale: leads to
<p>1. <i>Write</i> a short narrative, based on an element of a story that will be read later (a title, a first paragraph, a closing paragraph, an illustration);</p> <p>2. <i>Content</i>: can be applied to all kind of texts-to-be-comprehended as pre-reading task.</p>	<p>Writing activates genre knowledge and world knowledge, and former experiences. This supports students' understanding of the text to be read.</p> <p>When students compare their own text with the original text, they see that one can make choices: a story is not fixed, it is something that is constructed.</p> <p>When writing precedes reading, engagement in reading the story will be stronger than without writing.</p>
<p>1. <i>Process</i> feedback (<i>data processing: collect, organize, select data</i>) from <i>readers</i>:</p> <p>2. <i>Content</i>: can be applied to all kind of texts, especially when the communicative setting is ill defined.</p>	<p>Rationale: leads to ... because ...</p> <p>Feedback from <i>readers</i> is real: the author/learner experiences what a text <i>does</i> when a reader processes the text. Learners construct the idea that texts are being read, that readers bring in their own background and qualities, and that the text must deal with this variety to reach its goal.</p>

Instructional activity/requirements

<p>Potentially best conditions</p> <ol style="list-style-type: none"> 1. Story choice (must evoke the students' interest) 2. Should students start by comparing the stories they have written? With what effect? 3. Create a task for comparing students' own story to the original. Focus on the different choices authors may make, and the effects of those choices. 	<p>This Instructional Activity is most probably effective, because it stimulates learners to "think as an author" while reading a text. This may lead to the insight that a text/story is something that is constructed, and based on choices. The question then is: how did the author solve the problem of writing this text?</p> <p>Writing one's own version of the text first may also lead to a higher level of engagement during reading, and more appreciation of the author's skill in telling a story.</p>	<p>Writing to Learn (in literature lessons)</p>
<p>Potentially best conditions:</p> <p>Best option is that the author <i>experiences</i> the reader's process as actual data.</p> <p>Create quality input:</p> <ol style="list-style-type: none"> 1. Set a writing task in which classroom peers/students can be the intended and actual readers. 2. Provide multiple readers per text. 	<p>Rationale: because ...</p> <p>When authors experience how readers processes the text, they have direct insight in the interaction between reader and text ('online'), without interference from the jargon of the literacy lesson. As soon as rubrics or feedback schemes are provided, the reader moves from a reader into an instructor role. (This could be a next step.)</p>	<p>Learning to write / Writing to learn; depends on focus of feedback</p>
<p>Create support for handling data:</p> <ol style="list-style-type: none"> 3. Provide authors/learners with worksheets to organize their feedback, and then to make choices from the multiple interpretations. 	<ol style="list-style-type: none"> 1. Including readers and writers in the same group may create a community of 'communication researchers'. 2. When multiple readers are involved, authors experience that multiple interpretations of a text exist, and that in principle, multiple interpretations of texts are valid. 3. Collecting and organizing feedback data is a complex cognitive and affective task. Providing students with support may help them overcome hindrances, and help them to focus on the content of the feedback, i.e. similarities and differences between readers. 	

Presentation:
 Participant:

Effective Learning Activity (LA) as I observed in the presentation	Explanation: LA leads to ... (output/results)	Effective instruction/task (I), that leads to learning activity	Explanation: I is effective, because	Reference to observation
What is a crucial, obviously effective Learning Activity?	LA is effective because ... (probably here you will refer to the aim of the activity)	What is crucial I, that causes that LA to happens? (If you want that LA to happen, then do I)	I is effective, because (what is the power of I?)	
1				
2				
etc.				

FIGURE 12.2 *Design rules/parameters to be filled in individually*

shared and discussed the findings in small groups. Finally each group presented three to four ingredients they found most crucial.

We used data forms, with a focus on learning activities to support the participants (see Figure 12.2).

We collected and typed out all individual and group datasheets, identified the learning activities in the reports, and tried to group and synthesize the learning activities iteratively, starting with the findings of the six small groups, then adding data from the individual datasheets if these contained new learning activities. In this process of coding and synthesising, we encountered two problems which might also play a role when instructors or researchers must report on the construct of the independent variable.

The first problem was that participants focused on (1) the instructional support for the main components of the writing process: planning, organizing, translating, editing and revising, monitoring, and (2) the instructional process as a whole (observing, practicing, collaborating, memorising strategies, scaffolding, dialogue and discussion in the context of composing a text, etc.). What participants selected as effective from the presentations were in many cases procedural facilitators the instructor provided to support processes such as revision: offering students worksheets, or working in pairs. All these instructional devices were intended to steer and guide the activity of writing, planning and revising, creating the opportunity to successfully accomplish the activity, raise self-confidence, lower the writer’s cognitive load etc. Thus, participants focussed on the conditions that supported the probability of success, which,

of course is what instructors do: they attempt to optimize the success of an instructional action. But our aim was not to identify effective instructional facilitators, but to identify crucial learning activities.

Our second finding was that participants found it difficult to identify and label learning activities. In many instances they agreed upon a certain element in an intervention that they found effective. For instance, the idea that students 'pretested' their texts by having them read by a real (or simulated) audience or that they designed their own guide for how to synthesize a text, got much support (see example 3 in Figure 12.1). But participants only generated views on learning that did not go beyond expressions as 'this motivates students', 'great for ownership' etc. when they started discussing what might have *caused* the effect. Reconstructing which cognitive activity was triggered by this particular lesson situation proved to be difficult. The learning activity seems to be the black box in teaching.

Having said that, we cannot present the ultimate set of learning activities that are crucial for strategy oriented writing education. But when we tried to ignore all bias in the data we come to the following set of six categories of learning activities.

Observing/Noticing

Observing is what we may call a first principle of learning in writing instruction. It applies to various objects: texts, strategies of all kinds of sub-processes, genres, communicative contexts, feedback. There is a wide variety of actual implemented forms ('operationalisations'): observing and/or analysing and/or evaluating one text, or comparing texts, or scale texts, seeing one model (a teacher, a peer, a professional writer) thinking aloud, or comparing two or more of these models (live, on video). The model can think aloud, using a script, showing or not showing the text in progress (on the video, on the smart board), showing the process for a text with the same topic as the students got or not, students may make notes or not, must answer or ask questions, can include emotional self-regulation or not etc. etc. The key factor is: *students must observe (and notice ..., and internalize ..., and represent ...) when learning to write.*

When we analyse the participants' explanations in the seminar more precisely, we see that observation can include comparing, contrasting, labelling, or remembering. It serves the identification of crucial elements and structures between elements, through abstracting and generalisation.

Generative and Divergent Thinking

Generative thinking plays a role in pre-writing activities, goal-setting (for learning, for writing), generating content to write about, creating responses to authors (feedback), thinking about possible applications (generalizing to contexts), and students are asked to generate multiple responses. Generative thinking is not only an ingredient of learning-to-write but of learning in general (Wittrock, 1992).

Generative thinking can include pure association, retrieval, combining, transformation, comparing, contrasting, synthesizing, and relating. It serves the ideation of text when writing and reading, but also the processes of problem finding, problem solution, strategy construction, and is relevant in learning-to-write and writing-to-learn programmes.

Analysing/Synthesizing/Representing: Reprocessing

Students must constantly work on input. They must work on what they have observed and noticed, and what they generated. They re-represent the writing task, the text(s) they must study to include in their paper, the generated elements to include in their text, the peer's text they must provide feedback on, and the processes they observed. Students must comprehend all this external and internal input. They must analyse, relate, abstract, synthesize, and build an internal representation of the task, the text, the strategy, and the writing process. What writers and learners-to-write do is reprocess the available and or newly created internal and external materials. Reprocessing is a key element of rich and effective writing processes (Bonk, Reynolds, & Medury, 1996; Scardamalia & Bereiter, 1985)

Convergent/Evaluative Thinking

What is generated in response to tasks and sub-tasks must be weighted, selected and evaluated. Such objects can vary in writing lessons; elements of the text to be written, solutions for an exercise, elements for feedback, elements of the text as it is written, as text-written-so-far, or the text as whole. Convergence and evaluation follow generation and exploration.

Convergent and Evaluative thinking can include selecting, prioritizing, or checking. It serves the ideation of text when writing and reading, but also the processes of goal setting (for writing: rhetorical goal, for learning: learning goal) and strategy selection.

Structuring/Relating/Ordering

Students must group and relate elements (of all kinds) hierarchically, must create patterns based on elements to write about, arguments, genre charac-

teristics, positive and negative aspects, cause and effect, chronology, or multiple causality etc. Structuring can include relating, ordering, clustering, coordinating, or sub-ordinating. It serves the structure of text when writing, the structuring of the writing process, but also the processes of learning from writing and reading (the preparation for remembering, recall).

Practising/Consolidating/Applying/Automatisation/Transfer

In learning skills like writing, deliberate and intentional practise supports the automation of certain writing sub-skills: applying genre patterns, sub-skills like generating and revising, motor skills, and fluency (Kellogg, 2008). Also, transfer: applying what has been learned to new tasks, texts, contexts.

Once we had created these categories from the data, we went back to the data and collected the verbs used when participants labelled learning activities and related outcomes. We classified them according to the six categories. Table 12.2 provides a classification of verbs that refer to learning activities. We checked the chapters of this volume on the use of verbs describing learning activities, and added them to the list. This list and categorization is just a beginning: categories overlap, activities may appear in more than one category. Nevertheless, this scheme may serve as heuristic to transfer programme descriptions that focus on instruction to descriptions that focus on learning.

A Full Account of Writing Interventions: Instructional Theory

Design Principles for Writing-to-Learn or Learning-to-Write interventions must be centred around learning activities (see Table 12.2 for categories). These activities are learning activities, as they aim to create a learning outcome. If a learner wants to achieve y , she should probably do x . To get learners engaged in such learning activities, the instructional environment must stimulate these activities. The creator of the intervention must estimate which instructional activity or tool (teacher, material) will most likely trigger that learning activity. This implies that three sets of theories play a role in designing interventions in writing research and writing lessons:

1. *Theory of writing*: the fundamental cognitive and verbal, affective, and regulative processes in writing texts, and, in the case of writing-to-learn, fundamental in creating knowledge via writing. Theories of writing provides the learning objects for learning-to-write programmes and learning activities for writing-to-learn programmes. For the theory of writing we may use the major components of Hayes' model of writing, that has been

TABLE 12.2 *Categories of learning activities and their operationalisations from Amsterdam (May 2012) data, with activities added from chapters in this volume*

Categories of learning activities	Verbs used to describe learning activities
1. Observing/ Noticing	focus attention, imitate, mobilize effort, monitor, motivate, observe, persist, produce self-talk, self-questioning, underline ...
2. Divergent/ generative/ explorative thinking	activate prior knowledge, create mind map, construct, elaborate, explore, generate, ...
3. Analysing/ Synthesizing/ Representing	abstract, analyse, compare, comprehend, copying, diagnose, generalize, highlight ideas, integrate, note-taking, pretest text, recapitulate, represent, revise, review, schematize, sharing, transfer, understand, verbalize, visualize, ...
4. Structuring/ Grouping/ Relating	categorize, compare, connect, contrast, impose structure, link, mind map, organize, ...
5. Convergent/Evaluative thinking	advise, assess, check, choose, evaluate, explain, instruct, pick a goal, select, remove details, revise, select, set a goal, ...
6. Practising/ Consolidating/ Applying/ Automation/ Transfer	automate, create, help (use writing to extent memory), use records (linking words, strategy charts), dialogue/negotiate (working in pairs, collaboratively), memorise, practice, reflect, repeat/reiterate, rehearse, seek social assistance, thinking aloud while doing a task, transfer, ...

proven to explain almost 90% of the quality of written texts (Breetvelt, Rijlaarsdam & Van den Bergh, 1994): Planning (goal-setting, structuring, generating), formulating, transcription, reading, evaluating, revising, editing, monitoring, etc., and the knowledge domains these activities interact with. In learning-to-write learning programmes these activities are the purpose of instruction, in writing-to-learn programmes they are the means for content learning. To write effectively, one must master all of these cognitive activities to some degree: these are objects of learning (learning-to-write) or learning activities (writing-to-learn).

2. *Theory of learning to write*, that is about relations between learning activities, elements of the writing process, and learning results. For instance,

when the object of learning is structuring ideas, one can choose to activate observing (category 1 in Table 12.2) when introducing new ways of structuring, to activate practising (category 6) when students already have access to structuring strategies, or to activate detecting hierarchies in ideas (superordinate, subordinate, and coordinate) (category 4 in Table 12.2). We want to make a distinction between the activity of generating ideas in the light of creating a text and generating when a learner is learning how to generate ideas. The aim of the activity is then learning—learning how to generate—and not so much: writing. The learning activity of how to generate might be embedded in a text production task, as a means to motivate the students for instance, and to integrate the learning activity in a real task so that learners experience the effect of the learning activity. So when we provide a learner with a strategy to generate ideas, for a specific genre like the narrative, the generation process is executed with two results: (1) ideas to choose from for text production, and (2) the experience that this strategy works, for this genre. The issue here is what aim/result was the main focus of the instructor and the learner? When learning is an informed activity, for the instructor and the learner the learning aim must be dominant. From descriptions of earlier writing interventions it has become clear that activities were focused on learning about writing and not ‘just’ on text production (Rijlaarsdam & Couzijn, 2000).

3. *Instructional theory of writing*, concerns optimizing the learning environment—the instructional conditions and activities—and learning activities. The designer now has to decide what the best option is to get students in an effective observing mode, or to get students motivated to practise, or motivated to sort ideas and place them in hierarchies. Here we can use the work done by Merrill (2002) that we will present in the next section.

General Instructional Theory for Writing Interventions: Merrill's First Principles

David Merrill made it his life work to identify prescriptive principles that are common to the various instructional theories (Merrill, 2002). It is worthwhile to investigate whether the principles he distilled also fit, albeit in a somewhat altered form, in learning-to-write and writing-to-learn programs. There is no need to reinvent the wheel.⁶

6 There are other lists of key-ingredients available that one wants to consider. On <http://www.apa.org/ed/precollege/ptn/2015/09/top-20-principles.aspx> Nancy Fenton applies the Top 20

TABLE 12.3 *Merrill's first principles*

Learning is promoted when

1. Learners are engaged in solving real world problems.
 2. Existing knowledge is activated as a foundation for new knowledge.
 3. New knowledge is demonstrated to the learner.
 4. New knowledge is applied by the learner.
 5. New knowledge is integrated into the learner's world.
-

Merrill presents his five First Principles, each with some corollaries, and shows that these relate to major learning and instructional theories. To explore how valid these five principles are for education in writing and writing research interventions, we will first present this framework, and then apply it to learning-to-write and writing-to-learn lessons. The principles are presented from an instructor's point of view, and we will see that learning activities are embedded in most of these principles. We have put them in italics to visualize the relation with our set of learning activities in Table 12.2.

Principle 1: Problem centred: learners must *engage* in complete real-world problems. That is: the task is a whole task rather than just separate components, and must be representative of a task that learners may encounter in real life.

1.1: Show task: learners must be able to *observe* the task that they will be able to do or the problem they will be able to solve. This helps students to *orientate* their learning more than a verbal statement of learning goals ('after this course you will be able to ...').

1.2 Task level: learners must *engage* at the problem or task level, not just the operation or action level. It means that learners are not just 'doing the operations of the task' but are involved in the complete *constructive* process of *problem solving*: *representing* the problem, *analysis* of tasks that help solve the problem, *fine tuning* what operations are required, and *operating* and *monitoring* the tasks.

1.3 Problem progression: learners must *solve* a progressive consecutive number of problems that are explicitly compared to one another.

principles to the design of Psychology courses. The Top 20 principles from psychology research is set up by APA, see <http://www.apa.org/ed/schools/cpse/top-twenty-principles.aspx>.

Principle 2: Activation. Learning is promoted by *activating relevant previous experience*.

2.1 Previous experience: this means that students must *recall, relate, describe* or *apply* knowledge from relevant past experience that can be used as a foundation for the new knowledge. This works when learners have such experiences, and are provided with an opportunity to *demonstrate* what they already know or can do.

2.2 New experience: learners are provided with *relevant experience* that can be integrated with their new knowledge.

2.3 Learners are provided with or encouraged to *recall* a structure that can be used to organize their new knowledge.

Principle 3: Demonstration ('Show me'). The instruction or instructor *demonstrates* what is to be learned (rather than *telling* students what is to be learned).

3.1 Demonstration consistency. This demonstration needs to be in line with the learning goal: (a) provide examples and non-examples for concepts; (b) provide demonstrations for procedures; (c) provide visualisations for processes; (d) provide modeling for behavior.

3.2 Guidance: (a) direct learners to relevant information (specification of structural features of the problem at hand); (b) support learners to *tune their mental models* by providing multiple representations for demonstrations or *compare* multiple demonstrations.

3.3. Relevant media. Use multiple forms of media that do not compete for attention.

Principle 4. Application ('Let me'). Learners use their knowledge or skill to solve problems.

4.1 Practice consistency. *Practice* and target behaviour must be consistent.

4.2 Diminishing coaching. Appropriate feedback and coaching, including *error detection* and *correction*, must be gradually withdrawn to support self-related learning.

4.3 Varied problems: provide a sequence of varied problems to solve. These could gradually become more complex problems/tasks.

Principle 5. Integration. Learners are encouraged to *integrate* (transfer) their new knowledge or skill into their everyday life.

5.1 'Watch me'. Learners have the opportunity to *publicly demonstrate* their newly acquired knowledge.

5.2 Reflection. Let learners *reflect* upon, *synthesize*, discuss, and defend their newly acquired knowledge.

5.3 Creation. Let learners *create, invent, and explore* new and personal ways to use their new knowledge.

Applying Merrill's First Principles to Learning to Write and Writing-to-Learn Programs in this Volume

If these five first principles are generally applicable, and predict good learning, as Merrill claims, we expect that we will find these principles in the descriptions of the writing programs in this Volume. This is not an exhaustive analysis: we selected four chapters, two on Learning to Write (Fidalgo and Torrance; Harris and Graham) and two on Writing-to-learn (Foxworth and Mason; Martínez, Mateos and Martín), and did not take into account the materials in the e-book materials that accompany this volume. It is not meant as a critical analysis of the programmes, but as a demonstration to relate Merrill's first principles to writing programmes as they are presented in this Volume. It is just a demonstration how the system to describe interventions would result when we go through the descriptions provided in these chapters. When we see something, it is because there is a match between our system and the analytic descriptions provided. When we miss something, it might be due to the description (the real intervention is different from what was available here), or it was there but we didn't pick up on it, or it is indeed not an element of the intervention, for good reasons. This might imply that our system is not valid.

We will now discuss them, one by one, and demonstrate the principle for one or more programmes described in this Volume. It appears that the principles do indeed apply in strategy oriented writing programmes, but not in full.

Problem Centred

Learning to write is part of learning to communicate (Rijlaarsdam, Braaksma, Couzijn, Janssen, Raedts, Van Steendam, et al., 2008). A written text connects the author(s) to readers and vice versa. The act of writing in school is seldom an act in itself, writing-because-of-writing—the poetic function in Jacobson's system of language functions (Jacobson, 1960). But even when a text is meant to be read by the author only, as might be the case in diaries and other forms of expressive writing, the text still fulfils a role to connect two roles within the individual: the author and the reader. This connection is a crucial element in writing tasks: when writing is not followed by reading, the First of 'Problem centred' principle is not met.

The problem can be stated as a communicative problem, defined by factors in the communicative situation. Factors that constitute the problem at hand are at least fourfold: (1) characteristics of the author (personality, attitude, writing skill, and knowledge), (2) the communicative aim (to record,

report, explain, argue, persuade, etc.), (3) the relation between author (and co-authors) and readers (e.g., close versus distant), and (4) the intrinsic complexity of the referential object (the topic, the matters to convey) (see Moffett, 1968, for the factors 2, 3 and 4; see Foxworth & Mason's RAFT strategy, this volume).

Following this design principle, interventions or programs aimed at learning to write must start by showing students the real world task they will learn to master so that students can orient themselves and estimate their progress towards mastering the final task. This task is the driving force during the other phases in the learning situation.

The whole, real world task to complete is not shown in any of the programmes described in this Volume. In the programmes that focus on writing-to-learn, the content of the reading texts seems to be academic (history, natural science), and writing is used to enhance understanding of the topic. In the programmes that focus on learning-to-write, the task must fit the genre (compare-contrast, opinion essay), and might be of interest to students, but the content of writing does not seem to play a role in the other lessons, and the task serves the acquisition of a particular writing strategy. Even when communicative analysis is part of the strategy repertoire (Harris & Graham, this volume, Fidalgo & Torrance, this volume), there is no indication of problem centrality, a problem to overcome. The driving force that is created in these programmes, most obvious in Harris and Graham (this volume), is a personal motivation goal via goal setting procedures, perfectly fitting in self-regulated learning programmes. The problem created in these programmes is that students become aware that they must—and can—improve their writing. Certainly, there are many problems to solve for students to accomplish the tasks, as strategy-oriented programmes have problem-solving schemes as the key-heuristic to decompose the writing and learning process in doable elements. But it does not seem that the task as a whole is driven from a 'real world problem to solve'. Whether this is a deviation from Merrill's first principles for the selection of chapters, for strategy-oriented programmes, or for writing interventions in general is something to sort out. We leave the option open that there might be a variation of representations of the idea of 'Real world problems.' From a certain perspective, when one sees writing as a tool for communication, the real world problem is to establish a relationship with the reader, trying to guide the reader to a certain idea or action you want to share. From another perspective, for instance a learning science specialist, the real world problem is the lack of self-efficacy or trust or competence in writing, which might hinder a student to develop his capacities. And, even if an intervention does not deal with the Real World Problem as driving force for the course, the descriptive system detects that, and shows it: that suffices. There will be good reasons not to start from this driving force, but

from another force, like a lack of confidence in writing, the need to improve regulation and learning skills, the need to master subject knowledge.

Activation

Students must activate previous relevant experience. If this principle is applied in education that is skill oriented, like writing education, this principle is quite easy to implement. A completely new skill is rarely taught in writing education. What students learn is to improve a skill-already-present-to-a-certain-extent in a more complex situation or in a somewhat different situation (another genre, for instance). The striking feature of a new writing task is that students can already fulfil the task to some extent: they can write an 'approximate' text based on their experience. They can then build on this experience by adding the new knowledge that they need and will acquire in the next lessons to reach a higher level of writing competence.

This principle is demonstrated in chapter 6 (Harris and Graham, this volume, p. 132), when they describe that pupils write a kind of pretest prior to instruction to experience the task, so that the content of the following sessions can be built upon that experience, and pupils can refer to this text throughout and at the end of the lessons, to see how much they have learned, tracking and following their development and achievements.

Demonstration

Students must observe demonstrations of the procedures they can use to complete the target task (cognitive modelling). Please note that this step follows the Activation fase: first there is the experience, then the model(s). For interventions on learning to write this means: first children must write something that resembles the target text (activation or building experience), then observe a model, e.g., a teacher, demonstrating how she writes such a text while thinking aloud.

Most authors in this volume underline the importance of modelling, and provide examples of a large variety of applications. There is variety in content (cognitive modelling of a strategy, and/or modelling of self-regulation), variety in tasks, and in the level of detail of descriptions. A good example of detailed description is presented in Fidalgo and Torrance's chapter (this volume, p. 100), with rationales for the task set for pupils. They also showed that the modelling phase has strong effects on skill improvement. As this is clearly so important and varied, this principle must be described with as much detail as possible in intervention studies in which modelling plays a role.

Application

Next, students start to write or rewrite, with guidance and feedback, and may repeat this step several times. During this phase the level of guidance and coaching gradually diminishes, and task difficulty increases.

This stage or phase is present in almost all programs presented in this volume (all but Rosario's et al.). Here too, variation is observable. In CSRI (Fidalgo & Torrance, this volume, p. 103), students work in pairs and then individually, which is a common instructional measure for facilitating the move to independent, self-regulated learning. But special in this programme is that one member of the pair thinks aloud when applying the strategy step by step, while the other student observes and makes notes to provide feedback on the way the other student applied the strategy. Here the students form pairs of *learners*, rather than pairs of writers. In other chapters, like Martinez, Mateos and Martín (this volume), students form groups, and later pairs, working collaboratively to do the synthesis task that was set for them. Here the learning situation differs from Fidalgo and Torrance's programme, as it entails a form of distributed learning; students complement each other and work together to make the best of it. The learning occurs during their discussion on how to carry out and complete the task.

A striking difference in the programmes is the time allowed for the application phase. Harris and Graham's programme is the only one that embraces the mastery principle: each child should receive enough time to master the strategy that is on the menu. In the other programmes, time for application and relearning former steps are fixed.

This variety implies that in these programmes a diverse number of other principles guided the design of the Application stage. These principles must all be related to a theoretical point of view. For Harris and Graham, among others, a principal choice is the Mastery Principle; provide students the time they need to master the specific strategy or genre before moving on. For Fidalgo and Torrance it seems to be the standpoint that thinking aloud accompanies strategy acquisition, let us say, an Acquisition through inner speech Principle. Therefore it is understandable that Fidalgo and Torrance pay quite some attention to describing this stage, with a rationale: it is a characteristic choice.

Integration

Students show that they master the writing task to some degree; they write a text, and receive feedback from authentic readers. They can explain the strong points of the text, explain the choices they made, and the goals they tried to achieve.

This stage is fundamental for generalisation to other tasks, new types of tasks, learning situations, and genres. It means that students write another text (to experience and show their improvement) and that they make their progress in skill and knowledge explicit. This phase is seldom reported in the chapters of this volume, although it is most pronounced in Harris and Graham (this volume, p. 127). In her Reading and Writing chapter (this volume), Linda Mason describes the PLAN-strategy, 'a framework for developing personal product writing goals and methods for evaluating their writing performance' (Mason, this volume). Much is said about how goals are established and negotiated, but next to nothing about how students reflect on the extent they reached their goals. This phase also seems to get little attention in the twelve lesson series on synthesis writing (Martínez, Mateos, & Martín, this volume). However, the integration phase is well integrated in Fidalgo and Torrance's chapter (this volume, p. 105) as a reflection phase at the end of each of the two practice sessions: practice-in-pairs and practice-alone. Harris and Graham (this volume, p. 127) list various teacher activities to support generalization by students.

Perhaps integration is not, or should not be, a concluding phase, but a learning activity dispersed throughout the sessions (see Harris and Graham, this volume, in their theoretical chapter, p. 127), a procedure that was also implemented in the Martínez, Mateos and Martín chapter (this volume). This calls for a flexible, recursive pattern of the six principles, as Harris and Graham explain when they lay out the six *recursive* stages of SRSD (Harris & Graham, this volume, p. 127).

Interim Conclusion

Merrill's five First Principles seem a valid set of design principles to describe, compare, and evaluate the programmes presented in this Volume. Phases or stages in the programmes go hand in hand with the five principles. When we compared the programmes with the five principles we learned that not all principles receive equal attention in the descriptions of the programmes: the starting point (real world problem, problem centred) is usually missing, and the integration principle receives attention in only a few programme descriptions. This finding does not invalidate the set of principles as yet: (1) that principle one is barely represented in this set of programmes, might turn out to be a particular characteristic of strategy training programmes, while other writing improvement programmes do include it; (2) that the fifth principle is not operationalized in the programmes as a final instructional phase but rather as part of other stages, made us consider that principles can be realized in intervention programmes as recursive elements in instructional phases, rather than as separate stages.

The issue now is whether this focus on principle 2, 3 and 4 is typical for strategy oriented writing programmes, or writing programmes in general. In the next section, we will explore this idea, by relating the five principles to different rationales of writing-to-learn programmes.

Applying First Principles to Writing-to-Learn Programs

In this section, we will try to validate the five First principles for Writing-to-Learn programmes more generally than we did before for the strategy oriented programmes in particular. The assumption is that different rationales or conceptions of writing programmes correlate with a different emphasis on the five principles. Applying the five design principles on a variety of conceptions of writing programmes may show that these five first principles are indeed applicable, but that different rationales emphasize different design principles.

To explore this issue, we use eight conceptions of writing-to-learn that Klein and Kirkpatrick (2010, p. 3) presented as data. They present these eight design parameters as orientations:

(...) that teachers can use to create writing intensive content area units for a variety of topics in science and social studies; it is not a programme of prepared lessons. It attempts to coherently address several levels and aspects of content area writing education, including programme organisation, teaching strategies, activity type, motivational methods, and assessment.

The authors stress that the elements must be seen as complementary, to support the knowledge development via learning activities that lead to a certain text—most often in the argumentative or explanatory genres—and to a certain knowledge gain.

In Table 12.4 we present the eight design parameters Klein and Kirkpatrick reported—in the column Elements κ&κ—and relate them to Merrill's first principles (first column). For sake of clarity, we kept the order of the eight parameters Klein and Kirkpatrick reported, their definitions, and/or rationale, and illustrative teaching practices intact.

Table 12.4 shows that the eight elements—or rationales—Klein and Kirkpatrick (2010) distinguished all fit the set of First Principles. In the following paragraphs, we will discuss the content of the table, now following the order of the five first principles. Note that Klein and Kirkpatrick list various conceptions or paradigms of writing-to-learn programmes: designers, researchers, or teachers who depart from 'Content area literacy with a focus on writing' (Element 1) might combine this element with some other elements, but not necessarily.

TABLE 12.4 *Content literacy framework* (Klein & Kirkpatrick 2010) (adapted with permission)

Merrill's first principle	Element κ&κ	Definition and/or rationale	Illustrative teaching practices
Principle 4: Application (gradually withdrawn support)	1. Content area literacy with writing focus	Frequent writing contributes to content area learning; talk supports writing	<ul style="list-style-type: none"> – Writing three or more times per week – Reading to become familiar with analytical genres and learn content – Talk as a prewriting activity – Research using non-text and mixed media, e.g., internet; producing mixed media (e.g., explanations with diagrams)
Principle 1: Problem centred Principle 5: Integration Principle 2: Activation previous experience	2. Conception of writing as learning	Writers' goals guide their planning and revision	<ul style="list-style-type: none"> – Writing to interpret “raw” data and experiences – Discussing the purposes of writing with students – Reflecting on learning following writing sessions – Not providing source materials in the same genre in which students will write to prevent paraphrasing
Principle 2: Activate previous experience	3. Education in analytical genres	Argumentation and explanation are central to content area disciplines	<ul style="list-style-type: none"> – Reading in analytical genres – Constructing genre knowledge by analyzing models
Principle 2: Activate relevant genre knowledge	4. Analytical genres as heuristics for thinking and learning	Genre guides transformation of information from sources and construction of relationships among ideas in student text	<ul style="list-style-type: none"> – Writing arguments to think critically about content – Writing explanations to construct theories

Merrill's first principle	Element κ&κ	Definition and/or rationale	Illustrative teaching practices
Principle 1: Problem centred	5. Inquiry writing as preferred lesson type	Writing lessons built around interpretation of concrete data	<ul style="list-style-type: none"> – Pre-writing experiences to generate, e.g., experiments, observations, reading. – Teacher-led lessons on writing strategies – Writing to interpret data
Principle 3: Demonstration Principle 4: Application (gradually withdrawn support)	6. Cognitive strategy approach to instruction	Scaffolded instruction in planning and monitoring writing is highly effective	<ul style="list-style-type: none"> – Teaching a strategy for writing each genre – Gradual transfer of responsibility to students: Modelling, shared writing, guided writing, independent writing – Modelling self-monitoring and self-reinforcement
Principle 4: Application	7. Assessment to scaffold self-assessment, focused on ideas	Teaching self-evaluation may increase writing achievement	<ul style="list-style-type: none"> – Instructions to revise focus on genre-based relationships among ideas (e.g., claim-evidence; cause-effect) – Teacher and peer conferencing to scaffold revision – Students using checklists to monitor genre elements in their own writing
Principle 1: Problem centred; real communication	8. Building intrinsic motivation	Positive attitude toward writing predicts variance in achievement	<ul style="list-style-type: none"> – Interesting topics – Hands-on experiences – Peer collaboration

Note. Columns Element, Definition, and/or Rationale, and Illustrative Teaching Practices stems from the original overview from Klein and Kirkpatrick (2010); the first column (Merrill's First Principles) was added by authors of this chapter. In the original table, the column Definition and/or Rationale contained references to various authors. These were removed for the sake of clarity. See Klein and Kirkpatrick (2010) for more information.

What becomes clear is that each of the eight rationales in Table 12.4 seems to focus on one or two of Merrill's First principles. So here the First Principles help to identify the place writing obtains in the understanding of writing-to-learn conceptions. These two rationales can complement each other.

The first element in Table 12.4 reflects the idea that frequent literacy tasks (talk, reading, writing) support content acquisition. The learning is in the application of writing, without further instruction, with or without support.

The second element places emphasis on learning: the act of writing is meant to help understand problematic data and experiences, and is guided by setting goals and integrated in further learning.

The third and the fourth element both focus on genre knowledge: element 3 emphasises genre knowledge for a better understanding of texts, while element 4 aims to facilitate the productive guidance of genre knowledge.

The 5th, 6th and 7th rationale each place more emphasis on writing instruction. The inquiry element (element 5) has much in common with element 2, but differs in emphasis. The act of writing was used in rationale 2 for learning, while in element 5 data are used for writing.

In the 6th element we recognize the strategy-oriented programmes that are presented in this Volume, while element 7 emphasizes evaluation and revision as tool to better, and more precisely, understand relations between phenomena in the outer world (cause-effect) and the language used. The three rationales each place a different emphasis on the five first principles.

The 8th rationale departs from and revolves around motivation for writing. Interest and collaboration are the keywords here, with no emphasis on instruction. Both the topic of writing and the act of writing must be interesting. Therefore, principle 1 seems to be the guiding design principle in this case.

This exploration shows us at least two things related to the usefulness of the five first principles for describing interventions in writing education. First, the exploration shows that these principles seem to discriminate between different programs. Different rationales behind a programme lead to different choices in realizing and emphasizing the first principles. Second, we needed all five principles to label the eight rationales. We also found that the finding that principles 1 and 5 were underrepresented when we analysed the programmes on writing to learn presented in this Volume, corresponded with the finding in Table 12.4: the teaching practices related to strategy instruction as reported in this Volume do not show indices of real world problems as a driving force for the lessons, nor do they all put time and effort in generalization. This conclusion is just to demonstrate how the set of reporting elements can work out; we may expect that when our reporting scheme could have been the input for the

program descriptions, our analysis would result in other conclusions. Here we do not qualify the programs, but the descriptions that were available in the volume.

In Conclusion: Proposal for Reporting Interventions in Writing Studies

In this chapter we tried to set up a reporting scheme for writing interventions, to take a step towards setting a standard. We based the chapter on two sets of data: an analysis of learning activities generated and discussed in a seminar on strategy oriented interventions, and a validation of instructional principles on learning-to-write and writing-to-learn programmes. Our final proposal is an adjusted scheme we used in the Amsterdam seminar we presented in Figure 12.2 of this chapter. We now added the first column with the phases Merrill (2002) presented as First Principles in educational design, and the second column with learning activities to choose from, which might be further elaborated with more concrete activities from Table 12.2.

In Table 12.5 we present a scheme that might help to report the content and structure of future interventions in writing research. In its barest minimal form a reader must have access to information in columns 1, 2 and 4. That is a numbered list of learning activities and content in column 2, each positioned in one of the main phases of the lesson series (column 1), and clearly related to an instructional stimulus (column 4). The phases resemble Acts in a play, with learning activities as Scenes: as soon as the content or the cognitive activity changes, we speak of a new scene or another learning activity. In principle, Scenes and Acts are unrelated: all learning activities can occur in all phases. In reality, these two axes might actually be correlated.

The two columns with explanations or rationales require that the designer/researcher relates instructional design choices to theory, research, or experiences. We hope this scheme helps researchers report their findings related to writing intervention research in such a way that others can learn from them and help take writing research to the next level. We conclude this chapter with a call to share researchers' experiences with this or other schemes with a similar function: operationalize the construct of the interventions in a study.

TABLE 12.5 *Reporting scheme for interventions in writing to learn & learning to write research*

Design principle	Phase	Learning activity
		Describe
Label the design principles. A principle may occur more often	Choose from 1. Problem centred 2. Activation existing knowledge 3. Demonstration new knowledge/skill 4. Applying new knowledge/skill 5. Integrating new knowledge/skill	Label each learning activity in the sequence in terms of cognitive activity <i>and</i> content to operate upon and expected outcome/result. Add operationalisation from Table 12.2. For cognitive activity choose from main actions: 1. Observing/ Noticing 2. Divergent/ Generative/ Explorative thinking 3. Analysing/ Synthesizing/ Representing 4. Structuring/ Grouping/ Relating 5. Convergent/Evaluative thinking 6. Practising/ Consolidating/ Applying/Automate
Principle 1:		Activity 1 ...
		Activity 2 ...
		Activity 3 ...
Principle 2:		Activity n ...

Instruction/task, that stimulates or leads to learning activity		
Explain	Describe	Explain
<p>Explain This learning activity is effective because ...</p> <p>Relate learning result to former/ following Learning Result</p>	<p>Describe instruction/task, distinguish relevant features</p>	<p>Explain This instruction is effective, because/ these elements in the instruction leads to ...</p> <p>Relate features of instruction to the learning activity</p>

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